

RTF MODEL ROCKET STARTER SET SPEED FREAK

Using the Estes Speed Freak's sophisticated Advanced Velocity Tracking Technology capsule, you can track the speed of your Estes Starter Set Rocket! The capsule contains an easy-to-use digital speedometer that records the speed of your rocket during flight.

When using Estes B and C engines, the electronic speedometer on the Speed Freak Model Rocket is boosted 600 feet (183 m) straight up with the on board electronic system recording the flight data. The rocket floats down to Earth using a colorful 12" (30 cm) parachute, while the electronic capsule returns gently using a bright neon streamer.

After it lands, check the capsule display screen to see the speed of the flight. Launch this silver speed demon over and over for hours of fun.

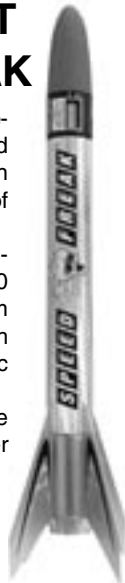
Speed Freak Ready To Fly Starter Set includes:

- Estes launch pad
 - Estes launch controller
 - Igniters, Engine Plugs & Recovery Wadding
 - (2) Estes rocket engines
 - Ready to fly RTF 1889 Speed Freak Estes Model Rocket
- Requires four AA alkaline batteries (for your launch controller) sold separately. Recommended for ages 10 and up with adult supervision for those under 12.

Technical Specifications and Features:

- Length 17 in. (43.2 cm)
- Diameter 1.35 in. (34.3 mm)
- Weight 2.6 oz. (74 g)
- Molded Plastic Fins
- Self Stick Decals
- Parachute Recovery
- Digital Speedometer
- Max Altitude: 600ft. (183 m)

Part No. 78TE1889 • Price: \$37.80



TANDEM X LAUNCH SET

This giant towers almost three ft. (91cm) high and is quick and easy to build! A tiger-striped body tube, pre-colored plastic nose cone and fins and self-stick decals make building this rocket easy to do in about an hour. When flown on standard Estes Engines, this huge model rocket can reach heights over 650 feet (198 m) with recovery on a colorful 18" (46 cm) pre-assembled parachute. The Crossfire ISX is an Estes Skill Level 1 Model Rocket Kit that can easily be built in about a day.

This Rocket features a totally streamlined shape with aerodynamic fins and nose cone. It stands 15.6"(39.6 cm) tall.

When launched with powerful Estes Rocket engines, this bullet can reach cloud-busting heights up to 1,200 feet (366 m). A pre-assembled 12"(30 cm) parachute returns the Crossfire back to earth to launch again and again.

Glue, building tools and Estes engines required sold separately. The Electron Beam Launch Controller uses four AA alkaline batteries - sold separately. Recommended for ages 10 and up with adult supervision for those under 12.

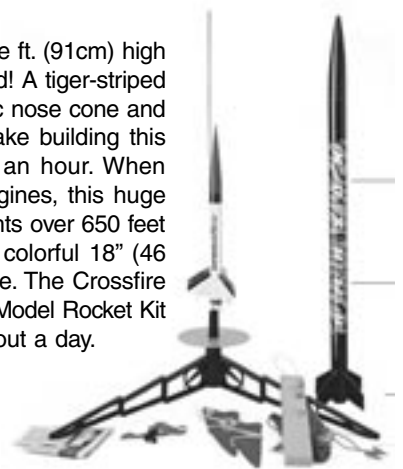
Tandem-X Estes Launch Set includes:

- Estes launch pad
- Estes Electron Beam launch controller
- E2X Almost Ready to fly Amazon model rocket
- Skill Level 1 Crossfire ISX model rocket

Technical Specifications and Features:

- Length 33.6 in. (85.3 cm)
- Diameter 1.35 in. (34.3 mm)
- Weight 3.3 oz. (94 g)
- Molded Plastic Fins
- Self Stick Decals
- Parachute Recovery
- Two Rocket Set
- Max Altitude: 644 ft. (196 m)

Part No. 78TE1483-2 • Price: \$21.90



RIPTIDE RTF LAUNCH SET

The exciting Riptide stands 18" tall. When launched on our standard engines, it can reach cloud topping heights of over 600 feet. It returns smoothly on a colorful 12" pre-assembled parachute. Rip through the sky with your own ready to fly Riptide! LAUNCH SYSTEM includes Electron Beam Launch Controller and Porta-Pad II Launch Pad.

