The NEW Kelvin® Elite Kel-Timer™ features redesigned start/finish sensors with LED lights that can be aligned quickly and easily.

KELVIN® ECONOMY MOTION TIMER

The NEW KELVIN® Elite Kel-Timer™ features redesigned start/finish sensors with LED lights that can be aligned quickly and easily. The Kelvin® Elite Kel-Timer™ Motion Timer provides accurate timing in a compact and durable design.

P.L.T.W. - PROJECT LEAD THE WAY

KELVIN® STEM Lab: Alternative Energy
Experiments with Wind, Solar & Hydro, #842472
Find Additional S.T.E.M. Labs on pgs. 2-8

KELVIN® Night Light
A photocell turns on/off a super bright LED as the room darkens or lightens. Night Light Battery Charger also available.

KELVIN® Kel-Air™ ORIGINAL
Air-Powered Dragster Launcher, p. 63, $245

KELVIN® #1 Innovation in Education

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Air-Powered Dragster Launcher, p. 63, $245
WOOD, Balsa and Foam Blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

Dear Educators & Friends

KELVIN® offers you the largest selection of educational products for Science, Technology, Engineering and Math. We offer challenging activities, kits, labs, and curriculum, as well as workshops and teachers training. And we take pride in offering you the lowest possible prices!

NY State Contract #PC67818

PO accepted from USA & Canadian Public Schools. Ships from USA (NY) and Canada (Ontario); GST added to Canadian invoice. Prices listed are in USD. USA & CAN, 1-631-756-1750 (EST)

KELVIN® Kel-Air™ Air-Powered Dragster Kits w/ Blanks

10 in. L wood blank (w/ pre-drilled axle & air input holes), wheels, axles, straw, screweyes and washers.

842380 Bulk Pack for 50 ........ $3.20 Per Kit $160

Requires Air-Powered Dragster Launcher, see pg. 62.

KELVIN® Economy Build A Better® Mousetrap Racer™

Includes: front wheels (1-3/8 in. dia.), CD inserts, mousetrap, wooden dowel rods with cable ties for mousetrap arm, wood bases and axles.

841414 Bulk Pack for 100 ....... $1.95 Per Kit $195

KELVIN® Clipper Glider

841233 Bulk Pack for 10 .......... 99¢ Per Kit $9.95

Find More Planes on pgs. 66-70

Downhill Racer

Scouts love this activity, now you can do it too!

Bulk pack includes: 30 blank wood wedges, 30 high speed wheel sets with high speed axles.

841817 Bulk Pack for 30 ........ $3.30 Per Kit $99

KNELVIN® Pontoon Boat Kit

Design a boat that runs on an alternate form of energy. Includes (2) foam blanks (2 x 2 x 12 in.), wood parts, propeller and a rubber band.

842406 Pack of 20 Kits .......... $4.95 Per Kit $99

KELVIN® Foam Penny Racer™

Bulk pack includes foam blocks to shape, wood chassis, wheels, axles and instructions. Gr. 1-6.

842038 Bulk Pack for 20 ......... $3.49 Per Kit $69.95

Hovercraft Racer

Includes floating bag, foam, motor, propeller, battery holder and switch. Requires (4) AAA batteries as well as tools for cutting and shaping.

842391 Bulk Pack for 20 ....... $5.95 Per Kit $89.25

Super Capacitor Hovercraft

A simple and effective hovercraft that floats above a smooth surface. Does not need or require batteries.

841805 Bulk Pack for 10 ........ $9.90 Per Kit $99

KELVIN® Universal Maglev Base

Attach student designs to this standard maglev base with velcro strips.

841412 Bulk Pack for 100 ....... $1.45 Per Kit $145

Outlet Maglev Magnets

1x3/4x3/16 in., 250/pkg.,

640090 ....................... $36.95 or $32.50 ea./3+

Pre-Drilled Air Input Hole

Pre-Drilled Axle Holes

ONLY $3.30 PER KIT

ONLY $5.95 PER KIT

ONLY $9.90 PER KIT

ONLY $3.20 PER KIT

ONLY $1.95 PER KIT

ONLY $1.45 PER KIT
NEW! KELVIN®
Worm Gear

This versatile worm gear can be used for a
variety of projects. It features two hole sizes.
One side fits a 2mm motor shaft. The other
side fits a 1/8 in. axle. Black. Does not include
motor and gear assembly shown.
990377 10/pkg. .......... $9.95 or $9.45 ea./3+
See pg. 98 for More Worm Gears.
See pg. 99 for Gear Boxes

KELVIN® Universal Motor Mount

This unique KELVIN® motor mount can be used
with smaller motors (like 850646 or 851949)
combined with the insert or it can be used
without it for bigger motors (like 850647, 850887,
851230, and 851950).
990364 10/pkg. ........ $5.95 or $5.45 ea. pkg./10+
See pg. 93 For More Motors Holders

Small Project Motor with Solder Tab
Nom. voltage: 1.5 V DC. Voltage: 1.2-3 V DC.
Current: 0.034 A. Speed: 10,200 rpm. Torque: 6.81
g/cm. Shaft dia.: 2 mm. Shaft length: 8.1 mm.
Dimensions: 20 x 25 mm. Wire length: 125 mm.
850646 .......... $95¢ or 89¢ ea./10+ or 69¢ ea./100+

KELVIN® Worm Gear

As Low As
69¢
Per Motor

As Low As
79¢
Per Motor

Project Motor with Solder Tab
Nom. voltage: 6V DC. Voltage: 3-6V DC. Current:
0.026 A. Speed: 17,000 rpm. Torque: 20.72 g/cm.
Shaft dia.: 2 mm. Shaft length: 6.5 mm.
Dimensions: 23.5 x 27 mm. Wire length: 125 mm.
850647 .......... $99¢ or 95¢ ea./10+ or 79¢ ea./100+

Project Motor with Wire Leads
Nominal voltage: 2 V DC. Voltage: 0.7-5 V DC.
Current: 0.018 A. Speed: 2,200 rpm. Torque: 2.8
g/cm. Shaft dia.: 2 mm. Shaft length: 6 mm.
Dimensions: 25 x 13.5 mm. Wire length: 125 mm.
851105 .... $3.35 or $2.95 ea./10+ or $2.75 ea./100+

BULK PACKS

$245
Per Kit

KELVIN® Basic Car Platform
Add your own body design from foam, cardboard, etc.
Each kit includes wood base (1/4 x 1-1/2 x 6 in.), wheels,
axes & straws. Shaping, hot gun gluing & assembly req.
842439 Kit ........................................ $2.95 or $2.45 ea./10+
841417 Bulk Pack for 100 ......................... 99¢ Per Kit $99

NEW!
KELVIN®
Balloon Racer

842477 Kit .................. $3.45 or $2.95 ea./10+
842482 Bulk Pack for 30 .................... $73.50

See pgs. 92-93 For More Motors

Find More
Build Your
Own® Car
Kits on
pgs. 57-59

BUILD & DECORATE YOUR WAY

As Low As
99¢
Per Kit

KELVIN® Worm Gear

Fits 1/8 in. Shaft
Fits 2mm Shaft

GREAT DEALS ON BULK PACKS

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
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**NEW**

KELVIN® STEM Lab: Beams & Triangles™

KELVIN® NEW STEM lab lets students design and build structures, vehicles and mechanisms with this unique assembly system. Extra parts and an instruction manual complete the lab. Cut, join and assemble wood beams using specially designed tools, holding jigs and materials. This lab is perfect for the young engineer and builder. Each lab provides enough materials to construct many items depending on size.


Assign teams of two students each to investigate the kits. Students design their own display board or project portfolio for use in the classroom or STEM fair. Requires assembly with hand tools.

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<th>Code</th>
<th>Description</th>
<th>Price</th>
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</thead>
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<td>842475</td>
<td>Team Pack for 10 - Tools &amp; Parts</td>
<td>$145</td>
</tr>
<tr>
<td>842479</td>
<td>Class Pack for 20 - Team Pack x 2 plus ★ BONUS Hand Drill, Drill Bits &amp; Clamp-On Work Vise</td>
<td>$290</td>
</tr>
</tbody>
</table>

**Activity Guide**

Find Beams & Triangles™ on pgs. 38-39
**KELVIN® STEM Lab: Kre8®**

Kre8® products are built from a unique building system consisting of tubes and connectors. The system can be used to model structures, vehicles and mechanisms. The tubes are cut to size using the included snips and snapped into position using different connectors. Parts are included to mount motors, gears and wheels. This is the perfect lab for the young engineer.

The Team Pack consists of four pre-designed ready to build kits - Jet Car, Solar Car, Mars Rover, Catapult - as well as an open-ended kit - STEM Maker - used to model student-designed objects. Two snips and an instruction manual complete the lab. Assign teams of two students each to investigate each of the kits. Requires assembly with snips.

- **842476** Team Pack - 5 Kits & Manual ............................................ $99.95
- **842480** Class Pack - Team Pack x 3 plus ★ Kre8® Robotic Arm ......... $295


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Kre8® kits can be assembled in regular classrooms. Kits may require hand tools and adult supervision. Kre8® is a registered trademark of KELVIN L.P.

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KELVIN® STEM Lab: Alternative Energy - Wind, Solar & Hydro

This lab includes kits that will help students, in teams of two, explore different aspects of alternative energy - wind, hydroelectric and solar. Additional parts are included, so they can apply their knowledge with their own designs. Activities include designing and building a:

- Wind Turbine (2 included), powered by a hair dryer (not included), to light an LED.
- Solar-powered Model Car.
- Solar-powered Model House.
- Hydroelectric Generator that uses running water from a sink or hose to generate electricity.

The Team Pack includes: 2 Wind Turbine Kits, Hydroelectric Kit, Solar House Fan Kit, Solar Car Kit and more.

The display board is not included; students design their own display board or project portfolio for use in the classroom or STEM fair. Needs assembly with hand tools as well as blower fan and access to running water.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
<th>Grade Level</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>842472</td>
<td>Team Pack - 5 Kits, Extra Parts &amp; Manual - Grades 7-12</td>
<td>$75</td>
<td></td>
</tr>
<tr>
<td>842473</td>
<td>Class Pack - Team Pack x 3 plus ★ BONUS [2] 50LE Multimeter - Grades 7-12</td>
<td>$225</td>
<td></td>
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</tbody>
</table>

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
S.T.E.M. LABS

KELVIN® EDUCATIONAL

KELVIN® STEM Lab:
Work, Machine & Gears

Discover how the application of gears help machines perform work with speed and power. KELVIN® NEW lab uses a hands-on approach to teach the concepts of gearing up, gearing down and gear train design.

Students, in teams of two, will assemble gear trains, calculate gear ratios and predict gear directions. They will also build vehicles experimenting with gear train designs to help solve speed and torque problems.


KELVIN® STEM Lab:

WOOD, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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Unlock the mystery of motors for your students with this KELVIN® STEM Lab. Students, in teams of two, will explore hands-on activities including: Single Magnet Motors, Electromagnets, Reverse Engineering DC Motors, Motor Driven Air Powered Carts and more discovery experiments.

The Team Pack includes:

- [5] Air Cart Kits
- [8] DC Motors
- Battery Holders
- Magnets
- Cardstock Wheels
- Wood
- Axles
- Pliers
- Cardstock (pre-cut & scored)
- Motor Mounts
- 50LE Multimeter
- Alligator Jumper Cables
- Propellers
- Copper Wire
- Magnet Wire
- Solid Wire
- Two Compasses
- Abrasive Paper
- Nails
- Rubber Bands
- Wood Mounting Blocks
- Detailed Instructions

Students can design a display board or project portfolio for use in the classroom or STEM fair. Requires assembly with hand tools and batteries (AA and D). Gr. 7-12.

842486 Basic Pack ................................................. $125

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“I spent the past thirty-two years as a middle school Technology Education teacher. I personally used the engineering activities featured on this page with my students with great success. The activities are challenging, fun to design, build and to apply the mechanical concepts to real world situations.” – Neal Swernofsky

KELVIN® STEM Lab: Mechanical Engineering

Design and model working mechanisms that solve real world engineering problems with this new STEM Lab. Change rotary motion into linear and reciprocating movement using linkages, cams, cranks and gear trains.

Five teams, two students each, select three challenges from a list provided in the lab instructions. Enough materials are provided for the teams to build 15 models total.

The Team Pack includes: Printed Grid Paper, Gears, Pulleys, Cams, Cardstock, Kre8 Parts, Plastic Wheels, Fasteners, Cardstock Wheels, String, Dowel Rods, Design Problem Cards, Spray Glue and Instructions.

Students design their own display board or project portfolio for use in the classroom or STEM fair. Requires assembly with hand tools. Teachers will need to supply glue and hand tools (such as a ruler, scissors, awl, hole punch, utility knife, etc.).

842489 Team Pack - 5 Kits, Extra Parts & Manual ................................................................. $95
842478 Class Pack - Team Pack x 3 plus ★ BONUS STEM Mechanical Tool Pack 7 .......... $285

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® STEM Mechanical Tool Pack 7

The STEM Mechanical Tool Pack includes Awl, Hole Punch, Plastic Ruler, Utility Knife, Scissor, Mini Cool Glue Gun with Slugs, and Safety Edge Cutting Guide. 842312 ......................................................... $29.95

★ BONUS PRODUCT included with Class Pack

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Aeronautics and Flight

Design Challenge
build and test the performance of different style model aircraft and their components.

Specifications

- May only use materials provided by the teacher.
- Must model a glider, powered plane, propeller and helicopter with five flaps.
- Must demonstrate the impacts of changing the center of gravity and size on lift.
- Must demonstrate the impacts of changing the number of surface features such as wood, rubber and cardboard.

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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NEW

KELVIN® STEM Lab: Aeronautics & Flight

Trace the expansion of aeronautics and flight design with the KELVIN® Aeronautics & Flight STEM Lab. Students will learn and apply the principles of flight as they build and test gliders, rubber band powered planes and helicopter rotors. Explore the force of lift by forming an airfoil glider wing. Control flight by adjusting wing flaps. Set the dihedral wing angle and wind the propeller that provides thrust for a balsa plane. Assemble the double rotors to fly the helicopter simulator.


Assign teams of two students each to investigate the kits. Students design their own display board or project portfolio for use in the classroom or STEM fair. The display board is not included. Req. assembly with hand tools.

842487   Adv Team Pack - Basic Team Pack w/ Rubber Band PowerPole™ plus ★ BONUS Propeller Winder ................. $145
842485   Basic Class Pack - Basic Team Pack x 3 ................................................................................................. $275

Blue Bird Foam Gliders

Rubber Band PowerPole™

Double Prop Helicopter

Propeller Winder

★ BONUS PRODUCT

included with Adv. Team Packs

851266, $7.95 or $7.45 ea./6+

Find Foam Gliders
on pgs. 66-70

Find KELVIN® Rubber Band PowerPole™ Systems & Planes on pg. 67

Find the Double Prop
Helicopters on pg. 68

Find Propellers & Winders
on pgs. 94-95

Find Foam Gliders

on pgs. 66-70

Find KELVIN® Rubber Band PowerPole™ Systems & Planes on pg. 67

Find the Double Prop
Helicopters on pg. 68

Find Propellers & Winders
on pgs. 94-95

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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**KELVIN® Cuss Remediator Kit**
The user loses a coin each time they cuss. The ‘Cuss Remediator’ will drop a coin into a container in a series of steps. Keep in mind that Rube Goldberg® made his drawings as a reaction to technology. They were a linear series of complicated steps to perform a simple task. The first lever is pulled by someone after a person cusses, thus activating a second lever, which in turn activates a third lever pulling the magnet away from the steel ball (4th step). The steel ball rolls down the ramp tipping the teeter-totter (5th step) and knocking the coin onto the exposed wires (6th step), which in turn activates the buzzer (7th step) thus vibrating the coin into the cup (8th and last step).


841854   Kit ...........................................$29.95 or $27.95 ea./6+ $25.95 ea./10+
841856   10 Kit Bulk Pack ................................$19.95 Per Kit $199.95

**KELVIN® Hard-To Find Machine Contest Materials**
Since 1989, students have been challenged to participate in their local Rube Goldberg® Machine Contests. Students can learn about: Following Directions, Assembling a Product, Simple Machines, Systems and Sub-systems, Simple Electrical Circuits, Basic Wood & Metal Fabrication, and Problem Solving.

KELVIN® provides the hard-to-find materials students need to supplement their machine’s whether they are using the national design theme or their own class theme.

**Rube Goldberg® Explorers Team Packs**
The kind of items in this package include, but are not limited to: ping pong balls, marbles, dowel rods, string, springs, pulleys, gears, plastic spoons, plastic cups, mousetraps, balloons, etc.

841300   1-2 Students ..............................................$19.95 or $18.95 ea./4+
841301   2-4 Students ............................................$39.95 or $37.95 ea./3+
841302   Bulk Pack for 4-8 Kids ....................................$125

**Rube Goldberg® Electronics Team Pack**
The kind of items you’ll find in this package include, but are not limited to: switches, wire, sensors, battery holders, buzzer, bulbs, bulb holders, magnetic switches, gearbox kit, etc.

841303   2-4 Students ............................................$39.95 or $37.95 ea./3+

**Rube Goldberg® Electronics Class Pack**
4 Electronics Team Packs PLUS a soldering iron, multimeter, wire cutter and gearbox kit.

841304   For 8-16 Students .............................................$125

**KELVIN® Simple Machines Lab**
Students can experiment with hands-on activities to learn about simple machines like gears, pulleys, wheels levers, and inclined planes. Covers subjects like mechanical advantage, rotational direction, angle, force, wedges, lifting loads, friction and friction belts.

Kit includes enough materials for one student to complete experiments including: laser cut plastic work board, gears, pulleys, string, rubber bands, spring scale, protractor, screws and instruction book.

**Kit w/ Laser Cut Plastic Work Board**
841743 .................................................................$32.95

**Economy Kit w/ Cardstock Template Only (NO WORK BOARD)**
841752 ..................................................$19.95 or $17.95 ea./10+

**Class Pack for 10 (NO WORK BOARD)**
282198 ..................................................$125 or $115 ea./3+

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KELVIN® Reverse Engineering A Flashlight
Reverse engineer an everyday product and discover its designer’s ideas and concepts. The activity includes step by step instructions for the student and teacher along with probing questions that direct the students’ investigation of the product.
Each kit comes with: Flashlights, Student Study Guides and a Teacher Resource Guide. Please note actual project contents are subject to change.
841828  Bulk Pack for 10 ................................................As Low As $8.99 $89.95

KELVIN® Hand Crank Flashlight
Turn mechanical energy into light energy using our Hand Crank Generator Flashlight Kit. Batteries not needed. Assemble the LED circuit within the pre-scored cardstock body. The crank turns a small DC motor changing the mechanical energy into electrical energy lighting the LED.
842442  Kit ..........................................................$11.95 or $9.95 ea./10+

KELVIN® Hand Crank Headlamp
When the lights go out use this headlamp to help get around. Crank generator lights three super bright LEDs. The head strap is adjustable.
842444  Kit ..........................................................$19.95 or $14.95 ea./10+

KELVIN® Mini LED Flashlight
Design, assemble and test a keychain flashlight with a super bright LED. Requires a heat gun.
842037  Bulk Pack of 25 ........................................$2.95 Per Kit $73.75
842259  Assembled Demo ..................................$39.95

KELVIN® Discover It™ Lighthouse
Students can design their own creation, model an existing lighthouse or use the KELVIN® design to produce a working model. Class pack includes [30] pre-printed cardstock, knife switches, lamps, lamp bases, wires, battery holders and instructions. Requires AA batteries. Grades 2 & up.
842044  Bulk Pack of 10 Kits ..........................................................$5.99 Per Kit $59.95
842045  Bulk Pack of 20 Kits ..........................................................$4.99 Per Kit $99.95

KELVIN® Lamp Kit
A great product for mass production projects. It can also be used for fund raising. Students design and construct the base for this lamp out of almost anything—a stack of books, a mason jar or a creative wood sculpture. The kit includes: 6 ft. long cord with plug, push-thru socket, 12 in. lamp pipe, and [2] hex nuts. Requires harp/final below.
840675  Kit ..........................................................$6.95 or $5.95 ea./10+
842383  Bulk Pack of 15 ..................................................$5.66 Per Kit $84.95
280162  Harp/Final, 10 in. long ...........................................$3.75

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
**KELVIN® Shapes in Paper Kit**
The Shapes in Paper Kit enables students to build a pyramid, a cylinder, a cube and a prism. They learn how these 3-D shapes can be constructed from flat materials similar to what an engineer might do in designing ductwork or metal cabinetry for industry. The finished products can be used as samples for practicing shading and 3-D renderings.

841318 ......................................................... $4.95 or $4.75 ea./10+ or $4.45 ea./25+

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**KELVIN® Geodesic Dome Kit**
In utilizing the Geodesic Dome Kit, the children can build structures and arrange them to build spheres or a model station for an alien planet. Students learn about the construction of geodesic domes as well as the shapes that go into their development. Architectural concepts are also studied.

This kit includes heavy pre-printed cardstock that students can use to build and decorate their geodesic dome according to the criteria and constraints from the teacher.

841321 .......................................................... $2.95 or $2.85 ea./10+ or $2.75 ea./25+

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**KELVIN® Packaging Design Challenge™**
Students build four different types of boxes. They can decorate these boxes prior to assembly as a design activity. For a design challenge, have students design the product information, promotional words, packaging for a: Soap Box, Jewelry Box, Perfume Box and Game Box. After assembling their box, they design the decoration, logo, UPC code, etc.

This kit includes heavy pre-printed cardstock that students can use to build a box or container and decorate it according to the criteria and constraints from the teacher.

841312 .......................................................... $3.45 or $3.25 ea./10+ or $2.95 ea./25+
841821 Bulk Pack for 35 .............................................. $4.14 Per Kit $145

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**KELVIN® Egg Drop Design Challenge™**
In this activity, students apply the principles of physics and engineering by designing and testing a container to protect an egg that is dropped from a given height. Mathematical principles will also be used, incorporated in calculating the efficiency of the unit. Kit includes: cardstock, craft sticks, balsa wood strips, high-density foam, bubble wrap, graph paper, isometric paper and instruction guide. Eggs not included.

This kit includes heavy pre-printed cardstock that students can use to build a box or container and decorate it according to the criteria and constraints from the teacher.

841339 .......................................................... $7.95 or $7.45 ea./10+ or $7.25 ea./25+

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
S.T.E.M. ACTIVITIES

6D Design for the Sides, Top & Bottom!

**KELVIN® Design-A-Totem Pole™**

Every part of a totem pole is significant and has its own story. Northwest Pacific Coast Natives carved totem poles as records of the past in a culture that had no written language.

Students design all six dimensions (top, bottom and 4 sides) of the totem pole either using grid paper or, for more advanced students, CAD software. After drafting a final design, students transfer it to the wood blank. Using various wood crafting techniques, they carve out their totem pole. The totem pole can be sanded and then considered finished or taken even further by painting it.

Includes DesignGrid® Paper and Wood Blank. Plans are not included to encourage student problem-solving skills. Grades 3 to 8.

841150 ................................................................. $6.95 or $6.45 ea./10+

KELVIN® Design-A-Top™

Tops are among the oldest toys. The first may have been nuts or other symmetrical forms found in nature. Tops as toys were used by the early Chinese and Japanese, and other early civilizations around the world.

While a seemingly simple device the operation of a top is based on application sophisticated science principles including: torque, angular momentum, gravity, center of gravity and precession. Opportunities to relate concepts such as symmetry in design and planning, to apply knowledge related to math in areas of measurement, and skills in technical areas such as cutting, shaping and fastening are all part of the make of a Keltop.

Kit includes: 3/4 x 1 x 5-1/2 in. soft wood stick, 1/4 x 6 in. wood dowel, #18 x 1/2 in. escutcheon pin, 18 in. long piece of string, KELVIN® CD 1/4 in. axle insert, KELVIN® CD wheel and a KELVIN® TeAct Direction Sheet.

282383 Bulk pack for 50 ............................................ $1.50 Per Kit $75

Experience the world of creativity, invention, technology education and engineering through the eyes of a nationally recognized engineer, inventor, and technology educator Harry T. Roman.

**Thomas Alva Edison: Prophet of Progress**

Re-live the excitement of the world’s greatest inventor as he completely changed our world. Much of what we take for granted today was the brainchild of the great Mr. Edison. Learn how his inventive world was so similar to technology education, and what it teaches us today for the classroom.

652338 Booklet ...........................................$14.95 or $13.95 ea./10+

**Engineering: More Than Just Technology**

Learn how engineering and technology education are intimately related, both historically and in the practical world. Understand the engineering process as discussed through actual examples given by the author in his own career. Explore values of an engineering education, the fields of engineering available today, and how to prepare for a challenging and well-paying job in it.

652336 Booklet ...........................................$14.95 or $13.95 ea./10+

**Technology, Invention & Creativity in the Classroom: The Road to Relevancy**

Designed to stimulate creative thinking and integrated problem solving, this book will provide the basics for unleashing the creative potential of students. It is loaded with real-world information and techniques for integrating the curricula; and a superb way to bring heads and hands together in the classroom. Learn how inventor’s invent and move their products to the market.

652295 Booklet ...........................................$14.95 or $13.95 ea./10+
652335 Workbook ...........................................$14.95 or $13.95 ea./10+

**Technology Education: Themes, Issues and Classroom Activities**

Take a tour of the many issues and themes of technology education today. This book surfaces a variety of valuable tech ed topics for you and your students to discuss; and presents a wealth of practical activities for your classroom.

652337 Booklet ...........................................$14.95 or $13.95 ea./10+

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KELVIN® Design-A-Clock™ Kit
A fun project ideal for Technology, Arts, Crafts, Fairs and Fundraisers. Kit includes a round or square wooden clock face with pre-drilled hole, quartz clock movement (2-1/4 in. sq. x 5/8 in. thick) with arabic numbers (1/2 in. high), seconds, hours and minute hands (6-3/8 in. diameter), washers, nuts 6 colors of poster paint and a paintbrush. Requires AA battery.
841765   Kit w/ 10 in. Round Face ..........$15.95 or $14.95 ea./6+ or $13.95 ea./20+
841764   Kit w/ 10 in. Square Face ..........$15.95 or $14.95 ea./6+ or $13.95 ea./20+

Quartz Clock Kit
Design your own clock for any occasion. Includes a digital quartz clock movement that measures 2-1/4 x 2-1/4 x 5/8 in. with a 3/8 in. L x 5/16 in. diameter threaded shaft (includes washers and nuts). Also included are clock hands for hours and minutes with a diameter of 6-3/8 in. Requires a AA battery (#220016).
280161  Quartz Clock Kit. ..........................................................$5.00 or $4.45 ea./10+

KELVIN® Design-A-Game™ Classroom Challenge
Students begin by sketching and describing their game (the rules, how many can play, why it would be fun, etc.). They then continue to design the game mechanically or use desktop publishing software and a computer. Use the products below and other materials to BUILD a prototype and EVALUATE the game by playing it. With FEEDBACK from participants, students should make any adjustments needed to make the game a success. Grades 2-12.

Design-A-Game™ Class Pack
This class pack contains: 120 Assorted Dice (20 ea. of 4-, 6-, 8-, 10-, 12- and 20-sided), 500 Large Pawns, 500 Novelty Pawns (100 ea. of Rocket, Airplane, Horse and Rider, House and Hotel), 100 Scoring Pencils, 10 pkgs. of Paper Money, 20 Sand Timers (10 ea. of 10-second and 30-second), 35 sheets of 24 x 36 in. Chipboard for the game board, and 50 sheets of DesignGrid™ Paper and 20 cardboard boxes for game storage.
840998  Design-A-Game™ Class Pack ................................................$245

Design-A-Game™ Parts
Use your color printer to design the box cover! Both part sets include playing board, unassembled blank game box, large game pawns (assorted colors), spinner, 2 backgammon dice, sand timer, blank paper and DesignGrid™ Paper.
The Advanced Parts set also includes additional pawns (rocket, horse, hotel, house, airplane), fake money and doubling dice.
841049  Basic Design-A-Game™ Parts .........................$7.95 or $6.95 ea./24+
841050  Advanced Design-A-Game™ Parts ..................$9.95 or $8.95 ea./24+

Design-A-Game™ Box Kit
Cardboard for creating top and bottom boxes (8 x 11 in.). Ready for design, cutting, assembly and decoration.
430158  20/pkgs. .................................................................$49.95

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Cardboard Constructions Guide
How strong a stool can students construct from a small cardboard box? Will it support an adult? Building on this experience, students build a bed using a large piece of cardboard supported by small boxes. In the final activities, large modular houses are constructed from refrigerator boxes. 651814 .......... $9.95 or $8.95 ea./10+

Sand & Water Clocks Guide
Students use flowing sand and water in connected soda bottles to try to make accurate and consistent sand and water clocks that time intervals. 651669 .......... $9.95 or $8.95 ea./10+

Pinball Guide
Build pinball games complete with bumpers, traps, flippers and plungers. Students assign their own numbers to their traps and decide where they should be, and test different methods of launching the ball. 651660 .......... $9.95 or $8.95 ea./10+

Paper Bridges Guide
Make strong structures with limited materials. Students perform more and more difficult challenges to uncover many simple principles of bridge building. 651668 .......... $9.95 or $8.95 ea./10+

Blinking Lights Guide
Your students are challenged to design a flashlight from a soda can, cardboard, battery and wires. A rotary switch can also be designed, which is used to control a model traffic light system. 651658 .......... $9.95 or $8.95 ea./10+

Brick Band Powered Cars Guide
Using cardboard, dowels, plastic plates, and rubber bands, students can build their own cars, and learn in a direct way the engineering concept of optimization by testing different sized rubber bands and different diameter plates as wheels. 651663 .......... $9.95 or $8.95 ea./10+

Straw Rockets Guide
Launch the outer straw like a toy rocket by blowing. By using a sandwich bag propulsion system, students test different kinds of fins while trying to refine their toy rockets so that they will hit targets consistently. 651816 .......... $9.95 or $8.95 ea./10+

String Telephones Guide
Using paper cups & string, discover principles that govern the simplest form of a string telephone. Refine this model with other materials and get messages to go around corners. 651817 .......... $9.95 or $8.95 ea./10+

Cranes Guide
Using a cardboard box as the body, yardstick as a boom, and small electric motor as the power source, students make a working model of a crane. Use different ways of attaching string to the shaft of the motor so that it can lift varying amounts of nails in a cup. 651813 .......... $9.95 or $8.95 ea./10+

Balloon Powered Cars Guide
There is more to this project than just making an inflated balloon move a car. Engineering involves designing a way to support the balloon and get it to work consistently. Match the power requirements of the car with the right balloon. Nozzles can be designed and tested. 651659 .......... $9.95 or $8.95 ea./10+

Giders Guide
Construct simple planes from paper. After testing designs for tails, bodies and wings, construct a rubber band launcher. This allows for a more consistent way of evaluating all of the variables. 651661 .......... $9.95 or $8.95 ea./10+

Spinning Toys Guide
Plates, dowels, rubber washers, and tuna fish cans become homemade tops and yo-yos. Uncover the principles of balance and spin. 651815 .......... $9.95 or $8.95 ea./10+

Trebuchets Guide
Start with a working design of an ancient throwing machine similar to catapults and slingshots. The challenge is to improve on the design by testing and adjusting the different parts of this device. 651667 .......... $9.95 or $8.95 ea./10+

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S.T.E.M. ACTIVITIES: EDC EXPLORE IT!

EDC EXPLORE IT! LESSON GUIDES
A series of introductory science experiences with instructions for each project as well as implementation suggestions for extended projects. Suitable for after-school programs and elementary school students (ages 8–12). Funded by the National Science Foundation and developed by the Education Development Center, Inc.

Soda Science
Children can make up their own soda recipes while practicing the mathematical operations of ratio and proportion. Then, they analyze a real soda to compare how the ingredients in the commercial version compare with theirs.
652285 $9.95 or $8.95 ea./20+

Heating a House & an Oven
By finding different ways to insulate a cardboard "house" warmed by a 40W light bulb, children explore the difference between the heat and temperature. Using a 100W bulb, they turn the house into an "oven" that can bake cookies.
652282 $9.95 or $8.95 ea./20+

Wiring a House
Children discover some of the principles of practical wiring and electrical circuitry by installing lights and switches in the rooms of a cardboard house. They follow electrical "pathways" to explain why some light bulbs shine differently.
652286 $9.95 or $8.95 ea./20+

Exploring Food
Marooned on a desert island with a limited food supply, children investigate the properties and make-up of common foods. Investigations of water, fat and the roles of starch and gluten in flour all contribute to the overall question of what is a "balanced" diet.
652280 $9.95 or $8.95 ea./20+

Cake Chemistry
What are the ingredients in a recipe that cause a cake to rise? Is the same gas produced when using baking powder, baking soda, or yeast? These are some questions pursued in this exploration while, at the same time, getting to eat experiments!
652279 $9.95 or $8.95 ea./20+

Bubbles
Floating giant bubbles (3 feet in diameter), small bubble domes on a table top, and soap film in frames are ways to observe some of the more obvious properties of bubbles (such as their round shapes) as well as subtle properties (such as surface tension).
652278 $9.95 or $8.95 ea./20+

Colliding Balls
Using a piece of molding as a track and a set of different kinds of balls, children experiment to see what happens when the balls collide with each other, through which children gain some sense of how objects exchange energy.
652277 $9.95 or $8.95 ea./20+

Permanent Magnets and Electromagnets
Children explore the properties of permanent magnets, such as how to make their magnetic fields visible. Making fun gadgets help determine the properties of electromagnets.
652281 $9.95 or $8.95 ea./20+

Sinking & Floating
Children explore the buoyancy of common objects and make boats from a variety of materials. Gaining a sense of the contribution of the material and shape will sink or float. They repeat their experiments with other solutions to see how the type of liquid makes a difference in how things float.
652283 $9.95 or $8.95 ea./20+

Measuring Ourselves
Children measure their own bodies in a variety of ways to learn more about their basic physical make-up and to observe both the consistency and variation of body shape, size, and strength among their peers.
652287 $9.95 or $8.95 ea./20+

Siphon Systems
Using an arrangement of plastic tubing and a special connector, children transform a soda bottle into an interesting device for exploring how water flows through a closed or open system. Connecting multiples of bottles allows analyzing what happens to the air and water pressure.
652284 $9.95 or $8.95 ea./20+

Balancing Toys
Children transform a pool noodle into a model of a person, a plane, and a boat, and then manipulate them to see how they balance. They also build simple mobiles to explore other kinds of balancing arrangements to understand about equilibrium.
652275 $9.95 or $8.95 ea./20+

Balloons
Different sizes and shapes of inflated balloons can be launched in a variety of ways with the result being different trajectories and different distances traveled. Children learn about the phenomena of action-reaction and the properties of air pressure.
652276 $9.95 or $8.95 ea./20+

Implementation Guide
Designed to serve as an introduction to the Explore It! series, this guide covers aspects of managing and structuring each exploration by providing suggestions for effective practices that engage the children in a productive and satisfying experience.
652345 $9.95 or $8.95 ea./20+

Complete Explore It! Series Set
652562 $139.95

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COMMUNITY DESIGN: S.T.E.M. ACTIVITIES

Have students begin work as town planners by designing their own mini-community.

KELVIN® Build-Your-Own® Community Design Challenge
A great cooperative class project that integrates many subject areas, including: tech ed, math, science, social studies and art. Set up problem-solving scenarios such as lakes, streams or hills which students must consider in their designs. Stores, schools, houses and roads must be worked into the layout of the community.

Materials included permit students to design original miniature structures or they can work with pre-designed buildings. Students develop a portfolio emphasizing key concepts covered in the project. This activity offers an excellent opportunity for students to learn about the concepts of community planning while working in cooperative groups. The finished project makes an excellent display for Parents' Night or to promote your technology program.


Kit includes: foam boards (for project platform), pre-printed building patterns with windows and doors, extra windows and doors, pre-printed patterns for stores and school, accessory starter set (trees, cars and people), Land Developer Design Portfolio and grid cardstock for designing new buildings.

Kit with Accessory Starter Set
841395 ............................................................................................ $149.95

Economy Community Design Kit
841442 Kit without Accessory Starter Set................................................... $64.95

Accessory Starter Set
Includes cars, people, trees and bushes as well as paint and brushes.
Close to N-Scale.
841403 .............................................................. $99.95 or $89.95 /4+

KELVIN® Basic Design-A-Deck
Includes instructions and enough materials (wood and brads) to make a student-designed deck and stair system. Size is approximately 12 x 12 in. Other accessories can be purchased separately.
841561 Kit ........................................... $20.95 or $18.95 ea./3+

KELVIN® Advanced Design-A-Deck
Includes instructions and enough materials (wood and brads) to make a student-designed, multilevel deck. The deck size is approximately 24 x 12 in. Additional accessories can be purchased separately.
841562 Kit .............................................................. $19.95 or $18.95 ea./3+

Tools for Your Deck Design

Sandpaper Assortment
Variety of grits for light sanding.
850542  [A] 9 x 11 in. Sheets, 15/pkg. .................. $2.75 or $2.45 ea./3+

Spring Clamps
540029  [B] 4 in. L with 1 in. Jaws ............... $2.45 or $1.95 ea./3+

Pro Heavy-Duty Hacksaw with 12 in. L Blade
980005  [C] ................................................... $16.95 or $15.95 ea./3+

Electric Nail & Brad Gun with Trigger-Safety Lock
Heavy-duty gun will drive 5/8, 3/4 and 1 in. brads.
490062  [D] Electric Nail & Brad Gun ........................................... $74.95
391077  Brads, 5/8 in. L, 18 ga., Type T50BN, 500/pkg. ............... $7.99
391076  Brads, 3/4 in. L, 18 ga., Type T100BN, 2000/pkg. ........... $19.95

Manual Nail & Brad Driver Tool
Holds small nails and brads so they can be pushed into the wood.
391078  Brads, 1/2 in. L, 19 ga., 600/pkg. ................ $1.95
391079  Brads, 3/4 in. L, 17 ga., 2000/pkg. ................ $1.95

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® Kre8® Maker STEM Kit
Build structural, mechanical and mathematical models. Enough parts are supplied to make models shown individually except for the Kre8® air powered vehicle which also needs the Kre8® Air powered upgrade pack.

To extend the range of activities you can purchase a Kre8® Maker Maths kit below. Requires Kre8® Tube Cutter or snips below. Patent pending.

Kre8® is ideal for Science, Technology, Engineering & Math

KELVIN® Kre8® Maker Maths Kit
Make basic geometric forms, including polyhedra, moving linkages etc. Enough reusable parts are supplied to make the complex models shown as well as a number of smaller models.

This kit is supplied with 138 parts including: tubes, connectors, and collars plus a link to videos & help sheets. To extend the range of activities you can purchase a Kre8® Maker STEM kit (above). Requires Kre8® Tube Cutter or snips below. Patent pending.

Kre8® kits can be assembled in regular classrooms. Kits may require hand tools and adult supervision. Kre8® is a registered trademark of KELVIN L.P.
**KELVIN® Kre8® Marble Maze**

Get your marble to loop the loop, spin a wheel, travel along the tracks and round corners - all in 30 seconds! Adjust the incline and position of parts to vary the speed of descent. Add sounds or musical features triggered by the marble to make it even more exciting. Students will learn about rolling resistance, friction, kinetic energy, gravity, centrifugal forces, structures and mechanisms. Use snips to cut sheet materials and light blue tubes. Optional Kre8® cutter (#283653) can be used to score and snap tubes to length.

283673 Kit ...................... $29.95 or $28.95 ea./5+ or $27.95 ea./10+

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**KELVIN® Kre8® Romantic Rube**

To start, a marble is placed at the start of the marble run. After a few seconds the marble drops into an open box which via leverage lifts the flag up. A second marble runs down and jumps off the end of main marble run to trigger the wheels which roll down the red track. It rolls into a trigger that releases the rose which swings upright. A lever swings tipping the bottle holder to fill the glass. As this happens two wires touch and the propeller blows the music card open which starts the music. Lastly, the candle LED glows. Requires beverage, glass and musical card.

Use snips to cut sheet materials and light blue tubes. Optional Kre8® cutter (#283653) can be used to score and snap tubes to length.

283678 Kit .......................... $39.95 or $36.95 ea./5+ or $34.95 ea./10+

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**KELVIN® Kre8® Small Tube Cutter**

Cuts up to 6mm dia. tubes including rigid pvc tubing.

283653 [A] ....$7.95 or $6.95 ea./10+ or $6.45 ea./20+

**Utility Snips**

Handle color may vary. 7-1/2 in. long.

480009 [B].......................... $3.75 or $3.55 ea./6+

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**KELVIN® Kre8® Electronics Parts**


PLUS These Bonus Items: Digital Multimeter, Soldering Iron, Solder, and Soldering Iron Holder with Sponge.

| 283656          | $79.95  |

**KELVIN® Kre8® Mechanical Parts**


| 283655          | $99.95  |

**KELVIN® Kre8® Autonomous Vehicle**

Self-Driving Robotic Car

Students build a basic robotic car and expand it with autonomous control by adding your choice of motor control board (see below). The kit includes [2] mechanical sensors, wheels and body frame parts. Once built, the car can be taken apart and rebuilt by the next group. Requires Control Board (see below). [4] AA batteries, snips or Kre8® Tube Cutter to cut tubes to length. Sold to schools only. Grades 7+.

| 283707          | $24.95 ea./10+ or $22.95 ea./5+ |

**KELVIN® Kre8® Mars Rover**

This model of the NASA Mars Rover is steerable with included remote controller— right, left, forward, and backward. Also comes with motors and Kre8® parts. Requires Kre8® Tube Cutter or snips (see pg. 18).

| 283658          | $29.95 ea./5+ or $19.95 ea./10+ |

**S.T.E.M. ACTIVITIES: Kre8®**

Find More KELVIN® Kre8® products on pgs. 3, 17-18, 23, 31, 41, 42, 53, 59, 77, 80, and 82.

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The KELVIN® GENIE Program It™ Control Activity Starter Kit is an innovative way to teach programming!

KELVIN® GENIE® Program It™ Control

The Genie Program It™ Activity Starter Kit is an innovative new product intended to teach programming to a wide range of individuals. There is no age barrier for this amazing tool. It hides all the complicated parts of a typical programming environment and lets you program a microcontroller by visually describing the logic using popular and well known flowchart symbols.

With the help of an amazingly easy to use and beautifully done software and a programming cable (sold separately) you can program the Genie Program It™ to blink the two LEDs on a specific sequence, or to respond to the pressing of the switch or to respond to changing light condition or to play a note or a complete tune sequence (there are many preprogrammed tunes to select from or you can create your own).

After creating a program, using the Genie design studio, click the mouse to send it to the Genie Program It™ activity board (connected to your computer with a USB cable) and it will start running immediately. It will continue running even if you turn the Genie Program It™ activity board off, or if you replace the batteries, because it stores the program in internal memory.

The Genie Program It™ activity board is the simplest of the Genie family of products. Once you get familiar with it, you can move to other boards with more powerful features. You can control external devices (with relays) of directly connect servo motors and even stepper motors. Kit requires soldering experience or order assembled. Requires at least one download cable, see below.

842291 Program It™ Activity Board Kit (Base not included. Req. Soldering) .................................................. $24.95
842294 Assembled/Tested with Mounted Acrylic Base ................................................................. $75
780080 USB Download Cable (at least 1 needed) ................................................................. $29.95
842292 Bulk Pack for 10 (Includes 1 set of instructions. Base not included) ........ As Low As $15 Per Kit $150

The Genie Program It™ Activity Starter Kit includes:

- Genie Program It™ Activity Board Kit consisting of a small board (PCB) that houses the electronics as well as a programmable IC, two LEDs, a switch, a light sensor and a buzzer/speaker. Assembly and soldering required.
- Battery Holder with on/off switch.
- A CD with Genie programming software and a collection of demo programs.
- A Manual with instructions and many simple programs.
- USB Download Cable.
- See-through Storage Pouch.

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Control Your World with KELVIN® GENIE Kits!

Students assemble fun and educational kits for well-known functions. Each kit includes parts and a sample code to operate or test them. By experimenting and using the provided code, they develop an important understanding between hardware and software. Another important feature is that the student can take advantage of the available resources on the PCB (switches, LEDs, buzzer) and develop the software to do something totally different and unrelated to the original idea of the kit.

The programming environment for developing new programs or editing old ones is the “GENIE Design Studio”. The software is revolutionary in its nature. Develop simple or complicated programs without having to write a single line of code. It is all visually done with the aid of flowcharts.

KELVIN® Response Timer
This is a two-player game. The circuit (based on the provided code) initiates a sequence of signals and then it captures the response from the two players and identifies the faster one. It uses a buzzer, two buttons and two LEDs. After the students master the project, they can develop many different variations of similar games based on sounds and lights produced by the LEDs. Supply voltage is 4.5 – 6V.

842213 Kit (Requires a USB Cable - See Note) ★..............$23.95 or $19.95 ea./5+
842212 Teachers Hand Assembled Board...........................................$73.95
590442 Optional Microcontroller Chip for #842213 .................$7.95 or $6.95 ea./5+

KELVIN® Egg Timer
The circuit simulates an egg timer. The kit has four LEDs, two switches and a buzzer. One of the switches is labeled “Set Timer”. As you press the switch multiple times the LEDs light up and stay on representing the total set time. Each step has a preset associated time. Once the total desired time has been set, pressing the second button labeled “Start” starts the countdown sequence. As the timer counts down it turns off the associated LEDs in the reverse order. When the last LED goes off the buzzer announces that end of the preset time. After the students master the project as presented they can develop any kind of application that uses four LED a buzzer and up to two buttons. Supply voltage is 4.5 – 6V.

842214 Kit (Requires a USB Cable - See Note) ★..............$23.95 or $19.95 ea./5+
842215 Teachers Hand Assembled Board...........................................$73.95
590442 Optional Microcontroller Chip for #842214 .................$7.95 or $6.95 ea./5+

KELVIN® Traffic Light Controller
This kit simulates the sequence of the traffic lights at an intersection. It consists of two PCBs. The main controller board and the LED holder PCB. It produces the correct light sequences but in a faster way so that the students do not have to wait very long between changes. The second PCB that houses the lights (LEDs) can be packed into something that resembles the real traffic light assembly and if the students use a set of seven wires, they can mount it remotely to more realistically simulate the real traffic lights.

After the students master the project as presented they can develop any kind of application that uses LEDs. Due to the shape of the LED PCB many “fun” applications can be developed like interesting and fun light sequences like simulating disco lights. Supply voltage is 4.5 – 6V.

842219 Kit (Requires a USB Cable - See Note) ★..............$29.95 or $27.95 ea./5+
842218 Teachers Hand Assembled Board...........................................$79.95
590444 Optional Microcontroller Chip for #842219 .................$9.95 or $8.95 ea./5+

KELVIN® Three Zone Alarm
This kit simulates a three zone alarm system. It has connections for three sensors. These sensors can be lever switches, magnetic switches, motion detectors or any other type of alarm sensors that provides an open and close contact (most common type of alarm sensors). The PCB also provides switches that enable or disable each zone, three LEDs that indicate the status of each zone and a buzzer that buzzes if any of the zones is open (active).

After the students master the project as presented they can develop any kind of application that uses externally located switches (on-board enable and disable functionality) three LEDs and a buzzer. Supply voltage is 4.5 – 6V.

842222 Kit (Requires a USB Cable - See Note) ★..............$39.95 or $36.95 ea./5+
842221 Teachers Hand Assembled Board...........................................$89.95
590443 Optional Microcontroller Chip for #842222 .................$8.95 or $7.95 ea./5+

★ NOTE: You will need to purchase at least one USB programming cable, #780080, $29.95, (we recommend multiple cables) for your students to be able to download the code they develop to the Genie controllers. Optional microcontroller chips sold separately.

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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Control Your World with KELVIN® GENIE Kits!

PCB208 - 2 Inputs & 2 Outputs
The two inputs can be used as digital inputs and control any of the outputs. One of the inputs can be used as an analog input. They can be used to measure an analog signal and control an output.

The two outputs are not the same in their current handling capabilities. One is directly connected to the microcontroller and it can drive a load by sourcing or sinking a current up to 20mA. The other output can be used as a transistor that can sink up to 200mA of current and there is a diode for transient suppression.

842201 Kit $19.95 or $18.95 ea./5+
Teachers Hand Assembled Board 842200 $59.95
Optional Microcontroller Chip for #842201 590441 $6.95 or $5.95 ea./5+

PCB214 - 5 Inputs & 5 Outputs
All of the inputs can be used as digital inputs and control any of the outputs. Two of the inputs can be used as analog inputs. They can be used to measure an analog signal and control an output.

Three of the outputs are a directly connected to the microcontroller and it can drive a load by sourcing or sinking a current up to 20mA. The other outputs use transistors that can sink up to 200mA of current and have diodes for transient suppression on the PCB.

842203 Kit $29.95 or $28.95 ea./5+
842202 $79.95
Optional Microcontroller Chip for #842203 590442 $7.95 or $6.95 ea./5+

PCB220 - 8 Inputs & 8 Outputs
All of the inputs can be used as digital inputs and control any of the outputs. Four of the inputs can be used as analog inputs. They can be used to measure an analog signal and control an output.

Outputs can control a number of different devices. They are provided through a driver IC that is capable of sinking up to 500mA of current and it has built-in clamp diodes for transient suppression.

842207 Kit $29.95 or $28.95 ea./5+
842206 Teachers Hand Assembled Board $79.95
Optional Microcontroller Chip for #842207 590443 $8.95 or $7.95 ea./5+

★ NOTE: You will need to purchase at least one USB programming cable. #780080, $29.95. (we recommend multiple cables) for your students to be able to download the code they develop to the Genie controllers. Optional microcontroller chips sold separately.

PCB218 - 5 Inputs & 8 Outputs
All of the inputs can be used as digital inputs and control any of the outputs. Three of the inputs can be used as analog inputs. They can be used to measure an analog signal and control an output.

The outputs can control a number of different devices. They are provided through a driver IC that is capable of sinking up to 500mA of current and it has built-in clamp diodes for transient suppression.

842205 Kit $27.95 or $26.95 ea./5+
Teachers Hand Assembled Board 842204 $79.95
Optional Microcontroller Chip for #842205 590444 $9.95 or $8.95 ea./5+

PCB228 - 12 Inputs & 8 Outputs
Eight of the inputs can be used as digital inputs and control any of the outputs. Four of the inputs can be used as analog inputs. They can be used to measure an analog signal and control an output.

The outputs can control a number of different devices. They are provided through a driver IC that is capable of sinking up to 500mA of current and it has built-in clamp diodes for transient suppression.

842209 Kit $49.95 or $44.95 ea./5+
842208 Teachers Hand Assembled Board $99.95
Optional Microcontroller Chip for #842209 590445 $19.95 or $18.95 ea./5+

PCB418 - 5 Inputs & 5 Outputs
All of the inputs can be used as digital inputs and control any of the outputs. Three of the inputs can be used as analog inputs. They can be used to measure an analog signal and control an output.

There are two different groups of outputs. The first group consists of two motor driving outputs. They can drive small project type motors. The second group consists of three servo motor driving outputs to control up to three servo motors at the same time.

842211 Kit $34.95 or $32.95 ea./5+
Teachers Hand Assembled Board 842210 $49.95 or $47.95 ea./5+
Optional Microcontroller Chip for #842211 590446 $9.95 or $8.95 ea./5+

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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3D Printer Controller Package  Arduino Compatible

Board features are:
- RAMPS 1.4: Designed to fit the entire electronics needed for a RepRap in one small package for low cost. RAMPS interfaces an Arduino Mega with the powerful Arduino MEGA platform and has plenty room for expansion. The modular design includes plug in stepper drivers and extruder control electronics on an Arduino MEGA shield for easy service, part replacement, upgrade-ability and expansion. Additionally, a number of Arduino expansion boards can be added to the system as long as the main RAMPS board is kept to the top of the stack.
- MEGA 2560 R3: Mega is an ATmega2560 as core microcontroller development board itself has 54 groups digital I / O input / output terminal (14 groups do PWM outputs), 16 sets of simulation than the input side, group 4 UARTs (hardware serial ports), using the 16 MHz crystal oscillator. With the bootloader, download the program directly via USB without having to go through other external writer. Supply part of the optional USB power, or as an external power using the AC-to-DC adapter and battery. Arduino development IDE interface is based on open-source principles, allows you to free download for use in project work, school teaching, motor control, interactive works.
- A4988 DRIVER: This is a carrier board or breakout board for Allegro’s A4988 DMOS Microstepping Driver with Translator and Overcurrent Protection by Pololu. This stepper motor drive lets you control one bipolar stepper motor at up to 2 A output current per coil.

590499  ...................................................................................................... $79.95

Raspberry Pi 3  Model B
Single-board computer with wireless LAN and Bluetooth connectivity.
Specifications: Quad Core 1.2GHz Broadcom BCM2837 64bit CPU, 1GB RAM BCM43438 wireless LAN and bluetooth, low energy (BLE) on board, 100 Base Ethernet, 40-pin extended GPIO, [4] USB 2 ports, 4-pole stereo output and composite video port, full size HDMI, CSI camera port for connecting a Raspberry Pi camera, CSI display port for connecting a Raspberry Pi, touchscreen display, micro SD port for loading an operating system and storing data, upgraded switched micro USB power source up to 2.5A.
You'll need (not included): Micro SD card with NOOBS, Micro USB power supply and to use it as a desktop computer, you'll need a TV or monitor, HDMI cable, keyboard and mouse.

590491   .............................................................................................. $79.95

KELVIN® Kre8® Conveyor Belt
This activity will expose students to a number of scientific principles including types of motion, speed ratios, gravity and compound gears.
Students will be challenged to get the most ping-pong balls into a box in one minute, make a ball hopper, achieve the highest lift, create a production line and control direction and speed.
The conveyor belt slope is adjustable and measures 18 in. (457 mm) long and 1 in. (25.4 mm) wide. Powered by an electric motor.
As an option, use with the Genie PCB418 board or the Wired Manual Controller on page K24. Requires two AA batteries.

283650   Kit..................................$33.95 or $29.95 ea./10+

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

**UNO Rev3 Arduino-Compatible**
The best board to get started with electronics and coding. Based on the ATmega328P. Pins include 14 digital input/outputs (6 PWM outputs) and 6 analog inputs. Other features include: 16 MHz quartz crystal, USB connection, power jack, ICSP header and a reset button. Compatible with Arduino IDE. Supports ISP download function. Requires USB cable, AC/DC adapter or battery.

590460 ................. $14.95 or $12.95 ea./5+

**Nano V3 Arduino-Compatible**
Compact board based on the ATmega328P. Pins include 22 digital input/output (6 PWM outputs) and 8 analog inputs. Compatible with Arduino IDE. Supports ISP download function. Requires a Mini-B USB cable to get started.

590462 ................. $14.95 or $12.95 ea./5+

**LilyPad Arduino-Compatible**
Designed for e-textiles and wearable projects. It can be sewn to fabric with conductive thread. Based on the ATmega 168V (the low-power version of the ATmega 168). Pins include 14 digital input/outputs and 6 analog inputs. Power: 2.5V. Works with ATmega168 or ATmega328V.

590466 ................. $9.95 or $8.95 ea./5+

**Uno Rev3 ProtoShield Expansion Board Arduino-Compatible**
Mini breadboard is connected to the circuit board with double-sided adhesive. Components can be soldered directly on the board or through the mini breadboard. Comes with two LEDs and two pushbutton circuits that are ready to use, with all pins and power supplies present. Use with UNO R3.

590461 ................. $8.95 or $7.95 ea./5+

**Mega 2560 Rev3 Arduino-Compatible**
Ideal for devices like 3D printers and other demanding applications. Pins include 54 digital input/outputs (15 PWM outputs) and 16 analog inputs. Also has 16 MHz quartz crystal, USB connection, power jack, ICSP header and a reset button. Requires USB cable, AC/DC adapter or battery.

590463 ................. $27.95 or $23.95 ea./5+

**WeMos D1 WiFi Board Arduino-Compatible**
Pins include 11 digital input/outputs and 1 analog input. Micro USB for auto programming or use OTA. Based on ESP-8266EX. Compatible with Arduino IDE and NodeMCU. Power with micro-USB cable, AC/DC adapter or battery.

590464 ................. $19.95 or $18.95 ea./5+

**Stepper Motor Control Board Arduino-Compatible**
Assembled package includes: motor control board, plug-on motor control shield, USB download cable, motor wires, and battery holder. Requires batteries.

842435 Assembled Package .......... $39.95 or $37.95 ea./5+
590484 Motor Control Board Only .... $11.95 or $9.95 ea./3+
590485 Plug-On Motor Control Shield Only $11.95 or $9.95 ea./5+

**Nano V3 Basic Starter Kit Arduino-Compatible**
UNO R3 board, USB cable, prototype extension board, mini breadboard, 5V stepper motor with driver board, LEDs (green, red and blue), sensors (vibration, flame and temperature), infrared receiver, photoresistors, key caps, key switches, piezo buzzer, tone generator, adjustable potentiometer, jumper cap, large breadboard, remote contro, screen, servos, component box, DuPont line, breadboard line, 220ohm resistor, dot matrix display, single digit 7-segment LED bar display, four digit 7-segment LED bar display, IC 74HC595, battery holder, 1K resistor, 10K resistor, 9V battery, 40-pin header, and more.

590465 ................. $49.95 or $46.95 ea./5+

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Weather Sensor Module Arduino Compatible
LED lights up when it senses wet weather conditions like snow, humidity and rain. Sensitivity can be adjusted with a potentiometer.
590481 $12.95 or $11.95 ea./5+

Temperature & Humidity Sensor Module Arduino Compatible
High-precision temperature measurement device with a high performance, 8-bit microcontroller connection and capacitive humidity sensing element.
590469 $13.95 or $11.95 ea./5+

Sound Detection Sensor Module Arduino Compatible
Electronic microphone with single-channel signal output.
590480 $10.95 or $9.95 ea./5+

DFPlayer Mini MP3 Player Sensor Module Arduino Compatible
Outputs directly to a speaker. The module can be used as a stand-alone device by attaching a battery, speaker and push buttons or use with an Arduino UNO or any other with RX/TX capabilities.
590468 $12.95 or $10.95 ea./5+

USB to TTL Serial Converter Module Arduino Compatible
Converts USB connection to TX/RX. Requires a Mini-B USB cable to get started.
590471 $13.95 or $11.95 ea./5+

Wireless Bluetooth Serial Transceiver Module Arduino Compatible
Can be set to master or slave by user. Wiring (only need 4 wires): RX to RXD, TX to TxD, GND to GND and 3.6V to 6V. Not suitable for iOS system.
590475 $16.95 or $15.95 ea./5+

Micro SD Card Module Arduino Compatible
Includes SD card to complete the library card initialization and read-write.
590470 $8.95 or $7.95 ea./5+

Tricolor LED Module Arduino Compatible
Access the current limiting resistor to prevent burn out. The PWM modulator with three primary colors can be mixed in different colors.
590479 $8.95 or $7.95 ea./5+

High Precision Real Time Clock Module Arduino Compatible
Extremely accurate with integrated temperature-compensated crystal oscillator.
590472 $12.95 or $11.95 ea./5+

Dot Matrix MCU LED Display Module Arduino Compatible
A single module can drive an 8 x 8 common cathode lattice. Support for cascading multiple modules.
590477 $11.95 or $9.95 ea./5+

Dot Matrix 4-in-1 Display Module Arduino Compatible
A single module can drive a 8x8 dot matrix common cathode. Support for cascading multiple modules.
590478 $17.95 or $15.95 ea./5+

LCD Display Module Arduino Compatible
A low-power consumption character LCD module with a built-in controller. Can be easily interfaced with a M CU. White text, blue backlight.
590482 $19.95 or $17.95 ea./5+

LED & Key Display Module Arduino Compatible
Gathers more than three common SCM peripheral circuits. Only three IO ports are occupied when it drives. SCM doesn't need to work for scanning display and key scanning. Features 8 Bits, 8 keys, 8 LEDs, 8 digital tubes, common cathode LED digital tube.
590474 $12.95 or $11.95 ea./5+

Breadboard Adapter Shield Module Arduino Compatible
Breadboard power supply module is compatible with 3.3-5 V. Apply to MB102 breadboard.
590476 $4.95 or $3.95 ea./5+

4-Channel Relay Module Arduino Compatible
Control various appliances and other equipment with large current.
590483 $13.95 or $11.95 ea./5+

PS2 Game Joystick Module Arduino Compatible
Connect two analog inputs and control a robot with X/Y control.
590473 $9.95 or $7.95 ea./5+

Find more Arduino-Compatible Modules on pg. 23-24
Find Genie Controllers on pg. 22

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
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The LOWEST Prices on Robotic Kits!

KELVIN® SUMO Wrestler® Wireless Plastic Car Bases

Small Base Kits - MS to HS
Kits include 7-1/2 in. plastic base, motors, plastic gearboxes, gear sets, wheels, traction bands, tether control, axles, washers, nuts and instructions.

842069  [A] Circular Base Kit ................................................................. $49.95 or $44.50 ea./10+
842071  Rectangular Base Kit ................................................................. $49.95 or $44.50 ea./10+

Add-On Small Base w/ Screws & Spacers ONLY
842070  Circular Base w/ Screws & Spacers ........................................... $16.95 or $14.95 ea./10+
842072  Rectangular Base w/ Screws & Spacers ..................................... $16.95 or $14.95 ea./10+

Large Base Kits - HS to College
Kits include 10-1/2 in. bases, motors, larger metal gearboxes, gear sets, pre-punched U-shape gear bracket, wheels, traction bands, tether control, axles, washers, nuts and instructions.

842073  Circular Large Base Kit ............................................................. $59.95 or $57.95 ea./10+
842075  [B] Rectangular Large Base Kit ............................................... $59.95 or $57.95 ea./10+

Add-On Large Base w/ Screws & Spacers ONLY
842074  Circular Base w/ Screws & Spacers .......................................... $19.95 or $18.95 ea./10+
842076  Rectangular Base w/ Screws & Spacers .................................... $19.95 or $18.95 ea./10+

KELVIN® SUMO Wrestler® Wireless Metal Car Base
Students work with sheet metal to design and fabricate their SUMO Wrestler®. Kit comes with [2] metal gear box kits, brackets, screws and wood wheels. Requires proper hand tools and assembly. HS to College.

282359  [C] Kit .............................................................................. $64.95 or $59.95 ea./10+

KELVIN® Add-On Sensor Package
Includes: [2] lever switch sensors, whisker extenders, screws and wire to connect the robot brain interface (sold sep.). Does not include plans or car base.

842277  .............................................................................. $12.95 or $9.95 ea./3+

KELVIN® Add-On Swivel & Push Package
Includes toy motor, motor holders, screws, wire, gears, pulley sets, rods, wood, wheels, metal chain and more. Parts may vary. Does not include plans or car base.

842276  .............................................................................. $29.95 or $27.95 ea./3+

KELVIN® 2 x 2 SUMO Wrestler® Wired Controller
One control box with two joysticks. Each joystick operates two motors on two student-designed robotic cars. Can also be used to control up to four motors on one robotic car.

840555  Control Box w/ 2 Joysticks ......................................................... $195

KELVIN® 4 x 2 SUMO Wrestler® Wired Controller
Two control boxes with four joysticks. Each joystick operates up to four motors each - two for flippers and two for wheels - on two student-designed robotic cars.

840896  Control Box w/ 2 Controllers .................................................... $295
841265  Replacement Controller Only .................................................. $29.95

KELVIN® SUMO Wrestler® Competition Arena
8ft. diameter. Additional shipping charges apply.

282361  ......................................................................................... $325
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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**KELVIN® SUMO Wrestler® Wireless Controller Starter Set**
Add to each competing SUMO Wrestler® if going wireless. Can also be added on the second level. Includes a transmitter, [2] receivers, [2] joysticks as well as BONUS [2] SUMO Wrestler® Wireless Car Kits (each kit with 3 geared motors and a project motor). Battery and charger not included (see 281773 below).

- 281773  Battery Pack & Charger ........................................................................................................... $29.95

**KELVIN® SUMO Wrestler® Wireless Car Kit**

- 842451  Kit ........................................................................................................................................ $44.95 or $39.95 ea./10+

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**KELVIN® SUMOler™ Manual Hand Controller**
This assembled wired controller includes: [4] directional switches and 15 ft cable.

- 842306  [A] Assembled ........................................ $29.95 or $27.95 ea./5+
- 'D' Alkaline Battery 220014 ...................................... $1.75 or $1.55 ea./10+

**KELVIN® SUMO Wrestler® Cardstock Base Kit**
Build your own SUMO Wrestler™ on top of the cardstock base and attach to smart board controller such as Arduino (see below). Includes cardstock, [2] assembled gear motors, wires, a front wheel and [2] back wheels. Requires folding and hot glue gun assembly. Controller not included - see above. MS to HS.

- 842433  [B] Kit ....................................................... $24.95 or $22.95 ea./10+

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**Genie® Motor Control Board**
Features 5 inputs and 5 outputs. Uses easy logic based programming. Download software at genieonline.com. Kit requires advanced soldering and all versions require USB download cable (see below).

- 842211  Kit - Requires Advanced Soldering.............................................. $34.95 or $32.95 ea./5+
- 842210  Assembled Board ................................................................. $49.95 or $47.95 ea./5+
- 780080  USB Download Cable ........................................................... $29.95

**Arduino Motor Control Board**
Assembled package includes: Motor Control Board, Plug-On Motor Control Shield, USB Download Cable, Motor Wires, and Battery Holder. Requires batteries. Download FREE Software at www.arduino.cc/.

- 842435  Assembled .......... $39.95 or $37.95 ea./5+

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**Find other Arduino products and controllers on pgs. 23-25.**

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*Original Ideas from Kelvin® Educational*
SUMO WRESTLER®: ROBOTICS

KELVIN® SUMO Wrestler® Wireless Robotic Controllers

Students will design a car that is controlled by either two servo motors and a controller (SUMO Wrestler® W2) or four servo motors and one controller (SUMO® W4). This project is designed for the problem-solving or ‘design crazy’ student. It is intended for school use only. Two sets are required for competitions.

The W2 version allows students to move the car front, back, right, and left. The W4 allows the students to also add control flaps or a ping-pong ball launcher to their robotic car design along with controlling the movement of the car from front, back, right, and left.

Each set includes 2 or 4 servo motors, receiver, transmitter to control 2 or 4 motors and a Robotic Car Kit complete with a battery for servo and battery for powering the car and battery charger.

841289 Wireless W2 Set (2 Motors and Transmitter to Control 2 Motors) ............... $195
841290 Wireless W2 Set (841289) PLUS Assembled Car Sample ....................... $275
841292 Wireless W4 Set (4 Motors and Transmitter to Control 4 Motors) .......... $345

KELVIN® SUMO Wrestler® W2 Robotic Car


841291 Kit .............................................. $32.95 or $29.95 ea./4+

KELVIN® SUMO Wrestler® Robotic Platform


841293 Kit .................................................. $18.95
★ NOTE: Does not include servos, receiver or batteries - use those supplied with the SUM O Wrestler® W2, #841289, or the SUMO® Wrestler® W4, #841292. Servos are also sold separately.

KELVIN® SUMO Wrestler® Wireless Controllers

Add to above kits (needed for each competing SUMO Wrestler® if going wireless). Can be added on the second level. Controller kits include servo motors, rechargeable battery, battery charger, receiver, and KELVIN® PC board. Assembly and soldering required.

842077 Kit - Control 2 Motors ........................................... $195
842078 Kit - Control 4 Motors ........................................... $295

Rechargeable Battery Pack

Ideal for KELVIN’s® SUMO Wrestler® Wireless Robotic Car.

220123 9.6V Battery Pack ........... $19.95
220122 9.6V Battery Charger ...... $26.95

Pushbutton Terminal

This pushbutton terminal has spring loaded posts for easy connection with four positions; two red and two black:

390737 ................................................ $1.50

Ping Pong Balls

Use as the load for your catapult, as a nose cone for model rockets, or with the KELVIN® SUMO Car Competition (see who can gather the most ping pong balls).

870036 6/pkg. ........................................ $2.10

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TUG OF WAR: The first team that pulls the other one over the line is the winner!

KELVIN® Tug-of-War & Tractor Lift Competition with Track
Classmates can compete directly against each other with the Kelvin Tug-of-War Activity or they can compete indirectly with the Kelvin Tractor Pull. By altering gear ratios, vehicle weight, traction systems and wheel sizes student’s build vehicles with the greatest pulling power. They can try to move the greatest weight or pull another vehicle across the threshold. A fun learning experience.

Includes:
- Track with high traction surface
- [2] 2-1/2 lb. weights for tractor pull
- Sled to hold weights
- Connecting Chain

Requires variable power supply for operation (see below). Can be used with a single KELVIN® Power Supply (#841386, 841051 or 841052) controlling both vehicles simultaneously. Two KELVIN® Power Supplies can be used with one powering each vehicle, or a KELVIN® Dual Power Supply (#841387) can be used to power both vehicles.

841640 Tug-of-War/Tractor Pull Competition Kit with Track .......................................................... $99.95
841051 Variable D.C. Power Supply, 0 to 16V DC, 1.5A ............................................................................... $125

Tug-of-War/Tractor Pull Car Kit
283123 Kit .................................................................................. $29.95 or $27.95 ea./6+ or $24.95 ea./10+

Robot Wheels
Wood wheels are 1-1/2 in. thick with a 11/64 in. dia. center hole. Rubber tread traction material sold separately.
282347 [A] 2-3/4 in. dia. .............................................................................. $1.95 or $1.45 ea./10+ or $1.25 ea. 100+
283020 [A] 3-3/4 in. dia. .............................................................................. $2.75 or $1.95 ea./10+ or $1.65 ea. 100+
851308 [B] Traction Material, 12 in. W x 4 ft. L, Cut to Fit ................. $7.95

KELVIN® Gear Box Kits
Build a gear box for robots or where a gear reduction or gearing change is needed. The kits include a pre-punched U-shaped bracket, motor, axles, gears, washers and instructions. 2.5 W x 6.75 L x 1.70 H inches. ★ NOTE: Wheels not included. You must enlarge holes in the gears.

Tug-of-War Gear Box Kit
Axles connects to 2 wheels for the Tug-of-War activity. It includes a long threaded rod axle for attachment to wheels (not included). The assembly lends itself to forward and backward motion with both wheels being driven by the same gear box.
283122 ......................................... $19.95 or $17.95 ea./10+

SUMO Wrestler® Gear Box Kit
Connects to one wheel for SUMO Wrestler® vehicles. It’s ideal for where many directional changes will to be made. The box includes a screw and nut axle that connects to the wheel (sold separately). Two gear boxes are required to transmit power to each wheel individually.
282360 ......................................... $18.95 or $16.95 ea./10+

As Low As $9.45
Per Student

As Low As $16.95
Per 10+

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
HYDRAULICS: ROBOTICS

KELVIN® Econobot™
Using craft sticks or pre-drilled and pre-cut wood parts, the Econobot™ is specifically developed to fit a limited budget and still provide a valuable hands-on experience for your students. The Econobot™ robotic arm moves on three joints each controlled by water filled syringes. An electromagnet grabber is used to gather magnetic materials for a pick and place challenge.

Both kits include detailed instructions and background material. AA batteries are needed for operation.

KELVIN® Hydraulic Robot
For Advanced Students. Build a working robotic arm with four degrees of freedom (movement). The arm rotates at its waist, swivels up and down at its shoulder and elbow joint and opens and closes its gripper end effector. Features laser cut wood parts but also provides students an opportunity to process materials. Requires drilling, cutting, gluing, bending and mechanical assembly.

Econobot™ with Craft Sticks
(see lower right, 950301) in addition to cutting and assembly.
842410 Kit with Craft Sticks (Req. Drilling) .................. $14.95 or $12.95 ea./3+
842419 Bulk Pack for 10 with Craft Sticks (Req. Drilling) .... $11.50 Per Kit $115

Econobot™ with Pre-Cut & Pre-Drilled 1/4 in. Plywood Parts
842425 ............ $24.95 or $22.95 ea./3+

KELVIN® Hand Drill & Drill Press
Includes drill press, a hand drill and [3] drill bits (1/16, 3/16 and 1/8 in.) with hand drill.
950301 ........ $139.95 or $129.95 ea./3+

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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**KELVIN® Educational Robotics: Kre8® & TechCard**

**KELVIN® Kre8® Hydraulic Robotic Arm**
Build this revolutionary Kre8® hydraulic robotic arm designed for STEM education. Three syringes are used to explore hydraulics, leverage, control and motion. To operate, open the gripper, move the arm above the load, swing the arm around, lower the load and release it. Requires Kre8® Tube Cutter or snips (see pg. 18).

- 283767 Kit ............................................................... $29.95 or $27.95 ea./3+

**KELVIN® Kre8® POP Robots**
Comes with printout pages for 5 types of robots, Kre8® parts, an assembled manual remote controller and two motors per kit. It can also be controlled using a computer instead of the hand controller. Requires AA batteries as well as Kre8® Tube Cutter or snips (see pg. 18).

- 283672 ................................................................. $25.95 or $22.95 ea./5+ or $18.95 ea./10+

**TechCard Build-It Kit**
Explores simple structures and mechanisms such as wheels axles, hinges, cranks, cams and linkages. Includes worksheets, teacher’s notes and enough TechCard and mechanical components to construct 10 different models (two each).

- 283263 Kit ............................................................. $59.95

**TechCard Pneumatics Resource Pack**
Includes: 5ml syringes, (20) 20ml syringes, 10m of plastic tubing and notes.

- 283517 Pack for 20 ........ $34.95 or $32.95 ea./3+

**TechCard Motors Resource Pack**
Includes: economy motors, sticky fixers, battery holders, battery snaps and notes.

- 283516 Pack for 10 ........ $24.95 or $22.95 ea./3+

**TechCard Wheels/Axles Resource Pack**
Includes: 300mm axles, 30mm card wheels, 50mm card wheels and notes.

- 283513 Pack for 20 ........ $45.95 or $42.95 ea./3

**TechCard Resource Pack**
Pre-cut, pre-punched, pre-scored strips, girders, beams, bases, project bases, A5 sheets and notes.

- 283512 Pack for 30 ........ $39.95 or $37.95 ea./3+

Find More KELVIN® Kre8® products on pgs. 3, 17-19, 23, 41, 42, 53, 59, 77, 80, and 82.
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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KELVIN® Robotic Battle Ball™ Competition Arena Class Set
This complete system for conducting all-out robotic arm combat is an economical, one time expense for your school because you can use it with all robotic classes.

The challenge is to design a robotic arm with an electromagnet head that picks up balls with metal screws through them. Robotic arm construction and team work throughout are keys to winning. The first team to move six balls from the central container and put them in their team’s ball return container is the winner.

Class Set Includes:
- Arena Board: assembled 16 x 47 x 3/4 in. plywood with yellow/blue acrylic top
- [4] Robotic Battle Ball™ Robotic Arm Kits: enough essential parts for 4 teams—see #841333 for content
- Competition parts: ball container, ball return tubes and balls with screws
- [6] Hand Controllers: assembled on plywood bases (three per team)
- [2] Switches: for turning on/off the electromagnets (one per team)
- Instructions and drawings

Requires two 6V lantern batteries (#220045-spring or #220012-screw). 841333 $24.95 or $22.95 ea./10+ or $19.95 ea./20+ or more

KELVIN® Build Your Own™ Battle Ball™ Robotic Arm Parts Kit
Since we don’t know the material or design students will choose for their robotic arm, we’ve put together this kit with the parts they must use, such as: [3] syringes, [3] syringe holders, magnet wire, bolt washers for magnet head, and wire. In addition, we have added [3] 1 x 2 x 12 in. pieces of pine and [2] small aluminum plates.

This is an open-ended design competition so we don’t provide plans; we recommend purchasing the Hydraulic Robotic Arm Demo Unit (#841329) in order to get ideas. Requires 3 Competition Arena Controllers (#841376) or the Electronic Power Pack Controllers (#841330). One kit required for a team of 3-4 students.

841333 $24.95 or $22.95 ea./10+ or $19.95 ea./20+ or more

Assembled Robotic Arm
Requires #841356 or #841330.
841384, $195

Robbyc Arm Demo Unit

841329 $395

Shown to the left is Marty Nelson, the competition’s designer, and his students from Quince Orchard High School in Montgomery County, MD. He and his students have successfully conducted this activity every year since 1997. The kids love it!!
HYDRAULICS CONTROL UNIT

SWITCHES

POWER & CONTROL UNIT

WATER RESERVOIR & PUMPS

ROBOTIC ARM

HYDRAULIC ROBOTIC ARM

KELVIN® RoboTech™ Electronic Control System

Enrich your Battle Ball™ Robotic Arm (#841333) or any hydraulic robot of your own design with this full blown hydraulics system! Controls 4 axes on a robot with hydraulics or 3 axes and an electro-magnetic gripper. You can also use the power pack controller (6-12 VDC) and the four control switch units to control electric motors or actuators on a motorized robot. The hydraulics are installed on a sturdy aluminum base.

The RoboTech™ Electronic Control System requires an Assembled Robotic Arm (#841384) or Robotic Arm Kit (#841333).

841330 RoboTech™ Electronic Control System ................................................. $595
841694 Above System with Assembled Robot Arm ....................................... $795

KELVIN® RoboTech™ Electronic Control System & Computer Control Complete Package


841641 RoboTech™ Control Complete Package ............................................. $1,995

KELVIN® RoboTech™ Computer Control

This robotic interface/software takes the place of manual hand control switches. The RoboTech™ Software can be used to enter a sequence of robot commands that can be stored and executed or used for real-time robot control of 4 axes.

Program the fourth axis for a motor, pump or electromagnet. Commands include moving each axis forward or back, turning an electromagnet gripper on/off and looping instructions. A ‘home’ command will move the robot to a reference position. The interface can monitor and respond to 2 limit switches per axis for a total of 8 switches.

Comes with: USB computer interface, USB cable, Interface to Electric Control Power Pack cable, (8) limit switches, RoboTech™ software and instructions. Requires Electronic Control System (#841330) and a Robotic Arm (#841384 or #841333).

841331 ........................................................................................................ $495

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

### KELVIN® EDUCATIONAL ROBOTIC ARM

Ideal for Robotics units. The DC motor operates from 6-12V DC and runs with KELVIN® Variable Speed Power Supply (listed below). Comes with two stands for holders. Choose your own height (low to high) or remove. Add your sensors to count, sort, read IDs, time, etc. Dimensions: 3 ft. L x 4 in. W with adjustable height. Comes assembled. Robotic Arm not included (see above).

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>841893</td>
<td>Assembled Conveyor Belt</td>
<td>$695</td>
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<tr>
<td>841051</td>
<td>Kel-K.P.S.® #100 Variable Power Supply</td>
<td>$125</td>
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</tbody>
</table>

### KELVIN® Turntable

This rotating, 13 in. diameter turntable can be used along with KELVIN® Conveyor belt to illustrate the manufacturing process. Requires variable power supply (listed below). Robotic Arm not included (see above).

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>841972</td>
<td>Turntable with DC Motor</td>
<td>$395</td>
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<tr>
<td>841973</td>
<td>Turntable w/ Stepper Motor, Controller, Interface, Software</td>
<td>$495</td>
</tr>
<tr>
<td>841051</td>
<td>Kel-K.P.S.® #100 Variable Power Supply</td>
<td>$125</td>
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</tbody>
</table>

### KELVIN® Conveyor Belt

Ideal for Robotics units. The DC motor operates from 6-12V DC and runs with KELVIN® Variable Speed Power Supply (listed below). Comes with two stands for holders. Choose your own height (low to high) or remove. Add your sensors to count, sort, read IDs, time, etc. Dimensions: 3 ft. L x 4 in. W with adjustable height. Comes assembled. Robotic Arm not included (see above).

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<td>Kel-K.P.S.® #100 Variable Power Supply</td>
<td>$125</td>
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</tbody>
</table>

### KELVIN® Kel-Botics™ Robotic Control System

Now you can program the robotic arm for PAUSE, REPEAT and GO TO. KELVIN® Robotic Control System has superior hardware and software for better robotic arm response.

- Fully Assembled Interface, Software, Robotic Arm (Fully Assembled or Unassembled Robotic Arm Kit), Wall Adapter. The Unassembled Robotic Arm Kit requires that students assemble the robotic arm with assistance from the teacher. The robotic arm requires four ‘D’ batteries (#220014) or the Battery Eliminator (listed below). KELVIN® has worked hard to make the Kel-Botics™ Robotic Arm easy to operate, easy to control; easy to program for all ages (best for grades 2 and up). Windows XP-7, USB.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
<th>Price</th>
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<tr>
<td>841046</td>
<td>ASSEMBLED Robotic Arm with Manual Controller, Gr. 2+</td>
<td>$139.95</td>
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<tr>
<td>841916</td>
<td>ASSEMBLED Robotic Arm &amp; Interface plus Software, WIN XP-7, USB</td>
<td>$275</td>
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<tr>
<td>841915</td>
<td>UNASSEMBLED Robotic Arm Kit, ASSEMBLED Interface &amp; Software</td>
<td>$225</td>
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<td>220119</td>
<td>BATTERY ELIMINATOR Replaces [4] ‘D’ Cells</td>
<td>$29.95</td>
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<tr>
<td>841098</td>
<td>KELVIN® Kel-Botics™ 5-10 Module</td>
<td>$39.95</td>
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### KELVIN® Kel-Botics™ Deluxe Package

This package includes:
- Computer with Screen
- Pre-Loaded Software
- Fully Assembled Robotic Arm
- Fully Assembled Interface.

IBM Windows XP-7, USB, Grades 6 & Up

<table>
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<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>841957</td>
<td>$1,495</td>
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</tbody>
</table>

### Combine the KELVIN® Kel-Botics® Robotic Arm, Conveyor Belt and Turntable to Create Your Own Robotic Manufacturing

**BEST VALUE!**

**KELVIN® Kel-Botics™ Deluxe Package**

This package includes:
- Computer with Screen
- Pre-Loaded Software
- Fully Assembled Robotic Arm
- Fully Assembled Interface.

IBM Windows XP-7, USB, Grades 6 & Up

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<th>Item Code</th>
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<tr>
<td>841957</td>
<td>$1,495</td>
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</tbody>
</table>
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® Educational Robotics: Mechatronics

KELVIN® HydraBasics™ Trainer
Hydraulic products like automobile lifts, elevators, and robots are often operated using oil as the working "fluid." KELVIN® HydraBasics™ Trainer uses distilled water instead of oil which, can be messy when used in a classroom lab.

The workbook contains a series of problems that investigate the control of cylinders and the integration of hydraulics with mechanical and electrical systems. The assembled, compact trainer includes industrial-grade components, student workbook and teacher guide. Grades 9 and up.

Assembled Trainer
840723 .................................. $1,695

Hydraulic Parts Only
840735 ........................................ $945

KELVIN® PneumaBasics™ Trainer
Use problem-solving learning to teach students about pneumatics. The workbook contains a series of hands-on activities based in situations occurring in every day life. The assembled, industrial-grade trainer also comes with quick-disconnect tubes, fittings, student workbook and teacher guide. Requires access to an air source. Grades 9 and up.