Technical Specifications : Skill Level RTF

Length: 18"(45.7cm),
Diameter: 1.33"(34mm),
Weight: 2.7oz. (76.5 g)

Molded Plastic Fins, Self-Stick Decals,
Parachute Recovery, Chrome Components
Recommended Engines: B4-4, B6-4, C6-5
Max Altitude: 600 ft. (183 m)

Estes model rocketry is recommended for ages 10 and up with adult supervision for those under 12. Unless otherwise specified, all models require assembly. Tools, construction and finishing supplies sold separately. In order to launch, a launch system, model rocket engines, igniters and recovery wadding are required sold separately-unless otherwise specified.

Part No. 78TE1893-1 • Price: \$23.65



ALPHA BULK PACK

Launch the Alpha with Estes A, B or C engines. For school launches, we recommend using the A8-3 engine so students can see the entire flight profile of the rocket and most importantly, recover their rocket. To launch this rocket, you will need the Estes Electron Launch Controller and the Porta-Pad II Launch Pad that are sold separately.

Technical Specifications: Skill Level 1

- Length: 12.3" (31.1cm), Diameter: 0.98"(24.9 mm), Weight: 0.8 oz. (23 g)
- Laser Cut Balsa fins, Self-stick Decals, Parachute Recovery
- Recommended Engines: 1/2A6-2, A8-3, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7
- Max Altitude: 1000 ft. (305 m)
- 12 Rockets per Bulk Pack

For ages 10 and up with adult supervision for those under 12. Unless otherwise specified, all models require assembly. Tools, construction and finishing supplies sold separately. In order to launch, a launch system, model rocket engines, igniters and recovery wadding are required - sold separately-unless otherwise specified.

Part No. 78TE1756 • Price: \$82.40

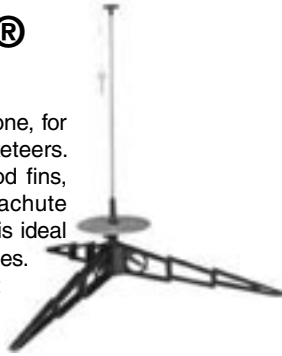


ROCKETS AND GLIDERS

PORTA-PAD®

II LAUNCH PAD

The Alpha's simply the best rocket, bar none, for beginners and experienced student rocketeers. It's got everything you need – balsa wood fins, molded nose cone, engine mount, parachute recovery and self-stick decals. The Alpha is ideal for illustrating basic rocket stability principles. Besides having an aerodynamic design, it is a very reliable launcher that can use a wide variety of engines.



When your students build the Awesome Alpha, they will acquire many new modeling skills and experience teamwork and safety at the launch field.

Launch the Alpha with Estes A, B or C engines. For school launches, we recommend using the A8-3 engine so students can see the entire flight profile of the rocket and most importantly, recover their rocket. To launch this rocket, you will need the Estes Electron Launch Controller and the Porta-Pad II Launch Pad that are sold separately. Your students deserve the best - the Alpha.

Part No. 78TE302215 • Price: \$25.45

E LAUNCH CONTROLLER

Comes complete with safety key and 30 ft. of cable. Requires 4 "AA" batteries – not included.



Technical Specifications

Estes E engine powered rocket kits are recommended for ages 18 and up with adult supervision for those under 18. Unless otherwise specified, all models require assembly. Tools, construction and finishing supplies sold separately. In order to launch, an Estes E™ Launch Controller and Porta-Pad® E Launch Pad, model rocket engines, igniters and recovery wadding are required - sold separately-unless otherwise specified.

Part No. 78TE2230 • Price: \$32.25

TUBE MARKING GUIDE

Easy way to mark fin and launch lug placement lines. Also includes a fin gluing jig.

Technical Specifications:

Estes model rocketry is recommended for ages 10 and up with adult supervision for those under 12. Unless otherwise specified, all models require assembly.



Tools, construction and finishing supplies sold separately. In order to launch, a launch system, model rocket engines, igniters and recovery wadding are required - sold separately-unless otherwise specified.

Part No. 78TE302227 • Price: \$11.05

A8-3 ENGINE BULK PACK

This rocket engine bulk packs are available in four total impulse ranges: ½ A (mini engine), A, B or C (standard engines). These packs may be used for the rocket bulk packs or other Estes rockets. Whether you are launching rockets at school with students, at a youth group activity or



rocket club monthly launch, Estes engine bulk packs are a must. Engine bulk packs come with all the rocket engine supplies you need to launch 24 rockets. Included are 24 rocket engines, 30 model rocket igniters, 24 reusable igniter plugs and 75 squares of recovery wadding. Use the A8-3 engine to launch these bulk pack rockets: Alpha, Alpha III, Generic E2X, Wizard, and Viking.