Assembled Trainer
840629 .................................. $1,495

Pneumatic Parts Only
840733 ........................................ $895

Portable Air Compressor with Built-In Air Tank
500027 .................................. $175

Portable Air Tank with 5-Gallon Volume
500026 .................................. $49.95

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The Natural Ideas of Kelvin

KELVIN® Design Grid™ Paper
Use 17 x 22 in. sheets for thumbnails, sketches, roughs and final drawings. Features a black grid, in 1/4 in. increments, printed on one side.
420238 100 Sheets/pkg. ...................... $29.50

KELVIN® Educational

KELVIN® DesignGrid™ Paper

Grid Paper
A pad of white grid paper with 4 squares per inch printed in black. 11 x 17 in.
42021 50 Sheets ................................ $19.95

Paper-Backed Foam Sheets
Draw your bridge design on paper and then attach it to foam sheets with pins to create a pattern for building your bridge. Lay the balsa wood on top of the pattern and use pins to hold it in place while the glue dries. Sheets measure 3/16 x 20 x 30 in.
420223 3/pkg. .................................. $14.95

KELVIN® Competition Certificates
High quality, cardstock awards are generic; teachers can customize name, competition and placement.
840704 30/pkg. ...................................... $4.95

KELVIN® Technology Competition Medals
Each set includes three 2 in. diameter medals: one each of gold, silver and brass colors. Each medal has a decorative ribbon.
840706 .......................................................... $19.95

Pins
Useful for attaching balsa to foam as you design your bridge or tower.
Round Head Pins

Flat Head Pins
390480 [B] 1000/pkg. ....................... $12.95

T-Head Pins
390440 [C] 1 in. L, 4 oz. Box ............. $29.95
390441 [C] 1-1/2 in. L, 4 oz. Box ...... $13.95

KELVIN® Design Portfolios
Design portfolios encourage students to use the problem-solving method of INPUT—PROCESS—OUTPUT—FEEDBACK when planning and designing projects. Each portfolio consists of 4 pages for students to fill out.
651030 100/pkg. ................................. $25

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### ModelSmart™
Explore engineering concepts, utilizing math and science. Students interactively design and test balsa and bass wood models of various styles of bridges, cranes and towers, as well as other structures on the computer. This results in less material waste and more fun!

<table>
<thead>
<tr>
<th>Item Code</th>
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<td>121603</td>
<td>CD-ROM, IBM, Grades 6-12</td>
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<tr>
<td>121604</td>
<td>Lab, IBM, Grades 6-12</td>
<td>$299.95</td>
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<tr>
<td>121605</td>
<td>School, IBM, Grades 6-12</td>
<td>$599.95</td>
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### ModelSmart 3D with SpaceGuide™
Introduce basic engineering concepts while reinforcing math and science. Students interactively design and test structural models of bridges, cranes, towers, and other structural systems.

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<td>121611</td>
<td>CD-ROM, IBM, Grades 6-12</td>
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<td>121612</td>
<td>Lab Pkg., IBM, Grades 6-12</td>
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<td>121613</td>
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<tr>
<td>121614</td>
<td>Network Pkg., IBM, Grades 6-12</td>
<td>$799.95</td>
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### KELVIN® Kubes™
Machined aluminum drafting cubes are ideal for practicing drafting skills. Actual size of each cube is 2 x 2 x 2 in. Set of 12 cubes.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>420407</td>
<td>Machined aluminum drafting cubes</td>
<td>$495</td>
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### 30°/60° Triangles

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<tr>
<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>420098</td>
<td>4 in. L.</td>
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<tr>
<td>420099</td>
<td>6 in. L.</td>
<td>$1.65</td>
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<td>420100</td>
<td>8 in. L.</td>
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<td>420044</td>
<td>10 in. L.</td>
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<td>420101</td>
<td>12 in. L.</td>
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### 45°/90° Triangles

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<td>4 in. L.</td>
<td>$1.20</td>
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<td>420095</td>
<td>6 in. L.</td>
<td>$1.85</td>
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<td>420096</td>
<td>8 in. L.</td>
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<tr>
<td>420045</td>
<td>10 in. L.</td>
<td>$2.85</td>
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<td>420097</td>
<td>12 in. L.</td>
<td>$4.95</td>
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### T-Squares

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<th>Item Code</th>
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<td>420086</td>
<td>24 in. L.</td>
<td>$14.95</td>
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<tr>
<td>420087</td>
<td>30 in. L.</td>
<td>$16.95</td>
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<tr>
<td>420088</td>
<td>36 in. L.</td>
<td>$17.95</td>
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### All-Purpose Template

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<tbody>
<tr>
<td>420002</td>
<td></td>
<td>$5.95 or $5.45 ea./6+</td>
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### Protractor

<table>
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<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>420226</td>
<td>3-1/2 in. W</td>
<td>$0.99 or $0.85 ea./10+</td>
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### Compass/Divider

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>420066</td>
<td>Bow Style with 6 in. diameter.</td>
<td>$13.95 or $12.95 ea./3+</td>
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### French Curve Set

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<td>420089</td>
<td>12 in. L.</td>
<td>$9.95 or $8.95 ea./10+</td>
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<tr>
<td>420077</td>
<td>24 in. L.</td>
<td>$11.95</td>
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### Digital Calipers

<table>
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<tr>
<th>Item Code</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>910062</td>
<td>Digitally precise calipers</td>
<td>$39.95</td>
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### Flexible Curve Ruler

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<td>420074</td>
<td>12 in. L.</td>
<td>$7.95</td>
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<tr>
<td>420077</td>
<td>24 in. L.</td>
<td>$11.95</td>
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### Inch Dial Calipers

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<td>910042</td>
<td>Direct reading calipers</td>
<td>$34.95 or $32.95 ea./3+</td>
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### Rulers

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<th>Item Code</th>
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<tr>
<td>910039</td>
<td>6 in. Steel Ruler with Pocket Clip</td>
<td>$2.45</td>
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### Triangle Scales

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<th>Item Code</th>
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<td>420078</td>
<td>Architect's, White</td>
<td>$7.95</td>
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<td>420079</td>
<td>Architect's, Yellow</td>
<td>$7.95</td>
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<tr>
<td>420080</td>
<td>Mechanical, White</td>
<td>$7.95</td>
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### Pencil Compass

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<th>Price</th>
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<tr>
<td>420225</td>
<td>12 in. Plastic Ruler</td>
<td>$1.25 or $99¢ ea./20+</td>
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<tr>
<td>910038</td>
<td>12 in. Steel Ruler</td>
<td>$7.95 or $7.45 ea./10+</td>
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### Basic Micrometer

<table>
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<tr>
<th>Item Code</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>910040</td>
<td>Economical. Has a satin finish, zero adjust and 0.001 in. accuracy.</td>
<td>$22.95 or $20.95 ea./3+</td>
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</table>

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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**Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.**

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**KELVIN® Tools & Jigs Set**


840680  Set .......................................................... $325

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**KELVIN® Beams & Triangles™ Consumables Basic Class Pack**


840681  Basic Class Pack ........................................ $145

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**KELVIN® Beams & Triangles™ Consumables Deluxe Class Pack**


840972  Deluxe Class Pack ........................................ $295

---

**KELVIN® Beams & Triangles™ Consumables & Tools Package**

Includes: Deluxe Consumables Kit (#840972), Jigs & Tools Kit (#840680, see pg. D2), Technology Certificates, Instruction Guide & Workstation Sign.

840926  ................................................................. $695

---

**Pine Wood Beams**

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<th>$5+</th>
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<td>24</td>
<td>16.95</td>
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<tr>
<td>970048</td>
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<td>970049</td>
<td>3/4</td>
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**Cardboard Wheels**

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<td>13/16</td>
<td>100</td>
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<tr>
<td>420335</td>
<td>2-1/2</td>
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<td>15.95</td>
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**Dowels**

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<th>$50+</th>
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<td>.18</td>
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<td>.22</td>
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<td>36</td>
<td>3.49</td>
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**KELVIN® Beams & Triangles™ Cardstock Triangles & Axle Mounts**

Find the NEW! KELVIN® STEM Lab for Beams & Triangles™ on pg. 3

---

**KELVIN® Beams & Triangles™ Consumeables & Tools Package**

Include: Deluxe Consumables Kit (#840972), Jigs & Tools Kit (#840680, see pg. D2), Technology Certificates, Instruction Guide & Workstation Sign.

840926  ................................................................. $695

---

**CHALLENGE YOUR STUDENTS**

**Design and Construction Skills!**

---

**Find the**

**NEW! KELVIN® STEM Lab for Beams & Triangles™ on pg. 3**

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**Wood & Foam Blanks**

**Balsa and Foam Blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.**

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**KELVIN® Beams & Triangles™ Design Kit**

An Open-Ended Design. Design and create structures, vehicles and machines (shown below) using student made frames, gears, levers, pulleys, wheel and axles. Give your students the opportunity to design, plan, measure, construct and test their ideas with working models. Kit includes wood, tubing, axle mounts and triangles. Assembly is required so students will have to drill, cut and glue their projects. Requires KELVIN® Gear Jig, Joint Jig and Cutting Jig (see below) as well as other hand tools.

- 842307 Kit .................................................................................................................................................... $9.95 or $8.95 ea./5+
- 842308 Bulk Pack for 10 ............................................................................................................ As Low As $6.99 Per Kit $69.95
- 650511 Lesson Guide ............................................................................................................................................ $4.95

Find Triangles, Axle Mounts, and Cardboard Wheels on pg. 38

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**Jr. Hacksaw**

Ideal tool for young students to use for simple cutting of beams and rods. Actual style may vary.

- 980042 [D] ............................................................................................................. $6.95
- 980044 Blades, 10/pkg. ............................................................................................ $2.75

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required. www.kelvin.com • KELVIN®, 280 Adams Blvd., New York 11735, USA • Copyright © Kelvin L.P. • Prices in this catalog represent discounted pricing for educational institutions.
Build a wind turbine with a motor/generator. Advanced students can wind their own motor/generator using magnet wire.

Test rotor and blade designs by varying the rotor sweep, blade size and blade shape to change the electrical output of the generator. Test rotor output with the included multimeter or see how many LEDs are lit.

Fold a cardstock model house and create a LED circuit to plug into the wind turbine generator. A box fan or similar fan on a stand is required but not included.

**KELVIN® Experimental Wind Turbine with Motor Generator**
Includes: motor generator, gearbox parts, hub, corrugated plastic for blades, PVC stand with sturdy base, multimeter, LEDs, breadboard, printed house layout, wire, terminals, and instructions. Available as a kit or assembled and complete with stand.
- 842267 Kit w/Stand ........................................ $125
- 842268 Assembled w/Stand .............................. $199

**Motor Generator Kit Only**
Build your own! Comes with motor generator, gearbox parts and hub. Does not come with blades, PVC stand or wind turbine class parts.
- 851924 Kit- No Stand .......................... $85 or $75 ea./5+

**KELVIN® Experimental Wind Turbine w/ Transformer & Wind-Up Generator**
Build a motor generator. Includes: motor generator parts, hub, corrugated plastic for blades, PVC stand with sturdy base, multimeter, LEDs, breadboard, printed house layout, wire, terminals, & instructions. Requires motor coil winding and assembly.
- 842258 Kit w/Stand .......................... $139.95
- 842257 Assembled w/Stand ................. $295

**Transformer Generator Kit Only**
Build your own! Includes motor generator parts and hub. Requires motor/coil winding and assembly. Does NOT include blades, PVC stand or wind turbine parts.
- 851925 Kit- No Stand .......................... $99 or $89 ea./5+

**KELVIN® WinData™ Data Collection Interfaces**
Add data collection to your projects with these economical interfaces. Can monitor 3 or 6 motor generators. Graph displays voltage on your computer. For best results, use with KELVIN® motor (851363). Can monitor 3 or 6 motor generators.
- 842354 Win Data™ 3 - Up to 3 Motors ............. $145
- 842363 Win Data™ 6 - Up to 6 Motors ............ $225

**KELVIN® Wind Turbine Model House**
Bulk pack includes cardstock, LEDs, LED holder, resistor, wire, clips, and connectors. Req. Experimental Wind Turbine (see left), soldering and circuit wiring.
- 652613 Bulk Pack for 10 .......................... $32.95

**KELVIN® Wind Turbine Blade Design**
Includes: (10) corrugated plastic boards (design your own blade shape) and (10) dowel rods.
- 283726 ..................................................... $19.95

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KELVIN® EDUCATIONAL

KELVIN® Wind Turbine Lab
Produce, store and use energy. Individual pack includes: Adjustable Gearbox System, Turbine, Meter, LEDs, Super Capacitor, and Super Capacitor Dragster Kit (charge it and run it).

Individual Pack
841984 No Box Fan .................................................. $49.95
841960 Lab–Box Fan & [5] Individual Packs .............. $245
390442 Box Fan, 20 in. x 20 in. ...................................... $29.95

Wind Turbine Consumables
Dowels, hubs, corrugated board, LEDs and Super Capacitor Dragster kit.
851462 Bulb Pack for 10 ................................ $9.95 Per Team $99.95

KELVIN® Eco-Power Wind Turbine
You provide the material for the blades and we’ll provide the gearbox and instructions.

Gearbox Only (No Stand, No Blades)
842068, $34.95 or $29.95 ea./10+

Gearbox WITH a Stand
842146, $39.95

KELVIN® Wind Turbine Junior Design Challenge
Design, build and test a wind turbine generator that will light an LED. Works with The Wind Farm (pg. 6). Each kit has enough materials to make either a vertical or horizontal axis wind turbine. Kit includes: plastic bottle, cap, DC motor, LED, predrilled acrylic mounting base, wire, wood hub, motor mount, rotor design materials and instructions.
842139 Kit .................................................. $9.95 or $9.45 ea./10+

KELVIN® Economy Wind Turbine
See how wind can be used to light an LED using a Box Fan (NOT included). Comes with: 2- and 3-bladed propellers, KELVIN® 50LE Meter, LED and alligator clips. Measures 7 in. tall.
841958 ........................................ $32.95 or $29.95 ea./2+

KELVIN® Basic Wind Turbine Parts
842353 Bulb Pack for 20 .................................. $79

KELVIN® Kre8® Wind Generator
Experiment with wind power - a renewable energy source. The solar motor is powered by the wind and can provide energy to other projects - like powering up the included LED. Take the kit apart and build it again in the next class. Adjust the gearings and you can increase the motor speed. Students can also experiment with the number, angle, size and shape of the blades. If there is no wind, you can use the orange finger spinner for testing purposes. Requires a blower for use with indoor experiments.
283733 Kit .................................................. $19.95 or $17.95 ea./10+

283740 Bulk Pack for 20 ............................... $14.75 Per Kit $295

KELVIN® Wind Farm Lab
Join three wind turbines in series or parallel and measure current and voltage for each generator or the total output of the wind farm as the load is varied. Lab includes base, analog display, wind blower and instructions.
842100 Lab .................................................. $295
Above Lab (#842100) PLUS Computer w/ LCD Screen & Software with Data Collection Interface (#842099) 842101 Lab with Computer .................................. $1,495

Wind Turbine Designer’s Kit
Gearbox & bracket ONLY (No Base).
842097 ........................................ $29.95 or $27.95 ea./5+

For Wind Tunnels, see pg. 75

For Power Grid & Solar Farm Labs, see pg. 44

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**KELVIN® Solar Energy Houses**

These kits will guide your students through activities focused on the conversion of light into electrical energy as well as heat transfer and storage for the purpose of space and water heating. Requires a light source.

**KELVIN® Active Solar & Space Heater with Data Collection**

Introduce students to active solar hot water and heat production used in homes worldwide and how to create a sustainable source of energy. A series of activities focus on heat transfer, heat absorption, insulation, solar geometry and solar heat collector mechanics.

Students then apply this information in the design of a solar hot water and space heater. A data interface and sensors are used to gather data during activities as well as display the data in graph and chart form.

**Active Solar & Space Heater Data Collection Interface**

Includes: data collection interface, windows software, USB cable and student/teacher instructions. Also includes information for the material needed to build an active solar & space heater.

842431 Data Interface with Software & Instructions .................................................. $295

Assembled Active Solar & Space Heater with Data Collection Lab

Includes: data collection interface (with windows software, sensors, USB cable, and interactions), adjustable solar collector, pump, lamp (light source) and stand, supplies (like absorption materials, insulation materials, tubing, tubing clamps, digital thermometer, angle finder, measuring containers and more), instruction booklet and design portfolio.

841611 Data Interface, Software, Instructions, & Complete System............................ $895

---

**Solar Energy House Template**

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<thead>
<tr>
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<tbody>
<tr>
<td>Beginner</td>
<td>Beginner</td>
<td>Intermediate</td>
<td>Advanced</td>
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<td>Template Only for 1-Room House</td>
<td>Template &amp; Foam Board for 1-Room House</td>
<td>Template &amp; Foam Board for Multi-Room House</td>
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**Stick-On Thermometer**

<table>
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<th>1 Solar Cell</th>
<th>2 Motors</th>
<th>2 Motors</th>
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<tbody>
<tr>
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<td>2 Propellers</td>
<td>2 Propellers</td>
</tr>
<tr>
<td>1 Propeller</td>
<td>2 Propellers</td>
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</tbody>
</table>

Includes:
- Aluminum Sheet
- Instructions

Includes #841748
- Contents PLUS:
  - Ceramic Tile
  - Alligator Leads

Includes #841635
- Contents PLUS:
  - Water Pump
  - Foam Cutter
  - Knife Switch
  - Beaker
  - Battery Holder
  - Tubing
  - LEDs
  - Clothespins
  - Wood

Includes #841603
- Contents PLUS:
  - Socket & Lamp
  - 50 LE Multimeter
  - Car Kit

---

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**KELVIN® Power Grid**

**Electrical Distribution Grid Lab**
Explore how electrical energy arrives at its final destination, as well as introduce alternative sources of energy. Construct a model home from the pattern provided and then assemble a simple LED and resistor light circuit that is installed into the model home.

Each model house snaps into the power grid base and picks up current from overhead wires. Measure power output using a multimeter. The house can also work off the grid using electrical energy from the included solar cells or optional batteries or wind turbine generator (sold separately).

Lab includes: grid base, preprinted mini model home patterns on cardstock, all electronic parts, solar cells and multimeter. Requires assembly. For off grid operation, [4] AA batteries (sold separately), and/or wind turbine generator (shown) not included.

842082  Lab for 24 .................................................................$6.45 Per Kit $175 or $155 ea./3+

**Power Grid Mini Model Homes Bulk Pack**
Pre-printed cardstock, special LED, LED holder, wires, connector, and alligator clips.

652520  Bulk Pack for 10 – Requires Power Grid Above .................................................................$2.95 Per Kit $29.50

---

**KELVIN® Solar Energy Farm**
Teach the basics of solar voltaic energy! The kit consists of [6] 0.5 volt encapsulated solar cells mounted to a movable arm. Jumpers are used to connect the cells in series or parallel. Also included are 50LE multimeter, [10] LEDs, breadboard, motor, fan prop, protractor to measure the cell angle and instructions.

842035  Individual Kit .............................................................$39.95 or $36.95 ea./6+

---

**KELVIN® Telegraph & Buzzer Kit**
Wind coil, connect wires and learn to operate and communicate with this system. Have your students take an interdisciplinary journey into the world of telecommunications. Your students will also discover the history of the telegraph, the science of magnetism and electrical circuits and the technology of sending data over wires. The activities culminate with the construction of a real, working telegraph sender and receiver.

Included in the kit are materials and instructions for experiments: magnetize a nail using a rare earth magnet, build an electromagnet, levitate ceramic magnets, and investigate circuits. Batteries are included.

841978  Individual Kit .........................................................$39.95 or $36.95 ea./6+

---

**How the Electric Utility System Works**
Learn how electricity is generated, transmitted, and distributed. Also covers how the electric industry started, how we use energy, and where the industry is going. Booklet.

652497  .................................................................$14.95 or $13.95 ea./6+

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® Solar Racer™

Solar Racer™ with Wood Base
Bulk pack includes: motors, solar cells, wheels, axles, tube holders for axles, washers, gear set, wood bases and instructions.
841236 Kit.......................................................... $11.45 or $10.25 ea./10+
841415 Bulk Pack of 20 ........................................ $6.45 Per Kit $129

Solar Racer™ with Plastic Base
Includes: solar cells (2V, 200mA), DC solar motors, choice of wood or corrugated plastic bases, gear wheels, plastic axles and grid design paper.
842095 Kit.......................................................... $11.45 or $10.25 ea./10+
842096 Bulk Pack for 20 ...................................... $6.45 Per Kit $129

KELVIN® Educational Solar Power & Energy

Solar Panels with AA & 9V Battery Chargers
Switch to select 3, 6, 9 & 12VDC. 600mW. 165 x 89 x 25 mm. Has adapters to charge AA or 9V batteries.
280202 [E] ......................................................... $19.95

Solar Motors
[A] 0.7-5 V, 18mA, 2200 RPM
851105 $2.95 or $2.65 ea./10+ or $2.45 ea./100+
[B] 1.5 V, 140mA, 6900 RPM
851363 $2.45 or $2.20 ea./10+ or $2.10 ea./100+

KELVIN® Solar Backup Power Kit
Convert your solar racer to battery power for indoor rainy day testing. Includes battery holder, slide switch and wire. Requires AA batteries.
840694 [F] .......................................................... $1.95 or $1.75 ea./12+

Rechargeable Light Source
10,000,000 candle power. Charger included. Perfect for performing solar activities indoors.
260204 [G] .......................................................... $79.95
KELVIN® Solar Sedan Kit
Teach your student’s the principles of light to electricity conversions through this hands-on modeling adventure. Students will design and model the vehicle body and solar panel positioning mechanism. Kit includes: 9-1/2 in. long foam body block, 2V, 550mA solar cell, wheels, axles, motor, gears, instructions and more. Requires assembly and tools for cutting, shaping, and gluing.

842415 Kit - Shown Above .................................................. $19.95 or $18.45 ea./10+
842417 Bulk Pack of 10 Kits .................................................. $16.50 Per Kit $165

KELVIN® Solar Dragster Design & Model Kit
Teach your student’s the principles of light to electricity conversions through this hands-on modeling adventure. Students will design and model the vehicle body and solar panel positioning mechanism. The kit includes the following: 10 in. long wood blank, 2V, 550mA solar cell, wheels, axles, motor, gears, instructions and more. Requires assembly and tools for cutting, shaping, and gluing.

842412 Kit - Shown Right .................................................. $19.95 or $17.95 ea./10+
842414 Bulk Pack of 10 Kits .................................................. $16.50 Per Kit $165

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® ECONOMY Solar Car Kit
Teach your student’s the principles of light to electricity conversions through this hands-on modeling adventure. Students will design and model the vehicle body and solar panel positioning mechanism.

Kit includes: 7 in. long foam body block, 2V, 200mA solar cell, wheels, axles, motor, gears, instructions and more. Requires assembly and tools for cutting, shaping, and gluing.

842409           $11.85 or $10.45 ea./10+
842413           Bulk Pack of 10 Kits          $99.50
As Low As $9.95 Per Kit

2V, 550mA Solar Cell

KELVIN® Solar Monster Truck Kit
Students will design a truck that can carry the largest load powered by the solar cell. The kit includes the following: foam body block, solar panel, wheels, axles, motor, gears, instructions and more. Requires assembly and tools for cutting, shaping, and gluing.

842416 Kit, $19.95 or $18.45 ea./10+
842418 Bulk Pack of 10 Kits, $165
As Low As $16.50 Per Kit

Solar cell type will vary based on stock.
Design, build and evaluate a maglev vehicle using the 8 ft. long, pre-assembled maglev track. Add another 8 ft. L track using the maglev track connector, #840451, to extend it to 16 ft. Includes platform vehicle, wood base, self-adhesive magnetic strips, flat aluminum center rail and L-shaped aluminum guide rails. Electric power can be carried to the vehicles through the metal rails. Requires a power supply (#841051). Gr. 5-12. $20 Oversized Shipping Charges Apply.

840445  Track, 1-Lane, 8 ft. L ...... $135  
841209  Track, 2-Lane, 8 ft. L ...... $185  
840451  Track Connector ........ $26.95  
841051  Var. Speed Power Supply.. $125

KELVIN® Maglev Track with see-through side rails allows students to see the levitation of the vehicle while it is on the track and to run vehicles with electric motors. Although it is made of plastic, this track can be electrified with KELVIN® power supply (#841051). It also offers them the ability to measure the height of the vehicle, above the track, as cargo is added.

Students will plan, build, test and modify a maglev vehicle with an electric motor. One challenge is to design a vehicle that will go the fastest when propelled by an electric-powered propeller while using different brush configurations: 2 or 4, side or upper. Another challenge for students is how to supply the needed electric power to the vehicles during the run on the road without batteries? $20 Oversized Shipping Charges Apply.

842137  Maglev Track w/See-Through Rails, 8ft. L (shown with maglev cars)........ $145  
841051  Variable Speed Power Supply.......................................................... $125

KELVIN® Maglev Vehicle Lab

The need to travel has provided our world with many types of transportation. Futuristic maglev vehicles that can travel at speeds of up to 300 mph on magnetic waves, without friction, have become a reality. Students will learn about futuristic vehicles with this lab. This start-up package features the KELVIN® Maglev Racer™ which allows students to design, build and evaluate their maglev vehicle.

This Lab Includes:
- [2] KELVIN® Maglev Racer™ Tracks, Assembled
- [10] Basic Maglev Kits
- [10] Advanced Maglev Kits
- [2] Self-Propelled Car Kits
- Variable Power Supply
- Stop Watch, Hand-Held
- Universal Maglev Sled Kit
- Assorted Books

Consumables: Balsa Strips, Balloons, Rubber Bands, Velcro Tape
Project Parts: Motors, Propellers, Magnets
Tools: Soldering Irons and Solder, Glue Gun and Glue Slugs, Scissors, Snap Blade Craft Knives and Blades, Self-Healing Cutting Mats, Rulers

840768  Maglev Vehicle Lab - Grades 6-12 ........................................................... $995
These kits work with ALL of our MAGLEV RACER® tracks

KELVIN® Basic Maglev Kit
No plans are included with this kit. Students must design and plan their own maglev vehicle. Includes foam, magnets, wind power package, straws, craft sticks, dowels, wire and a student workbook.
840665 .................................................. $5.95 or $5.45 ea./10+ or $4.95 ea./25+

KELVIN® Experimental Power On-Board Maglev Kit
Kit is used to power your maglev car with a battery on-board. Works with both tracks. Incl. foam body, motor, propeller, magnets, battery holder, wires, guide and switch. Requires 9V battery.
841294 .................................................. $6.45 or $5.95 ea./10+ or $5.45 ea./25+

KELVIN® Universal Maglev Base Kit
You can attach student designs to this standard maglev base with velcro strips.
840730 Kit............................................. $5.95 or $5.45 ea./10+ or $4.95 ea./25+
841412 Bulk Pack for 100 Students ............... As Low As $1.45 Per Kit $145
841114 Foam Blank, 2-1/2” W x 2” H x 8” L., 10/pkg. .................... $9.95 or $8.95 ea./5+
640090 Maglev Magnets, 1” x 3/4” x 3/16”, 250/pkg................ $36.95 or $32.50 ea./3+

KELVIN® Turbo Maglev Vehicle
841733 Shown Right ...........................................$25.95 or $22.95 ea./3+

Electric Ducted Fan 6 to 7.2 VDC, 2.6 to 3.4A, 54 to 72g thrust.
851370 .......................................................... $19.95

KELVIN® Advanced Maglev Kit
Plans not included with kit. Students design and plan their own maglev vehicle. Includes magnets, toy motor, [2] propellers, balsa, foam blank, 4 x 2 in. tin plate, plastic base, wind power package, plastic straws, craft sticks, dowels, wire and a student workbook.
840666, $9.95 or $9.65 ea./10+ or $9.25 ea./25+

KELVIN® Elite Kel-Timer™ Motion Timer
The NEW KELVIN® Elite Kel-Timer™ features REDESIGNED start/finish sensors with LED lights that can be aligned quickly and easily.

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**A Fresh Approach to Maglev Activities**

**KELVIN® The NEXT Generation Maglev Tracks™ with Single & Double Lanes**

Build the next generation in maglev modeling. The new keel design base eliminates the need for side rails on the track. This track design change allows students to easily see the levitating effects of the magnets and increases interest in the activity. The design change also allows for wider body design and eliminates the problem of magnets applied beyond the edge of the vehicle base wedging the vehicle in the guide way. Power can be easily picked up from the track. The included voltage meter displays the voltage being applied to the track rails. The bumper at the end of the track prevents vehicles from flying off the guide way and getting damaged.

- **842359** Single Lane Maglev Track w/Volt Meter, Assembled, 8ft. L - $20 Oversized Shipping Charges Apply $175
- **842360** Dual Lane Maglev Track (side by side lanes), Assembled, 8ft. L - $20 Oversized Shipping Charges Apply $285
- **841051** Kel-KPS™ #100 Variable Speed Power Supply $125

**KELVIN® The NEXT Generation Maglev Track™ with a Track on Two Levels**

The same keel design guidance and other innovation used in our single and two lane tracks are incorporated into the two level track system (does not include voltage meter). This system is a real attention grabber. The track includes leveling feet and bumpers at the end of the guide way. Watching head to head vehicle performance from a side view helps students observe design differences and flaws helpful in optimizing their design solutions.

- **842364** Two Level Maglev Track (layered lanes), Assembled, 8ft. L - $40 Oversized Shipping Charges Apply $325
- **841051** Kel-KPS™ #100 Variable Speed Power Supply $125

**KELVIN® The NEXT Generation Maglev Racer™ Vehicle Keel Kits**

Add on a cardstock or foam vehicle design to the platform base.

- **Basic Vehicle Keel**
  - **842361** Kit .......................................................... $4.95 or $4.50 ea.10+ $99
- **Advanced Vehicle Keel with Power From Track Kit**
  - Kit comes with: [6] magnets, chassis and keel material in addition to a foam block, motor, propeller and wire.
  - **842365** Kit ........................................ $7.45 or $6.85 ea./10+ $115

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
KELVIN® has created an original learning system that allows students to design, model and test vehicles in a reduced pressure Hyperloop tube. The track and tube measures 8 ft. long. A vacuum is used to reduce the pressure within the tube while the vehicles travel on the track. A compressor provides the air power to move the vehicles down the track.

Students will integrate math, science and technology concepts by designing pods, experimenting with different air pressures within the tube and air pressure powering the vehicle.

**KELVIN® Hyperloop Starter Set**

The Starter Set comes with a Hyperloop Vehicle Launching System, a Single Lane Next Generation Maglev Track (8 ft. long), a clear Hyperloop Tube (5 in. dia. x 8 ft. long), Hyperloop Vehicle Bulk Pack of [10] Kits and instructions.

Not included but required are a vacuum and compressor. Additional optional items (not included) are the KELVIN® Motion Timer, Sensor Stand and Sensor Holders - see below #842423 for complete system. Please note, oversized shipping charges of $150 apply.

842421  Starter Set with Maglev Track, Hyperloop Tube and Vehicle Bulk Pack ....$1,495

**KELVIN® Hyperloop Trainer**

The Hyperloop trainer includes: a Hyperloop Vehicle Launching System, a Next Generation Single Lane Maglev Track (8 ft. long), a clear Hyperloop Tube (5 in. dia. x 8 ft. long), KELVIN® Motion Timer with Sensor Cables, Sensor Stands, Compressor, Vacuum, Hyperloop Vehicle Bulk Pack of [10] Kits and instructions.

Please note, oversized shipping charges of $150 apply.

842423  Starter Set PLUS Compressor, Vacuum, Motion Timer & Sensor Setup ....$1,895

**KELVIN® Hyperloop Experimental Vehicle Kit Bulk Pack**

Enough materials to build and design your own hyperloop vehicle.

842422  Bulk Pack of 10 .................................................................$9.95 Per Kit $99.50
KELVIN® Super Racer™
New from KELVIN®. Design a dragster vehicle with 1 or 2 super capacitors that can be recharged multiple times using the Capacitor Charging Unit (see right).

Super Racer I measures 6-1/2 in. long with a 10F super capacitor. Super Racer II measures 8-1/2 in. long with [2] 10F super capacitors. Comes with perforated cardstock cover that can be designed as you wish or taken off and use just the platform. Capacitor Charging Units listed below required. Racing Track for two lanes available (842395, see right). Soldering, shaping and assembly required.

- 842390 Super Racer Kit with [1] 10F Super Capacitor .................................. $7.95 or $6.95 ea./10+
- 842392 Super Racer Kit with [2] 10F Super Capacitors ...................................... $11.95 or $9.95 ea./10+

KELVIN® Super Capacitor Track
Two-lane super capacitor track is 8 ft. long. Add several to make a longer track. You may want to use fishing line and screw eyes to keep car straight on the track while running. $20

Oversized Shipping Charges Apply.
- 842395 8 ft. L Track .................................. $75

KELVIN® Super Capacitor Dragster
Design a dragster vehicle with a 20F super capacitor that can be recharged multiple times using a 9V battery snap connector. Comes with a 20F super capacitor and perforated cardstock cover that can be designed as you wish or taken off and use just the platform. Measures 12 in. long. Racing Track for two lanes available top right. Soldering, shaping and assembly required.

- 841802 Kit w/[1] 20F Capacitor & 9V Connector ................ $9.75 or $8.95 ea./10+
- 841803 Bulk Pack of 10 ............................................................ $8.49 Per Kit $84.95

KELVIN® Super Capacitor Airplane
Design and build a foam plane, charge the capacitor, engage the magnet activated switch and launch. The wings can be trimmed to affect the flight. Magnet activated switch disengages, if the plane should crash, turning off the motor. Kit includes foam that students cut and shape, motor, super-capacitor, propeller, magnet, reed switch, wire and instructions.

- 841800 Kit ......................................................... $15.95 or $14.95 ea./10+
- 841801 Bulk Pack of 10 .................................................. $13.50 Per Kit $135

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® Monsters™ Vehicle Design Challenge
Features an 8 ft setup with obstacles track plus built-in trays for wood, stones etc. (designed for easy storage). The track must be powered with a KELVIN® Power Supply (DC) to move from points A to B at the end of the track, using overhead wires. Teachers may elevate the track on one end to increase the climbing challenge of the truck.

Students design trucks from basic kits available from KELVIN®, and work in teams or individually to design and construct springs and a propulsion system. They can then compete in the newest engineering challenge. Track assembly required by the teacher. Design Challenge includes Obstacle Track and [2] Individual Kits. Requires a power supply (see below).

841676 Kit - U-Design™ .................................................................$19.95 or $18.95 ea./10+
841677 Bulk Pack of 9 Kits ..............................................................$18.30 Per Kit $165
841051 Variable Power Supply - see kelvin.com for more info ..................................................$125
841386 Digital Display Power Supply - see kelvin.com ..............................................$295 or $275 ea./3+
841387 Dual Digital Display Power Supply - see kelvin.com ............................................$395 or $375 ea./3+

As Low As
$1830
Per Student

Find More KELVIN® products on pgs. 3, 17-19, 23, 31, 41, 42, 59, 77, 80, and 82.

KELVIN® Kre8® Monster Truck
Steer this 8.66 in. long customizable monster truck model over objects on the table. Connect up to the 3V hand controller provided to make it move forward, backward, and turn. Requires one AA battery.

283710 Kit with Manual Controller ........$29.95 or $26.95 ea./5+ or $24.95 ea./10+

KELVIN® Spring Maker
Wind your own springs with KELVIN® Spring Maker™ and learn about math. The Spring Maker™ creates several different thicknesses of springs to use with your cars, machines and inventions. In addition, a special Power Point presentation covers spring design, manufacturing and calculation and measurement of spring rate. It also includes student activity to manufacture spring scale.

System includes: Spring Winder, Table Metal Rods, Student Activity and Power Point Presentation. Can be mounted in a table vise.

841345 Spring Maker System™ ..............................................$125
390982 Additional Rod Pack for Making Springs .........................$14.95

Design and Wind Vehicle Suspensions
KELVIN® Vehicle Safety Testing Track
Design safety restraints (like bumpers and air bags) for a student-built vehicle that will keep an egg intact after an impact of up to 35 mph. Includes 5 ft. launch track, giant elastic band propulsion system and manual with vehicle plans. ★NOTE: Please allow $50 for oversized shipping. $295
840672 ★ Replacement Elastic Tubing, 50 ft. (Cut to Size) $49.95
390565
KELVIN® Krasher™, Starter Kits, Impact Analyzer PLUS a Computer with Monitor and Pre-Loaded Software $1,995
841637

KELVIN® Vehicle Test Station
Help your students understand the use and importance of “testing” in the engineering and design process with KELVIN® Vehicle Test Station. This unique product will test a vehicle’s speed, torque and climbing ability, helping your students to optimize their design solutions.

The LED dynamometer will visually show the drive wheel speed. The more LEDs lit, the faster the wheels are turning. The gram scale will measure the torque of the vehicle in grams or Newtons. The adjustable ramp can be set at specific angles to measure the climbing ability of the vehicle. Batteries and vehicles not included. $195 or $175 ea./3+
842079 Vehicle Test Station

KELVIN® “Build A Program” Engineering Mini Module: Auto Safety Design 1
Design and test safety systems that protect egg passengers during crash simulations. Module includes Kelvin Krasher, [3] Car Bases, DesignGrid Cardstock, Balloons, Bubble Wrap, 10cc Syringes and Plastic Tubing $695
841680 Level: ELM, M, HS

KELVIN® “Build A Program” Engineering Mini Module: Auto Safety Design 2
Students use sensors to gather data about crash impact and interpret computer graphs. Requires Auto Safety Design 1 above. Module includes: Krasher Vehicle, Computer Interface, Software, Kel-Timer Jr. and Sensor Holders. $995
841702 Level: ELM, M, HS

KELVIN® “Build A Program” Engineering Mini Module: Auto Safety 1 & 2 Combo
Includes the contents of Auto Safety Design 1 and 2 above PLUS a PC and 17 in. LCD Monitor. $2,945
841703 Level: ELM, M, HS

Test Your Vehicle’s Speed, Torque and Climbing Ability!

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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KELVIN® E-Road™ Experimental Car

Design & Build A Dragster That Runs On The Electrified E-Road™!

E-Road™ Dragster
E-Road™ Experimental Car

KELVIN® E-Road™ Starter Track

Students can test to see which dragster is the fastest to the finish line. Put 2 or 3 tracks together to extend the track length to 16 or 24 ft. Metal springs provide electricity from the metal rails.

Includes an assembled 8 ft. long track and [2] car kits. ★ NOTE: Please allow $40 for oversized shipping.
840999   Starter Track & [2] Car Kits ............$199
841051   Variable Power Supply ..................$125

E-Road™ Track Connector Kit

Connects two 8 ft. long tracks together for a total length of 16 ft.
841617   Track Connector Kit ....................$19.95

KELVIN® E-Road™ Advanced Track

841101   24 ft. Track & [10] Car Kits ...........$1,095

E-Road™ Dragster

841587   $5.95 or $4.95 ea./10+ or $4.45 ea./25+ 841588   Bulk Pack for 25 ........$3.96 Per Kit $99

KELVIN® E-Road™ Experimental Car

841000   $6.95 or $6.45 ea./10+ or $5.95 ea./25+ 841589   Bulk Pack for 20 ........$4.95 Per Kit $99

Safety Car and Egg ‘Passenger’

KELVIN® Bill and Ted’s “Eggsellent” Adventure Unit

Bill and Ted’s “Eggsellent” Adventure is a Safety Car Case Study Activity developed by Barry Borakove, a leading technology education teacher from Syosset High School in New York. This activity, originally developed for use in the Principles of Engineering Course, incorporates engineering concepts along with problem-solving, design, physics, mathematics, and technology.

The class is divided into teams. Students are challenged to design a safety system for a pre-assembled platform base car that protects the occupant (an egg), in a plastic bag.

The object is to design and build the:

- Restraint System
- Ergonomics System
- Car Body
- Crumbling Zone

Students describe and then draw their designs for each objective using a design portfolio and, if possible, formally draft their design using a school CAD program. The teacher should be presented with the design portfolio before the team proceeds to the next step.

Once a design is approved, the teacher will provide the students with the tools and material needed to build the car body and crumbling zone. For the restraint and ergonomics systems, the teams can also use foam, bubblewrap, cardboard, plastic bags, rubberband, etc.

After construction is done, the teams test their designs and evaluate the survival of the occupant; the egg. The car is released from the top of a 16 ft. ramp and races down towards impact with the brick (provided by the teacher). During the evaluation stage, you may want to incorporate one of the Kelvin® Motion Timers™, to measure the car’s speed or the Kelvin® Odyssey™ Impact Analyzer to measure the impact on the passenger.

Each unit includes an 8 ft. long Kelvin® Eggsellent Track (we recommend two tracks connected end-to-end for this activity, #841262), Assembled Car Base (#841263), Car Base Kit (#841264) and Reproducible Teaching Materials. Grades 7-12.
840978   KELVIN® Kel-Timer™ - see online for info..........................$295

KELVIN® “Eggsellent” Assembled Car Base

You’ll need one car for each team of 2 students and at least 4 cars per class. The car bases are reusable by the next team.
841263   Assembled Car Base ..........................$25.95

KELVIN® “Eggsellent” Car Base Kit

841264   Car Base Kit ..................................$12.95

Low-Friction Ballbearing Wheel

1-7/8 in. dia. For the KELVIN® “Eggsellent” Adventure Unit or other projects.
390735   4 for $1.95 or 50+ for $1.45 ea.

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® Downhill Racer™ Tracks
Similar to the Pinewood Derby® of the Boy Scouts of America, this raceway is an incredible 32 ft. long (in four 8 ft. sections). Available separately is the timing unit (see Multi-Lane Timer at left) with display that shows the winner of the different races and the racing time of the different cars.

841445  2-Lane Track ONLY (No Frame) ★ ..................$325
841446  4-Lane Track ONLY (No Frame) ★ ..................$525
841388  2-Lane Track & Frame ★ ............................$575
841389  4-Lane Frame and Track ★ ....................$795
★ NOTE: $350 Oversized Shipping Charges Apply.

KELVIN® Multi-Lane Timer
This easy to operate timer is ideal for competitions and timing from 1 to 6 lanes (with the 2 add-on units). The bright LED displays are large enough for the whole class to view.

All the lanes are timed beginning when the lever for the Downhill Racer™ (see left) releases the cars. When cars pass the sensors at the end of the ramp they stop the counter and the winning lane is displayed on top and the rest in winning order. The lane number is shown on the left and the time it took is shown on the right.

The Starter Unit includes: a Multi-Lane Controller, 2-Lane Display with mounting, power adapter, and 50 ft. long Cables.

Starter Unit with Controller (for up to 6 lanes) and 2-Lane Display
841393 .................................................$295
Additional 2-Lane Display (Optional)
841394 ..................................................$195

KELVIN® Foam Penny Racer™ Track & Kits
Create a foam vehicle that carries a minimum of ten pennies down an inclined ramp. Gather vehicle performance data including speed and distance traveled as pennies are added and removed and changing ramp heights. Includes foam block to shape, wood chassis, wheels, axles and instructions. Require shaping with tools and sanding.

842033  Gravity Track, 5 ft. long .........................$99.95
842034  Kit - Gr. 1-6 ..........................$6.95 or $5.95 ea./10+
842038  Bulk Pack of 20 ......................$3.49 Per Kit $69.95

KELVIN® Raceway Vehicle & Track
Engineer a car that can propel itself around an oval track without assistance! The Track Starter Kit comes with the KELVIN® Raceway Oval Track, [4] Raceway Vehicle Car Kits, and a Raceway Vehicle Booklet. Vehicle car kit includes wood, wheels, axles, motor, wire, switch, gears, battery holder, miscellaneous hardware and instructions.

841798  Track Starter Kit.................................$195
841827  Vehicle Kit ..........................$7.95 or $6.95 ea./10+
841799  Bulk Pack for 15 .. $6.67 Per Kit $99.95
652346  Raceway Booklet ..........................$6.95 or $5.95 ea./10+

Students race their car designs using gravity!

KELVIN® Foam Penny Racer™ Lab

842039 ......................................................$295
KELVIN® EggHead Pilot™
Bring in your empty foam egg carton and, with a few provided parts, drive your own EggHead Pilot™ vehicle! We provide the wheels, axles, propeller, wood, straws and rubberband. Requires use of hot glue gun.
841919 Kit ............NEW LOW PRICING - NOW ONLY $2.95 or $2.45 ea./10+

KELVIN® Egg Roll Motor Kit™
Turn trash into a toy! Bring in your empty foam egg carton and transform it into a student-designed vehicle! We supply the parts, including wheels, axles, motor, switch, pulley, wood, straws and tubes. Requires use of hot glue gun and simple soldering.
841959 Kit ............NEW LOW PRICING - NOW ONLY $3.95 or $3.45 ea./10+

KELVIN® Rubber Band & Propeller Car
841205 ........................................ $3.95 or $3.45 ea./10+ or $2.95 ea./25+
841954 Bulk Pack for 50 .................................................$2.50 Per Kit $125

KELVIN® Designer Rubber Band Powered Build A Better Racer™
Includes slotted wheel, wheels, wood dowel, axles, corrugated plastic, rubber band and string. Requires minor soldering.
841878 Kit .................................................................$7.95 or $6.95 ea./25+
841879 Bulk Pack for 20 .........................................................$6.25 Per Kit $125

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**KELVIN® E.V. Racer™ Car**
841016 [D] Kit ................................................ $4.95 or $4.45 ea./10+ or $3.95 ea./25+
841416 Bulk Pack for 25 ........................................... $3.96 Per Kit

**KELVIN® Worm Gear Car**
841255 [E] Kit ................................................ $7.95 or $6.95 ea./10+ or $5.95 ea./25+

**KELVIN® Wood Car**
Students design and shape a piece of bass wood into a fast racing car. Then they can have competitions to see whose is the fastest. Kit includes: [4] wheels, [2] axle straws and a wood blank.
841254 [B] .................................................. $4.95 or $4.45 ea./10+ or $3.95 ea./25+

**KELVIN® Ramp Racer™ Balsa Car**
Design and build a cruiser, sedan or mini van and the fastest down a test ramp is the winner. Easy to shape with hand tools (not included). This kit includes: wheels, balsa blank (2 x 3 x 9 in.), axles and DesignGrid™ Paper.
841337 [C] .................................................. $5.95 or $5.45 ea./10+ or $4.95 ea./25+

**KELVIN® Gearbox Car**
Students change the gear ratio to get different speeds. This kit includes a gearbox, motor, battery holder, switch, axles and wheels. Requires [2] AA batteries, soldering and the use of a hot glue gun for assembly.
841256 [F] Kit .................................................. $9.95 or $8.95 ea./10+ or $7.95 ea./25+

**KELVIN® Gear Car**
841207 [G] Kit .................................................. $9.95 or $8.95 ea./10+ or $7.95 ea./25+
990204 Gear & Motor Bracket, 5/pkg. .................................. $9.95 or $8.95 ea./10+ or $7.95 ea./25+

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**KELVIN® Air Motor Car**  
Basic kit includes: wheels, axles, motor, propeller, straw, battery holder, switch, stand and wood base.  
841208  [A] Kit ........................................ $4.95 or $4.45 ea./10+ or $3.95 ea./25+  
841419 Bulk Pack for 30 ........................................ $3.30 Per Kit $99

**KELVIN® “Bottle Geek” Car**  
841299  [B] Kit ........................................ $6.95 or $6.45 ea./10+ or $5.95 ea./25+  
841421 Bulk Pack for 20 ........................................ $6.75 Per Kit $165

**KELVIN® GR Cruiser Car**  
Build a battery-powered car with a U-shaped body and race it down the hall! Includes wood blanks, motors, gears, battery holders, wheels and axles.  
841396  [C] Kit ........................................... $7.95 or $7.45 ea./10+  
841425 Bulk Pack for 25 ........................................ $4.95 Per Kit $123.75

**KELVIN® Kre8® Electric Racer**  
Quick and easy for students to make – see how fast they can make it go! Decorate the body of the racer. Includes switched battery holder and motor. Requires AA batteries.  
283662  [D] Kit ........................................ $9.95 or $8.95 ea./5+ or $7.95 ea./10+

**KELVIN® Kre8® Air-Propelled Racer**  
Build and race this exciting air car – moves well on flat surfaces! Decorate the body of the racer. Learn about potential energy, stored energy and kinetic energy along with gravity, friction and rotary motion. Requires AA batteries. Kit.  
283657  [E] Kit ........................................ $12.95 or $10.95 ea./5+ or $8.95 ea./10+

**KELVIN® Generator Motor Car**  
Build Your Own® vehicle powered by a DC motor generator you build. Wind the coils and assemble. An ideal challenge for high school students.  
842087  [F] Kit ........................................ $29.95 or $27.95 ea./10+

**KELVIN® Balloon Car**  
Includes: balloon, balloon holder, stand, wheels, axles and wood base.  
841257 Kit ........................................ $3.95 or $3.45 ea./10+ or $3.25 ea./25+  
841418 Bulk Pack for 50 ......................................... $2.90 Per Kit $145  
870013 9 in. Balloons ........................................ $13.95 ea. or $12.59 ea./25+

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**EDC Design It! Balloon Powered Cars Guide**  
There is more to this project than just making an inflated balloon move a car. Engineering involves designing a way to support the balloon and get it to work consistently. Match the power requirements of the car with the right balloon. Nozzles can be designed and tested.  
651659 Guide Only .............................................. $9.95 or $8.95 ea./10+

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**Find More KELVIN® Kre8® products on**  
pgs. 3, 17-19, 23, 31, 41, 42, 53, 77, 80, and 82.

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KELVIN® Build A Better® Mousetrap Racer™
Students design and build a vehicle that uses the energy from a mousetrap spring for propulsion.

Kit with Inserts for CD Rear Wheels (CDs not included)
Includes [2] KELVIN® CD inserts, [2] 1-3/8" dia. front wheels, mousetrap, wooden dowel rod with cable ties for mousetrap arm, wood base and [2] axles. Rear wheel CDs are not included - use your own CDs or purchase KELVIN® Big Project Rear Wheels (990181, see right). Metal rods for mousetrap arms also available.

841282  Kit w/ Inserts for CD Rear Wheels...$3.45 or $2.95 ea./24+
841414  Bulk Pack for 100 ..................................$1.95 Per Kit $195

Kit with Large KELVIN® Big Project Rear Wheels

841206  Kit with Large Rear Wheels ...$3.45 or $3.25 ea./24+
842427  Bulk Pack for 50  ..................$2.95 Per Kit $147.50

KELVIN® Big Project Rear Wheels
4-3/4 in. dia. (same size as a CD) fits 1/4 in. dia. axle. Includes our 1/8 in. insert.

990181  10/pkg. .....................................$5.95 or $4.95 ea./10+

TWICE THE POWER!

KELVIN® Gear-Powered Mousetrap Racer™
Includes wheels, mousetrap, gears, wooden dowel rod with cable ties for mousetrap arm, wood base and axles. Minor soldering is required.

841868  [A] Kit ...............................$7.95 or $7.45 ea./10+ or $6.95 ea./25+
841869  Bulk Pack for 20 ..................As Low As $6.25 Per Kit $125

KELVIN® Pulley-Driven XL Mousetrap Racer™
Includes wheels, mousetrap, pulleys, wooden dowel rod with cable ties for mousetrap arm, wood base and [2] axles. Minor soldering required.

841870  [B] Kit ...............................$7.95 or $7.45 ea./10+ or $6.95 ea./25+
841871  Bulk Pack of 20 KIts ..........................As Low As $6.25 Per Kit $125

KELVIN® Pulley-Driven Mousetrap Racer™
Includes KELVIN® mousetrap wheels, front wheels, mousetrap, pulleys, wooden dowel rod with cable ties for mousetrap arm, wood base and axles. Minor soldering required.

841872  [C] Kit ...............................$9.45 or $8.95 ea./10+ or $8.45 ea./25+
841873  Bulk Pack of 20 KIts ..........................As Low As $7.50 Per Kit $150

KELVIN® Double Mousetrap Racer
Includes KELVIN® mousetrap wheels, front wheels, mousetraps, wooden dowel rod with cable ties for mousetrap arm, wood base and axles. Minor soldering is required.

841874  [D] Kit ...............................$11.95 or $9.95 ea./10+ or $9.45 ea./25+
841875  Bulk Pack of 20 KIts ..........................As Low As $8.50 Per Kit $170

KELVIN® Build-A-Better Mousetrap Racer Guide
Contains ready-to-copy design briefs and challenges to engage students in the engineering design process. Contains photographs, drawings and explanations of the scientific concepts behind the challenges.

652414  [H] Color Guide .................................$9.95
652579  Black & White Guide ...............................$4.95

Victor Regulation Mousetraps
850699  [E] 10/pkg. ...........$5.95 or $5.35 ea./6+
851205  [E] 72/pkg. ..................$37.95

Metal Mousetrap Arm
391040  [F] 12 in. L. 100/pkg.  .......................$24.95

Wood Dowel Rod
1/8 in. dia. 36 in. long. Req. min. order of 10.
850628  [G] ...............18¢ ea./10+ or 16¢ ea./50+

KELVIN® Build-A-Better Mousetrap Racer Guide
Contains ready-to-copy design briefs and challenges to engage students in the engineering design process. Contains photographs, drawings and explanations of the scientific concepts behind the challenges.

652414  [H] Color Guide .................................$9.95
652579  Black & White Guide ...............................$4.95
KELVIN® E.P. Mouse Trap Car
Students design and build a cardboard mouse trap racer. Kit includes: scored and pre-cut cardstock, (2) 3-3/4 in. dia. rear wheels and (2) 1-3/8 in. dia. front wheels, mousetrap, wooden dowel rod with cable ties for mousetrap arm and (2) axles. Assembly requires use of hot glue gun and hand tools.

841315 Kit......$4.95 or $4.75 ea./10+ or $4.45 ea./25+
842440 Bulk Pack of 30 ...............$4.25 Per Kit $127.50

KELVIN® E.P. Jet Balloon Car
Includes: pre-printed cardstock, balloon attachment, balloon, axles and wheels.

841314 Kit..................$7.95 or $6.95 ea./10+
842436 Bulk Pack of 20........ $5.95 Per Kit $119

KELVIN® E.P. Rubber Band Racer
Includes: pre-printed cardstock, rubber bands, axles and wheels.

842434 Kit..................$7.95 or $6.95 ea./10+
842437 Bulk Pack of 20 ........ $5.95 Per Kit $119

KELVIN® E.P. Rubber Band Antique Car
Includes pre-scored cardstock, wheels and axles, rubber bands and detailed instructions.

842454 Kit ..................$7.95 or $6.95 ea./10+
842455 Bulk Pack of 20 .......... $5.95 Per Kit $119

KELVIN® E.P. Hydraulic & Pneumatic Truck
A wooden frame with gussets provides for strength. Use pneumatic or hydraulic power in the operation of the dumpster.

841324 Kit..................$7.95 or $6.95 ea./10+
842438 Bulk Pack of 20 Kits........ $5.95 Per Kit $119

KELVIN® E.P. Rubber Band Cardstock Racer
Powered by a rubber band. Great for design competitions! Includes chipboard, rubber band, wheels and axles.

842301 Kit .................................................. $8.95
842302 Bulk Pack for 20 ........................................ $4.95 Per Kit $99

Build & Decorate Your Way

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
CARS: TRANSPORTATION

KELVIN® Kel-Air™ Air-Powered Dragster Launcher with DIGITAL DISPLAY Pressure Gauge

NEW VERSION includes digital display pressure gauge for exact competition pressure every time (requires air compressor - see below - which can adjust air pressure).

Other features include enhanced pneumatic valve controls, finish gate bumpers and a launch switch that sends vehicles racing down the track under the power of compressed air (no need for expensive CO2). This allows a greater design flexibility and uses less wood for body design. Grades 6-12.

851967 w/ Digital Display Gauge .......... $289

Portable Air Compressor w/ Pressure Gauge & Air Tank
500027 ........................................... $175

KELVIN® Kel-Air™ ORIGINAL Air-Powered Dragster Launcher
Without display - use the analog display on your compressor (not included).
840814 Launcher Only ................. $245

KELVIN® Kel-Air™ Economy Air-Powered Dragster Racing Track
Track is 24 ft. total L (3 sections) and 12 in. W. Requires any Kel-Air™ Launcher.
★ NOTE: Please allow $150 for shipping in contiguous U.S.
842429 (see below) .................. $250

KELVIN® Kel-Air™ Air-Powered Dragster BLANKS

Blanks Pre-Drilled
(with BOTH Axle and Air Input Holes)
Axle holes will fit plastic straw bushings used with traditional 1/8 in. steel axles. These blanks are perfect for anyone that doesn’t have the equipment to drill perpendicular axle holes.
970386 7-1/2 in. L x 3/4 in. W x 1/4 in. Front H x 1-1/4 in. Rear H, 50/pkg............................. $2.10 Per Blank $105

Blanks Pre-Drilled
(with Air Input Holes ONLY)
390689 7-1/2 in. L x 3/4 in. W x 1/4 in. Front H x 1-1/4 in. Rear H, 50/pkg. ....................... $55
390690 10 in. L x 1-1/4 in. W x 1/4 in. Front H x 1-1/4 in. Rear H, 50/pkg. ....................... $75

Blanks (NO HOLES DRILLED)
Blanks are to be drilled with teacher supervision.
970211 7-1/2 in. L x 3/4 in. W x 1/4 in. Front H x 1-1/4 in. Rear H, Bass, 50/pkg. .............. $65
390555 7-1/2 in. L x 3/4 in. W x 1/4 in. Front H x 1-1/4 in. Rear H, Poplar, 100/pkg. ... $75
390555 10 in. L x 1-1/4 in. W x 1/4 in. Front H x 1-1/4 in. Rear H, Poplar, 100/pkg. ... $115

Available Options for Drilling Blanks
970046 Blank Drill Jig for 7-1/2 in. L Blank......................... $19.50
970047 Blank Drill Jig for 10 in. L Blank......................... $19.50
950300 Air Input Hole Drill Set (4) Drill Bits/Drill Stop .............................. $29.95

KELVIN® Kel-Air™ Air-Powered Dragster KITS

Kits with Blanks
(Pre-Drilled with Air Input Holes ONLY)
840918 Class Pack of 10 Kits with 10 in. L Blank .................. $2.79 Per Kit $27.95
840918 Class Pack of 10 Kits with 7-1/2 in. L Blank .................. $2.79 Per Kit $27.95
841093 Kit with 10 in. L Blank ................................ $3.75 Per Kit $37.50
841093 Kit with 7-1/2 in. L Blank ................................ $3.75 Per Kit $37.50
841091 Kit with 7-1/2 in. L Blank................................. $2.95 or $2.75 ea./10+

Kits with Blanks
(Pre-Drilled with BOTH Axle and Air Input Holes)
Includes: 10 in. L wood blank with pre-drilled axle holes and air input holes (3 in. deep). Also includes wheels, axles, straw, screw-eyes and washers.
842380 Bulk Pack of 50 Kits with 10 in. L Blanks ............... $2.60 Per Kit $130
841423 Bulk Pack of 50 Kits with 7-1/2 in. L Blanks.............. $2.60 Per Kit $130
841091 Kit with 7-1/2 in. L Blank ................................ $2.95 or $2.75 ea./10+
841093 Kit with 10 in. L Blank ................................ $3.75 or $3.45 ea./10+

Kits with Blanks
(Pre-Drilled)
or
841093 Kit with 10 in. L Blank ................................ $3.75 or $3.45 ea./10+
840918 Class Pack of 10 Kits with 7-1/2 in. L Blank .................. $2.79 Per Kit $27.95
840917 Class Pack of 10 Kits with 7-1/2 in. L Blank .................. $2.69 Per Kit $26.95

Kits with Blanks
(Pre-Drilled with Air Input Holes)
841093 Kit with 10 in. L Blank........................................ $3.75 or $3.45 ea./10+
841091 Kit with 7-1/2 in. L Blank................................. $2.95 or $2.75 ea./10+

KITS

Bulk Pack Kit Price As Low As
$2.60
$2.10

Pre-Drilled Axle Holes

Pre-Drilled Air Input Hole

Price As Low As
$2.60
$2.10

Pre-Drilled Axle Holes

Pre-Drilled Air Input Hole

Price As Low As
$2.60
$2.10

PORTABLE AIR COMPRESSOR

500027 PORTABLE AIR COMPRESSOR w/ DIGITAL DISPLAY PRESSURE GAUGE KIT

$289

$175

$250

$245

$160

$130

$105

$75

$55

$3.95

$3.20

$2.60

$2.10

$2.60

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10

$2.10
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® Educational TRANSPORTATION: CARS

KELVIN® Kel-Air™ Air-Powered ELECTRONIC Dragster Launcher w/ Track & Class View Timer™
841367 Launcher PLUS Track, ClassView Timer™ & More, ★ ........................................ $2,295
500027 Portable Air Compressor w/ Built-In Air Tank & Pressure Gauge ........................ $175

Hand Controllers (Additional), Blue / Red / Yellow
851518 ........................................ $30

Racing Track (see pg. 62)
842429, ★ $250

KELVIN® Kel-Air™ ELECTRONIC Air-Powered Dragster Launcher
Compressed air launches vehicles safety and economically when the hand-held controllers are pressed. The interface box translates the signal from the hand-held controllers and electrically activates the launch mechanism. Features built-in circuitry for independent launching.

KELVIN® Kel-Accel™ Data Acquisition
Accurately time the speed of a moving object! Position four sensors along the track. Enter the distance between the sensors and the computer will measure the travel time between sensors, calculate speeds and accelerations, then plot them graphically on the screen for motion analysis. View the results directly on the computer or store for later use. Includes 2 sets of sensor cables (4 total) open up to 100 ft., DC power supply, start/finish gates sensor cables (state-of-the art infrared sensors set), interface and software.
841806 Kel-Accel, Windows XP-7, USB ................................................................. $245

KELVIN® K2™ Balsa Air-Powered Racing Car
(Blank Pre-Drilled with Air Input Holes ONLY)
Design a race car that uses compressed air – no CO2 cartridges! Kit includes pre-drilled balsa blank (7x2-1/2x2 in.), wheels, axles, etc. Requires air-powered launcher, see above or pg. 62.
842017 Kit ................................................................. $12.95 or $11.95 ea./10+
842019 Bulk Pack for 10 .................................................. $9.99 Per Kit $99.95

Balsa Blanks ONLY
391248 Pre-Drilled w/ Air Hole Only, 7 in. L ........................................ $6.75 or $5.95 ea./10+
391246 NO HOLES, 7 in. L .................................................. $5.75 or $5.45 ea./10+

Always Uses Compressed Air!

For more on the ClassView™ Timer, see kelvin.com
2-Lane HotShot Raceway™ Dragster Launcher

Self-contained mechanism doesn’t have dangerous spring tension hammers that can cause injury. Works with the CO2 Racing Track (see right). Grades 6-12 w/ adult supervision.

840710 [A] 1-Lane HotShot Raceway’ .............................................................. $295
840711 [B] 2-Lane HotShot Raceway’ .............................................................. $375
330344 Monofilament Line, 260 yds. ................................................................. $3.95
390346 Screweyes, 9/64 in. I.D., 9/16 in. L Shank, 100/pkg. .......................... $2.95

KELVIN® Kel-Timer Jr.™ Motion Timer

Portable, ideal for field testing— no computer required. Use with dragsters, maglev vehicles, water channel testers, etc. Measures Acceleration in One Lane

841089 KELVIN® Kel-Timer Jr.™ ................................................................. $13.95
841005 Sensor Holder (Height Adj., 1-Lane) .................................................. $49.95
780061 Sens. Cable (1-Lane set up to 100 ft.) ............................................... $99.95

KELVIN® Kel-Timer™ Motion Timer

Portable, ideal for field testing— no computer required. Use with dragsters, maglev vehicles, water channel testers, etc. Measures Acceleration in One Lane

840978 Kel-Timer™ ................................................................. $295
841807 Kel-Timer™ Deluxe ................................................................. $345
841005 Sensor Holder (Height Adj., 1-Lane) .................................................. $49.95
780061 Sens. Cable (1-Lane set up to 100 ft.) ............................................... $99.95

KELVIN® CO2 Racing Track

Ideal for HotShot Raceway’ Dragsters and other CO2 dragsters. This 12 in. wide track measures an incredible 72 ft. in total length! Arrives in 9 sections, each 8 ft. long. Works on table top or floor. Use with monofilament line and screw eyes to keep your dragster on the track. ★ NOTE: Allow $400 for shipping in contiguous U.S.

841097 [C] CO2 Racing Track ................................................................. $795

Find More Kel-Timer™ Motion Timers on pg. 74

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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**KELVIN® HOTSHOT RACEWAY™ CO₂ DRAGSTER**

**BLANKS**

**AS LOW AS $2.60 PER BLANK**

Blanks Pre-Drilled (with BOTH Axle and CO₂ Cartridge Holes)

Blanks can now be purchased with pre-drilled for axles and CO₂ cartridge. Axles holes will fit plastic straw bushings used with traditional 1/8 in. steel axles. These blanks are perfect for anyone that does not have the equipment to drill perpendicular axle holes on the dragster’s sides.

<table>
<thead>
<tr>
<th>Blank Type</th>
<th>Dimensions</th>
<th>Cost/100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pine Wood, 12 in. Long</td>
<td>$1.95</td>
<td>$1.75 ea./100+</td>
</tr>
<tr>
<td>Bass Wood, 12 in. Long</td>
<td>$2.45</td>
<td>$2.25 ea./100+</td>
</tr>
<tr>
<td>Balsa Wood, 12 in. Long</td>
<td>$3.95</td>
<td>$3.75 ea./100+</td>
</tr>
</tbody>
</table>

Blanks (NO HOLES DRILLED)

Foam blanks are to be drilled with teacher supervision.

<table>
<thead>
<tr>
<th>Blank Type</th>
<th>Dimensions</th>
<th>Cost/100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foam, 12 in. Long</td>
<td>$4.95</td>
<td>$4.75 ea./100+</td>
</tr>
</tbody>
</table>

**CO₂ Dragster Paint Jig**

Holds your dragster steady while you paint it.

<table>
<thead>
<tr>
<th>Paint Jig</th>
<th>Cost/100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paint Jig</td>
<td>$6.95 or $5.65 ea./3+</td>
</tr>
</tbody>
</table>

**Screweyes**

Place on the bottom of dragsters to use with monofilament line (330344, 260 yds., $3.95) to keep dragsters straight on the track.

<table>
<thead>
<tr>
<th>Screweyes</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screweyes</td>
<td>$2.95 or $2.45 ea./100+</td>
</tr>
</tbody>
</table>

**CO₂ Cartridges**

We only ship CO₂ cartridges to the Continental U.S. via Ground Service.

<table>
<thead>
<tr>
<th>Cartridge</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Gram, 10/pkg</td>
<td>$4.85 or $4.36 ea./10+</td>
</tr>
<tr>
<td>8 Gram w/safety cap, 10/pkg</td>
<td>$5.95 or $5.35 ea./10+</td>
</tr>
</tbody>
</table>

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

---

**KELVIN® HOTSHOT RACEWAY™ CO₂ DRAGSTER**

**KITS**

**AS LOW AS 90¢ PER KIT**

Kits with Blanks (Pre-Drilled with CO₂ Cartridge Holes ONLY)

Kits include your choice of pre-drilled 12 in. long wood blank (pine, bass or balsa), [2] rear wheels, [2] spoke wheels, metal axles, straws, screw eyes, washers and instructions. Shaping and assembly required. Bulk packs do not include CO₂ cartridges.

<table>
<thead>
<tr>
<th>Kit Type</th>
<th>Cost/100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit with Pine Wood Blank</td>
<td>$5.25 or $4.95 ea./10+</td>
</tr>
<tr>
<td>Bulk Pack of 50 Kits with Pine Wood Blanks</td>
<td>$2.98 Per Kit</td>
</tr>
<tr>
<td>Kit with Bass Wood Blank</td>
<td>$4.50 or $3.95 ea./10+</td>
</tr>
<tr>
<td>Bulk Pack of 50 Kits with Bass Wood Blank</td>
<td>$3.30 Per Kit</td>
</tr>
<tr>
<td>Kit with Balsa Wood Blank</td>
<td>$5.75 or $4.95 ea./10+</td>
</tr>
<tr>
<td>Bulk Pack of 50 Kits with Balsa Wood Blank</td>
<td>$3.60 Per Kit</td>
</tr>
<tr>
<td>Kit with Parts Only - NO BLANK</td>
<td>$1.75 or $1.50 ea./10+</td>
</tr>
<tr>
<td>Bulk Pack of 50 Kits with Parts Only - NO BLANK</td>
<td>$0.90 Per Kit</td>
</tr>
</tbody>
</table>

**KELVIN® K1™ Balsa CO₂ Racing Car**

Pre-Drilled Blanks (with CO₂ Cartridge Holes ONLY)

Design a race car that uses CO₂ cartridges (sold separately and shipped ground, see lower left). Kit includes balsa blank (Pre-Drilled with CO₂ Input Hole ONLY 3/8 in. Long), wheels, axles, etc. The blanks measure approximately 8-3/8 x 2-1/2 x 2 in. (223mm x 65mm x 50mm). Requires a CO₂ Launcher, see next page.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Cost/100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kit</td>
<td>$12.95 or $11.95 ea./10+</td>
</tr>
<tr>
<td>Bulk Pack for 10</td>
<td>$9.99 Per Kit</td>
</tr>
</tbody>
</table>

**Balsa Blanks ONLY**

<table>
<thead>
<tr>
<th>Blank Type</th>
<th>Cost/100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Drilled w/ CO₂ Hole Only, 8-3/8 in.</td>
<td>$6.75 or $5.95 ea./10+</td>
</tr>
<tr>
<td>NO HOLES, 8-3/8 in.</td>
<td>$5.75 or $5.45 ea./10+</td>
</tr>
</tbody>
</table>

**CO₂ Dragster Paint Jig**

Pre-Drilled CO₂ Dragster Paint Jig

Pre-drilled blanks have a CO₂ cartridge hole ONLY. Students must drill the axle holes in these blanks. All blanks are 1-1/2 in. wide with a front height of 3/4 in. and a rear height of 2-3/4 in.

<table>
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<tr>
<th>Blank Type</th>
<th>Dimensions</th>
<th>Cost/100+</th>
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<tbody>
<tr>
<td>Pine Wood, 8 in. Long</td>
<td>$1.95 or $1.75 ea./100+</td>
<td></td>
</tr>
<tr>
<td>Bass Wood, 8 in. Long</td>
<td>$2.45 or $2.25 ea./100+</td>
<td></td>
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<tr>
<td>Balsa Wood, 8 in. Long</td>
<td>$3.95 or $3.75 ea./100+</td>
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**Balsa Blanks ONLY**

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<tr>
<td>Pin Wood, 8 in. Long</td>
<td>$2.80 or $2.49 ea./100+</td>
<td></td>
</tr>
<tr>
<td>Bass Wood, 8 in. Long</td>
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**CO₂ Dragster Paint Jig**

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Holds your dragster steady while you paint it.

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**Screweyes**

Place on the bottom of dragsters to use with monofilament line (330344, 260 yds., $3.95) to keep dragsters straight on the track.

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
KELVIN® ORIGINAL Around The PowerPole™ Design Challenge

Students in middle school and up, can learn about aeronautics and problem-solving while they build a complete model from provided kit material and then test how it flies around the PowerPole™. Model planes are evaluated on their speed (rpm), how much load they can carry, and how high they can fly. Airplanes can now be designed to fly faster and higher, controlled by the operator, with no time limit. Includes PowerPole™ and (2) balsa plane kits. Requires power supply. Use safety glasses.

NEW! PowerPole™ Balsa Planes
842445 [D] Pre-Cut Balsa Kit w/Motor, Props, Wire...$14.95 or $12.95 ea./10+
842446 [E] Balsa Blank Kit (Not Pre-Cut, U-Design™)...$12.95 or $9.95 ea./10+

Plane with Connectors
842933 [F] Kit ..........................................................$9.45 or $8.95 ea./10+

Kel-Pole™ Cargo Plane Kit
Includes foam, foam core board, landing gear, motor, three different propellers, instructions and four experiments.
841673 [G] Kit ..........................................................$9.95 or $8.95 ea./10+

Around The Pole Aerospace Activity Booklet
650973 [H] ...............................................................$6.95 or $6.45 ea./10+

KELVIN® Wright Brothers Design Challenge™ Planes

Foam Plane
All planes work with the KELVIN® PowerPole™ Above.
841672 [A] Kit .........................................................$9.95 or $8.95 ea./10+
840732 [A] Bulk Pack of 10 Kits ....................................$8.49 Per Kit $84.95
842102 [A] w/ Power Jack Connector, Bulk Pack of 10 ....$8.49 Per Kit $84.95

Balsa & Tissue Paper Plane
Design and test wing structure. Comes with adjustable balsa structure, wire to power pole, motor, propeller and tissue paper.
840732 [A] Kit .........................................................$9.95 or $8.95 ea./10+

Plane Trainer
Hook-up this pre-assembled model airplane to the PowerPole™ and fly! Ideal for younger students who may find it easier to begin the challenge by first designing a styrofoam wing for the pre-assembled model plane. The original wings can be easily removed with a screwdriver and replaced with student-designed wings. Requires PowerPole™ and power supply.
840828 [C] Assembled Plane Trainer ................................$79.95

Replica Plane
842125 [D] Kit .........................................................$11.95 or $9.95 ea./10+
842130 Bulk Pack of 10 Kits ........................................$89.95

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KELVIN® EDUCATIONAL

KELVIN® Rubber Band PowerPole™ Class Set
242046   Class Set .................................. $199.95

Rubber Bands for Competition
420749   [F] Enough for 10 Planes ...................... $29.95

Rubber Band Winders
851266   [G] 3:1 .................................................. $7.95 or $7.45 ea./6+
283694   [G] 10:1 .................................................. $29.95

Rubber Band Hand Winder
Make it easy to wind the rubber band on your propeller or glider. Save time and also easy to count number of turns for competition. One revolution of hand crank equals 15 turns of rubber band.
851267   [H] .................................................. $21.95 or $20.95 ea./6+

KELVIN® Foam Gliders
Kit w/ Foam Blanks
Foam (requires you to design, cut out and shape the foam body and wing), nose weights, rubber bands and instructions.
280614   [A] Kit .................................. $3.75
280606   [B] Kit .................................. $2.99 Per Kit $19.95

Kit w/ Pre-Cut Foam
Pre-cut foam body and wing (requires shaping), nose weights, rubber bands and instructions.
280613   [B] Kit .................................. $3.95
280611   [B] Kit .................................. $2.99 Per Kit $59.95
280612   [B] Kit .................................. $2.25 Per Kit $225

Rubber Band Hand Winder
Make it easy to wind the rubber band on your propeller or glider. Save time and also easy to count number of turns for competition. One revolution of hand crank equals 15 turns of rubber band.
851267   [H] .................................................. $21.95 or $20.95 ea./6+

KELVIN® Helicopter Flight Test Center
After designing and building a helicopter, students can actually observe them hovering in the Test Center viewing area. Using a variety of propeller blade arrangements provided they will gather data focusing on the properties of the blades including wind speed and power.
842449   Test Center for Class .................................. $195

KELVIN® Helicopter Flight Test Center Consumables
Includes: foam body blanks, motor mount tubes, hand powered flying prop materials, pins, and straws. Requires propellers and motors.
842450   Bulk Pack for 10 .................................. $19.95

Planes As Low As
$1.99
Per Kit

B

D

E

A

KELVIN® Rubber Band PowerPole™ Starter Set
Students design, build and test a rubber band powered plane that they will fly around a stationary pole as many times as possible. It helps students understand the forces and mechanisms that make it possible for flight.
842126   Starter Set .................................. $99.95

U-Design & Build Around The Pole Rubber Band Powered Plane
283693   [A] Kit .................................. $3.45 or $2.95 ea./10+
842047   Bulk Pack for 50 .......................... $1.99 Per Kit $99.95

Rubber Band-Powered Plane
841818   [B] Bulk Pack for 30 ...................... $3.30 Per Kit $99

Rubber Band Flight Activity & Booklet
One kit and one booklet (for assisting in the plane construction) is required for each student.
281662   [C] Plane Kit .................................. $3.95 or $3.45 ea./12+
651448   [D] Booklet .................................. $2.25 or $1.95 ea./12+

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
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**KELVIN® Educational Planes**

**Delta Dart**
- Best for first time builders!
- Build with glue sticks and white glue for a faster, cleaner project. Wing dihedral can be lowered for a 305mm wingspan needed for national competition. English/Spanish instructions. Additional motor loops listed below.
- **842037** Kit ...........................................$2.45 or $2.25 ea./6+
- **840130** Bulk Pack for 35...$54.95 or $52.95 ea./3+
- **Motor Loops**
  - 1/8 in. dia. x 7 in L.
  - 850695 35/pkg. ...$4.95

**Super Delta Dart**
- Great for outdoor flying with longer flights, stronger framing, movable and removable wing for center of gravity experiments. Bulk pack includes bilingual instructions.
- **842036** Bulk Pack for 24...$69.95 or $67.95 ea./3+

**Flip Glider**
- Features wing tip dihedral for stability. This kit may be easily converted to an outdoor catapult launched glider.
- **840362** Bulk Pack of 35 Kits ...............$74.95

**Star Glider**
- An economical first step in aviation science. Students are each supplied with two gliders.
- **283693** Bulk Pack of 35 Kits ...............$49.95

**Shoebox R.O.G.**
- A rubber-powered flying laboratory designed to make long duration flights to a minute indoors!
- **283690** Bulk Pack for 8...$32.95 or $30.95 ea./3+

**KELVIN® Double Prop Helicopters**
- Propellers on planes helps pull it forward but when mounted horizontally, they lift a helicopter up. Features the same flights principles as a helicopter.
  - **Kit with Wood Propellers**
    - You Design & Shape Propellers
    - With dowel, balsa, thin wire, aluminum tube, rubber band and wood bead.
    - **842037** Kit..........................................$4.95 or $3.95 ea./10+
  - **Kit with Plastic Propellers**
    - Ready to Use & Easier to Assemble
    - **842039** Kit w/ Propellers, Balsa & Rubber Bands..............$5.95 or $4.95 ea./10+

**Right Flyer**
- The big brother to the Shoebox R.O.G. features cambered airfoil wings and a low thrust line for high performance.
- **283699** [F] Bulk Pack of 24 Kits ..................$99.95

**References**
- Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

**KELVIN® Condor Super Size Catapult Launcher**
The 47 in. long track will launch your school foam glider with excitement! Constructed from metal. To launch, use elastic surgical tubing or the optional CO2 launching unit (see below).

283381 Condor Catapult Launcher ................................................ $245

**KELVIN® CO2 Launching Unit**
This optional unit easily attaches to the Condor Catapult Launcher track with two screws. To operate the launcher the spring loaded firing pin is pulled back and lock into the firing position by the launch lever. The Condor plane is placed onto the track so the CO2 cartridge exhaust end slips into the launcher. When the launch lever is released the firing pin travels forward puncturing the CO2 cartridge allowing the gas to escape at high velocity thrusting the plane forward.

283406 CO2 Launching Unit ................................................ $175

**KELVIN® Condor™ Super Size Glider**
Design, build and test a foam glider’s 21 in. long Fuselage and 24 in. wide Wingspan.

Bulk pack includes foam (cut to rough shape of wing and fuselage), balsa, rubber bands, nose weights and instructions with wing templates.

283185 Bulk Pack for 20 ......... $99.95

**KELVIN® Skyrider™ Balsa Glider Catapult Launcher**
The sturdy Skyrider™ Balsa Glider Catapult Launcher uses a heavy-duty rubber band for the power source, and will send your glider on it’s way! Since no CO2 cylinders or engines are required, students can economically launch one flight after another. Launcher (6-ft. L) disassembles for easy storage.

283414 Launcher .................. $145

Balsa Bulk Pack for 20 w/ Activity Manual 283415 ...................... $4.95 Per Kit $99

Best Deal! Skyrider™ Package ................................................... $235

**KELVIN® Clipper Glider**
Design a balsa glider that glides the farthest or the highest.

841233 Class Pack for 10 ............ $9.95

**CO2 Cartridges**
We only ship CO2 cartridges to the Continental U.S. via Ground Service.

500025 8 Gram, 10/pkg. ......................... $4.85 or $4.36 ea./10+
500053 w/ Safety Cap, 10/pkg .................. $5.95 or $5.35 ea./10+

Please note: If not using the CO2 Launching Unit (283406), an empty CO2 cartridge (not included) is required for weight balance. A full CO2 cartridge is required if using the CO2 Launching Unit. Also, teacher supervision is required. School use only.

**Balsa Glider Kit**
Launch by hand!

283778 ...................................... $3.75 or $2.95 ea./10+ or $2.75 ea./25+

Prices in this catalog represent discounted pricing for educational institutions.
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

**KELVIN® Blue Bird Glider**

Blue and Depron foam with cardstock tail section. The wingspan measures 16 in wide. Require cutting, shaping and drilling the foam before assembly.

- 842466 Kit .......................................................... $5.95
- 842470 Bulk Pack for 25 ........................................ $3.00 Per Kit $75

**KELVIN® Depron Glider**

Require cutting, shaping and drilling the foam before assembly. The wingspan measures 16 in wide.

- 842466 Kit .......................................................... $6.95
- 842469 Bulk Pack for 25 ........................................ $4.00 Per Kit $100

**KELVIN® Geodesic Hot Air Balloon Challenge**

A new twist on hot air balloons. Give your students a lesson in geometry and measurement while they build hot air balloons based on geodesic domes. The Geodesic Hot Air Balloon Challenge includes plans and instructions for several different models ranging from fourteen inches to over five feet tall, all from standard size tissue paper.

The bigger the balloon, the better it flies (providing a good lesson on surface area and volume)! Flat panels made up of pentagons and hexagons are easy to assemble and repair. These balloons can be launched with an electric hot plate (great for flying in a gymnasium), or sterno solid fuel (outdoor use only). The thoroughly illustrated instruction manual includes information on the history of hot air balloons, plus tips for easy construction.

The Geodesic Hot Air Balloon Challenge Package includes: Launcher, Hot Plate and balloon starter Ppack with metal wire, tissue paper in assorted colors and glue. The challenge requires four gel heat cartridges for outdoor use (see below). Appropriate for grades 6 through 12.

- 841638 Geodesic Hot Air Balloon Challenge Package ................. $245

**Consumables**

Packs and single kits include: colored tissue paper, metal wire, and glue.

- 841651 Small Balloon Kit ........................................ $3.95 or $3.65 ea./10+
- 841652 Medium Balloon Kit ................................. $5.95 or $5.45 ea./10+
- 841653 Large Balloon Kit ..................................... $8.95 or $8.45 ea./10+
- 841639 Class Pack (15 Small, 10 Med. & 5 Large Balloons) ..... $3.30 Per Kit $99

**Sterno Gel Heat Cartridge**

Each sterno cartridge burns for approximately 4 hours. ★ Can only be shipped by UPS Ground within the Continental United States.

- 851316 8 oz. ★ .................................................. 99¢ or 89¢ ea./12+ or 79¢ ea./72+

**Tissue Paper Pack** Single Color Packs Available at www.kelvin.com

- 420399 Assorted Colors, 20 x 30 in., 50 Sheets ....................... $19.95
KELVIN® Rocket Scientist™
Air Powered Launcher
Explore the factors that influence rocket flight. Students will design, build and test rocket performance by varying fin shape, size, and number, rocket weight, length and nose cone shape. This STEM based lab demonstrates the application of scientific theory and concepts. And best of all, the air powered rockets require no rocket engines. Students can economically perform multiple tests on their design. Rockets travel up to 60 feet in height depending on design.

This system can also be used to test any model rocket that utilizes an ESTES® B-20 body tube (0.75 in. diameter). This saves money because you are not wasting expensive rocket engines.

Enough supplies for 20 students including: launcher, body tubes, balsa wood, plastic nose cones, foam nose cone fabrication materials and more. Requires air compressor, see below.

851958 Launcher (see left).......................... $295
283405 Bulk Pack of 20 .......................... $9.95 Per Kit $99
Air Compressor w/ Built-In Air Tank
500027 Portable .......................................... $175
Air Tank w/ 5-Gal. Volume
500026 Portable .......................................... $49.95

Save Money!
Pre-test model rockets (with an ESTES® B-20 body tube) without wasting expensive rocket engines!
See pgs. 72-73 for ESTES® Rockets & Supplies

KELVIN® Paper Rocket™
Launchers
KELVIN® adjustable angle launch pad can launch paper rockets up to 175 feet using compressed air. Flight is based on fin design and assembly. The system includes pre-printed colored paper, launch pad, extension tube attachment, dowel rods and instructions. Requires a portable air compressor (see below).