Part No. 78TE1781 • Price: \$53.60

B6-4 ENGINE BULK PACK

This is a medium impulse engine that delivers high altitude flights. Estes model rocket engine bulk packs are available in four total impulse ranges: ½A (mini engine), A, B or C (standard engines). These packs may be used for the rocket bulk packs or other Estes rockets.



Engine bulk packs come with all the rocket engine supplies you need to launch 24 rockets. Included are 24 rocket engines, 30 model rocket igniters, 24 reusable igniter plugs and 75 squares of recovery wadding. Use the B6-4 engine to launch these bulk pack rockets: Generic E2X, Alpha III, Wizard, Viking and Alpha.

Part No. 78TE1783 • Price: \$53.60

C6-5 ENGINE BULK PACK

This is your engine! This C engine is the highest impulse engine in a bulk pack.

ATTENTION: This rocket engine bulk packs are available in four total impulse ranges: ½A (mini engine), A, B or C (standard engines).

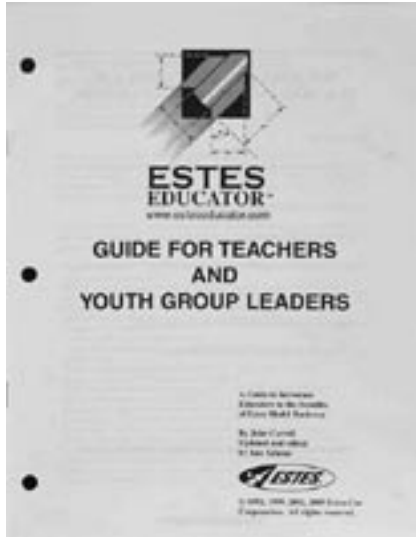


These packs may be used for the rocket bulk packs or other Estes rockets. Engine bulk packs come with all the rocket engine supplies you need to launch 24 rockets. Included are 24 rocket engines, 30 model rocket igniters, 24 reusable igniter plugs and 75 squares of recovery wadding. Use the C6-5 engine to launch these bulk pack rockets: Alpha III, Generic E2X, Alpha, Viking and Wizard.

Part No. 78TE1789 • Price: \$62.40

ESTES TEACHERS YOUTH LEADER GUIDE

Estes Educator "Guide for Teachers and Youth Group Leaders" by John Carroll, updated and edited by Ann Grimm. For over 45 years, Estes has been the world's leader in the manufacturing of reliable and high-quality model rocket products.



This guide introduces teachers to the benefits of using Estes Model Rocketry in the classroom, Includes:

- Developing connections between theory and hands-on application in science
- Development of greater fine motor skills
- Improvement of spatial relations and conceptual thinking skills
- Gaining experience in designing, conducting, and reporting basic experimental investigations
- Enhancement of self-image through successful accomplishments
- Improvement of cooperative skills in group activities.

FEATURES:

Illustrated paperback booklet comes 3-hole punched for convenient insertion into binders - Covers the basics of model rocketry equipment and explains how model rockets fly - Provides a thorough description of the Estes Educator educational program - Explains how to select a safe and successful model rocket launch site - Identifies laws pertaining to model rocketry and presents the NAR Model Rocketry Safety Code

Specifications: Size: 8-1/2" x 11" (216mm x 279mm)

INCLUDES: 20 pages, Copyright 2005

Part No. 78TE2814 • Price: \$6.50

ESTES ROCKET LABS DVD

Now teachers can teach Estes model rocketry in Language Arts, Math, Science, Social Studies, and Technology classes using the Estes Rocket Labs Lesson Plans. The Estes Rocket Labs (ERL) Lessons use a 3 Easy Steps!



Format that was designed just for model rockets: Step 1 - LEARN; Step 2 - BUILD; Step 3 - LAUNCH! The lesson plans cover all five-subject areas (Language Arts, Math, Science, Social Studies, and Technology) and are for grades 3-5, 6-8, and 9-12.

There are 45 lesson plans for one, two, or three class sessions. Plus, each lesson addresses a specific National Learning Standard.

Each lesson plan includes the National Learning Standard, Objectives, Materials, Time, Key Words, Background Information, Activities, Wrap Ups, Evaluation/Assessment, Extensions and References. ERL lessons are perfect to use for cross-curricular learning, too!