Suitable for Grades 5 and up.

840868 Single Paper Rocket™ Launcher (Not Shown) ........ $245
841045 Dual Paper Rocket™ Launcher .................................. $325
500027 Portable Air Compressor w/ Built-In 4 Gal. Air Tank .... $175
Pre-Printed Paper Rockets™ Body Tubes Bulk Pack
420406 8-1/2 x 11 in., 500 Sheets .......................7¢ Per Tube $39.95

EDC Design It! Straw Rockets Lesson Guide
Launch the outer straw like a toy rocket by blowing. By using a sandwich bag propulsion system, students test different kinds of fins while trying to refine their toy rockets so that they will hit targets consistently.

651816 ........................................ $9.95 or $8.95 ea./10+

Find More EDC Design It! Guides on pg. 14
ROCKETS: TRANSPORTATION

ESTES® Model Rockets
PLEASE NOTE: Rocketry is a hazardous activity and an experienced counselor should be in charge.

220 Swift
SKILL LEVEL 1
0.094 oz. Engines: 1/4A3-3T, 1/2A3-4T, A3-4T.
283652 [A] Kit - 4.5 in. L x 0.54 in. dia. .................$6.95 or $6.60 ea./3+

Yankee®
SKILL LEVEL 1
Comes with self-adhesive red, white and blue decals, streamer recovery and die cut balsa fins. 11 in. long x 0.74 in. dia. Engines: 1/2A6-2, A8-3, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7.
281893 [B] Kit - 11 in. L x 0.74 in. dia. ...............$10.95 or $10.40 ea./3+

Alpha III™
SKILL LEVEL 2X – Max. Altitude of 1100 ft.
A great first rocket with bright molded one piece fin unit, nose cone and parachute. 1.2 oz. Engines: 1/2A6-2, A8-3, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7.
282022 [G] Kit - 12.25 in. L x 0.98 in. dia. ............$17.95 or $17.05 ea./3+
280004 [G] Bulk Pack of 12 .......................$107.95 or $102.55 ea./3+

Big Bertha®
SKILL LEVEL 1 – Max. Altitude of 500 ft.
2.2 oz. Engines: B4-2, B4-4, B6-2, B6-4, C6-5.
282035 [F] Kit - 24 in. L x 1.64 in. dia. ..............$22.50 or $21.45 ea./3+

Wizard™
SKILL LEVEL 1 – Max. Altitude of 1500 ft.
Engines: 1/2A6-2, A8-3, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7.
840277 [C] Kit - 12 in. L x 0.74 in. dia. .............$10.95 or $10.40 ea./3+
281833 [C] Bulk Pack of 12 .....................$68.95 or $65.50 ea./3+

Viking®
SKILL LEVEL 1 – Max. Altitude of 1470 ft.
Features multiple fin configurations. Engines: 1/2A6-2, A8-3, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7.
282036 [D] Kit - 12.1 in. L x 0.74 in. dia. ..........$10.95 or $10.40 ea./3+
280083 [C] Bulk Pack of 12 .....................$59.95 or $56.95 ea./3+

Alpha IV™
SKILL LEVEL 1 – Max. Altitude of 1000 ft.
The perfect rocket to get you started with parachute recovery (12 in.)! Engines: 1/2A6-2, A8-3, A8-5, B4-4, B6-4, B6-6, B6-6, C6-5, C6-7.
282034 [E] Kit - 12.3 in. L x 0.98 in. dia. ...........$13.95 or $13.25 ea./3+
281837 [E] Bulk Pack of 12 .....................$88.95 or $81.95 ea./3+

Porta-Pad® II Launch Pad
Quick assembly - no glue or tools required! Comes complete with blast deflector and standoff, two-piece 1/8 in. (3 mm) launch rod, safety cap and key. Porta-Pad® II can accommodate a 3/16 in. (5 mm) Maxi™ launch rod - not included.
840380 .........................$27.95 or $26.95 ea./3+

Build Your Own® Launch Pad
Combine the two items below and create your own economical model rocket launcher.
220012 6V DC Battery ...$7.95 or $7.45 ea./3+
310001 #60 Alligator Clip...39¢ or 36¢ ea./100+

Electron Beam® Launch Controller
Launch controller comes complete with safety key, continuity light, push button launch button, 17 feet (5.2 m) of cable and micro-clips for igniter hook up. No assembly required! Requires four AA alkaline batteries - not included.
840287 ...............$24.95 or $23.95 ea./3+

Blast Deflector Plate
Replaces that worn-out deflector.
282052 ...........$5.45 or $5.25 ea./3+

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Rocket Engines Educational

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Rocket Engines Bulk Packs

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Elastic Shock Cords

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Nose Cones

Each package of nose cones contains a variety of shapes. Some cones are 1-piece, others 2-piece. All have eyelets for shock cord/shroud line attachments.

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<td>828263</td>
<td>BT-55, 18 in. L, 4pkg</td>
<td>...$7.95 or $7.15 ea./5+</td>
<td></td>
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<tr>
<td>828264</td>
<td>BT-60, 14.2 in. L, 3pkg</td>
<td>...$8.50 or $7.65 ea./5+</td>
<td></td>
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</tr>
<tr>
<td>828265</td>
<td>BT-80, 11 in. L, 2pkg</td>
<td>...$7.95 or $7.15 ea./5+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Large Tube Coupler Pack

One coupler for BT-55, BT-56, BT-60; one for BT-80.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>TYPE</th>
<th>QTY.</th>
<th>$ 1-2</th>
<th>$ EA./3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>828076</td>
<td>Large Tube Coupler Pack</td>
<td>...$6.95 or $6.25 ea./5+</td>
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Recovery Wadding

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<th>STOCK #</th>
<th>TYPE</th>
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<th>$ EA./3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>840498</td>
<td>Flame resistant wadding protects recovery system. Required in most Estes® rockets. 75 sheets; enough for about 18-25 flights!</td>
<td>...$5.95 or $5.65 ea./5+</td>
<td></td>
<td></td>
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</table>

Parachutes

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>TYPE</th>
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<th>$ EA./3+</th>
</tr>
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<tbody>
<tr>
<td>840505</td>
<td>12 in</td>
<td>...$7.95 or $7.45 ea./5+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>840508</td>
<td>18 in</td>
<td>...$7.95 or $7.45 ea./5+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>840509</td>
<td>24 in</td>
<td>...$8.95 or $8.45 ea./5+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PLEASE NOTE:

We can only ship rocket engines to the Continental U.S. via US Postal Service Ground Shipment.

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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**KELVIN® Elite Kel-Timer™ Motion Timer**

New features include redesigned sensors with LED feedback and 4-line LCD backlight display with selectable units for distance and speed (ft, meters, m/h, km/h). This new Kel-Timer™ makes aligning sensors quick and easy. Each pair of sensors at both the start and finish gates has an LED light that indicates when the sensors are properly aimed. Any settings changes you make can be stored so that you do not need to re-enter them every time.

Ideal for 1 or 2 lane timing with 1/1000 second accuracy. Maximum 99 seconds. Modular RJ45 cable connectors can be chained together from start gate to finish gate for the sensors (one per lane). Uses inexpensive CAT5 cable to any length needed. Mini-USB serial connection to transmit race information to a computer or serial terminal.

Comes with two 20 ft. long cables for 2-lane competitions (see 780086 for longer cables) and 5V power adaptor (110V AC). Optional rechargeable battery pack (charged by any USB charger) and additional longer cables are available. Wood blocks by teachers, optional stand attachment available.

**KELVIN® Economy Motion Timer**

Portable, ideal for field testing—no computer required. Use with dragsters, maglevs, water channel testers, etc. Accurate to 1/1000 of a second. Features 7-segment, very bright red LED display.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>842467</td>
<td>1 lane Economy Motion Timer w/ 25 ft. Sensor Cable</td>
<td>$99.95</td>
</tr>
<tr>
<td>842468</td>
<td>1 or 2 lane Economy Motion Timer w/ 2 Sets of 25 ft. Cables</td>
<td>$145</td>
</tr>
<tr>
<td>780083</td>
<td>Sensor Cables, 1-Lane up to 75 ft.</td>
<td>$45</td>
</tr>
<tr>
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<td>$45</td>
</tr>
</tbody>
</table>

The NEW KELVIN® Elite Kel-Timer™ features **REDESIGNED** start/finish sensors with LED lights that can be aligned quickly and easily.

**And The Winner Is...®**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>842483</td>
<td>Elite Kel-Timer™ Motion Timer</td>
<td>$249.95</td>
</tr>
<tr>
<td>780086</td>
<td>CAT5 Network Cable</td>
<td>$24.95</td>
</tr>
<tr>
<td>780085</td>
<td>Optional Rechargeable Battery</td>
<td>$19.95</td>
</tr>
</tbody>
</table>

How much time did it take for your student’s designs to travel? Measure time in 1 Lane or 2 Lane Versions. Idea for STEM Activities & Competitions.
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® Flight Dynamic Wind Tunnel

Students can optimize their design solutions by gathering data and visualizing air flow over a surface. The tunnel can be used to view and measure the force of lift on airfoils and the force of drag on vehicle bodies, rocket parts and other objects. When used with a simple streamer or smoke machine students can observe the flow of air over any surface. 1/4 HP blower features wind speed up to 25mph. LED lit viewing chamber measures 14 x 6-1/4 x 6-1/2 in. Tunnel includes streamer, test stand, airfoil/rocket mounts and instructions. Optional Kel-Lift & Drag Sensors™ are available at left. ★ NOTE: Please allow $295 for oversize shipping.

841786 Flight Dynamic Wind Tunnel ................................................................. $1,495
841410 Kel-Lift & Drag Sensor™ (see details at left) ........................................... $995
841722 Kel-Lift & Drag Sensor™ w/ LCD Display (see details at left) ................ $1,250
841787 Scale Sensor (Mechanical Scale, Test Tray and Accessories) .................. $250
841410 Kel-Lift & Drag Sensor™ (see details at left) ........................................... $995
841722 Kel-Lift & Drag Sensor™ w/ LCD Display (see details at left) ................ $1,250

KELVIN® Kel-Lift & Drag Sensor™

Measure lift and drag properties of wings, vehicles, boat hulls using this interface. Attach a test item to the sensor rod and turn on the wind tunnel. Use the USB cable to interface with a computer and view, store, graph and compare test data.

Includes interface with USB port, software, digital wind speed meter and USB cable. This unit can be retrofitted to wind tunnels other than KELVIN®. Requires computer for display. Grades 6-College.
841410 Win, USB ........................................ $995

KELVIN® Stand-Alone Kel-Lift & Drag Sensor w/ LCD Display

View the data acquired from each test on the 2-line LCD display. This unit does not have the capability of storing data but can connect to a computer via USB connection. Power supply is included.

841410 Win, USB ........................................ $1,250

KELVIN® Power Generator Station

Design and test propellers to determine their efficiency in the wind tunnel. Mounts in wind tunnel. The system includes: fan, mounting stand, digital multimeter and (2) propellers.
840859 .......................................................... $125

KELVIN® ATEC Wind Tunnel

For airfoil shapes and lifting forces. Includes digital scale, magnetic protractor, blower fan, tunnel, special airfoil testing fixture and assembly instructions.
840580 Grades 5+ ......................................................... $345

KELVIN® Engineering Mini Module: Aerospace 4

Includes ATEC wind tunnel, teacher’s guide, foam cutter, high-density foam, balsa, tissue paper, foam abrasive pad and white glue.
841642 Grades 5+ ......................................................... $595

KELVIN® Stand-Alone Kel-Lift & Drag Sensor w/ LCD Display

View the data acquired from each test on the 2-line LCD display. This unit does not have the capability of storing data but can connect to a computer via USB connection. Power supply is included.

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841787 Scale Sensor (Mechanical Scale, Test Tray and Accessories) .................. $250
841410 Kel-Lift & Drag Sensor™ (see details at left) ........................................... $995
841722 Kel-Lift & Drag Sensor™ w/ LCD Display (see details at left) ................ $1,250

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**BOATS: TRANSPORTATION**

**KELVIN® Hovercraft Racer**
Design, build and compete with this model hovercraft. Includes floating bag, foam, motor, propeller, battery holder and switch. Requires [4] AAA batteries as well as tools for cutting and shaping.
- [A] Kit .......................................................... $8.95 or $7.95 ea./10+
- Bulk Pack of 15 ....................................................... $5.95 Per Kit $89.25

**KELVIN® Wired Power Adapter**
- .......................................................... $9.95 or $8.95 ea./10+

**Quick Charger**
- 220155 .......................................................... $29.95

**KELVIN® Super Capacitor Hovercraft**
Simple, but effective this super-capacitor hovercraft will float above a smooth surface. Use a regular or rechargeable battery to charge the super capacitor model for about 20 seconds. Turn on the switch and off it goes. This kit includes: foam base, plastic, propeller, motor, super-capacitor, reed switch, magnet, wire and instructions.
- 841804 Kit .................................................. $11.95 or $10.95 ea./10+
- 841805 Class Pack for 10 .......................... $9.90 Per Kit Per Kit $99

**KELVIN® Wave Runner**
Personal Watercrafts (PWC) have become extremely popular and can be found on lakes and oceans all over the world. Their unique propulsion system uses an impeller to draw water into the system and then pump it at high velocity out the back while propelling the craft forward.
- 842362 Kit .................................................. $19.95 or $17.95 ea./10+

**KELVIN® Lift-Push Foam Hovercraft**
This kit includes: foam tray, propeller, motor, 9V battery snap, wire, straw, mini slide switch, craft sticks and clips. Requires 9V battery. Grades 6-12.
- 841108 Kit .................................................. $5.95 or $5.45 ea./10+
- 842262 Bulk Pack for 25 ............................ $3.99 Per Kit $99.95

**KELVIN® Lift-Push**
Foam Hovercraft
- As Low As $3.99 Per Kit

**KELVIN® Advanced Competition Hovercraft**
Now you can design a hovercraft that not only lifts and travels from one point of the room to another but can also float in a pool and glide across tile - and NOW runs 50% faster for a longer time.
- 841109 Kit .................................................. $8.95 or $8.75 ea./10+ or $8.45 ea./25+
- 841420 Bulk Pack for 20 ............................ $6.75 Per Kit $135

**KELVIN® Lift-Push**
Foam Hovercraft
- As Low As $3.99 Per Kit

**KELVIN® Wave Runner**
- As Low As $5.95 Per Kit

**KELVIN® Super Capacitor Hovercraft**
- As Low As $5.95 Per Kit

**KELVIN® Lift-Push**
Foam Hovercraft
- As Low As $3.99 Per Kit

**KELVIN® Advanced Competition Hovercraft**
- As Low As $3.99 Per Kit
**Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.**

---

**KELVIN® Propeller Boat Kit**
Kit includes a propeller, rubber band, dowel and foam blank (2 x 3 x 12 in.).
840852...$4.95 or $4.75 ea./10+ or $4.65 ea./25+

**KELVIN® Motor Boat Kit**
Design a boat powered by a motor, propeller and battery. This kit includes a foam blank (2 x 2 x 8 in.), motor, switch, boat propeller kit assembly and a battery holder.
841247...$6.45 or $5.95 ea./10+ or $5.75 ea./25+

**KELVIN® Balsa Boat Hull**
Design and shape a boat hull to be propelled by an inboard or outboard motor (not included). Includes a balsa blank (2 x 4 x 12 in.).
841113...$6.95 or $6.50 ea./10+ or $5.95 ea./25+

**Motor Propulsion Kit**
Kit includes a motor, 1 in. propeller, shaft and a mounting bracket.
280412 .................$8.95 or $8.50 ea./6+

**KELVIN® Solar Boat Kit**
Design a boat powered by energy from the sun. The kit includes a foam blank (2 x 3 x 12 in.), motor, switch, solar cell and a propeller.
841252...$9.95 or $8.45 ea./10+ or $8.45 ea./25+

---

**KELVIN® Kre8® Sea Explorer**
Dives and Moves with Propulsion Control!
KELVIN® Sea Explorer™ allows your students to design, build and test their own submersible vessel. The kit includes three motors to allow for vertical and horizontal control of the vessel. Also included in the kit are plastic ballast tubes, control switches, Kre8® structural frame parts, propellers, detailed instructions and resource material, plus much more. Soldering, melting and pouring of low temperature wax is required. A Lantern Battery (see below) is required as a power source.
842107 [A] Kit ......................................................... $39.95 or $37.95 ea./3+ or $33.95 ea./10+
220012 Lantern Battery, 6V ......................................................... $7.95 or $7.45 ea./10+

**KELVIN® Basic Submarine Design**
Designed with a younger student in mind, this basic version allows them to design, test and modify a submarine that ascends and descends in a tank of water. Discover the principles of buoyancy, balance, density and pressure while engaging in a hands-on, learning activity. Each kit includes plastic bottles, additional resource materials and instructions.
842105 [B] Kit ........................................... $9.95 or $8.95 ea./10+

**KELVIN® Rubber Band-Powered Submarine**
After assembling this unique rubber band powered submarine, students will experiment with different propellers, rudder sizes and the placement of stability wings. Students will experience the concepts of buoyancy, action and reaction, friction and drag. Bottle is included.
842108 [C] Kit ........................................... $9.95 or $8.95 ea./10+

**KELVIN® Adv. Submarine Design Challenge**
The sight of a submarine disappearing into the vast ocean captures the imagination of both the young and old. How does the sub descend and then climb back to the water’s surface? What propels the submarine deep underwater?

Designed for elementary through high school students, this activity will challenge your students to design, model and test a working submarine model. Younger children can make the sub descend and ascend while older students can add a propulsion system to the diving submarine.

Kits include detailed instructions and resource materials along with plastic bottles and all the necessary materials for building variable designs.
842106 [D] Kit ........................................... $19.95 or $18.95 ea./10+

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**KELVIN® Solar Cell & Battery Boat Kit**
Advanced kit includes: solar cell, motor, rudder, large propeller, boat propeller, foam blank (2 x 53 x 12 in.) and AA battery holder. Requires 2 AA batteries.
840853 .................$13.95 or $13.45 ea./10+ or $12.95 ea./25+

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### KELVIN® House Framing Kits

Try your hand at designing and building a model house frame! Students can design their own house or build one based on the drawings supplied. Kits include balsa or pine wood, DesignGrid® paper, glue, pins and instructions. Some kits include the optional KELVIN® StiKutter™.

#### Balsa House Framing
Includes 1/8 x 3/8 x 24 in. beams.

- **841771** Kit ...................................... $29.95 or $28.95 ea./6+ or $27.95 ea./10+
- **841770** Kit w/ StiKutter™ ........................ $38.95 or $35.95 ea./10+
- **841886** Bulk Pack of 10 Kits ......................... $25.00 Per Kit $295

#### Pine Wood House Framing
Includes 1/2 x 3/16 x 24 in. & 3/4 x 3/16 x 24 in. beams.

- **841104** Kit .................................... $29.95 or $28.95 ea./10+ or $27.95 ea./20+
- **841887** Bulk Pack of 10 Kits ........................ $25.00 Per Kit $295

### KELVIN® Roof Framing Kit

Try your hand at designing and building a model house roof! Students can design their own roof or build one based on the drawings supplied. Kit includes 1/8 x 3/8 x 24 in. balsa, DesignGrid® paper, glue, pins and instructions.

- **841773** Kit ...................... $22.95 or $21.95 ea./10+
- **841772** Kit with StiKutter™ .. $28.95 or $27.95 ea./10+
- **841888** Bulk Pack of 10 Kits ........ $19.90 Per Kit $199

### KELVIN® A-Frame Model House Kits
With this kit, students design and build a structure model of an A-frame house. Kits includes balsa wood, glue, grid paper and instructions. The Large A-Frame is built to 1 in. scale and the Small A-Frame is built to 1/2 in. scale.

#### Small A-Frame Model Houses (not shown)

- **841777** Kit ........................................ $9.95 or $9.45 ea./6+ or $8.95 ea./10+
- **841822** Bulk Pack of 15 Kits ........................ $8.33 Per Kit $125

#### Large A-Frame Model Houses (shown above)

- **841774** Kit ...................................... $29.95 or $24.95 ea./6+ or $22.95 ea./10+
- **841889** Bulk Pack of 10 Kits ................................. $12.50 Per Kit $225

### KELVIN® Bungalow Framing Kits

Students must design, draw, calculate and build a frame house; using their own design and the materials supplied with the kit and by the teacher. In the design process students should always make sure that they have enough materials for the four outside walls, the floor and the roof. Designs should include space for windows to scale and doors to scale.

#### Pine Wood Bungalow Kits

- **841103** Pine Wood Bungalow Kit ...... $12.95 or $11.95 ea./10+ or $10.95 ea./20+
- **841884** Pine Wood Bungalow Bulk Pack for 15 Teams .............................. $150

#### Balsa Bungalow Kits

- **841885** Balsa Bungalow Bulk Pack for 15 Teams ................................. $10.00 Per Kit $150

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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CATAPULTS: STRUCTURES

As Low As

$5.20

Per Kit

KELVIN® Small Catapult
This small catapult features a 7-1/2 in. long base with a swing arm that can be up to 12 in. L. Includes wood, plastic cup and ping pong ball.
841362 Kit ...................................................... $5.95 or $5.75 ea./10+ or $5.45 ea./25+
841815 Bulk Pack for 24 ...................................................... $5.20 Per Kit $125

KELVIN® Large Catapult
Large 18 in. base is 2-1/2 in. wide with a swing arm that can be up to 24 in. L. Includes wood, plastic cup and ping pong ball.
841229 Kit .................................................... $7.95 or $7.75 ea./10+ or $7.45 ea./25+
841814 Bulk Pack for 24 ...................................................... $5.41 Per Kit $129.95

KELVIN® Kre8® Catapult
Build and rebuild this catapult. Includes: clip connectors, slit rods, tubes, string, bag, sand paper and instructions.
283660 [A] Kit .................................................... $8.95 or $7.95 ea./5+
283639 Bulk Pack for 20 ...................................................... $125

KELVIN® Kre8® Ball Launcher
See who can get the ball to hit a target by pulling a rubber band to alter the launch arm angle and shoot the ball. Comes with all the parts required to make it.
283765 [B] Kit .................................................... $9.95 or $8.95 ea./5+ or $7.95 ea./10+

KELVIN® Kre8® Power Ping-Pong Ball Launcher
Launch ping-pong balls using two wheels attached to spinning toy motors - change the trajectory angle to see how far they go. Comes with all the parts required to make it. Requires AA batteries.
283659 ...$19.95 or $17.95 ea./5+ or $14.95 ea./10+ or $13.50 Per Kit $135
283648 Bulk Pack for 10 ...................................................... $11.50 Per Kit $135

KELVIN® Magnetic Repulsion Adjustable Stop Catapult
Updated with magnets - works with or without them. Simple assembly has this fun activity ready to test in a short time. Learn the fundamentals of force, energy, simple machines, Newton’s Laws, trajectory and other science and math concepts. The moving lever arm is powered by a rubber band and adjustable to twelve different stop positions. Includes pre-cut wood parts and magnets.
Kit w/ Magnets & Pre-Cut Wood Parts
842461 ...................................................... $14.95 or $12.95 ea./10+
Kit w/ Pre-Cut Wood Parts Only
842381 ...................................................... $9.95 or $8.95 ea./10+

KELVIN® Mousetrap Catapult
Use a mousetrap to catapult ping-pong balls. Adjust the length of the lever arm as well as the stopping angle of the arm’s forward motion.
841882 ..................................................Kit, ...................................................... $11.95 or $10.95 ea./10+ or $9.95 ea./25+
842270 Bulk Pack for 10 ........................................................ $8.99 Per Kit $89.95
841883 Bulk Pack for 20 ........................................................ $8.49 Per Kit $169.95

KELVIN® Ancient Catapult
All you need to design your own ancient catapult or use the plans included.
841860 Kit ...................................................... $14.95 or $12.95 ea./10+
841863 Bulk Pack for 10 ...................................................... $8.99 Per Kit $115

KELVIN® Medieval Trebuchet
All you need to design your own medieval trebuchet. Includes 24 in. long wood and instructions. Requires hand tools.
841861 Kit ...................................................... $14.95 or $12.95 ea./10+
841864 Bulk Pack for 10 ...................................................... $11.50 Per Kit $115
WOOD, Balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® EDUCATIONAL STRUCTURES: CRANES

KELVIN® Tower Crane
Includes: Gear Set, Pulley Set, Creative Crane Pulley, Motor, Motor Holder, Balsa, Wire, Wood Base and Instructions. Requires (2) power supplies (see 841051 below) or dual power supply to operate crane and swing unit simultaneously.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>841823</td>
<td>Kit</td>
<td>$12.95 or $11.95 ea./10+</td>
</tr>
<tr>
<td>841824</td>
<td>Bulk Pack for 10</td>
<td>$9.90 Per Kit $99</td>
</tr>
<tr>
<td>841051</td>
<td>Variable Power Supply</td>
<td>$125</td>
</tr>
</tbody>
</table>

KELVIN® Gear Box & Pulley Activity
Learning about gears and what they can be used for (gearing for speed or for power) is an important aspect of many crane and vehicle activities and this kit enables students to do just that. Kit includes: Gear Set, Pulley Set, Creative Crane Pulley, Motor and Motor Holder, Wood, and Instructions.

★ NOTE: The activity must be clamped to a table (clamp is not included). The teacher will need to supply: string, glue, screws and a C-Clamp.

<table>
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<tr>
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<th>Price</th>
</tr>
</thead>
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<td>Kit</td>
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<td>841811</td>
<td>Bulk Pack for 20</td>
<td>$6.25 Per Kit $125</td>
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KELVIN® Creative Crane
Your students will design and build a lightweight crane that creatively lifts a variable load from a structure a minimum vertical height of 18 in. with a minimum horizontal clearance distance of 9 in. from the edge of the tower or footprint of the crane. The crane structure may encroach on a 45° angle from the lifting point.

The crane must lift the load at least 6 in. to qualify; the one that lifts the greatest load and meets portfolio/interview requirements showing proper application of the concepts introduced will be deemed the best design. Scores are based on Maximum Load, Team Portfolio and Team Interview.

Standard U.S. pennies are used for weights and counterweights, which must be suspended from the crane. Students design a container to hold the pennies for both weight and counterweight. There are no restrictions except that the container may not be structural and can not rest on the ground.

Kit includes official competition balsa, pulley pack (4 pcs.), DC motor, motor holder, competition guide. Teacher supplies glue (such as hot glue guns or wood glue), thin sheet metal (for block and tackle), nuts and bolts or pins and nails (for pulley axle). Great for Grades 7 and up. ★ NOTES: A DC voltage power source is required (see below). This is NOT a laser cut or pre-designed.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
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<td>Kit with Balsa</td>
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<td>841692</td>
<td>Kit with Balsa &amp; Stikutter®</td>
<td>$16.95 or $15.95 ea./10+</td>
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<td>841285</td>
<td>Team Class Pack of 6 Kits (No Wood)</td>
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<tr>
<td>281684</td>
<td>Class Pack w/ 1/8 in. x 1/8 in. x 12 in. Balsa</td>
<td>$44.95</td>
</tr>
<tr>
<td>990212</td>
<td>Creative Crane Pulley, 10/pkg.</td>
<td>$9.95 or $8.95 ea./3+</td>
</tr>
<tr>
<td>841051</td>
<td>Variable Power Supply</td>
<td>$125</td>
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</table>

KELVIN® Variable Power Supply

As Low As
$5.99
Per Student

As Low As
$9.90
Per Student

KELVIN® Original Ideas From

KELVIN® Tower Crane
Includes: Gear Set, Pulley Set, Creative Crane Pulley, Motor, Motor Holder, Balsa, Wire, Wood Base and Instructions. Requires (2) power supplies (see #841051 below) or dual power supply to operate crane and swing unit simultaneously.

841823 Kit .............................................. $12.95 or $11.95 ea./10+
841824 Bulk Pack for 10 ........................... $9.90 Per Kit $99
841051 Variable Power Supply ........................ $125

KELVIN® Gear Box & Pulley Activity
Learning about gears and what they can be used for (gearing for speed or for power) is an important aspect of many crane and vehicle activities and this kit enables students to do just that. Kit includes: Gear Set, Pulley Set, Creative Crane Pulley, Motor and Motor Holder, Wood, and Instructions.

★ NOTE: The activity must be clamped to a table (clamp is not included). The teacher will need to supply: string, glue, screws and a C-Clamp.

841810 Kit .............................................. $8.95 or $7.95 ea./10+
841811 Bulk Pack for 20 ........................... $6.25 Per Kit $125

KELVIN® Creative Crane
Your students will design and build a lightweight crane that creatively lifts a variable load from a structure a minimum vertical height of 18 in. with a minimum horizontal clearance distance of 9 in. from the edge of the tower or footprint of the crane. The crane structure may encroach on a 45° angle from the lifting point.

The crane must lift the load at least 6 in. to qualify; the one that lifts the greatest load and meets portfolio/interview requirements showing proper application of the concepts introduced will be deemed the best design. Scores are based on Maximum Load, Team Portfolio and Team Interview.

Standard U.S. pennies are used for weights and counterweights, which must be suspended from the crane. Students design a container to hold the pennies for both weight and counterweight. There are no restrictions except that the container may not be structural and can not rest on the ground.

Kit includes official competition balsa, pulley pack (4 pcs.), DC motor, motor holder, competition guide. Teacher supplies glue (such as hot glue guns or wood glue), thin sheet metal (for block and tackle), nuts and bolts or pins and nails (for pulley axle). Great for Grades 7 and up. ★ NOTES: A DC voltage power source is required (see below). This is NOT a laser cut or pre-designed.

841544 Kit with Balsa ........................ $9.95 or $8.95 ea./10+
841692 Kit with Balsa & Stikutter® ........ $16.95 or $15.95 ea./10+
841285 Team Class Pack of 6 Kits (No Wood) ........................ $5.99 Per Kit $35.95
281684 Class Pack w/ 1/8 in. x 1/8 in. x 12 in. Balsa .................. $44.95
990212 Creative Crane Pulley, 10/pkg. ....... $9.95 or $8.95 ea./3+
841051 Variable Power Supply ......................... $125

KELVIN® Variable Power Supply

As Low As
$5.99
Per Student

As Low As
$9.90
Per Student

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
**KELVIN® Long Island Structure Tester**
This unit is solidly welded, completely assembled and sold at a low cost. Includes frame, bridge support, boom testing system, bucket, plus the hook attachments and instructions. Complies with the specs set forth by the Science Olympiads.

**FREE BONUS!** A class pack of balsa wood bridge/tower parts with glue, enough for 24 students—a $75 value!

841363 ★ Bucket is included! $345

---

**KELVIN® Tabletop Bridge & Tower Tester**
New tabletop tester is ideal for engineering units. The center table can be adjusted up and down to accommodate different height structures. A hand bicycle pump slowly provides the air to activate the 100 psi pneumatic cylinder movement. The tester is provided with an accurate digital display.

851964 ................................................................. $995

---

**KELVIN® Build Your Own® Bridge & Tower Tester with Design & Build Essential Parts**
The teacher comes up with their own design for a structure to hold the cylinder and bridge or tower in place. The cylinder arm extends to compress and break the bridge or tower.

Build the tester design using the essential parts provided in the kit. These parts include: cylinder, pressure sensor, [3] metal cylinder attachments, electronics with digital read out display, pump wall adapter, [2] blocks of wood to put bridge on top, and hardware for attaching cylinder.

851971 Kit ............................................................. $645

---

**Bridge Builder®**
This unique computer-aided design software brings real life engineering problem into the classroom for hands-on problem solving. Challenge students to design a bridge that can support 40 tons. The program incorporates a custom computer-aided design (CAD+) system with editing features such as joint shifts and deletes, member deletes, size changes and strength inquires. Gr. 6-12.

121587 CD-ROM, IBM ......................... $69.95
121588 Lab, IBM ................................. $299.95
121589 School, IBM .............................. $599.95
121590 Network, IBM ............................ $699.95

---

**NEW**

Build a structure to hold the cylinder and the bridge or tower using your own materials and KELVIN®'s Design & Build Essential Parts.

---

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---
WOOD: PROJECT MATERIALS

KELVIN® Miter Box
Use the aluminum miter box with our razor saw for precise cutting of wood and plastic stock. Cuts 45°, 90° and 180° angles. 470101 ...$9.95 or $8.95 ea./12+ or $7.95 ea./24+

KELVIN® Razor Saw
24-Teeth Blade 5 in. L 470102 ...$4.95 or $4.45 ea./12+ or $3.95 ea./24+
30-Teeth Blade 5 in. L 470103 ...$4.95 or $4.45 ea./12+ or $3.95 ea./24+
Razor Saw Handle Comes with blade screw off. 470104 ...$4.95 or $4.45 ea./12+ or $3.95 ea./24+

Basswood

Basswood Bridge Kits
Enough beams, glue and DesignGrid™ Bridge Kits

KELVIN® EDUCATIONAL

Stock # H x w x l in. QTY. $ 1-4 $ EA./5+
970214 1/2 x 3 x 24 10 36.95 34.95
970215 1/2 x 4 x 24 10 44.95 42.95

Wood Beams Pack 3/16 x 1/16 x 5-1/2 in. 841347 1,000/pkg. ..........$4.95 or $4.45 ea./5+

PINEWOOD

Stock # H x w x l in. QTY. $ 1-4 $ EA./5+
850960 3/16 x 3/8 x 24 50 14.95 14.20
970323 3/8 x 3/8 x 24 50 16.95 15.25
970048 1/2 x 1/8 x 24 100 35.95 32.95
970049 3/8 x 1/4 x 24 100 37.95 32.95
970217 1-1/2 x 2-1/2 x 7 1 1.95 1.75

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KELVIN® Balsa StiKutter™
Affordable enough for every student to own! Easy to use with a long handle and compact size: 4-1/2 x 4-1/2 in. Clear plastic shield acts as a finger protector. Cut angles easily in one step with a built-in protractor and moveable guide. Cuts up to 3/16 in. thick with a replaceable blade (by teacher). Base has four corner holes for mounting and no stop on the right side.

$9.95 or $8.95 ea./10+
841430 Add. StiKutter™ Blades, 10pkg. ........... $2.95

Bridge & Tower Balsa Kits with StiKutter™
With StiKutter™, balsa, glue, DesignGrid® paper and instructions.

Kit with Basic Instructions 841667. $14.95 or $13.95 ea./10+
Kit with Advanced Instructions 841668. $15.95 or $14.95 ea./10+

Balsa Packs
Design and build a bridge or tower your way with the provided balsa.

Single Balsa Kits

1/16 x 1/8 x 13 in. & 1/8 x 1/8 x 13 in.
841348 .......... $6.95 or $5.95 ea./10+
3/32 x 3/32 x 18 in.
841350 .......... $7.95 or $6.95 ea./10+

Class Packs for 24 Students
280028 1/16 x 1/8 x 36 in. ............. $125
280363 1/8 x 1/8 x 24 in. ............... $99

Stock # H x W x L in. QTY. $1-4 $EA./5+
970005 1/16 x 1/8 x 36 10 $3.95 $3.95
970010 3/32 x 3/32 x 36 10 $9.95 $9.95
970012 1/8 x 1/8 x 36 100 $19.95 $19.95
970013 1/8 x 1/8 x 36 300 $59.95 $59.95
970017 3/32 x 1/8 x 36 50 $14.95 $14.95
970018 1/4 x 1/4 x 36 25 $34.95 $34.95
970020 1/4 x 1/4 x 36 100 $109.95 $109.95
970021 1/4 x 1/4 x 36 500 $549.95 $549.95
970025 1/4 x 1/4 x 36 3000 $1549.95 $1549.95

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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### METAL: PROJECT MATERIALS

#### Brass Rods

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<th>STOCK #</th>
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#### Brass Round Tubes

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#### Brass Strips

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#### Brass Rectangle Tubes

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#### Copper Rectangle Tubes

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<th>$ 10+</th>
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#### Steel Rods

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<tr>
<td>390220</td>
<td>6</td>
<td>5/32</td>
<td>5</td>
<td>3.95</td>
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</table>

#### Nichrome Wire
- Ideal for various uses or as replacement cutter for StyroDesigner. 10 ft. L.
- 330338 24 ga. ........ $6.95
- 330339 18 ga. .......... $17.95

#### Steel Wire
- Galvanized. 100 ft. L.
- 330342 $4.95
- or 330340 $4.65 ea.3+
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® EDUCATIONAL

Lowest Price Anywhere on Similar Product!

KELVIN® Economy Foam Cutter
Ready to operate and now comes with starter set of 5 assorted foam blocks. A perfect machine for modeling design ideas and hobbyists at an affordable price! Features one level of heat and an acrylic table with an adjustable wire cutting angle. Includes wall adapter.
841982 Assembl. w/Foam Blocks...$99.95 NOW $69.95

KELVIN® Economy Foam Cutter Kit
Students and teacher assemble this affordable foam cutter. Features acrylic table with an adjustable wire cutting angle that's simple and quick to set! Comes with wall adapter. Kit requires assembly.
842428 Kit ....$59.95

KELVIN® Foam Car
Design, shape, assemble and paint your foam into a car! Foam is easy to cut, shape and decorate. Includes: [4] wheels, [2] axles, straw, wood base and foam block (2 x 2-1/2 x 8 in.). Shaping and assembly required.
842386 ..................$9.95 or $8.95 ea./10+
842387 Bulk Pack of 10 ..............$7.90 Per Kit $79

KELVIN® Pontoon Boat Kit
842406 Pack of 20 Kits ............$99
Find More Foam Boat Kits on pg. 77

KELVIN® Foam Cutter with Built-In Plug
842460, $79.95

STOCK # FIG. T in. W in. L in. QTY. $ 1-4 $ 5+
391082 I 1/2 3 8 10 9.95 8.95
420557 C 2 8 10 9.95 8.95
750212 F 2 14 10 12.95 11.95
420217 A 3 8 10 12.95 11.95
420560 B 3 10 10 13.95 12.95
841114 E 2.5 8 10 9.95 8.95
420478 D 3 12 10 14.95 13.95
851199 G 4 12 10 15.95 14.95
750211 H 3 4 10 9.95 8.95

Polystyrene Foam Blanks Blue

STOCK # FIG. T in. W in. L in. QTY. $ 1-4 $ 5+
750166 J 1 24 24 5 26.95
750167 J 2 24 24 5 49.95
750168 J 3 24 24 5 63.95

Polystyrene Foam Sheets ★
Hi-Density. Blue polystyrene.
★ Oversized Shipping Charges Apply.

Abrasive Shaping Pads 100/pkg.
851197 .....................$69

STOCK # FIG. T in. W in. L in. QTY. $ 1-4 $ 5+
851197 J 24 24 5

KELVIN® ECONOMY FOAM CUTTER

Cuts Foam Easily!

Kit As Low As
$59.95

Assembled As Low As
$69.95

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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Learn about Injection Molding While Making Fun and Useful Products!

Manual Injection Molder
Economical choice for school technology programs with plastics units. Uses 700W, 117 VAC, 2/3 oz. capacity, 550W plastics heater, electronic heat control, 2,500 lb. mold clamp, GFI power handling, teflon coated ram cylinder, instructions and a one year warranty. Accepts most HONA and EMCO molds. Maximum mold size measures 2-1/4 x 4 x 1 in. Please note this product requires 4 weeks to ship.

$1799.95

KELVIN® Aluminum Injection Molds
Use low density polyethylene for these molds. Standard sizes.

570018 Checker $99.95
570019 Golf Tee $99.95
570020 Poker Chips $99.95
570129 Guitar Pick $99.95
570130 Bottle Cap $99.95
570131 Spinning Top $99.95
570022 Front Wheel $126.95
570023 Rear Wheel $126.95
570132 Blank, 4 x 2.25 x 1 in. $99.95

KELVIN® Build Your Own® Screwdriver
Make your own screw-drivers with the tool handle mold, nickel-plated steel blades and polystyrene resin crystals (for the screwdriver mold ONLY).

570017 Screwdriver Tool Handle Mold $126.95
570024 Slotted Blades, 100/pkg $41.95
570025 Phillips Blades, 100/pkg $59.95
570027 Blue Polystyrene, 5 lbs. $39.95
570028 Red Polystyrene, 5 lbs $39.95
570029 Green Polystyrene, 5 lbs. $39.95
570030 Yellow Polystyrene, 5 lbs. $39.95

KELVIN® Hot Line Acrylic Bender
The bender heats acrylic plastic making it easy to form. Place the heated acrylic on the Angle Bender to obtain crisp tight bends at any angle.

841999 [A] Hot Line Acrylic Bender - Requires 110 V DC $295
841998 [B] Matching Angle Jig $195

Warm and Bend Acrylic at Pre-Set Angles

Acrylic Sheets
Sheets measure 12 x 24 x 1/8 in.

<table>
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<td>750010</td>
<td>Red</td>
<td>8.95</td>
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Plastic Cutter
Cuts plastic sheets up to 1/4 in. thick and easily creates beveled edges.

390430 $4.95

Edge Scraper
Use to remove saw cuts from acrylic sheet edges.

390432 $15.95

KELVIN® ALUMINUM INJECTION MOLDS
Use low density polyethylene for these molds. Standard sizes.

A

PROJECT MATERIALS: ACRYLIC

Find More Manufacturing Tools and Supplies at www.kelvin.com

Learn about Injection Molding While Making Fun and Useful Products.

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**WHEELS: PROJECT PARTS**

**Front Wheels - Racing Style - Thin**
- Black: $9.95 or $8.95 ea./5+
- Blue/Yellow: $10.95 or $9.95 ea./5+

**Front Wheels - Racing Style - Thick**
- Black: $9.95 or $8.95 ea./5+
- Green/Yellow: $10.95 or $9.95 ea./5+

**Rear Wheels**
- Black: $9.95 or $8.95 ea./5+
- Colors: $10.95 or $9.95 ea./5+

**Rear Wheels - Racing Style**
1-1/2 in. dia., 5/8 in. tread width. Center hole fits 1/8 in. axle. With end cap. Pack of 100 wheels.
- Black: $13.95 or $12.95 ea./5+
- Colors: $14.95 or $13.95 ea./5+

**Rubber Tires w/ White Rims**
- 10/pkg.: $13.95 or $12.95 ea./3+

**Hi-Traction Rubber Wheels**
5/8 in. thick rubber wheels. Black rim with black tire.
- 1-5/8 in. dia. Wheel, Fits 1/8 in. Shaft: $19.95 or $18.95 ea./3+
- 2-3/8 in. dia. Wheel, Fits 3/16 in. Shaft: $13.95 or $12.95 ea./3+

**KELVIN® Project Parts Bulk Pack**
An ECONOMICAL variety of project parts!
- 30/pkg.: $19.95 or $18.95 ea./6+
- 10/pkg.: $13.95 or $12.95 ea./6+

**Big Wheels**
Turn big 3 in. dia. wheels into gear wheels using the center holes to mount gears (below) with screws and nuts. Push fits 1/8 in. axle. Pack of 4 wheels.
- Colors: $2.95 or $2.75 ea./10+
- Screws: 6-32 x 5/8 in., 100/pkg.: $2.50
- Nuts: 6-32, 100/pkg.: $2.35
- Rubber Bands: $2.50

**For More Gears, see pgs. 98-99**

**Super Economy Gear Set**
Set of [4] gears ranging from 10- to 40-teeth. Use holes to attach to each other with screws. Large gear measures 1-5/8 in. dia. Small gear fits 2mm motor shafts. Other gears fit 3mm shaft.
- Black: $95¢ or 85¢ ea./10+ or 80¢ ea./50+
- Green: $1.45 or $1.25 ea./10+

**Gear Wheel**
Use 36-tooth gear wheel in tandem with small motor gears. 1-3/4 in. dia. wheel is 1/2 in. thick and push-fits a 1/8 in. dia. axle. Pack of 100 wheels.
- Black: $29.95 or $24.95 ea./5+

**Front Wheels**
For use with Gear Wheel above. Can also use it for other purposes. 1-3/16 in. dia. wheel is 3/8 in. thick and push-fits a 1/8 in. axle. Pack of 100 wheels.
- Black: $19.95 or $14.95 ea./5+

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**KELVIN® Educational**

**4-3/4 in. Diameter**

---

**KELVIN® Big Project Rear Wheels**
Ideal wheel for your mousetrap dragster or other projects. This wheel measures 4-3/4 in. dia. (same size as a CD) fits 1/4 in. dia. axle. Includes our 1/8 in. insert.
[990181] 10/pkg. ...............................................................

**KELVIN® CD to Wheel Adapter**
Cleverly converts CDs into a project wheel. Adapter fits a wheel or CD with a 5/8 in. hole onto a 1/4 in. diameter axle. Use with the adapter below to fit a 1/8 in. diameter axle. Includes [2] 1-3/8 in. dia. front wheels with a rim and [2] 1-3/4 in. dia. back wheels with a rim and a built-in gear (2-gear ratio; fits a 2mm shaft and matches the big back wheels, [990176]).

**Wheel to 1/8 in. Axle Adapter**

---

**Plane Landing Wheels**
Create landing gear for model planes or other activities. Fits thin wire (music wire). 100 wheels per package.

**Landing Wheels Set**
1-1/16 in. dia. x 5/16 in. thick wheels. Does not include thin wire (see below).

---

**Thin Wire**
Used to create landing gear for model planes.

**Tail Wheels**
[2] 3/4 in. dia. x 1/4 in. thick; Fits 1/16 in. Axle

---

**Materials for Axles & Bushings**

**Rods**
- Delrin Rod – Lightweight, self-lubricating rod. Easily cuts to size for axles.
- Steel Rods
- Welding Rod

**Straws**
- White Plastic Milk Straw – Use as bushing for 1/8 in. dia. axles.
- White Paper Art Straw

---

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MOTORS: PROJECT PARTS

KELVIN® PROJECT MOTORS - Always Great Prices & Great Value!

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---

Project Motors with Solder Tabs

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>FIG.</th>
<th>NOM. VOLT. (V)</th>
<th>VOLT. RANGE (V)</th>
<th>CURRENT (A)</th>
<th>SPEED (rpm)</th>
<th>TORQUE (g/cm)</th>
<th>SHAFT DIA. (mm)</th>
<th>SHAFT L. (mm)</th>
<th>DIMENSIONS (mm)</th>
<th>WIRE LENGTH (mm)</th>
<th>$ 1-9</th>
<th>$ 10-99</th>
<th>$ 100+</th>
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<tr>
<td>850646</td>
<td>[A]</td>
<td>1.5</td>
<td>1.2-3</td>
<td>0.34</td>
<td>10,200</td>
<td>6.81</td>
<td>2</td>
<td>8.1</td>
<td>20 x 25</td>
<td>.95</td>
<td>.89</td>
<td>.69</td>
<td></td>
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<tr>
<td>850647</td>
<td>[B]</td>
<td>6</td>
<td>3-6</td>
<td>0.26</td>
<td>17,000</td>
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<td>6.5</td>
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<td>.99</td>
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<tr>
<td>851165</td>
<td>[C]</td>
<td>6</td>
<td>1.5-6</td>
<td>—</td>
<td>12,000</td>
<td>—</td>
<td>1.5</td>
<td>3.5</td>
<td>18 x 10 x 19</td>
<td>1.35</td>
<td>1.15</td>
<td>.95</td>
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<tr>
<td>850887</td>
<td>[D]</td>
<td>12</td>
<td>6-12</td>
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<td>10</td>
<td>24 x 32</td>
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<td>1.75</td>
<td>1.55</td>
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<tr>
<td>851254</td>
<td>[E]</td>
<td>3</td>
<td>6</td>
<td>0.7</td>
<td>14,400</td>
<td>12.4</td>
<td>2</td>
<td>8.1</td>
<td>20 x 25</td>
<td>2.75</td>
<td>2.45</td>
<td>2.25</td>
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<tr>
<td>851255</td>
<td>[F]</td>
<td>6</td>
<td>1</td>
<td>0.041</td>
<td>10,000</td>
<td>4.3</td>
<td>1.5</td>
<td>4</td>
<td>15.5 x 24.1</td>
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<tr>
<td>851256</td>
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<td>1</td>
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<td>12 x 15</td>
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<tr>
<td>851257</td>
<td>[G]</td>
<td>1.5</td>
<td>0.9-1.6</td>
<td>0.1</td>
<td>6,500</td>
<td>—</td>
<td>Vibrator</td>
<td>10 x 12.4</td>
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<td>3.25</td>
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<tr>
<td>850941</td>
<td>[H]</td>
<td>12</td>
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<td>236.5</td>
<td>3</td>
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<td>851934</td>
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Project Motors with Wire Leads

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<tr>
<th>STOCK #</th>
<th>FIG.</th>
<th>NOM. VOLT. (V)</th>
<th>VOLT. RANGE (V)</th>
<th>CURRENT (A)</th>
<th>SPEED (rpm)</th>
<th>TORQUE (g/cm)</th>
<th>SHAFT DIA. (mm)</th>
<th>SHAFT L. (mm)</th>
<th>DIMENSIONS (mm)</th>
<th>WIRE LENGTH (mm)</th>
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<th>$ 100+</th>
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<td>851949</td>
<td>[J]</td>
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<td>1.25</td>
<td>.99</td>
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</tr>
<tr>
<td>851950</td>
<td>[K]</td>
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<td>20.72</td>
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<td>23.5 x 27</td>
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<tr>
<td>851105</td>
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<td>2</td>
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<td>0.018</td>
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<tr>
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<td>10 x 12.4</td>
<td>3.95</td>
<td>3.55</td>
<td>3.25</td>
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---

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

---

PROJECT WIRE

22AWG wire measures 10 in. long with stripped ends. 50/pkg.
Red, 330427, $7.95 or $6.95 ea./3+
Black, 330428, $7.95 or $6.95 ea./3+
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® EDUCATIONAL PROJECT PARTS:

### MOTORS

#### Motor/Syringe Mounts

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>FIG.</th>
<th>INSIDE DIA. IN.</th>
<th>FITS</th>
<th>QTY.</th>
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<th>$ 10+</th>
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<td>[A]</td>
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<td>1</td>
<td>.49</td>
<td>.46</td>
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<tr>
<td>390968</td>
<td>[A]</td>
<td>7/8</td>
<td>Motors: #850647, 851950, 851230, 850887, 851105, Syringes: 30cc Luer, #390979</td>
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<td>.59</td>
<td>.56</td>
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<tr>
<td>390963</td>
<td>[B]</td>
<td>1/2</td>
<td>Syringes: 10cc Straight, #390977</td>
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<td>.75</td>
<td>.66</td>
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<tr>
<td>390967</td>
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<td>3/4</td>
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<td>.75</td>
<td>.69</td>
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<tr>
<td>390962</td>
<td>[B]</td>
<td>1</td>
<td>Syringes: 60cc Luer, #390981</td>
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<td>1.69</td>
<td>1.60</td>
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<tr>
<td>390726</td>
<td>[C]</td>
<td>3/4</td>
<td>—</td>
<td>10</td>
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<td>.99</td>
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<tr>
<td>390727</td>
<td>[C]</td>
<td>1-1/4</td>
<td>—</td>
<td>2</td>
<td>.79</td>
<td>.69</td>
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<tr>
<td>390588</td>
<td>[D]</td>
<td>3/4</td>
<td>Motors: #850646, 851949, Syringes: 20cc Luer, #390979</td>
<td>10</td>
<td>5.95</td>
<td>5.65</td>
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<tr>
<td>390572</td>
<td>[D]</td>
<td>7/8</td>
<td>Motors: #850647, 851950, 851230, 850887, 851105, Syringes: 30cc Luer, #390979</td>
<td>10</td>
<td>5.95</td>
<td>5.65</td>
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#### Luer Lock Project Syringes

Provides plunger movement for robotic arms, science activities, etc. All syringes fit 1/8 in. inside diameter vinyl tubing. 10/pkg.

- 282424 [A] 5/8 — $8.95
- 390975 [A] 3cc — $3.95
- 390976 [A] 6cc — $4.95
- 390977 [A] 10cc — $5.95

#### Vinyl Tubing

For projects and experiments. 100 feet/package.

- 390314 1/8 in. Inside Dia. — $15.95
- 390696 3/16 in. Inside Dia. — $18.95
- 390697 1/4 in. Inside Dia. — $19.95

#### Connectors

Use with 1/8 in. diameter vinyl tubing.

- 390398 [A] 2-Way — $1.35 or $1.25 ea./10+
- 390399 [B] 3-Way "Y" — $1.35 or $1.25 ea./10+
- 390400 [C] 3-Way "T" — $1.35 or $1.25 ea./10+
- 390401 [D] 4-Way — $3.15 or $2.65 ea./10+

#### Control Valves

Use with 1/8 in. diameter vinyl tubing.

- 390617 [E] 3-Way — $2.95 or $2.65 ea./10+
- 390618 [F] No-Return — $12.95 or $11.65 ea./10+

#### Experimenting with Syringes


<table>
<thead>
<tr>
<th>STOCK #</th>
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<th>QTY.</th>
<th>$ 1-9</th>
<th>$ 10+</th>
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<tr>
<td>390975</td>
<td>[A]</td>
<td>2cc</td>
<td>20</td>
<td>$8.95</td>
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<tr>
<td>390976</td>
<td>[A]</td>
<td>3cc</td>
<td>30</td>
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<tr>
<td>390977</td>
<td>[A]</td>
<td>5cc</td>
<td>35</td>
<td>$15.95</td>
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<tr>
<td>390978</td>
<td>[A]</td>
<td>6cc</td>
<td>60</td>
<td>$15.95</td>
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#### Motors for Jr. Solar Sprint Competitions

<table>
<thead>
<tr>
<th>MOTOR</th>
<th>DESCRIPTION</th>
<th>RPM</th>
<th>STARTING VOLTS</th>
<th>MAX CURRENT</th>
<th>TORQUE</th>
<th>SHAFT SIZE</th>
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<tbody>
<tr>
<td>260</td>
<td>1.5 to 3V DC, 120mA, 6,500 RPM, 51G-CM, 23x31mm. Shaft length is 6mm and the shaft diameter is 2mm.</td>
<td>1810</td>
<td>1.5-3</td>
<td>0.2</td>
<td>215</td>
<td>2x2.5</td>
</tr>
<tr>
<td>280</td>
<td>1.5 to 3V DC, 200mA, 8,200 RPM, 142G-CM. The overall motor size is 23x34mm. Shaft length is 10mm and shaft diameter is 2mm.</td>
<td>2865</td>
<td>1.5-3</td>
<td>0.4</td>
<td>215</td>
<td>2x2.5</td>
</tr>
<tr>
<td>370</td>
<td>12VDC, 16mA, 3500 RPM, 119G-CM. Add a propeller and place in front of a fan to make a great generator. Can light an LED. The overall motor size is 24x33mm. Shaft length is 9mm and the shaft diameter is 2mm.</td>
<td>3765</td>
<td>1.2-3</td>
<td>0.5</td>
<td>215</td>
<td>2x2.5</td>
</tr>
</tbody>
</table>

#### KELVIN® Project Motors Set

- [1] Basic Solar Motor (2,200 rpm)
- [4] High Speed Motors (17,000 rpm)
- [8] SUMO Motor (12,500 rpm)

Four kinds of motors - 17 motors total.

Find KELVIN® Motor Speed Control Kit on pg. 110.
### Project Propellers

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>FIG.</th>
<th>DIA. in.</th>
<th>AXLE DIA.</th>
<th>QTY.</th>
<th>$ 1-4</th>
<th>$ 5-9</th>
<th>$ 10-24</th>
<th>$ 25-49</th>
<th>$ 50+</th>
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<tr>
<td>851102</td>
<td>[A]</td>
<td>1</td>
<td>2 mm</td>
<td>1</td>
<td>1.35</td>
<td>1.25</td>
<td>1.05</td>
<td>.95</td>
<td>.95</td>
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<tr>
<td>850651</td>
<td>[B]</td>
<td>1-1/4</td>
<td>3 mm</td>
<td>1</td>
<td>1.65</td>
<td>1.35</td>
<td>1.25</td>
<td>1.05</td>
<td>.99</td>
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<tr>
<td>851166</td>
<td>[B]</td>
<td>1-3/4</td>
<td>3 mm</td>
<td>1</td>
<td>1.45</td>
<td>1.35</td>
<td>1.25</td>
<td>1.20</td>
<td>1.15</td>
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<tr>
<td>990324</td>
<td>[C]</td>
<td>2-1/4</td>
<td>2 mm</td>
<td>1</td>
<td>1.95</td>
<td>1.85</td>
<td>1.75</td>
<td>1.65</td>
<td>1.55</td>
</tr>
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</table>

### Nosehook Propellers

5 in. wide propeller fits wood .21 x .45 in.

- 851219 [A] ...........................................$0.69 ea./.75+ or $0.60 ea./10+
- 851166 [B] ...........................................$0.49 ea./.50+ or $0.42 ea./.50+
- 851315 [C] ...........................................$0.33 ea./.50+

6 in. wide propeller fits wood .135 x .35 in.

- 850654 [B] ...........................................$0.49 ea./.50+ or $0.42 ea./.50+

7 in. wide propeller fits wood .15 x .23 in.

- 851460 [D] ...........................................$0.33 ea./.50+

### Indoor Flight Propeller

Adjustable pitch for indoor flights. 150 mm (5.9 in.) diameter, light construction (1.1 gm). Includes bearing and hook.

- 990337 [C] ...........................................$8.95 or $8.45 ea./10+

### Adjustable Pitch Propeller

- 851458 [E] ...........................................$5.95 ea./4 pkg.

### Motor Loops

Works with nose hook propellers. 7 in. long and 0.125 in. thick.

- 850695 35/pkg. ...........................................$4.95
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

KELVIN® EDUCATIONAL

Plastic Propellers
Push-fits 2mm dia. shaft. Set of 8 in yellow/green.
851314 [A] 3 in. dia., 8/pkg........$5.95 or $5.75 ea./5+ or $5.45 ea./10+ or $5.25 ea./25+ or $4.95 ea./50+

Low Torque, High Speed Propeller
This propeller provides greater airflow for use with hovercrafts and light model planes. 9cm long x 1cm wide (3.5 x 0.393 in.). Fits tightly 2mm dia. shafts.
990332 [B] 3.5 in. Dia., 3/pkg........$4.95

Red Plastic Propellers
Push-fits 3/64 in. diameter shaft.
5 in. dia. propeller
850632 [C]..........................45¢ or .40¢ ea./10+ or .35¢ ea./50+
6 in. dia. propeller
850889 [C]..........................75¢ or .70¢ ea./10+ or .65¢ ea./25+ or .63¢ ea./50+
7 in. dia. propeller
850890 [C]..........................85¢ or .80¢ ea./10+ or .75¢ ea./25+ or .70¢ ea./50+

Rigid Black Plastic Propellers
990334 [D] 6 in. dia.............$2.95 or $2.75 ea./5+ or $2.45 ea./10+
990335 [D] 7 in. dia.............$3.95 or $3.75 ea./5+ or $3.45 ea./10+

Propeller - Ideal for model planes, etc. 9 in. Dia. with 3/64 in. hole. M in. order of 5.
850926 [E]..........................95¢ or .90¢ ea./10+ or .85¢ ea./25+ or .80¢ ea./50+

Rubber Band Propeller
Propeller freewheels when Rubber Band power runs out. Includes a rubber band hook. 1/2 in. diameter mounting hole to attach to the fuselage. Requires a rubber band and winder.
851108 [F] 9.8 in. Dia.............$5.95 or $5.45 ea./5+ or $5.25 ea./10+ or $5.15 ea./25+ or $5.05 ea./50+

Safety Propellers
The propellers force fits onto any small electric motor but has the advantage of a safety ring preventing contact with spinning blade tips. Black propeller push-fits 2mm shaft. 125mm (4.92 in.) dia.
990338 [G] 10/pkg.................$8.95 or $8.10 ea./5+

Inboard Motor Propulsion Kit
For use with model boats. Kit includes 1 in. diameter propeller, motor, shaft and mounting bracket.
280412 [H]..........................$8.95 or $8.50 ea./6+

Rubber Band Winder
 Makes it easy to wind the rubber band on propellers and count number of turns.
851266 [I] 1.5 Winder..............$7.95 or $7.45 ea./6+ 851267 [I] 1.15 Winder...........$21.95 or $20.95 ea./6+

Rubber Band Winder

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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**PULLEYS: PROJECT PARTS**

**KELVIN® Economy Pulley Set**
An economical set of four pulleys.

- 10mm dia. pulley fits 2mm shaft: 20mm dia. pulley fits 1/8 in. shaft.
- 30mm dia. pulley fits 1/8 in. shaft.
- 40mm dia. pulley fits 1/8 in. shaft.

841538: $1.95 or $1.75 ea./10+ or $1.45 ea./100+
841539: Bulk Pack of 20 Sets (4/Set) .................$9.95

**Gear/Pulley Combo**
Fits 2mm (toy motor) shaft.

- 390585: 20/pkg. .................................................$3.95 or $3.45 ea./3+

**High Quality Pulleys**
High quality pulleys for all your experiments. Style may vary.

- 50mm.

710075: .................................................................
710065: .................................................................
710068: .................................................................
710064: .................................................................
710063: .................................................................
710062: .................................................................

**Hanging Pulleys**
For mounting or hanging experiments. Metal.

390455: [A] 1 in. dia. ........$3.45 or $3.25 ea./3+
390743: [B] Small Single Pulley ..........$5.95
390744: [C] Small Dual Pulley ..........$7.95

**Clothesline Pulley**
Simulate conveyor belts in the class with cord and clothespins.

390742: [D] Small, Plastic .......................$4.95
390374: [E] 4 in. Dia. ......$1.95 or $1.85 ea./3+

**Ball Bearing Pulley**
Great for experiments or projects with robotics or cars. 1-1/2 in. dia. sized to fit a 1/4 in. dia. shaft.

390457: 2/pkg. .................................................$9.95

**Drive Belts for Pulleys**
For precise motion transfer. 5/pkg.

841937: 60mm...$3.95 or $3.75 ea./3+
841429: 90mm...$3.95 or $3.75 ea./3+

**Pulley on a Rod**
Use it for incline plane or other apparatus. 8mm shaft diameter w/ plastic case.

710071: .................................................................$3.95 or $4.95 ea./3+

**Hole Reducers**
Adapts hole from 4mm to 3mm.

391294: 10/pkg. .................................................$4.95 or $4.45 ea./3+

**KELVIN® Creative Crane Pulley**
Pulley fits a 2mm motor shaft or a 1/8 in. dia. axle. Inside width is 3/8 in. and overall width is 0.94 in. (the inner dia. is 0.28 and the outer dia. is 1-1/2 in.). Features holes in side wall to thread string through.

990212: 10/pkg. .................................................$9.95 or $8.95 ea./3+

**KELVIN® Educational**

- Each pulley is sized to fit a 3/16 in. diameter shaft.
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**KELVIN® SUPER-SIZED Parts**
Bulk Pack w/ Storage Cabinet
A variety of parts needed for your mechanical and prototype design needs with a BONUS Storage Cabinet!

841328: .................................................................$359

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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**KELVIN® EDUCATIONAL**

**Super-Powerful Magnets!**

**Rare Earth Magnets**

These magnet discs are the most powerful made! Demonstrate phenomena that's impossible with ordinary magnets.

<table>
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<th>STOCK #</th>
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<tr>
<td>640119</td>
<td>3/16</td>
<td>3/8</td>
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**KELVIN® Kel-View™ Film & Magnetic Investigation**

Demonstrate unusual magnetic fields with man-made magnet samples and view magnetic fields with special 2 x 2 in. film. Includes magnets, film, and a reproducible information sheet.

840815 Kit .......................................................... $12.95

**KELVIN® Magnets Pack**

- [10] Maglev Magnets [FIG. D]
- [13] Disc Magnets [FIG. A]
- [13] Ring Magnets [FIG. B]
- [13] Cube Magnets [FIG. C]
- [13] Bar Magnets [FIG. G]

841584, $9.95 or $8.95 ea./6+

**Project Parts: Magnets**

**Magnet Set**

[70] magnets includes [7] different types (10 of each type of magnet).

640106 ....... $17.95 or $16.95 ea./3+

**Iron Filings**

Demonstrate magnetic field patterns and separation technology. Ideal for general science experiments.

640111 Small Vial .......................... $1.95

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

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GEARS: PROJECT PARTS

KELVIN®
Super Economy Gear Sets
Set of 4 different-sized gears with holes to attach to each other with screws. Large gear measures 1-5/8 in. in diameter. The small gear fits 2mm toy motor shafts. Other gears push-fit 3mm (or 1/8 in. dia.) shaft/axle. 1/4 in. thick durable plastic.

990179 Black .......................................................... $95¢ or 85¢ ea./10+ or 80¢ ea./50+
990174 Colors ........................................................ $1.45 or $1.25 ea./10+

KELVIN® Advanced Gear Set
Evenly spaced holes near the edge, which can be used with a slotted optocoupler (#270115) to measure velocity, acceleration or distance of the gear or vehicle. Holes can also be used to attach the gear to a wheel, pulley or other objects.

Gear A has a 9/16 in. dia. with 13 teeth, Gear B has a 3/4 in. dia. with 18 teeth, Gear C has a 1-9/16 in. dia. with 38 teeth and Gear D has a 2-11/32 in. dia. with 58 teeth. Set includes four center hole inserts to 1/8 in. and one insert to 2mm. Gears are 1/4 in. thick.

391128 ........................................................................ $2.45 or $1.95 ea./10+

Slotted Optocoupler
For Advanced Gear Set. Can be used with your circuit to measure gear rotation speed. 5V DC. Shown right.

270115 ........................................................................... $3.95

KELVIN® Super Economy Gear Sets
Set of 4 different-sized gears with holes to attach to each other with screws. Large gear measures 1-5/8 in. in diameter. The small gear fits 2mm toy motor shafts. Other gears push-fit 3mm (or 1/8 in. dia.) shaft/axle. 1/4 in. thick durable plastic.

990179 Black .......................................................... $95¢ or 85¢ ea./10+ or 80¢ ea./50+
990174 Colors ........................................................ $1.45 or $1.25 ea./10+

KELVIN® Sprocket Chain
5 links per inch. 1/4 x 36 in. long.

Chain can be cut to your desired length. (Gear not included - use above).
750113 ........................................................... $5.95 or $5.45 ea./3+

Gear Rack
50mm (2 in.) long with 1/16 in. mounting holes.
390626 [A] 10/pkg. ...................................................... $5.95 or $5.45 ea./3+

Worm Gears
Use with racks.

750133 [B] Fits Toy Motor Shaft, White, 10/pkg. ............................................ $4.95
390621 [C] Fits 2mm Shaft, White, 10/pkg. ................................................. $9.95 or $9.45 ea./3+
990377 [D] NEW! Fits 2mm & 1/8 in. Shafts, Black, 10/pkg. ........ $9.95 or $9.45 ea./3+

Axle Hole Reducers
391294 [E] 4mm to 3mm, 10/pkg .................................................. $4.95 or $4.45 ea./3+

Beveled Gears
20mm diameter gears with beveled edges. Fits a 1/8 in. or 3mm diameter shaft.
390622 [F] 10/pkg. ...................................................... $6.95 or $6.45 ea./3+

Gear/Pulley Combo Unit
Fits 2mm (project motor) shaft. Gear/Pulley only - project motor not included. 20/pkg.
390585 .......................................................... $3.95 or $3.45 ea./3+

SAVE Money!

Gear/Pulley Combo Unit
Fits 2mm (project motor) shaft. Gear/Pulley only - project motor not included. 20/pkg.
390585 .......................................................... $3.95 or $3.45 ea./3+

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Large Gear Box
Larger gear is easier to mash. Use with solar cell project designs or battery car models. 6-12V DC. Has a 3mm diameter shaft.
841219 ................................................. $3.95 or $3.45 ea./10+

Clunk-Click Gearbox
This gearbox system is easy to assemble and take apart. Comes with motor holder and gears. Ideal for transportation projects. 1-6V DC, 0.1-1.0 A (load dependent). 2mm dia. shaft.
281739 Kit .............................................. $5.95 or $5.45 ea./10+

Heavy Duty Gear Box & Motor
Use for robotic activities. Motor: 1 in. dia. x 2-7/8 in. L. Shaft: 0.15 in. dia. x 3/8 in. L
851100 100:1, 6-12V DC .......... $12.95 or $10.95 ea./10+
851494 15:1, 1-3V DC ........... $12.95 or $10.95 ea./10+

Universal Gearbox
Expand this universal gearbox by adding gears up to 6 gear ratios. It has metal side plate. Output shaft is 4mm diameter. 1.5-4.5 VDC.
281740 ................................................. $16.95 or $16.10 ea./3+

Motor & Gearbox Kit
Eight different transmission ratios, from 5:1 up to 1125:1. Kit includes an RC20 motor (that runs on 1.5-4.5V DC) and instructions. The output shaft is 3mm in diameter.
280411 Kit .............................................. $12.95 or $11.95 ea./3+

2-in-1 Gearbox
Experiment with different gear settings to change speeds. Includes a motor, two sets of gears, metal shafts, gearbox and other accessories.
282394 Kit .............................................. $9.95 or $9.45 ea./3+

Gearbox & Wheel Kit
Special attachment to fit rectangle end and screw to attach wheel to motor. Includes: aluminum bracket, screws, gearbox, [2] half wheels, tube, screw eye, snap rod, acrylic hub and rubber band.
842398 ................................................. $19.95

Standard Servo Motor
4.8-6V DC. For robotics and remote-controlled prototypes. Lightweight plane motor outputs 44 to 57 oz. of torque per inch. Futaba S3003
851878 ................................................. $19.95 or $19.45 ea./4+

Servo Wheel Set ONLY
842424 ................................................. $4.95 or $4.50 ea./10+

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

Find TECHCARD PARTS in the ROBOTICS section on pg. 31.
Look for Kre8® PARTS in the S.T.E.M. section on pg. 19.
Look for BEAMS & TRIANGLES PARTS in the DESIGN section on pg. 38.
Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

**KELVIN® Tool Panels**

High quality tools and convenient storage panels to display and safely organize your tools. Specific tool manufactures may vary from the items pictured below depending on availability. Mounting holes for the panels are not predrilled so the panels can be custom installed to fit most situations.

### Measurement & Layout Tools w/ Tool Panel
- Digital Scale
- Sliding T-bevel
- [6] Rulers (12 in.)
- [2] Yard Sticks
- [2] Tape Measures
- Framing Square

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Digital Scale</td>
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<tr>
<td>Sliding T-bevel</td>
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<td>Rulers (12 in.)</td>
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<tr>
<td>Yard Sticks</td>
<td>[2]</td>
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<tr>
<td>Tape Measures</td>
<td>[2]</td>
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<tr>
<td>Framing Square</td>
<td></td>
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</tbody>
</table>

**Price:** $1,195

### Fastening Tools w/ Tool Panel
- [12] Quick Grip Bar Clamps
- [3] C-Clamps
- [4] 2-inch Spring Clamps
- Stapler

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tr>
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<tr>
<td>2-inch Spring Clamps</td>
<td>[4]</td>
</tr>
<tr>
<td>Stapler</td>
<td></td>
</tr>
</tbody>
</table>

**Price:** $995

### Portable Power Tools w/ Tool Panel
- 2HP Router with Basic Bit Set
- Jig Saw
- Variable Speed Drills (1/2 in.)
- Speed Bore Drill Set
- Twist Drill Set

**Price:** $1,995

### Basic Lab Tools w/ Tool Panel
- [2] Slip Joint Pliers
- Needle Nose Plier
- Vise Grip
- Wire Cutter
- Diagonal Cutter
- [2] Backsaws
- Hack Saw
- [2] Dovetail Saws

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slip Joint Pliers</td>
<td>[2]</td>
</tr>
<tr>
<td>Needle Nose Plier</td>
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<tr>
<td>Vise Grip</td>
<td></td>
</tr>
<tr>
<td>Wire Cutter</td>
<td></td>
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<tr>
<td>Diagonal Cutter</td>
<td></td>
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<tr>
<td>Backsaws</td>
<td>[2]</td>
</tr>
<tr>
<td>Hack Saw</td>
<td></td>
</tr>
<tr>
<td>Dovetail Saws</td>
<td>[2]</td>
</tr>
</tbody>
</table>

**Price:** $895

### Electronics Tools w/ Tool Panel
- [4] 200LE Multimeters
- [2] Soldering Irons (40W)
- [2] Soldering Irons (25W)
- Soldering Gun
- Screwdriver Set
- Utility Knife
- Nail Set
- Storage Panel

**Price:** $995 or $895 ea./2+

### Measurement & Layout Tools w/ Tool Panel
- Level
- Center Punch
- [2] Prick Punches
- [3] Awls
- [2] Compasses
- [4] Combo Squares

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Level</td>
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<tr>
<td>Center Punch</td>
<td></td>
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<tr>
<td>Prick Punches</td>
<td>[2]</td>
</tr>
<tr>
<td>Awls</td>
<td>[3]</td>
</tr>
<tr>
<td>Compasses</td>
<td>[2]</td>
</tr>
<tr>
<td>Combo Squares</td>
<td>[4]</td>
</tr>
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</table>

**Price:** $1,195

### Fastening Tools w/ Tool Panel
- 2 Low Melt Glue Guns
- Hot Melt Glue Gun
- Storage Panel

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tr>
<td>Hot Melt Glue Gun</td>
<td></td>
</tr>
<tr>
<td>Storage Panel</td>
<td></td>
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**Price:** $995

### Portable Power Tools w/ Tool Panel
- Cordless Screw Gun
- [2] Random Orbit Sanders
- Belt Sander w/ Extra Sanding Belts
- Individual Carrying Cases

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Cordless Screw Gun</td>
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<tr>
<td>Random Orbit Sanders</td>
<td>[2]</td>
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<tr>
<td>Belt Sander w/ Extra Sanding Belts</td>
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</tr>
<tr>
<td>Individual Carrying Cases</td>
<td></td>
</tr>
</tbody>
</table>

**Price:** $1,995

### Basic Lab Tools w/ Tool Panel
- Block Plane
- Chisel Set
- [3] Claw Hammers
- Lg. Claw Hammer
- Screwdriver Set
- Utility Knife
- Nail Set
- Storage Panel

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Plane</td>
<td></td>
</tr>
<tr>
<td>Chisel Set</td>
<td></td>
</tr>
<tr>
<td>Claw Hammers</td>
<td>[3]</td>
</tr>
<tr>
<td>Lg. Claw Hammer</td>
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</tr>
<tr>
<td>Screwdriver Set</td>
<td></td>
</tr>
<tr>
<td>Utility Knife</td>
<td></td>
</tr>
<tr>
<td>Nail Set</td>
<td></td>
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<tr>
<td>Storage Panel</td>
<td></td>
</tr>
</tbody>
</table>

**Price:** $895

### Electronics Tools w/ Tool Panel
- Precision Screwdrivers
- [2] Diagonal Pliers
- Electrician’s Pliers
- Needle Nose Pliers
- Storage Panel

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Wire Strippers</td>
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<tr>
<td>Precision Screwdrivers</td>
<td></td>
</tr>
<tr>
<td>Diagonal Pliers</td>
<td>[2]</td>
</tr>
<tr>
<td>Electrician’s Pliers</td>
<td></td>
</tr>
<tr>
<td>Needle Nose Pliers</td>
<td></td>
</tr>
<tr>
<td>Storage Panel</td>
<td></td>
</tr>
</tbody>
</table>

**Price:** $995 or $895 ea./2+

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*Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.*

www.kelvin.com  KELVIN®, 280 Adams Blvd., New York 11735, USA  Copyright © Kelvin L.P.  Prices in this catalog represent discounted pricing for educational institutions.
KELVIN® Investigation Groundwater Pollution Lab
Students will take part in five activities that explore soil science, surface contamination of water, purifying raw water, measuring particulate, and modeling groundwater and aquifers. Includes detailed student resource materials and a teacher’s guide.

282231 Lab ................................................ $99.95

KELVIN® Oil Spill Cleanup Activity Lab
A series of activities and design challenges focused on environmental cleanups resulting from oil spillage. Lab includes oil absorbent matting material, biological oil absorbing materials, absorbing powder, dispersants, instructions and much more. Each kit provides enough materials for a class of 20 students.

282232 Lab ................................................ $99.95

KELVIN® Exploring Water, Soil & Air Lab
This provides information and hands-on activities for the study of our natural environments and the interdependency of each of its parts. Air, water, soil, plants, animals and living organisms combine to create the ecosystem we live in.

281910 ................................................ $99.95

KELVIN® Hydroponics Engineering Mini Lab
Students learn the basics of hydroponics by designing and building their own growing unit as well as maintaining a classroom growing system. This lab includes enough materials for three classes to design their own hydroponic system.

Includes: drip emitters, tubing, flow valves, wicking material, seed starters, starting trays with hoods, growing medium, nutrients, seeds, lamp, and instructions. This lab also includes materials to build three raft style classroom growing units.

841681 ELM, MS, HS .................................. $795
840691 Class Hydroponics System™ .................. $375
650688 Hydroponics Booklet, 24 pgs .................. $5.95

KELVIN® Moisture Sensing Device
Moisture sensors are placed in each bucket. It works by activating the pump which draws water from the lower (drain) bucket when it is nearly full and transferring water to the upper bucket. The sensor in the upper bucket turns the unit off in the event that it has become too full.

841788 Moisture Sensing Device.......................... $195
450074 Pump .................................................. $95

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.

101
Unit 1
- How People Communicate (talking, drawing, Braille, camera, drums, telephone, etc.)
- Experiment with Batteries / Bulbs (light emitting diode, building and testing the flashing light communicator)
- Coding and Sending Messages (morse code, flashing light, binary code, encoding transmitting, receiving and decoding messages)

Unit 2
- Improving Communication with Electronic Circuitry (light sensor, voltage to frequency converter, loud speaker, power supplies, input /output and how they are connected, electronic measurements, range and speed).

Unit 3
- Communicating with Optical Fiber
- Understanding the Properties of Light Which Makes Optical Fiber Communications Possible (reflection, deflection, total internal reflection, light following in curved path, light traveling through fiber, light splitting into two fibers, sending your voice over a beam of light, making an optical fiber coupler)

This modular lab includes: [5] Assembled Modules, Lab Manual, Batteries, Fiber Cable, Light Bulbs, Speakers, Hookup Wire, Alligator Clips, and Plastic Parts for Light Devices. Other material will need to be supplied by the teacher in order to conduct activities (such as a c-clamp, milk, water, ruler, etc.). Grades 6-10 science and technology classes.

Project ComTech™ Lab
In this pilot module, Communicating with Light: From Smoke Signals to Fiber Optics, students become familiar with the elements of communications systems as well as with basic electronics, coding schemes, and the properties of light. Students master a limited number of powerful technology and science concepts, sense the excitement and challenge of technology, and develop critical thinking and reasoning skills that can be transferred to all disciplines. This instructive modular lab, supplemented with electronic, electro-optical, electrical and mechanical components, is recommended for use in grades 6-10 science and technology classes.

The key components are five electronic circuit boards (or modules) which accompany the written material. Modules 1 and 2 are very simple; Modules 3 and 4 are more advanced. The five Assembled Modules include: Light Sensor Module, Light-Emitting Diode (LED) Module, Voltage to Frequency Converter Module, Audio Modulator Module and Amplifier Module.

The written material, approximately 178 pages in length, describes a number of activities addressing light communication technology. Starting with simple low-technology flashing light communication systems and codes, students progress through voice-modulated signals employing optical fiber.

Technical topics covered include: signal codes, properties of light, transducers and simple circuitry. Sensory feedback is provided throughout the experiments with flashing lights, attractive colors, vibrating transducers, and interesting sounds.

Project ComTech™ was created by the Science Education Department of the Harvard-Smithsonian Center for Astrophysics, with support from the National Science Foundation.
Intro Electronics: Security Systems
This is an introduction to circuits and electronics set in the context of creating a building security system. The simplest system consists of switches, a power supply, and a buzzer. A variety of switches will be introduced, including magnetic, optical and thermal ones. You’ll gain familiarity with interpreting schematics, using breadboards, using meters, and debugging circuits. You will also build a power supply used later. Physics concepts include electrical terms, power, an introduction to solid state and experimental skills. This kit includes the parts needed to build a Low-Voltage Power Supply to use in this and other H.O.P. Units. Grades 9 through College.
840994   H.O.P. Electronics Kit ....................... $29.95

Intro Optics: Haze
The amount of haze in the atmosphere is increasing for reasons that are not fully understood. In this unit, you build optical sensors that can be used to infer haze levels and contribute your data to an international haze monitoring network.
This work involves understanding the physics of light with an emphasis on wavelengths, absorption, scattering, and photon energy. The unit introduces an amplifier and the concept of amplification. Investigate LEDs as lights. Measure the forward voltage for red, yellow, green, and blue LEDs. Look at the spectrum and polarization of the sun, LEDs, flames, other sources, and of scattered light using different kinds of scattering.
This kit includes all the parts needed to build a Sun Photometer. Grades 9 through College.
840995   H.O.P. Haze Kit ................................. $29.95

Intro Mechanics: Aircart
The study of motion is motivated in part by the human desire to move things from one place to another. Designing any transportation system requires an understanding of some basic ideas of physics.
In this unit you will build an aircart, decide what attributes of the cart are pertinent, and what variables are important for the description of motion. Determining a set of variables and the relationships between them is the primary work of creating a model. A good model can be generalized and extended. With a good model in hand, design work can proceed. What transportation problems could an aircart solve? What are its drawbacks? This kit includes the parts to build a propeller-driven cart and a force/thrust gauge. Grades 9 through College.
840996   H.O.P. Aircart Kit ............................ $23.95

Intro to Sound Waves
These extensions involve measurements of sound intensity. For these sound investigations you will need to build a Sound Level Meter. You will also need a sound source. The tone generator you build in the Core project will serve quite well if you add a speaker. All parts need for extensions are included.
841334   H.O.P. Sound Kit .............................. $29.95

H.O.P. Tool Box
An assortment of tools and supplies for use with the H.O.P. experiments.
840997   ................................................ $125

Wood, balsa and foam blanks require shaping with tools and sanding. Kits may require soldering and advanced assembly. Adult supervision required.
KELVIN® Investigating Electricity Lab
KELVIN® Investigating Electricity Lab takes a unique approach to teaching basic DC electricity concepts. The experiment board and components use a Velcro-like technique to mount parts when assembling circuits. The lab has been designed to teach students the basic fundamentals and concepts behind DC electricity and circuits. The lab provides background information on many topics and activities that allow the students to apply their knowledge. The activities include Measuring Voltage, Assembling Simple Electric Circuits, Assembling Circuits Using Schematic Diagrams, Series and Parallel Circuits, Using a Meter to Measure Electricity in a Circuit and The Effects of Voltage, Current and Resistance in a Circuit. 360029 Lab .......................................................... $99.95

KELVIN® Making Wet Cells & Batteries Lab
Design, build, test and experiment with electro-chemistry. Students will create wet cells and batteries using a variety of different electrode and electrolytic solutions while gathering and analyzing output data. This lab kit is the perfect companion to author Harry Roman’s booklet, Making Wet Cells and Batteries. Includes: detailed instructions, electrodes (copper, zinc, tin, aluminum, iron), Safe chemicals for creating electrolytic solutions, measuring containers and tools, cell containers, multimeters and alligator leads. 842300 Enough for 24 Students ...................................................... $195

KELVIN® Hydroelectric Turbine Generator
Hydroelectricity is a clean and renewable source of energy that supplies electricity to many parts of the United States. Assembling this kit gives your students an opportunity to produce a working model of a hydroelectric generator that will light an LED. The design element of this activity challenges your students to produce turbine blades that provide the most efficient use of the moving water. Measure output with a multimeter. Running water is needed; some tools are needed for drilling. Red acrylic base is included. 842339 Kit ..................$29.95 or $27.95 ea./5+ 842340 Bulk Pack of 10 ..........$25 Per Student $250

Kits may require soldering and advanced assembly. Adult supervision required. www.kelvin.com • KELVIN®, 280 Adams Blvd., New York 11735, USA • Copyright © Kelvin L.P. • Prices in this catalog represent discounted pricing for educational institutions.
KELVIN® Night Light
A photocell turns on/off a super bright LED as the room darkens or lightens. Includes pc board and parts. Kit requires soldering and assembly. Requires [2] AA batteries.