This DVD is divided into seven sections: Introduction, Acknowledgments, Lesson Plans, Resource Materials, PowerPoint, Ignite the Imagination Video and Guide for Teachers and Youth Group Leaders. Resource material includes visuals, student handouts and worksheets needed for each lesson.

Estes has done all the work for teachers! All a teacher needs to do to teach a model rocketry lesson is to choose a subject in their grade level by how many sessions (one, two or three) they have for the lesson, review the lesson plan, obtain rocket and engines lab/bulk packs and teach the lesson.

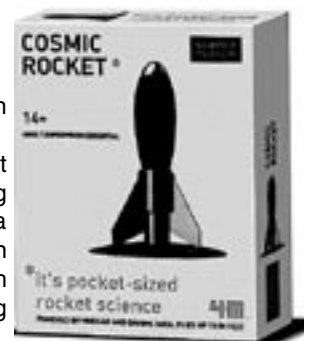
Part No. 78TE2855 • Price: \$19.70

METEOR ROCKET KIT

SHOOTS UP IN THE SKY USING BAKING SODA AND VINEGAR.

The Cosmic Rocket is a hands-on Rocket Launching kit.

Kit includes: a booklet of fun Rocket Science with detailed launching instructions. This Kit also includes a Rocket that can fly up to 50 feet in the air. Also included is booklet with detailed launching instructions. Baking soda and vinegar are not included.



Part No. 78EOTS3798 • Price: \$9.44

MAGNIFIERS

GIANT FOLDING MAGNIFIER

This magnifier offers an extra large field of view, hands free use, and folds down to a compact size for storage. Its 10 cm lens provides 6x magnification. Ideal for use on a lab table, and for dissecting small specimens like owl pellets. Dimensions: 7 x 5.75 x 2, shipping weight 1lb.



Part No. 71SUMGFL6X • Price: \$10.34

HAND LENS METAL FRAME

Glass lenses mounted on metal frames with bakelite handles.



Part No.	Description	Price
71SUMFG0415	50mm Diameter	\$2.15
71SUMFG0430	65mm Diameter	2.64
71SUMFG0440	75mm Diameter	3.34
71SUMFG0465	100mm Diameter	4.29

HAND LENS - PLASTIC FRAME

Glass lenses molded into high quality unibody plastic frames.



Part No.	Description	Price
71SUMFPO415	50mm Diameter	\$2.25
71SUMFPO430	65mm Diameter	2.71
71SUMFPO440	75mm Diameter	3.71
71SUMFPO455	90mm Diameter	4.05
71SUMFPO465	100mm Diameter	4.70

GLASS LENS MAGNIFIERS, BEND HANDLE



Part No.	Description	Price
71SOMH21537	Bend Handle 8 X Glass Lens, 2" Dia. 8X Power	\$0.94
71SOMH21537.5	Bend Handle 2.5 X Glass Lens, 2.5" Dia. 8X Power	1.19
71SOMH21538	Bend Handle 5 X Glass Lens, 3" Dia. 5X Power	1.28
71SOMH21539	Bend Handle 3 X Glass Lens, 4" Dia. 3X Power	1.53

HAND HELD MAGNIFIERS

Glass Lens, plastic handle magnifier.

Part No.	Description	Price
71SOMH1419	5" Dia., 3X	\$2.55
71SOMH7005B	2" Dia., 10X	0.95
71SOMH7009B	3" Dia., 6X	1.02
71SOMH7013B	4" Dia., 3X	1.28



HANDHELD MAGNIFIER - DUAL POWER LENS

5" Dia. Dual Lens Power of 3.5X and 9X Handle Length 4 1/2".

Part No. 71SOML1590 • Price: \$1.53



HANDHELD MAGNIFIER - 2X

Hand Held Magnifier, 5" Dia., glass lens, metal frame and body, power 5X., Handle length 5".

Part No. 71SOML8490 • Price: \$7.82



SOFT HANDLE MAGNIFIER - 2 1/2X

Power 2 1/2X, Acrylic Lens, 5" Diameter.

Part No. 71SOMF2695 • Price: \$2.55



LIGHTED MAGNIFIER

Power 10X, Double Adjustable Lens, 1" Dia. Uses 2C Batteries (Not Included).



Part No. 71SOMLH31L • Price: \$3.40

ILLUMINATED MAGNIFIER - 3X

3" Dia. Glass Lens, Power 3X, Handle Length 4". Uses 2AA Batteries (Not Included).