- 842141 Kit .............................................. $4.95 or $4.45 ea./10+ or $3.95 ea./20+
- 842142 Bulk Pack for 30 ............................... $3.30 Per Kit $99.00

KELVIN® Soldering Practice Lab

- 841259 Lab .................................................. $199.95

KELVIN® Speed Control
Use Pulse-Width Modulation (PWM) to vary the speed of a DC motor from 0 to 100%. Can be used for any DC motors from 3 to 25 Volt with 3 Amp maximum current draw. It is ideal to control the speed of a fan, toy motor, model train and so on.

- 841732 Kit $15.95 or $14.95 ea./10+
- 842227 Bulk Pack for 10 ............................... $125
- 842166 Assem. Demo ...................................... $69.95

Fundamentals of Electronics Kit
Kit includes a breadboard, switch, connection wires, transistors (NPN/PNP), red and green LEDs, capacitors, resistors, diode and photoresistor, buzzer, 9V battery and a teacher’s guide.

- 360186 Grades 7-12 ...................................... $79.95
  Build Over 300 Projects!

Snap Circuits™ Educational Kits
Make learning electronics a “snap.” Just follow the colorful pictures in the manual and build over 300 projects, such as AM radios, burglar alarms, flashlights, doorbells, and much more. You can even play electronic games with your friends! Enjoy hours of educational fun while learning about electronics. No tools required. Uses AA batteries (not included).

- 282378 Snap Circuits Jr. - Over 30 Parts .......... $29.95
- 282379 Snap Circuits - Over 60 Parts .............. $58.95

50-in-1 Electronic Playground
Learn about the basic principles of electronics while building these exciting circuits: finger touch lamp, magnetic bridge, voltmeter, Morse code, alarm, electronic noisemaker, electronic kazoo, electronic keyboard, transistor radio, a radio announcer and metal detector. Uses spring hook-up method. Includes all the parts needed to perform 50 experiments. Requires a 9V battery.

- 281645 Kit .................................................. $19.95

Kits may require soldering and advanced assembly. Adult supervision required.

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KELVIN® Basic 3™ Trainer
Electronic circuits and schematic diagrams can be difficult to understand when learning about them. Even simple concepts can be difficult to grasp! What's needed are simple, hands-on activities that explore the concepts as students learn about them - KELVIN’s® BASIC 3™ Trainer!

The original BASIC 3™ concept and activities were designed and written by Earl D. Gates, the author of Introduction to Electronics: A Practical Approach, 5th Edition, published by Delmar Publishers. Further developed by KELVIN® engineers, the BASIC 3™ Input-Process-Output Trainer introduces students to electronics in a non-threatening, thematic way. Hands-on activities help students, Gr. 5 & up, explore electronics at their own pace.

The compact, assembled trainer features a plug-in motherboard, 6-1/4 x 9-1/4 in., and built-in sensors. Stackable banana plug leads are used for quick circuitry design and hands-on experiments.

The assembled trainer includes: Expandable Motherboard, 9V DC Wall Transformer, Stackable Banana Plug Leads, Ten Activity Cards, Design Portfolio, Detailed Teacher’s Guide, and Plug-In Module Ready (additional plug-in modules for digital and analog are on the next page).

840551  Basic 3™ Trainer ........................................ $135 or $125 ea./6+
990136  Stackable Banana Cables ........................................ $29.95 or $26.95 ea./10+

Select Individual Functions or Buy the Set!

KELVIN® Basic 3™ Plug-In Boards
An excellent way to plug-in to the potential of the Basic 3™ Trainer!

ANALOG PLUG-IN BOARDS
Analog Outputs, Resistors & Potentiometers
840553  3 Boards ........................................ $125 or $119 ea./3+
Circuits & 555 Timers
840650  2 Boards/Circuitry ........................................ $99.95 or $94.95 ea./3+
Wire, Fiber Optics & Infrared Communications
840625  2 Boards ........................................ $99.95 or $94.95 ea./3+
Op-Amp
840836  1 Board ........................................ $59.95 or $49.95 ea./3+

DIGITAL PLUG-IN BOARDS
Logic Gates, Input & Output Devices
840552  3 Boards ........................................ $125
Digital Input & Output Devices
840554  3 Boards ........................................ $125
Counters & Shift Registers
840648  1 Board ........................................ $49.95
Binary Adders & Subtractors
840649  2 Boards/Circuitry ........................................ $99.95

MOUNTING BASES FOR PLUG-IN BOARDS
For organizing and storing your plug-in boards.
840797  Analog Mounting Base .......................... $95
840798  Digital Mounting Base .......................... $95

KELVIN® Basic 3™ External Sensors
Use instead of the built-in sensors on the BASIC 3™ motherboard to build a “Smart House,” explore controls, etc. External sensors reach up to 3 feet away from the motherboard.

Individual Sensors:
840656 – On/Off
840653 – LDR
840654 – Thermistor
840655 – Micro Lever
840657 – Liquid
840658 – Magnetic
840684 – Microphone

Complete Set of All 7 Above
840894 ........................................ $89.95 or $84.95 ea./3+

BEST VALUE! Basic 3™ Complete Set with Plug-In Boards
840796 ........................................ $895 or $845 ea./3+

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Kits may require soldering and advanced assembly. Adult supervision required.
**KELVIN® 1st Breadboard Lab™**

Actual Size is 6-1/4 x 6-1/2 in.

This trainer not only contains a small breadboard for students to assemble circuits on, but includes basic components that most circuits use—right on the board, ready for easy wiring.

In addition, an assortment of loose parts are included to build the 30 experiments in the lab manual and to design countless circuits. The completely assembled trainer includes a 6-1/4 x 6-1/2" breadboard, all the necessary experiment components and a detailed lab manual.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>840739</td>
<td>Trainer, English</td>
<td>$99.95</td>
<td>$95.95</td>
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<tr>
<td>841009</td>
<td>Trainer, Spanish</td>
<td>$99.95</td>
<td>$95.95</td>
</tr>
</tbody>
</table>

**KELVIN® Clip-On™ Electronics Experiment Trainer**

A low cost, no frills trainer that expands as your student’s knowledge base builds. Covers a variety of basic electronic components found in everyday use. Parts are connected together into circuits using jumper leads and a “parts holder”. Parts include a variety of switches, lamp, LED, buzzer, piezo buzzer, motor, fixed resistor, photoresistor, variable resistor, power pack (batteries not included), jumpers and instructions. No soldering is required.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
<th>Price</th>
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<tbody>
<tr>
<td>841980</td>
<td>Mini Lab</td>
<td>$39.95</td>
<td>$34.95</td>
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**AM/FM Radio Kit with Transistor & IC**


<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
<th>Price</th>
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<tbody>
<tr>
<td>842313</td>
<td>Kit</td>
<td>$29.95</td>
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</tbody>
</table>

**AM Radio Kits**

Easy-to-build, complete radio on a single printed circuit board. Unique design allows you to place parts over its corresponding symbol on the PC board. Teaches the basic theory of AM radio operation. Detailed instructions and illustrations make it an educationally sound project. Requires soldering and a 9V Battery.

<table>
<thead>
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<th>Part Number</th>
<th>Description</th>
<th>Price</th>
<th>Price</th>
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<tr>
<td>280642</td>
<td>Kit with 2 ICs</td>
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<td>$12.95</td>
</tr>
<tr>
<td>840262</td>
<td>Kit</td>
<td>$19.95</td>
<td>$18.95</td>
</tr>
</tbody>
</table>
ELECTRONICS

KELVIN® EDUCATIONAL

KELVIN® Electronic Troubleshooting Trainers
Ideal for middle school students and up. When working within the field of electronics, students should know how to troubleshoot, evaluate, and repair electronic circuitry. The KELVIN® Troubleshooting Trainers are inexpensive and easy to set-up because they require no wiring or soldering.

Using troubleshooting and problem-solving procedures, these troubleshooting trainers show students how to find a problem on a PC board and then fix it. The trainers were developed to make teaching troubleshooting fast, easy, and effective – with actual electronic equipment, hardware, and pre-wired circuits.

According to the experiments, the teacher inserts a problem into the circuit using DIP switches. By following the circuits and measuring the components, students then isolate the trouble and fix it using problem-solving techniques and by resetting the DIP switches. System concept and student manuals developed by Lou Frenzel.

Assembled trainers include: pre-wired PC boards (8-1/2 x 11 in.); 3-ring storage binder; working electronic circuits with DIP switches; student lab manuals with experiments and tests; and teacher’s guide with detailed, documented faults.

AC Troubleshooting Trainer
840627  14 Labs include circuits, resonance, filters, transformers ..........$195 or $185 ea./3+

DC Troubleshooting Trainer
840626  15 labs include voltage dividers, resistors, transistors, etc. ......$195 or $185 ea./3+

Linear/Analog Troubleshooting Trainer
840857  12 labs include emitters, amplifiers, switching, etc...................$195 or $185 ea./3+

Digital Troubleshooting Trainer
840856  12 labs include logic gates, counters, RAM, etc. ....................$195 or $185 ea./3+

Communications Troubleshooting Trainer
840951  12 Labs include modulation, diodes, generators, etc. ..........$385 or $365 ea./3+

KELVIN® Troubleshooting Trainers Complete Set
All five troubleshooting trainers – AC, DC, Digital, Analog, Communications – in one complete set!
841402 .............................................................................$995 or $895 ea./3+

Kits may require soldering and advanced assembly. Adult supervision required.

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Circuit Wizard
Circuit & PCB Design Software

A revolutionary system that combines circuit design, PCB design, simulation and CAD/CAM in one complete package.

Designed with Educational Institutions in mind. Easy to teach and easy to learn!

By integrating the entire design process, Circuit Wizard provides you with all the tools necessary to produce an electronics project from start to finish – even including on-screen testing of the PCB prior to construction!

Designing is easy with Circuit Wizard. Just grab the components you need from the library, connect them together using the intelligent wiring tool and then press the ‘Play’ button to begin simulation.

SPICE circuit simulation — Circuit Wizard features a new simulation engine based on Berkeley SPICE. This industry-standard technology is the most advanced in the world, so you can be confident that results will be very fast and accurate.

121747 Hobbyist Version 1.7, Single User ................................................................................ $175
121748 Professional Version 1.7, Single User ........................................................................... $275
121743 Educational Version 3 ★ , Single User ........................................................................ $275
121744 Educational Version 3 ★, 5-User Network ..................................................................... $695
121745 Educational Version 3 ★, 5-User Extension Network ....................................................... $245
121818 Educational Version 3 ★, 25-User Site License .............................................................. $1,495

★ EDUCATIONAL VERSIONS SOLD TO SCHOOLS ONLY

LIVEWIRE and CONTROL STUDIO Software are Also Available Online at www.kelvin.com

PCB Wizard 3
PCB DESIGN SOFTWARE
A powerful package for designing single-sided & double-sided PCBs.

PCB Wizard 3 Professional version has these extra features:
• 1000 extra components to choose from.
• Double-sided and Interactive PCB routing.
• DXF export for CAD/CAM

PCB Wizard 3 Educational includes Professional features plus:
• 1000 extra components to choose from
• More virtual instruments, incl. logic analyzer & word generator
• Component fault simulation for teaching students fault-finding.
• Educational support material and courseware authoring tools.
• Network support (Standard/Pro editions won’t run on networks).

121450 Hobbyist Version, Single User ... $79.95
121451 Professional Version, Single User .... $175
121763 Educational Version*, Single User .... $175
121452 Educational Version*, 5-Users ........ $495
121453 Educational Version*, Add. 5-Users .... $195

www.kelvin.com • KELVIN®, 280 Adams Blvd., New York 11735, USA • Copyright © Kelvin L.P. • Prices in this catalog represent discounted pricing for educational institutions.
### Blinking LEDs
Demonstrates how to blink two LEDs with many common electronic parts. Requires a 9V battery.

- Kit, 841123, $3.95 or $2.95 ea./10+
- Bulk Pack for 30, 842162, $58.50
- Assemb. Demo, 842163, $49.95

<table>
<thead>
<tr>
<th>Bulk Pack Prices As Low As</th>
<th>Per Each Student Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.95</td>
<td>$1.95</td>
</tr>
</tbody>
</table>

### Reaction Tester
Anticipate when the LED will light and release the switch. Stays lit up when right. Requires a 9V battery.

- Kit, 841134, $3.95 or $2.95 ea./10+
- Bulk Pack for 30, 842191, $82.50
- Assemb. Demo, 842192, $49.95

<table>
<thead>
<tr>
<th>Bulk Pack Prices As Low As</th>
<th>Per Each Student Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2.75</td>
<td>$2.75</td>
</tr>
</tbody>
</table>

### Decision Maker
Great for making any “YES,” “NO,” or “Heads or Tails” decisions. Requires a 9V battery.

- Kit, 841131, $3.95 or $2.95 ea./10+
- Bulk Pack for 30, 842193, $82.50
- Assemb. Demo, 842194, $49.95

<table>
<thead>
<tr>
<th>Bulk Pack Prices As Low As</th>
<th>Per Each Student Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2.75</td>
<td>$2.75</td>
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</tbody>
</table>

### Touch Control Circuit
Activates a relay just by touching the ON probe. Requires a 9V battery. Enclosure not included.

- Kit, 841130, $7.95 or $6.95 ea./10+
- Bulk Pack for 20, 842223, $120
- Assemb. Demo, 842160, $49.95

<table>
<thead>
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<th>Bulk Pack Prices As Low As</th>
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</tr>
</thead>
<tbody>
<tr>
<td>$6.00</td>
<td>$6.00</td>
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</tbody>
</table>

### Micro-Mazer™
Blinking LED eyes and a jumbo LED gives this kit a ‘robotic face’. Requires a 9V battery.

- Kit, 841124, $9.95 or $8.95 ea./10+
- Bulk Pack for 20, 842225, $149
- Assemb. Demo, 842164, $49.95

<table>
<thead>
<tr>
<th>Bulk Pack Prices As Low As</th>
<th>Per Each Student Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$7.45</td>
<td>$7.45</td>
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</table>

### Water Level Meter
A great tool to determine the liquid level in a container. Requires a 9V battery.

- Kit, 841126, $9.95 or $8.95 ea./10+
- Bulk Pack for 20, 842234, $149
- Assemb. Demo, 842173, $59.95

<table>
<thead>
<tr>
<th>Bulk Pack Prices As Low As</th>
<th>Per Each Student Kit</th>
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<tbody>
<tr>
<td>$7.99</td>
<td>$7.99</td>
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</table>

### Moisture Sensor
Check the soil moisture of plants with probes and keep them alive. Requires a 9V battery.

- Kit, 841132, $9.95 or $8.95 ea./10+
- Bulk Pack for 20, 842235, $149
- Assemb. Demo, 842175, $59.95

<table>
<thead>
<tr>
<th>Bulk Pack Prices As Low As</th>
<th>Per Each Student Kit</th>
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</thead>
<tbody>
<tr>
<td>$7.45</td>
<td>$7.45</td>
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</table>

### Continuity Testers
A great tool to test for continuity in a circuit. All three kits require a 9V battery.

- Kit, 841128, $10.95 or $9.95 ea./10+
- Bulk Pack for 20, 842236, $149
- Assemb. Demo, 842200, $49.95

### Light Activated Circuit
Light triggers a relay for an alarm or robot. Requires a 9V battery. Enclosure not included.

- Kit, 841129, $9.95 or $8.95 ea./10+
- Bulk Pack for 20, 842224, $149
- Assemb. Demo, 842161, $59.95

### PaceMaker™
Attach to your belt and it will keep track of your pace when walking or jogging. Requires a 9V battery.

- Kit, 842252, $13.95 or $12.95 ea./10+
- Bulk Pack for 20, 842254, $120
- Assemb. Demo, 842253, $49.95

### Kel-Wheel of Fortune
Push the button and see 10 LEDs appear to spin around the wheel. Requires a 9V battery.

- Kit, 841572, $10.95 or $9.95 ea./10+
- Bulk Pack for 10, 842251, $89
- Assemb. Demo, 842197, $59.95

<table>
<thead>
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<th>Bulk Pack Prices As Low As</th>
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</thead>
<tbody>
<tr>
<td>$8.90</td>
<td>$8.90</td>
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</table>

### Audio Level Meter
Uses an LM3915 Bar Graph IC and audio pre-amp to measure an audio level. Requires a 9V battery.

- Kit, 841127, $13.95 or $12.95 ea./10+
- Bulk Pack for 10, 842232, $120
- Assemb. Demo, 842170, $59.95

<table>
<thead>
<tr>
<th>Bulk Pack Prices As Low As</th>
<th>Per Each Student Kit</th>
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</thead>
<tbody>
<tr>
<td>$12</td>
<td>$12</td>
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</tbody>
</table>

### Kel-Decision Stick
Push the button to display the answers to all of your questions. Requires a 9V battery.

- Kit, 841569, $9.95 or $8.95 ea./10+
- Bulk Pack for 20, 842233, $149
- Assemb. Demo, 842195, $59.95

### PWM Speed Control
Use Pulse-Width Modulation to vary the speed of any DC motor (3-25V DC; 3A max.) from 0 to 100%. Ideal to control a fan, toy motor, etc.

- Kit, 841732, $15.95 or $14.95 ea./10+
- Bulk Pack for 10, 842227, $125
- Assemb. Demo, 842166, $69.95

<table>
<thead>
<tr>
<th>Bulk Pack Prices As Low As</th>
<th>Per Each Student Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$12.50</td>
<td>$12.50</td>
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</tbody>
</table>
### Sound Activated Circuit
Using sound or voice, a relay is energized. Increase or decrease the sensitivity. Requires a 9V battery.
- **Kit, 841128, $9.95 or $8.95 ea./10+**
- **Bulk Pack for 10, 842226, $84.95**
- **Assemb. Demo, 842165, $59.95**

### Temp. Control Circuit
Thermostat with range of 41° F – 86°F. High power load control with 30 second hysteresis. Requires a 9V battery. Enclosure not included.
- **Kit, 841591, $9.75 or $9.45 ea./10+**
- **Bulk Pack for 10, 842230, $85**
- **Assemb. Demo, 842169, $59.95**

### Bicycle Safety Light
- **Kit, 841596, $9.95 or $8.95 ea./10+**
- **Bulk Pack for 10, 842228, $78.95**
- **Assemb. Demo, 842167, $59.95**

### Hollywood Marquee
Includes a PC board, parts and instructions. Requires a 9V battery. Enclosure not included.
- **Kit, 840556, $12.95 or $9.95 ea./10+**
- **Bulk Pack for 10, 842229, $79.95**
- **Assemb. Demo, 842168, $69.95**

### Strobe Light
Controls flash rate. Includes pre-drilled PC board, parts and instructions. Requires a 9V battery.
- **Kit, 840662, $16.95 or $15.95 ea./10+**
- **Bulk Pack for 10, 842231, $135**
- **Assemb. Demo, 842170, $59.95**

### Telephone Bug
Transmit phone conversations to an FM radio. Requires a transistor radio and 9V battery.
- **Bulk Pack for 10, 842243, $10.95 or $11.95 ea./10+**
- **Kit, 840557, $19.95 or $17.95 ea./10+**
- **Bulk Pack for 10, 842244, $99.95**
- **Assemb. Demo, 842184, $69.95**

### Sound Effects Unit
Make four different sound effects; from a Laser Gun to Police Siren. Requires a 9V battery. Enclosure included.
- **Kit, 841597, $14.95 or $12.95 ea./10+**
- **Bulk Pack for 10, 842246, $111.95**
- **Assemb. Demo, 842188, $59.95**

### Big Ear
Build an ultra sensitive listening device. Use a funnel or build a reflective parabolic dish. Requires a 9V battery. Enclosure not included.
- **Kit, 841598, $10.95 or $9.95 ea./10+**
- **Bulk Pack for 10, 842239, $87.95**
- **Assemb. Demo, 842182, $69.95**

### Police Siren
Mimics a police car siren with tone adjustment. Can also be used as a burglar alarm. Requires a 9V battery.
- **Kit, 841567, $5.75 or $4.95 ea./10+**
- **Bulk Pack for 20, 842245, $87.95**
- **Assemb. Demo, 842189, $59.95**

### Telephone Bug
Transmit phone conversations to an FM radio. Requires a transistor radio and 9V battery.
- **Bulk Pack for 10, 842243, $79.95**
- **Assemb. Demo, 842186, $59.95**

### Metal Stud Finder
Detects metal studs behind a wall. Requires a 9V battery. Requires a 9V battery. Enclosure not included.
- **Kit, 841594, $12.75 or $11.95 ea./10+**
- **Bulk Pack for 10, 842241, $99.95**
- **Assemb. Demo, 842184, $69.95**

### Strobe Light
Controls flash rate. Includes pre-drilled PC board, parts and instructions. Requires a 9V battery.
- **Kit, 840662, $16.95 or $15.95 ea./10+**
- **Bulk Pack for 10, 842231, $135**
- **Assemb. Demo, 842170, $59.95**

### Telephone Bug
Transmit phone conversations to an FM radio. Requires a transistor radio and 9V battery.
- **Bulk Pack for 10, 842243, $79.95**
- **Assemb. Demo, 842186, $59.95**

### KGB Ear
Listen to a clear broadcast over 100 ft. away by using any FM radio. Requires a 9V battery and FM Radio.
- **Kit, 840557, $11.95 or $10.95 ea./10+**
- **Bulk Pack for 10, 842244, $99.95**
- **Assemb. Demo, 842187, $69.95**

### 2-Way Intercom Kit with Communication Lab
Includes a pair of high quality intercoms, project boxes, one pair of wires and batteries.
- **Kit, 841034, $39.95**
- **Assemb. Demo, 842180, $69.95**
- **Bulk Pack for 10, 842237, $19.95 or $17.95 ea./10+**
- **Assemb. Demo, 842184, $59.95**

### Wireless Microphone
Transmit your voice to any FM radio up to 100 feet away. Includes housing made from a PVC pipe. Requires a 9V battery.
- **Kit, 841599, $19.95 or $17.95 ea./10+**
- **Bulk Pack for 10, 842238, $159.95**
- **Assemb. Demo, 842181, $69.95**

### Sound Effects Unit
Make four different sound effects; from a Laser Gun to Police Siren. Requires a 9V battery. Enclosure not included.
- **Kit, 841597, $14.95 or $12.95 ea./10+**
- **Bulk Pack for 10, 842246, $111.95**
- **Assemb. Demo, 842188, $59.95**

### 20W Audio Amplifier
Amplify any small signal and drive an 8 ohm speaker with 1% THD. Requires a 12-30V DC power supply.
- **Kit, 841570, $15.95 or $14.95 ea./10+**
- **Bulk Pack for 10, 842237, $125**
- **Assemb. Demo, 842178, $69.95**

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*Kits may require soldering and advanced assembly. Adult supervision required.*

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### Electronic Christmas Tree
Christmas was never so congenial! 16 blinking LEDs. Measures 2.4 x 4 x 1 in. Requires a 9V battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282296</td>
<td>$10.95 or $9.95 ea./3+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### 3D Christmas Tree
16 flashing red LEDs. Extra green & yellow LEDs provided to customize your tree can be hung and supplied through the wires. 8mA. 3.1 x 3.5 x 4 in. Requires a 9V battery or 12V DC.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282234</td>
<td>$9.95 or $4.95 ea./3+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Deluxe Xmas Tree
A beautiful “tree” consisting of 134 LEDs. 18 randomly blinking candles. An on/off switch is also included. 5.6 x 3.2 in. Requires a 9V battery or 12V DC.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
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</thead>
<tbody>
<tr>
<td>282312</td>
<td>$24.95 or $23.95 ea./3+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### 83 LED Animated Bell
No need to remove the battery when using external supply. 12V DC operation possible for use in cars or trucks. On/off switch included. Requires a 9V battery or 12V DC.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282316</td>
<td>$19.95 or $18.95 ea./3+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Brain Game
Repeat a random pattern. 4 LEDs and 4 pushbuttons provide hours of fun. Low power consumption. Micro-processor controlled. Auto power-off. 2 x 2.6 in. Requires AAA batteries.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282080</td>
<td>$14.95 or $13.95 ea./3+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Wheel of Fortune
10-LED wheel of fortune. Push the button to start spinning action. When it stops, one LED remains lit. Auto Off. Low power use. 2.6 x 1.3 in. Requires a 9V battery or 12V DC.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282342</td>
<td>$9.95 or $8.95 ea./3+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Roulette
37 LEDs and spinning sound. Sounds ‘Winner’-tune for each color. Also spins LEDs between games. Kit includes pushbutton operation. Microprocessor: Auto Off. 3.6 x 1.3 in. Requires ‘AA’ batteries.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282314</td>
<td>$19.95 or $18.95 ea./10+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Quiz Table
Up to 4 players. Daisy-chain two units for 8 players! LED indicates first button pushed. 4.3 x 3.1 x 1.1 in. Requires 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282327</td>
<td>$14.95 or $13.95 ea./10+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Dual Electronic Dice
Have no doubt about the displayed results of this electronic dice! Comes with PC board, parts and manual. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
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<tbody>
<tr>
<td>282084</td>
<td>$19.75 or $18.95 ea./10+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Siren Sound Generator
Generates four different sounds: police siren, fire brigade, emergency vehicle plus a machine gun. RVI adjusts sound pitch. On/off switch and PCB speaker included. 2.4 x 1.6 in. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282308</td>
<td>$13.75 or $12.95 ea./10+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Electronic Cricket
Automatically comes on when it gets dark. Cricket repetition (time between two crickets), effect and tone adjustable. Adjustable light sensitivity. 2.4 x 0.4 x 1.0 in.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>282300</td>
<td>$9.95 or $8.95 ea./3+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Shaking Dice
No push buttons required, just give it a shake. Rolls out slowly and flashes last combination. Auto power-off. Microprocessor-controlled. 1.4 x 1.4 x 1.3 in. Requires a 3V Lithium button battery.

<table>
<thead>
<tr>
<th>Kit</th>
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<tr>
<td>282341</td>
<td>$15.95 or $14.95 ea./10+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Classic NTSC TV Game
1-2 players. 4 levels of difficulty. Audio/Video output, adjustable brightness, auto power off. Measures 2.9 x 5.5 in. Requires AAA batteries.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
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<tr>
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<td>Kit....</td>
</tr>
</tbody>
</table>

### Electronic Dice
Electronic die with an LED indication. Rolls slowly out when the push button is released. 1.7 x 2.4 in. Requires a 9V battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Packaging</th>
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<tr>
<td>282305</td>
<td>$10.75 or $9.95 ea./10+</td>
<td>Kit....</td>
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</tbody>
</table>

### Steam Engine Whistle Sound Generator
Generates sound of a vintage steam engine. Adjustable “speed” and volume. Comes with 8 ohm, 5W miniature speaker. 3.9 x 3.3 in. Requires a 9V DC battery.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>282328</td>
<td>$12.95 or $11.95 ea./10+</td>
<td>Kit....</td>
</tr>
</tbody>
</table>

### Sound Generator
Sounds include: machine gun, police sirens, phaser, engine, tire screech, explosion, mortar shot, “Wild Charge” tune, and “Snake Charmers” tune. Adjustable speed. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
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<tr>
<td>282087</td>
<td>$33.95 or $31.95 ea./10+</td>
<td>Kit....</td>
</tr>
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</table>

### Telephone Amplifier
Use either as an stand-alone amplifier with loudspeaker to follow a telephone conversation or connect it to an amplifier on a mixing panel. Comes with a PC board, parts and manual. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
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<tr>
<td>282303</td>
<td>$13.75 or $12.95 ea./10+</td>
<td>Kit....</td>
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</tbody>
</table>

### Electronic Recording and Playback Module Kit
Records a few lines of speech to play over and over again when triggered. Requires a 9V DC battery.

<table>
<thead>
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<th>Kit</th>
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<tr>
<td>282085</td>
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<td>Kit....</td>
</tr>
</tbody>
</table>
## Kelvin® Educational Kits

**Sound to Light Unit**
Four high-intensity LEDs light up and react with every sound. Adjustable sensitivity with potentiometer. Built-in mic. 0.5mA-12mA. 1.6 x 2.2 x 1.4 in. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282299</td>
<td>$9.75-11.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Dual Superbright Flashing Red LED Lights**
Very powerful flash effect. For warning signs, as eye-catcher, alarm, etc. Auto turn on at dark mode with adjustable sensitivity. 2.2 x 1.3 x 1.6 in. Requires a 9V battery or 12V DC.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282338</td>
<td>$12.95-11.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Dual White LED Stroboscope**
Two super bright white LEDs. Powerful flash effect. Great for parties, attention grabber, etc. Slow & fast selector and speed adjust trimmer. Includes power switch. 2.2 x 1.3 x 1.6 in. 40mA. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282338</td>
<td>$12.95-11.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Signal Generator**
Wave output: sine, triangle, square and integrator. Signal frequency about 1kHz (fixed). Output adjustable from 0-100mVrms. 2.2 x 1.6 in. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282301</td>
<td>$9.95-8.95</td>
<td>ea./3+</td>
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</tbody>
</table>

**Metronome**
LED beat indication. Adjust volume and beats per minute. Includes speaker and power switch. 2.4 x 1.7 in. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282302</td>
<td>$11.95-10.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**LED Running Light**
LEDs come on at a time in sequence or different selectable effects. Adjustable speed. 8 LEDs. 3.5 x 1.6 in. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282303</td>
<td>$9.95-9.45</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Mini Traffic Light**
Includes 12 LEDs. Realistic operation with adjustable delay. Kit is great for model railroads, exhibitions or as a toy. 15mA. Includes a power switch. 2 x 1.4 x 4.5 in. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282325</td>
<td>$9.95-8.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Rolling Message**
Create a moving message with 35 LEDs. Maximum of 16 characters. Adjustable speed. 5 x 2.6 in. 20mA max. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282318</td>
<td>$19.95-18.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Simple One Channel Light Organ**
Modulates a lamp according to the music signal. Adjustable sensitivity (2W to 60W). Max. load is 120W at 120VAC and 230W at 230VAC. 2.4 x 1.6 in. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282306</td>
<td>$13.75-12.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Light Sensitive Switch**
Automatically turns on at dusk and off at dawn. Adjustable sensitivity. Delay circuit avoids cycling. 2.6 x 2 off at dawn. Adjustable sensitivity. Requires a 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282319</td>
<td>$9.75-8.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Clap On/Off Switch**
Operate lighting with a handclap. Features built-in safety turn-off timer. 24V DC / AC 3A. 3.1 x 2.9 x 0.9 in. Requires 12VDC with adapter.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282333</td>
<td>$19.95-18.75</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Low Voltage Light Organ**
Make lamps flash to the music. Optically isolated speaker input. Adjustable sensitivity. 1.8 x 3.5 in. Requires 12VDC with adapter.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282309</td>
<td>$14.95-13.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Pocket VU Meter**
Surprise your friends in the disco! 5 red LEDs. Built-in mic. and sensitivity adjustment. Requires a 3V Lithium button battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282310</td>
<td>$12.95-11.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Clap On/Off Switch**
Operate lighting with a handclap. Features built-in safety turn-off timer. 24V DC / AC 3A. 3.1 x 2.9 x 0.9 in. Requires 12VDC with adapter.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282333</td>
<td>$19.95-18.75</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Mini SMD Flashing Heart**
6 flashing LEDs. 3mA. 1.9 x 1.7 x 0.3 in. Req. 3V Lithium button battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282335</td>
<td>$12.95-11.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Flashing Sweetheart LED**
28 LEDs form two fast blinking hearts. 2.4 x 2.4 Requires 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282329</td>
<td>$9.95-8.95</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

**Metal Detector**
Check for metal objects in walls, floors and ceilings. An LED turns on if the detector is in the vicinity of metal objects. Includes PC board, parts & manual. Requires 9V DC battery.

<table>
<thead>
<tr>
<th>Kit</th>
<th>Price</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>282079</td>
<td>$12.95-12.45</td>
<td>ea./3+</td>
</tr>
</tbody>
</table>

---

Kits may require soldering and advanced assembly. Adult supervision required.

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**General Purpose Boards**

Multi-purpose boards with pre-drilled and solder-ringed holes. Accept DIPs, sockets, headers. Indexed for pin-out ID. These boards are a convenient and economical way to assemble circuit components. Good for circuit design.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>440001</td>
<td>3 x 7 in.</td>
<td>$5.95</td>
<td>ea./10/ea./6+</td>
</tr>
<tr>
<td>440002</td>
<td>6 x 1-1/2 in.</td>
<td>$5.95</td>
<td>ea./10/ea./6+</td>
</tr>
<tr>
<td>440003</td>
<td>10 x 2-1/2 in.</td>
<td>$5.95</td>
<td>ea./10/ea./6+</td>
</tr>
</tbody>
</table>

**Press-n-Peel Transfer Film**

Photocopy or laser print circuit designs onto Press-N-Peel Film. Iron the film onto copper clad board and peel it off before etching. [S] 8.5x11 in. sheets. 440198 .................. $12.95 or $11.95 ea./6+

**Fast Etching Tank**

Etch in 4 minutes! Maximum PC board size is 160 x 250 mm. Includes electric agitator and hanging accessories. Requires tank heater (see below).

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>440142</td>
<td>[A] Tank</td>
<td>$89.95</td>
<td>ea./2+</td>
</tr>
<tr>
<td>440143</td>
<td>[B] Tank Heater</td>
<td>$19.95</td>
<td>ea./6+</td>
</tr>
</tbody>
</table>

**Ammonium Persulfate Etchant Powder**

4 lbs. makes 2 gallons. 440026  [C] 4 lb. ............. $17.95 or $16.19 ea./3+ |

**Ferric Chloride Etchant Powder**

1 lb. makes half-gallon. 2 lbs. makes one gallon. 440139  1 lb. .................. $16.95 or $14.95 ea./3+ |
| 440140      | 2 lb.       | $21.95 | or $20.95 ea./3+ |

**PCB Etch Resist Pens**

440116  1/4 in. dia. Point ....... $3.45 or $3.25 ea./6+ |

**Black Direct Etch Tape**

440010  1/8 in. x 54 ft. ........ $5.95 or $5.45 ea./6+ |

**Wire Jumper Kit**

Kit includes Quick Test Sockets, Bus Strips and 22-Gauge Wire (pre-cut, pre-stripped and color-coded). 330289  140 Piece Kit ...... $4.95 or $4.45 ea./3+ |
| 330290      | 350 Piece Kit | $13.95 | or $13.25 ea./3+ |

**Male BNC to 2 Mini Alligator Clips Test Leads**

39 in. long leads. Set of 2 leads; 1 Black / 1 Red. 990070  [A] .................. $3.95 or $3.75 ea./3+ |

**Alligator Clip Test Leads**

[C] Set of 10 leads in assorted colors with small clips. 22AWG, 20 in. L Leads 330009  22AWG, 20 in. L Leads. $2.45 or $2.25 ea./10+ |
| 330114      | 20AWG, 24 in. L Leads | $5.95 or $5.35 ea./10+ |
| 330410      | 22AWG, 180 in. L Leads | $7.95 or $7.45 ea./10+ |

**Component Test Leads**

Banana to alligator for testing capacitors, inductors, and resistors. 7 in. long. 282440  [C] .................. $3.95 or $3.65 ea./3+ |

**ALLIGATOR CLIPS**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Price</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>330008</td>
<td>[A] ..........</td>
<td>$0.25</td>
<td>ea./10+</td>
</tr>
<tr>
<td>330009</td>
<td>[B] ..........</td>
<td>$0.25</td>
<td>ea./10+</td>
</tr>
<tr>
<td>330010</td>
<td>[C] ..........</td>
<td>$0.15</td>
<td>ea./10+</td>
</tr>
</tbody>
</table>

**Micro, Bare, Solder-type**

310009  [A] ............... $0.59 or $0.55 ea./10+ |
| 310010      | [B] .......... | $0.30 or $0.28 ea./10+ |

**Micro, Insulated**

990013  [B] Black .......... $0.30 or $0.28 ea./10+ |
| 990012      | [C] Red ....... | $0.30 or $0.28 ea./10+ |

**Bare, Fits Banana Plugs, Solder-type**

310001  [D] ............... $0.39 or $0.36 ea./10+ |

**Bare, Threaded**

310010  [E] 70-S .......... $0.65 or $0.60 ea./10+ |
SOLDERING SUPPLIES & TOOLS

60/40 Solder Kester-brand, Flux Resin Core
830021 A 1/16 in. dia., 1 lb. Spool ........................................... $27.95 or $26.95 ea./4+
830020 1/32 in. dia., 1 lb. Spool ........................................... $29.95 or $27.95 ea./4+

60/40 Solder Pocket-Pack Flux Resin Core
830022 B 1/2 oz ................................................................. $1.95 or $1.85 ea./4+

Solder Paste
830003 C 50 grams ............................................................. $2.29

Heat Sinks
Protect heat-sensitive components from damage when soldering.
450034 D Clip-On Heat Sink ............................................. $79¢ or 69¢ ea./10+
480024 E Snap-On Heat Sink, TO-220 ................................ $69¢ or 59¢ ea./10+

Soldering Aids Kit
Kit includes a Heat Sink, Fine Probe, Slotted Probe and Brush/Scraper.
450032 F ............................................................................. $2.95 or $2.75 ea./10+

Solder Brush with Metal Bristles
830043 G ............................................................................. $1.75 or $1.50 ea./3+

Desoldering Wick
The easiest way to desolder PC board and terminal connections. 5 ft. long.
830007 H 0.050 in. W ........................................................ $27.95 or $25.95 ea./6+
830004 0.075 in. W, Imported .............................................. $1.45 or $1.25 ea./6+
830025 0.100 in. W, Imported .............................................. $1.45 or $1.25 ea./6+
830009 0.150 in. W ............................................................... $4.45 or $3.95 ea./6+
830026 0.190 in. W ............................................................... $4.65 or $4.25 ea./6+

Vacuum Desoldering Pumps
450030 I Metal ................................................................. $2.95 or $2.65 ea./6+
810058 J Plastic ................................................................. $2.95 or $2.75 ea./6+

Desoldering Bulb
Economical! Includes a high heat resistant, removable tip for removing solder, but without scratching or damaging delicate PC boards.
990084 K ............................................................................. $4.45 or $3.95 ea./6+

Heat Gun
Top quality gun with dual temperature and 6 ft. long cord. 1000W.
820025 ................................................................. $69.95 or $64.95 ea./3+

Heat Shrink Tubing
Shrinks to 50% of inside diameter.
330078 1/8 in. dia. x 10 ft. L ................................................. $2.95 or $2.75 ea./10+
330079 1/4 in. dia. x 10 ft. L ................................................. $2.95 or $2.75 ea./10+
330088 1/4 in. dia. x 10 ft. L ................................................. $4.45 or $4.95 ea./10+
330081 5/16 in. dia. x 10 ft. L ................................................. $6.95 or $6.45 ea./10+

Electronics Tool Set
BEGINNER SET
840213 ................................................................. $23.95 or $21.55 ea./6+

WELLER Marksman Soldering Iron
Featherweight (1-3/4 oz.) soldering iron is ideal for reaching hard to get spots on PC boards. Features replaceable tips. 25W.
830002 C Soldering Iron ....................................................... $22.95 or $21.95 ea./6+
810023 Chisel Tip, 2pkg. .................................................... $5.45 or $4.95 ea./6+
810004 Cone Tip ............................................................... $2.95 or $2.65 ea./6+

WELLER Marksman Soldering Kit
810029 ................................................................. $25.95 or $24.95 ea./3+

Student Soldering Stations
Electronically controlled to provide variable heat – 5 to 40 watts – for general soldering. The unit includes a soldering iron, holder funnel for the iron, sponge pad and an on/off indicator light.
282438 D Assembled .......................................................... $35.95 or $33.95 ea./3+
282439 Kit .......................................................................... $33.95 or $31.95 ea./3+

Project Soldering Iron
Soldering iron with 3/16 in. long tapered tip and break-resistant plastic handle. 30W, 117V, 60Hz (UL).
990098 A 2-Prong Soldering Iron ........................................ $4.95 or $4.65 ea./6+
990099 2-Prong Soldering Iron Tip Only ................................ $0.95 or 85¢ ea./12+
990072 3-Prong Soldering Iron ............................................ $12.95 or $11.65 ea./6+
990117 3-Prong Soldering Iron Tip Only ................................ $2.95 or $2.65 ea./12+

Project Soldering Iron Holder and Sponge
Heavy-duty spring with bakelite support, steel base, and sponge pad.
830010 B Holder and Sponge .............................................. $2.75 or $2.25 ea./10+
990083 Sponge Only ........................................................ $85¢ or 79¢ ea./10+

5 to 40 Watts
As Low As
$4.65
Per 6+
### Copper Wire
Solid, 18 AWG

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>L. ft.</th>
<th>$ EA.</th>
<th>$ EA./3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>330343</td>
<td>Bare</td>
<td>50</td>
<td>13.95</td>
<td>12.95</td>
</tr>
</tbody>
</table>

### Copper Enamel Magnet Wire
1 lb. Spool

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>AWG</th>
<th>L. ft.</th>
<th>$ EA.</th>
<th>$ EA./3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>330128</td>
<td>22</td>
<td>514</td>
<td>14.95</td>
<td>13.95</td>
</tr>
<tr>
<td>330130</td>
<td>24</td>
<td>817</td>
<td>15.95</td>
<td>14.95</td>
</tr>
<tr>
<td>330132</td>
<td>26</td>
<td>1300</td>
<td>15.95</td>
<td>14.95</td>
</tr>
<tr>
<td>330134</td>
<td>28</td>
<td>2067</td>
<td>16.95</td>
<td>15.95</td>
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<tr>
<td>330136</td>
<td>30</td>
<td>3287</td>
<td>16.95</td>
<td>15.95</td>
</tr>
</tbody>
</table>

### 22 AWG Project Wire
Ends Stripped.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>L. in.</th>
<th>QTY.</th>
<th>$ EA.</th>
<th>$ EA./3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>330425</td>
<td>Red</td>
<td>10</td>
<td>50</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330426</td>
<td>Black</td>
<td>10</td>
<td>50</td>
<td>7.95</td>
<td>6.95</td>
</tr>
</tbody>
</table>

### 22 AWG Wire

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>L. ft.</th>
<th>$ EA.</th>
<th>$ EA./3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>330193</td>
<td>Red</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330017</td>
<td>Red</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330208</td>
<td>Black</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330011</td>
<td>Black</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330192</td>
<td>Blue</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330012</td>
<td>Blue</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330209</td>
<td>Brown</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330013</td>
<td>Brown</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330210</td>
<td>Green</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330014</td>
<td>Green</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330211</td>
<td>Gray</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330015</td>
<td>Gray</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330213</td>
<td>Violet</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330018</td>
<td>Violet</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330214</td>
<td>White</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330019</td>
<td>White</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330194</td>
<td>Yellow</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>330020</td>
<td>Yellow</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
<tr>
<td>330212</td>
<td>Orange</td>
<td>100</td>
<td>7.95</td>
<td>6.95</td>
</tr>
<tr>
<td>3300016</td>
<td>Orange</td>
<td>1000</td>
<td>39.95</td>
<td>37.95</td>
</tr>
</tbody>
</table>

### Test Lead Wire
18 AWG

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>K</th>
<th>COLOR</th>
<th>L. ft.</th>
<th>IW</th>
<th>$ EA.</th>
</tr>
</thead>
<tbody>
<tr>
<td>330008</td>
<td>5</td>
<td>Black</td>
<td>100</td>
<td>PVC</td>
<td>25.95</td>
</tr>
<tr>
<td>330017</td>
<td>5</td>
<td>Black</td>
<td>1000</td>
<td>PVC</td>
<td>49.00</td>
</tr>
<tr>
<td>330369</td>
<td>10</td>
<td>Red</td>
<td>50</td>
<td>Rubber</td>
<td>12.95</td>
</tr>
<tr>
<td>330370</td>
<td>10</td>
<td>Black</td>
<td>50</td>
<td>Rubber</td>
<td>12.95</td>
</tr>
</tbody>
</table>

### Phone Wire

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>DESCRIPTION</th>
<th>L. ft.</th>
<th>$ EA.</th>
<th>$ EA./3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>860025</td>
<td>4 wires for 2 lines</td>
<td>50</td>
<td>3.95</td>
<td>3.65</td>
</tr>
</tbody>
</table>

### Speaker Wire
24 AWG

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>L. ft.</th>
<th>$ EA.</th>
<th>$ EA./3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>330154</td>
<td>Clear</td>
<td>25</td>
<td>3.95</td>
<td>3.65</td>
</tr>
<tr>
<td>330155</td>
<td>Clear</td>
<td>50</td>
<td>10.95</td>
<td>9.85</td>
</tr>
</tbody>
</table>
**Alkaline Batteries**

Eveready or Duracell Quality

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>FIG.</th>
<th>TYPE</th>
<th>V</th>
<th>$ EA.</th>
<th>$ EA./10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>220033</td>
<td>A</td>
<td>AAA</td>
<td>1.5</td>
<td>.85</td>
<td>.80</td>
</tr>
<tr>
<td>220016</td>
<td>B</td>
<td>AA</td>
<td>1.5</td>
<td>.80</td>
<td>.75</td>
</tr>
<tr>
<td>220015</td>
<td>C</td>
<td>C</td>
<td>1.5</td>
<td>1.25</td>
<td>1.10</td>
</tr>
<tr>
<td>220014</td>
<td>D</td>
<td>D</td>
<td>1.5</td>
<td>1.75</td>
<td>1.55</td>
</tr>
<tr>
<td>220019</td>
<td>E</td>
<td>Radio</td>
<td>9</td>
<td>2.35</td>
<td>1.85</td>
</tr>
</tbody>
</table>

**Carbon Batteries**

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>TYPE</th>
<th>V</th>
<th>QTY.</th>
<th>$ EA.</th>
<th>$ EA./10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>220009</td>
<td>AA</td>
<td>1.5</td>
<td>4</td>
<td>1.75</td>
<td>1.55</td>
</tr>
<tr>
<td>220008</td>
<td>C</td>
<td>1.5</td>
<td>4</td>
<td>2.79</td>
<td>2.65</td>
</tr>
<tr>
<td>220007</td>
<td>D</td>
<td>1.5</td>
<td>4</td>
<td>3.29</td>
<td>2.96</td>
</tr>
<tr>
<td>220010</td>
<td>Radio</td>
<td>9</td>
<td>1</td>
<td>1.15</td>
<td>.99</td>
</tr>
<tr>
<td>220012</td>
<td>Lantern Screw</td>
<td>6</td>
<td>1</td>
<td>7.95</td>
<td>7.45</td>
</tr>
<tr>
<td>220045</td>
<td>Lantern Spring</td>
<td>6</td>
<td>1</td>
<td>7.95</td>
<td>7.45</td>
</tr>
</tbody>
</table>

**Rechargeable Ni-Cad Batteries**

1.2V (except the 9V radio) sealed Nickel Cadmium cells provide up to 1,000 charge/discharge cycles.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>TYPE</th>
<th>V</th>
<th>QTY.</th>
<th>$ EA.</th>
<th>$ EA./10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>220039</td>
<td>AAA</td>
<td>1.2</td>
<td>1</td>
<td>1.35</td>
<td>1.25</td>
</tr>
<tr>
<td>220025</td>
<td>AA</td>
<td>500</td>
<td>1.2</td>
<td>1.35</td>
<td>1.25</td>
</tr>
<tr>
<td>220026</td>
<td>AA Tab</td>
<td>500</td>
<td>1.2</td>
<td>2.50</td>
<td>2.35</td>
</tr>
<tr>
<td>220027</td>
<td>C</td>
<td>1200</td>
<td>1.2</td>
<td>2.95</td>
<td>2.75</td>
</tr>
</tbody>
</table>

**Plastic Battery Holders**

- **9V Radio Battery Snaps and Clips**
  - T Snap w/ 6 in. L Tinned Leads
  - I Snap w/ 4-1/2 in. L Tinned Leads
  - Metal Clip

- **Button Batteries**
  - Maxell brand button batteries. For watches, calculators and more!

- **Lithium Battery**
  - #123

- **Stackable Plastic D-Cell Battery Holders**
  - Battery holders can be snapped together to form series and parallel battery packs.

- **AA Battery Boxes**
  - With leads and built-in on/off slide switch.

**Ni-Cad/Ni-mh 4-Cell Battery Charger**

Charges D, C, AA, AAA, 6V, and 9V Ni-Cad/Ni-mh batteries. LEDs indicate proper charging and switch charges at 50mAh or 120mAh.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>FIG.</th>
<th>TYPE</th>
<th>V</th>
<th>$ EA.</th>
<th>$ EA./10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>220035</td>
<td>A</td>
<td>AAA</td>
<td>1.5</td>
<td>.85</td>
<td>.80</td>
</tr>
<tr>
<td>220016</td>
<td>B</td>
<td>AA</td>
<td>1.5</td>
<td>.80</td>
<td>.75</td>
</tr>
<tr>
<td>220015</td>
<td>C</td>
<td>C</td>
<td>1.5</td>
<td>1.25</td>
<td>1.10</td>
</tr>
<tr>
<td>220014</td>
<td>D</td>
<td>D</td>
<td>1.5</td>
<td>1.75</td>
<td>1.55</td>
</tr>
<tr>
<td>220019</td>
<td>E</td>
<td>Radio</td>
<td>9</td>
<td>2.35</td>
<td>1.85</td>
</tr>
</tbody>
</table>

**FOR AAA BATTERIES**

- **FOR AA BATTERIES**
- **FOR C BATTERIES**
- **FOR D BATTERIES**

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### TERMINALS

**Terminal Strips**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Stock #</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solder-Type</td>
<td>4 Terminals</td>
<td>390073</td>
<td>$0.40</td>
</tr>
<tr>
<td>Threaded</td>
<td>6 Terminals</td>
<td>390099</td>
<td>$0.50</td>
</tr>
</tbody>
</table>

**Pushbutton Terminal**

Terminal includes spring-loaded posts for easy connection with 4 positions: 2 red, 2 black.

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>390737</td>
<td>A</td>
<td>$1.50</td>
</tr>
</tbody>
</table>

**Low-Profile Terminal Blocks**

Connect wires to PC boards. 5mm, Blue.

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>390123</td>
<td>A 2 Posts</td>
<td>$0.95</td>
</tr>
<tr>
<td>390119</td>
<td>4 Posts</td>
<td>$1.45</td>
</tr>
</tbody>
</table>

### BINDING POSTS

**Binding Posts**

5-way type binding posts. Includes 1/4 in. long post. Insulated and assembled.

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>400022</td>
<td>A Black</td>
<td>$0.25</td>
</tr>
<tr>
<td>400021</td>
<td>Red</td>
<td>$0.25</td>
</tr>
</tbody>
</table>

**Hex Mounting Hole**

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>400013</td>
<td>Black</td>
<td>$0.95</td>
</tr>
<tr>
<td>400012</td>
<td>Red</td>
<td>$0.95</td>
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</table>

### CD4000 SERIES INTEGRATED CIRCUITS

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Type</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>600124</td>
<td>4001</td>
<td>Hex Mounting Hole</td>
<td>$0.60</td>
</tr>
<tr>
<td>600117</td>
<td>4002</td>
<td>Hex Mounting Hole</td>
<td>$0.35</td>
</tr>
<tr>
<td>590229</td>
<td>4011</td>
<td>Hex Mounting Hole</td>
<td>$0.75</td>
</tr>
<tr>
<td>590118</td>
<td>4012</td>
<td>Hex Mounting Hole</td>
<td>$0.60</td>
</tr>
<tr>
<td>590084</td>
<td>4013</td>
<td>Hex Mounting Hole</td>
<td>$0.30</td>
</tr>
</tbody>
</table>

### 74HC SERIES INTEGRATED CIRCUITS

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Type</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>590227</td>
<td>00</td>
<td>Hex Mounting Hole</td>
<td>$0.35</td>
</tr>
<tr>
<td>590227</td>
<td>02</td>
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<tr>
<td>590274</td>
<td>04</td>
<td>Hex Mounting Hole</td>
<td>$0.35</td>
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<tr>
<td>590275</td>
<td>08</td>
<td>Hex Mounting Hole</td>
<td>$0.25</td>
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<tr>
<td>590281</td>
<td>30</td>
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<tr>
<td>590286</td>
<td>85</td>
<td>Hex Mounting Hole</td>
<td>$0.75</td>
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</table>

### 74LS00 SERIES INTEGRATED CIRCUITS

<table>
<thead>
<tr>
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<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>590088</td>
<td>00</td>
<td>$0.50</td>
</tr>
<tr>
<td>590124</td>
<td>01</td>
<td>$0.40</td>
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</tbody>
</table>

### PARTS

**Phone Plugs**

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>990043</td>
<td>3.5mm Dia.</td>
<td>$0.26</td>
</tr>
<tr>
<td>400041</td>
<td>Stereo</td>
<td>$0.85</td>
</tr>
</tbody>
</table>

**DC Power Supply Plug**

5.5 mm long, 2.1 mm dia.

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>370051</td>
<td>A</td>
<td>$0.35</td>
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</tbody>
</table>

**Jack Chassis**

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>370052</td>
<td>B</td>
<td>$0.25</td>
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</table>

**Right Angle Jack**

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>370058</td>
<td>C</td>
<td>$0.40</td>
</tr>
</tbody>
</table>

**Stereo Phone Jacks**

Includes nut and washer. Requires 1/4 in. dia. mounting hole.

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>400010</td>
<td>D Open</td>
<td>$0.45</td>
</tr>
<tr>
<td>990057</td>
<td>E Closed</td>
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</table>

### SERIAL EEPROM

<table>
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<tr>
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<tbody>
<tr>
<td>600225</td>
<td>64Kx8</td>
<td>$0.95 or $0.65</td>
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</table>

### SEMI-CONDUCTOR

<table>
<thead>
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<th>Stock #</th>
<th>Type</th>
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<th>Price</th>
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<tbody>
<tr>
<td>600203</td>
<td>UM3561</td>
<td>$2.35</td>
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### VOLTAGE REGULATORS

<table>
<thead>
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<th>Type</th>
<th>Description</th>
<th>Price</th>
</tr>
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<tbody>
<tr>
<td>600023</td>
<td>7805</td>
<td>$0.95 or $0.80</td>
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</tr>
<tr>
<td>600024</td>
<td>7812</td>
<td>$1.15 or $0.95</td>
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</tr>
<tr>
<td>600025</td>
<td>7815</td>
<td>$1.15 or $0.95</td>
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</tr>
</tbody>
</table>

### DIP SWITCHES

Suitable for flow soldering on PC boards or mounting with standard sockets.

<table>
<thead>
<tr>
<th>Stock #</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>270026</td>
<td>A 4 Positions</td>
<td>$0.80</td>
</tr>
<tr>
<td>270027</td>
<td>B 6 Positions</td>
<td>$0.99</td>
</tr>
<tr>
<td>270029</td>
<td>C 8 Positions</td>
<td>$1.45</td>
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</table>
## $3.00
1/4 W Pack of 200

<table>
<thead>
<tr>
<th>OHMS</th>
<th>1/4 W</th>
<th>1/2W</th>
<th>1 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>010016</td>
<td>030016</td>
<td>050016</td>
</tr>
<tr>
<td>15</td>
<td>010033</td>
<td>030035</td>
<td>050034</td>
</tr>
<tr>
<td>22</td>
<td>010057</td>
<td>030063</td>
<td>050061</td>
</tr>
<tr>
<td>27</td>
<td>010065</td>
<td>030071</td>
<td>050069</td>
</tr>
<tr>
<td>33</td>
<td>010081</td>
<td>030085</td>
<td>050086</td>
</tr>
<tr>
<td>39</td>
<td>010089</td>
<td>030093</td>
<td>050094</td>
</tr>
<tr>
<td>47</td>
<td>010101</td>
<td>031016</td>
<td>—</td>
</tr>
<tr>
<td>56</td>
<td>010113</td>
<td>031019</td>
<td>050121</td>
</tr>
<tr>
<td>68</td>
<td>010125</td>
<td>031012</td>
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<td>82</td>
<td>010137</td>
<td>031045</td>
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<td>100</td>
<td>01018</td>
<td>030019</td>
<td>050018</td>
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<tr>
<td>120</td>
<td>01026</td>
<td>030029</td>
<td>050027</td>
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<tr>
<td>150</td>
<td>01035</td>
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<td>050036</td>
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<td>180</td>
<td>01043</td>
<td>030047</td>
<td>050044</td>
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<tr>
<td>220</td>
<td>01055</td>
<td>030061</td>
<td>—</td>
</tr>
<tr>
<td>270</td>
<td>01067</td>
<td>030073</td>
<td>050071</td>
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<tr>
<td>300</td>
<td>01079</td>
<td>030083</td>
<td>—</td>
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<tr>
<td>330</td>
<td>01083</td>
<td>030087</td>
<td>050088</td>
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<tr>
<td>360</td>
<td>01087</td>
<td>030091</td>
<td>—</td>
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<tr>
<td>390</td>
<td>01091</td>
<td>030095</td>
<td>—</td>
</tr>
<tr>
<td>470</td>
<td>01103</td>
<td>031018</td>
<td>051019</td>
</tr>
<tr>
<td>510</td>
<td>01111</td>
<td>031017</td>
<td>050119</td>
</tr>
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</table>

## $4.00
1/2 W Pack of 200

## $8.00
1 W Pack of 50

## $18.00
1 W Pack of 100

### DIODES

<table>
<thead>
<tr>
<th>Project Diodes</th>
<th>620042</th>
<th>620043</th>
<th>620080</th>
<th>620051</th>
<th>620146</th>
</tr>
</thead>
<tbody>
<tr>
<td>1N34</td>
<td>38¢</td>
<td>38¢</td>
<td>23¢</td>
<td>24¢</td>
<td>60¢</td>
</tr>
<tr>
<td>1N34A</td>
<td>38¢</td>
<td>38¢</td>
<td>23¢</td>
<td>24¢</td>
<td>60¢</td>
</tr>
<tr>
<td>1N914</td>
<td>38¢</td>
<td>38¢</td>
<td>23¢</td>
<td>24¢</td>
<td>60¢</td>
</tr>
<tr>
<td>1N4148</td>
<td>38¢</td>
<td>38¢</td>
<td>23¢</td>
<td>24¢</td>
<td>60¢</td>
</tr>
<tr>
<td>3A, 100V</td>
<td>60¢</td>
<td>55¢</td>
<td>60¢</td>
<td>55¢</td>
<td>60¢</td>
</tr>
</tbody>
</table>

### Zener Diodes

| 620132 | 2.7 V, 1 W | 18¢ or 15¢ ea./10+ | 15¢ ea./100+ |
| 620023 | 5.1 V, 1 W | 10¢ or 15¢ ea./10+ | 15¢ ea./100+ |
| 620030 | 8.2 V, 1 W | 10¢ or 15¢ ea./10+ | 15¢ ea./100+ |
| 620031 | 9.1 V, 1 W | 10¢ or 15¢ ea./10+ | 15¢ ea./100+ |
| 620008 | 12 V, 1 W  | 10¢ or 15¢ ea./10+ | 15¢ ea./100+ |
| 620011 | 15 V, 1 W  | 10¢ or 15¢ ea./10+ | 15¢ ea./100+ |

### Shottky Diode

| 620145 | 1N5822, 40V, 3A | 99¢ or 89¢ ea./10+ |

### 2W Resistors

Minimum order of 10.

<table>
<thead>
<tr>
<th>OHMS</th>
<th>STOCK #</th>
<th>OHMS</th>
<th>STOCK #</th>
<th>OHMS</th>
<th>STOCK #</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.51</td>
<td>070150</td>
<td>1.8K</td>
<td>070011</td>
<td>1K</td>
<td>070149</td>
</tr>
<tr>
<td>2.2</td>
<td>070148</td>
<td>15K</td>
<td>070032</td>
<td>10</td>
<td>070015</td>
</tr>
<tr>
<td>12</td>
<td>070190</td>
<td>20K</td>
<td>070026</td>
<td>30</td>
<td>070099</td>
</tr>
<tr>
<td>47</td>
<td>070099</td>
<td>160K</td>
<td>070058</td>
<td>100</td>
<td>070017</td>
</tr>
<tr>
<td>110</td>
<td>470K</td>
<td>070102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>1M</td>
<td>070014</td>
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<tr>
<td>1K</td>
<td>070013</td>
<td>2M</td>
<td>070028</td>
<td>447</td>
<td>00019</td>
</tr>
</tbody>
</table>

### 17¢ ea. per 10+

### 38¢ ea. per 100+

### 40¢ ea.

### 38¢ ea. per 100+

### Resistor Kit

Contains five each of 73 standard values from 1W to 1M W, 1/4W. 365 pieces total.

282452 ........................................... $13.95 or $12.95 ea./3+

### Sip Resistors

| 010164 | 15k, 6 Pins | .......... 48¢ |
| 010167 | 10k x 9, 10 Pins | .......... 48¢ |
| 010168 | 220 x 9, 10 Pins | .......... 48¢ |
| 010169 | 3.3k x 9, 10 Pins | .......... 48¢ |

### Light Dependent Resistor

260125 [B] Top Quality ................................ $2.75

### Photo Cells

Variable Resistance

260017 [C] 450 Ohms ................................ $99¢ or 85¢ ea./100+

260018 1.5K Ohms ................................ $99¢ or 85¢ ea./100+

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Project Speakers
8 Ohms. Standard Brands.
350009 [A] 0.1 W, PM, 2 in. dia. ..........59¢ or 49¢ ea./4+
350004 0.1 W, 2-1/4 in. dia. ...................$2.95
350002 0.1 W, 2-1/2 in. dia. ...................$1.65
350016 [B] 0.1 W, PM, 4 in. dia. ...............$2.45

Low Impedance Earphones
8 ohm, 3.5mm, 3.55mm earplug hanger, 6 ft. cord.
990140 [C] ..............................................$1.75 or $1.65 ea./6+

Lightweight Stereo Headphones
100dB, 20-19K, 4-32 ohms. 3.5mm stereo plug.
350043 [D] ..............................................$3.95 or $3.60 ea./10+

Project Microphone
350041 [E] 10V DC, 1K ..............$2.25 or $1.95 ea./10+

Multi-Purpose Microphone
Ideal for project or tape recorders. Includes a 9 ft. long shielded cord with a 3.5mm mini phone plug.
990047 [F] ..............................................$8.95 or $8.05 ea./10+

Video Splitters
370027 [A] 2-Way, SUV-2 ..........65¢ or 58¢ ea./10+
770006 [B] 3-Way ..................48¢ or 40¢ ea./10+
770007 [C] 4-Way ............$1.20 or $1.08 ea./10+

Video Switch
370028 [D] A-B ..............$4.25 or $3.95 ea./10+

Video Cables
Gold Ends Brand
780009 [E] RCA to RCA ..........$1 or 90¢ ea./6+
780010 Dual RCA to RCA ........$6.95 or $6.25 ea./6+

Computer Connector
370056 [F] 9-pin, M/F ..........79¢ or 69¢ ea./10+

KELVIN® 50LE Multimeter
Comes with battery, holster, test lead, and manual. Operates on 9V battery.
990177 ..........$3.95 or $3.75 ea./5+ or $3.25 ea./10+

Crystal Radio Bulk Pack
Unique flat design that can be made to look like a postcard. The radio is assembled by soldering 2 components on to a pc board. The coil is 'printed' on the board and tuning is done by moving a metal plate over the coil. Includes crystal earpiece, aerial wire, and self-adhesive postcard graphics.
283701 Bulk Pack for 10 ......................$149.95

KELVIN® 20W+20W Stereo Audio Amplifier
High quality; uses an LM1875 to amplify any small signal and to drive an 8 ohm speaker with 1% THD. Requires 12-30 V DC power supply.
841593 Kit ........................................$21.95 or $20.95 ea./10+
842179 Assembled Demo .......................$69.95

TRIMMERS & POTENTIOMETERS

Trimming Potentiometers
Horizontal [A]
110121 10k ohms ..........$1.65 or $1.45 ea./10+
Horizontal PCB Mount, Top Adjusting [B]
110099 1k ohms ............$2.25 or $1.95 ea./10+
110107 47k ohms ..........$2.25 or $1.95 ea./10+
110110 1M ohms ...........$2.25 or $1.95 ea./10+

Vertical Mini [C]
110036 2k ohms ..........99¢ or 85¢ ea./10+
110038 10k ohms ..........99¢ or 85¢ ea./10+
110041 100k ohms .........99¢ or 85¢ ea./10+
110043 50k ohms ..........99¢ or 85¢ ea./10+
110044 1M ohms ..........99¢ or 85¢ ea./10+

Horizontal PCB Mount,CTS [D]
110109 2k ohms ..........1.25 or 95¢ ea./10+
110111 100k ohms .........$1.45 or 85¢ ea./10+
110102 50k ohms ..........$1.95 or 85¢ ea./10+

Linear Taper Potentiometers [E]
110052 1k ohms ..........$1.15 or $1.05 ea./10+
110055 10k ohms ..........$1.15 or $1.05 ea./10+
110057 50k ohms ..........$1.15 or $1.05 ea./10+
110058 100k ohms .........$1.15 or $1.05 ea./10+
110060 500k ohms .........$1.15 or $1.05 ea./10+
110061 1M ohms ..........$1.15 or $1.05 ea./10+

Audio Taper Potentiometer [E]
110064 1k ohms ..........$2.95 or $2.50 ea./10+

Rotary Switches [F]
With 30° indexing, single phenolic wafer sections and silver-plated contacts.
990031 2 ohms, 6 pos. ....$1.95 or $1.75 ea./10+
110055 3 ohms, 4 pos. ....$1.95 or $1.75 ea./10+
110057 4 ohms, 3 pos. ....$1.95 or $1.75 ea./10+

Vertical Potentiometers PCB Mount
110032 [G] 1k ohms ..........$1.95 or $1.76 ea./10+
110036 2k ohms ..........$1.95 or $1.76 ea./10+
110130 10k ohms ..........$1.95 or $1.76 ea./10+
110133 100k ohms .........$1.95 or $1.76 ea./10+
110135 500k ohms .........$1.95 or $1.76 ea./10+
110134 1M ohms ..........$1.95 or $1.76 ea./10+

Slide Potentiometers 3-1/2 in. Long
110076 [H] 10k ohms ..........$3.95 or $3.75 ea./10+
110077 100k ohms ......$3.95 or $3.75 ea./10+
Relays
200 V DC, 0.5 A, SPST. 5VDC, 10 mA. 500 ohms. 0.95 x 0.335 in.
120 V AC / 24 V DC, 10 A. SPDT: C6VDC, 60 mA. 100 ohms. 3/4 x 5/8 in.

Buzzers 80dB
680099 [D] Wire Lead, 3-12V DC, $1.25 or $1.15 ea./10+ or $99¢ ea./100+
680135 [E] Piezo, 3-6V DC, 7 mA

Key Switches
270081 [A] Normally Open .......... $0.45 or $0.36 ea./6+

Momentary Switches
270052 [B] SPST, Normally Open .......... $0.95 or $0.85 ea./10+
270074 [B] SPDT, Normally Open or Closed .......... $2.45 or $2.25 ea./10

Hall Effect Switch/Sensor [A]
270051 [D] Metal Can .......... $2.75 or $2.45 ea./10+

Tilt Switch [E]
270006 .......... $0.26 or $0.25 ea./10+

Magnetic Reed Switch [D]
270005 .......... $1.49 or $1.34 ea./10+

Thermistors
110097 [G] 100 Ohms .......... $1.35 or $1 ea./10+ or
110108 [G] 1K Ohms .......... $4.95 or $4.75 ea./10+ or
110098 [G] 10K Ohms .......... $1.35 or $1 ea./10+

Ultrasonic Sensor Set
680115 [H] Aluminum Flower Case .......... $12.95 or $11.95 ea./10+

Doll House Switches
270077 [A] Lever SPST, Fahnstock, On-Off .......... $1.25 or $1.15 ea./20+
270095 [B] Toggle SPST, Screw-Type, On-Off, 10/pkgs .......... $0.95 or $0.75 ea./20+
270097 [C] Pushbutton SPST, Screw-Type, NO. 10/pkgs .......... $0.95 or $0.75 ea./20+

Lever Switch
Submini Snap Action. SPDT. 125V/250V AC, 6A. 1/2 L x 1/4 W x 3/8 H in.
270084 [D] .......... $1.45 or $1.25 ea./10+ or $1.00 ea./25+

Rockerswitch
Lighted: SPST, 250V AC, 10A. Requi res panel cutout (1-1/8 x 1/2 in.).
340130 [E] .......... $1.85 or $1.80 ea./10+ or $1.75 ea./25+

Toggle Switches
SPST 125 V AC.
270034 [A] w/Nut, 6A .......... $0.90 or $0.79 ea./10+ or $0.65 ea./100+
270007 [B] w/Nut, 4A .......... $1.05 or $0.85 ea./10+ or $0.75 ea./100+

SPDT 125 V AC.
990097 [C] PCB-Mount, 0.3A .......... $1.95 or $1.80 ea./10+ or $1.75 ea./100+
270035 [D] w/Nut, 6A .......... $0.99 or $0.84 ea./10+ or $0.69 ea./100+
270036 [E] w/Nut, 6A, Center-Off .......... $1.25 or $0.99 ea./10+ or $0.88 ea./100+
270005 [F] w/Nut, 15A, Center-Off .......... $1.20 or $1.10 ea./10+ or $0.99 ea./100+

DPDT 125 V AC.
270037 [G] w/Nut, 6A .......... $0.99 or $0.79 ea./10+ or $0.70 ea./100+
270013 [H] w/Nut, 15A, Center-Off .......... $1.75 or $1.45 ea./10+ or $1.25 ea./100+

Slide Switches

Pushbutton Switches
Normally Closed Includes Nut.
990074 [A] Black, 110V, 3A, 1/4 in. Mounting Hole .......... $0.35 or $0.28 ea./100+
990002 Red, 110V, 3A, 1/4 in. Mounting Hole .......... $0.35 or $0.28 ea./100+
270023 Black, 14V DC, 2A, 3/8 in. Mounting Hole .......... $1.29 or $1.16 ea./100+

On-Off Includes Nut.
270021 [B] White, 14V DC, 2A, 3/8 in. Mounting Hole .......... $1.29 or $1.16 ea./100+
270058 [C] Red, 230V, 3A, 1/2 in. Mounting Hole .......... $2.95 or $2.25 ea./25+

 Normally Open Includes Nut.
270022 Red, 14V DC, 2A, 3/8 in. Mounting Hole .......... $1.29 or $1.16 ea./100+
270110 [D] Red, 125V AC, 3A, 3/8 in. Mounting Hole .......... $3.95 or $3.75 ea./100+
270109 [E] Black, 125V AC, 3A, 1/2 in. Mounting Hole .......... $3.95 or $3.75 ea./100+

Knife Switches
990193 [A] Screw Terminal, SPST .......... $1.59 or $1.49 ea./10+ or $1.35 ea./25+
990194 [B] Screw Terminal, SPST .......... $1.69 or $1.52 ea./10+ or $1.43 ea./25+
990195 [C] Screw Terminal, SPDT .......... $2.35 or $1.95 ea./10+ or $1.75 ea./25+
990192 [D] Binding Post, DPST .......... $1.79 or $1.60 ea./10+ or $1.50 ea./25+
990085 [E] Binding Post, DPDT .......... $4.95 or $4.45 ea./10+ or $4.25 ea./25+
Diffused LEDs

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>As Low As</th>
<th>Ea./20+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260020*</td>
<td>Red</td>
<td>.10</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>260027</td>
<td>Green</td>
<td>.11</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>260026</td>
<td>Yellow</td>
<td>.11</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>260067</td>
<td>Br. Red</td>
<td>.22</td>
<td>.19</td>
<td></td>
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Mini LEDs

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>As Low As</th>
<th>Ea./20+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260080</td>
<td>Red</td>
<td>.10</td>
<td>.09</td>
<td></td>
</tr>
<tr>
<td>260081</td>
<td>Green</td>
<td>.14</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>260082</td>
<td>Yellow</td>
<td>.14</td>
<td>.12</td>
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Dual Color LEDs

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>As Low As</th>
<th>Ea./10+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260078</td>
<td>Red</td>
<td>.29</td>
<td>.25</td>
<td></td>
</tr>
<tr>
<td>260079</td>
<td>Green</td>
<td>.29</td>
<td>.25</td>
<td></td>
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</table>

Blinking LEDs
5mm. Diffused. M. In. order of 10.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>As Low As</th>
<th>Ea./10+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260075</td>
<td>Red</td>
<td>.75</td>
<td>.65</td>
<td></td>
</tr>
<tr>
<td>260076</td>
<td>Green</td>
<td>.85</td>
<td>.75</td>
<td></td>
</tr>
<tr>
<td>260077</td>
<td>Yellow</td>
<td>.95</td>
<td>.85</td>
<td></td>
</tr>
</tbody>
</table>

Super Bright LEDs

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>V</th>
<th>mW</th>
<th>As Low As</th>
<th>Ea./10+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>20mA, 4000-8000mcd</td>
<td>2.0</td>
<td>.125</td>
<td>1.15</td>
</tr>
<tr>
<td>260172</td>
<td>Orange</td>
<td>2.0</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>260170</td>
<td>Red</td>
<td>2.2</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>260171</td>
<td>Yellow</td>
<td>2.4</td>
<td>800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>260168</td>
<td>White</td>
<td>3.5</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Rectangular LEDs
2x5mm, Diffused.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>As Low As</th>
<th>Ea./10+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260083</td>
<td>Red</td>
<td>.22</td>
<td>.18</td>
<td></td>
</tr>
<tr>
<td>260084</td>
<td>Green</td>
<td>.22</td>
<td>.18</td>
<td></td>
</tr>
</tbody>
</table>

PC Board Mount LEDs
5mm. M. In. order of 10.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>As Low As</th>
<th>Ea./10+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260104</td>
<td>Red</td>
<td>.25</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>260105</td>
<td>Green</td>
<td>.25</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>260106</td>
<td>Yellow</td>
<td>.25</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>260160</td>
<td>Orange</td>
<td>.25</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>260159</td>
<td>White</td>
<td>1.45</td>
<td>1.29</td>
<td></td>
</tr>
<tr>
<td>260158</td>
<td>Blue</td>
<td>.89</td>
<td>.80</td>
<td></td>
</tr>
</tbody>
</table>

Extra Large LEDs
10mm. M. In. order of 10.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>As Low As</th>
<th>Ea./10+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260085</td>
<td>Red</td>
<td>.39</td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>260086</td>
<td>Green</td>
<td>.39</td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>260087</td>
<td>Yellow</td>
<td>.39</td>
<td>.35</td>
<td></td>
</tr>
</tbody>
</table>

LED Readouts
7-Segment. Anode. Red.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>PIN #</th>
<th>SIZE</th>
<th>As Low As</th>
<th>Ea./10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260022</td>
<td>14</td>
<td>14mm</td>
<td>.95</td>
<td>.75</td>
</tr>
<tr>
<td>260021</td>
<td>10</td>
<td>0.3 in.</td>
<td>1.95</td>
<td>1.75</td>
</tr>
</tbody>
</table>

Neon Bulb Panel Kits
Kit includes NE2 neon bulb, high temperature lens cap (colored plastic), Tinmerman mounting clip, and a current limiting resistor (68K, 1/2W). Solder tabs.115V AC, 7/8 in. long. 11/32 in. diameter. Requires a 5/16 in. dia. mounting hole.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>COLOR</th>
<th>As Low As</th>
<th>Ea./10+</th>
<th>Ea./100+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260004</td>
<td>Red</td>
<td>..60</td>
<td>50</td>
<td>ea./100+</td>
</tr>
<tr>
<td>260005</td>
<td>Green</td>
<td>..60</td>
<td>50</td>
<td>ea./100+</td>
</tr>
<tr>
<td>260007</td>
<td>Blue</td>
<td>..60</td>
<td>50</td>
<td>ea./100+</td>
</tr>
<tr>
<td>260008</td>
<td>White</td>
<td>..60</td>
<td>50</td>
<td>ea./100+</td>
</tr>
<tr>
<td>260009</td>
<td>Clear</td>
<td>..60</td>
<td>50</td>
<td>ea./100+</td>
</tr>
</tbody>
</table>

Neon Bulb Only
Includes lead. 0.059 W, #NE2.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>As Low As</th>
<th>Ea./10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260003</td>
<td>..15</td>
<td>ea./20+</td>
</tr>
</tbody>
</table>

Xenon Strobe Tube
Ideally used for photoflashes. Features a 4KV trigger with a 200-300V DC anode.

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>As Low As</th>
<th>Ea./10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>260050</td>
<td>..5.95</td>
<td>ea./10+</td>
</tr>
<tr>
<td>320037</td>
<td>..3.75</td>
<td>ea./10+</td>
</tr>
</tbody>
</table>

KELVIN® Kel-Pack™ LED Assortment
840485 670 pcs ..............$59.95 or $54.95 ea./3+

Infrared Sensor Detector
260093 .............85¢ or $75¢ ea./20+

LED Holders
5mm, Black
250019 ...........48¢ ea./10+ or $32¢ ea./100+

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### Fuses

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Stock</th>
<th>Vols</th>
<th>Qty</th>
<th>EA</th>
<th>EA/10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-10 Base Mini Bulbs</td>
<td>Threaded</td>
<td>260016 [A] Clear, #222</td>
<td>.35c or .30c ea./10+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>260018 [A] Clear, #233</td>
<td>.75c or .65c ea./10+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>260017 [B] Red</td>
<td>$3.25 or $2.95 ea./10+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>260019 [C] Clear</td>
<td>$4.95 or $4.45 ea./10+</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bayonet Base Mini Bulb</td>
<td></td>
<td>260015 Clear, #49</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>260017 Clear, #1769</td>
<td>.75c or .55c ea./10+</td>
<td></td>
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<td></td>
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</tbody>
</table>

### Capacitors

#### Mini Radial Capacitors

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>Volts</th>
<th>Farads</th>
<th>QTY</th>
<th>EA</th>
<th>EA/10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>180037</td>
<td>16</td>
<td>100</td>
<td>1</td>
<td>.25</td>
<td>.23</td>
</tr>
<tr>
<td>180035</td>
<td>35</td>
<td>10</td>
<td>1</td>
<td>.25</td>
<td>.23</td>
</tr>
<tr>
<td>180036</td>
<td>50</td>
<td>1</td>
<td>1</td>
<td>.25</td>
<td>.23</td>
</tr>
</tbody>
</table>

#### Radial Capacitors

Electrolytic aluminum. *NOTE: Low ESR.*

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>Volts</th>
<th>Farads</th>
<th>QTY</th>
<th>EA</th>
<th>EA/10+</th>
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<tr>
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#### Ceramic Disc Capacitors

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### Fast-Acting Fuses

- **Min. order of 10.**
  - AGC-type. 250 V. 1/4 x 1/4 in. (6.3 x 31.7 mm).
  - **380002 [A]** 1A ................................ $49c ea./10+ or $45c ea./100+ $380024 1-1/2A ................................ $49c ea./10+ or $45c ea./100+
  - **380026 1-1/2A** ............................ $7.15 ea./10+ or $6.00 ea./100+
  - **380028 3 AG, 30A, 32V** .................... $4.95 ea./10+ or $4.45 ea./100+

### Test Instrument Fuses

- **Min. order of 10.**
  - GM-A-type. 250 V. 1/4 x 1/4 in. (5 x 20 mm).
  - **380034 [D]** .05A ................................ $15c or $11c ea./100+ $380035 1A ........................................ $15c or $11c ea./100+

### Auto Fuses

- **Min. order of 10.**
  - 3 AG, 30A, 32V. 1-1/4 x 1/4 in.
  - **380028 [E]** ................................ $18c ea./10+ or $16c ea./100+

### Bayonet-Type Fuse Holder

- Fits 1/4 x 1-1/4 in. fuse. Includes mounting nut.
  - **380001 [F]** ................................ $7.95 or $7.15 ea./10+
KELVIN® Low Voltage Electric System Trainer
Using the KELVIN® proprietary low voltage DC system, students will safely wire AC components (such as outlets, switches, breakers, a dimmer switch, light fixture and a ceiling fan) for practice with DC voltage.

Each assembled trainer comes with a portable table top work station, step by step instructions, explanations, theory and assessments. The supplied curriculum is geared for general education not vocational study.

841890 Assembled ................................. $495

KELVIN® Low Voltage Electric System Trainer Kit
Teachers can construct this economical version of the Low Voltage House Wiring Trainer from a kit. It requires wire stripping, frame assembly, and circuitry assembly. Includes: portable tabletop work station kit (teachers will need to construct it) and step by step instructions.

842401 Kit ............................................. $295

KELVIN® Kel-KPS™ Variable Power Supplies
Variable, regulated power supplies with low ripple and short circuit protection. Ideal for electronic projects or for use with KELVIN® Power Pole™, Maglev Racer™, etc. The #100 model has a variable range of 0-16V DC, 1.5A. The #101 model supplies fixed voltages of 1.5, 3, 4.5, 6, 9, and 12VDC at 1.5A.

841051 Kel-KPS™ #100, 0-16VDC ........................................ $125
841052 Kel-KPS™ #101, Voltage Switch ........................................ $135

KELVIN® Kel-KPS™ Digital Display Power Supplies
Both power supplies provide 0-20V DC at 2A. Bright LED display(s) are switchable between voltage and current. Built-in overload indicator and protection, LED, and circuit breaker(s). Easy to control large crank knob(s). Rugged metal case. The dual power supply has two independent power supplies in one box and is ideal for dual maglev, etc. Made in the USA.

841386 Single Display.................................. $295 or $275 ea./3+
841387 Dual Display (Shown)........................ $395 or $375 ea./3+

KELVIN® Dual Power Supply Kit
Build a dual adjustable power supply to power your projects. Outputs positive-negative voltages from +/-1.25 to +/-15VDC at 700mA per supply. Requires wall adapter, use #220136.

841590 Kit ........................................ $23.95 or $22.45 ea./10+
842174 Assembled Demo .......................... $79.95

KELVIN® Kel-Function Frequency Generator
Real test equipment for an electronic technician or hobbyist. Produces sine, triangle and square waveforms with frequency range of 100Hz to 100KHz. Includes amplitude adjustment. Requires a 9V battery.

841571 Kit ........................................ $12.75 or $12.45 ea./10+
842176 Assembled Demo .......................... $69.95

KELVIN® Home Electrical Wiring Trainer
Students get valuable experience with home wiring tools and supplies. This comprehensive trainer includes all the supplies needed for students to complete a number of hands-on activities like creating and testing common AC/DC circuits. Subsequent activities challenge students as they wire progressively harder circuits. For Grade 9 through College.

840642 ................................................. $695
KELVIN® Balsa StiKutter™
Easily cuts balsa!
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Each Per 10+

KELVIN® also has GREAT PRICES on a Variety of Balsa Sizes!

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PAGE 23 #590491

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PAGE 90

Gears As Low As 59¢ Each
PAGE 98

Solar Cells As Low As $4.45 Each
PAGE 92

Motors As Low As $6.95 Each

KELVIN® Kre8® Sea Explorer™

Shown is #842435, Stepper Motor Control Board

PAGE 24-25

KELVIN® Variable Power Supply

#841051 $125

KELVIN® Multimeter

#990177 $325

Extensive Electronic Kits Selection

PAGE 110

Blinking LEDs Bulk Pack
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PAGE 45

PAGE 77

PAGE 60

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