Part No. 71SOMC8921L • Price: \$1.70



ILLUMINATED MAGNIFIER - 4X

2.5" Dia. Glass Lens, Power 4X, Handle Length 3 3/4". Uses 2AA Batteries (Not Included).

Part No. 71SOMC8924L • Price: \$1.53



MAGNIFIERS

BENCH ILLUMINATED MAGNIFIER

Power: 2X, 6X, 4" Dia., Acrylic



Part No. 71SOMC731 • Price: \$9.18

CLEAR PLASTIC MAGNIFIER 3X, 6X

Clear plastic magnifier is 110mm (4.50") in length and features dual lenses of 3x and 6x magnification. 3x lens is 50mm in diameter and 6x lens is 20mm in diameter.



Part No. 71SUPMD00367 • Price: \$0.55

TRIPLE MAGNIFIER PLASTIC

Handy molded plastic magnifier has 2x, 6x, and 8x magnification lenses.



Part No. 71SUPMT00368 • Price: \$0.60

TRIPOD MAGNIFIER PLASTIC

Tripod magnifier, 10x magnification. Plastic.



Part No. 71SUTRP10X • Price: \$3.81

TRIPOD MAGNIFIER BRASS

Tripod magnifier, 10x magnification. Brass.



Part No. 71SUTRPBR366 • Price: \$7.94

MAGNIFIER TWEEZER - 3 3/4"

Stainless Steel Tweezer with Magnifier, 1" Dia. Glass Lens, Power 4X, Pouch Pack.



Part No. 71SOMC411 • Price: \$1.36

HELPING HAND WITH SOLDERING STATION

2 1/2" Dia. Glass Lens, Power 2X.



Part No. 71SOMZ474 • Price: \$4.93

HEAD VISOR

Power 5X, Acrylic Lens. Made in USA .



Part No. 71SOMV370 • Price: \$18.62

BINOCULAR MAGNIFIER OPTIVISOR

With Lens Plate, Glass Lens. Made in USA.



Part No.	Description	Price
71SOOPV367	1.5X	\$42.50
71SOOPV368	1.75X	42.50
71SOOPV369	2X	42.50
71SOOPV370	2.5X	42.50
71SOOPV372	2.75X	42.50
71SOOPV375	3.5X	42.50

POCKET MAGNIFIERS

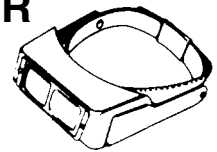
10 x power magnification comes with leather case.



Part No.	1-9	10+
0604H901	\$9.95	\$9.50

BINOCULAR MAGNIFIER

Ideal for detailed work over long periods. Adjustable headband. 2 1/2 x magnification.



Part No.	1-9	10+
0604H910	\$15.95	\$14.95

INSPECTION MIRROR

- 1 1/2" diameter round mirror, 360° rotation.
- Cushion grip.
- See in hard to reach places.



Part No.	1-9	10+
0604IM	\$2.50	\$2.25

FLEXIBLE MAGNIFIER

- X2 magnification
- 4 1/2" diameter



Part No.	1-9	10+
0604MC205	\$7.95	\$6.95

DELUXE MAGNIFYING LAMP W/ 45" EXTENDABLE ARM

- 45" extendable steel arm.
- 5" dia. lens with x3 magnification.
- 22W fluorescent lamp.
- Metal cover.

Part No.	Description	1-9	10+
060439100	Magnifying Lamp	\$52.00	\$49.00
0604MLBULB	Replacement Bulb	7.50	7.25

MAGNIFIERS

LAMP WITH MAGNIFYING GLASS 22W

This magnifying lamp was designed as an aid for all kinds of precision applications from health care to precision engineering. It's also ideal for home applications. It comes with a three-dioptre lens (1.75x magnification). A well-balanced, universally jointed arm makes for maximum adjustment. Light is provided by a circular fluorescent tube of 22W that encircles the glass. Use the clamp to mount the device on a table.



DIMENSIONS:

- Arm length: 41.3" • Width: 9.4"
- Height: 2.4" • Power supply: 110V AC

Part No.	Description	Price
71EOVTLAMP367	Black	\$82.00
71EOVTLAMP367W	White	82.00

MAGNIFYING LAMP

Ideal for all applications. Comes without bulb (max. 60W - E27). Real glass.

SPECIFICATIONS

- Power supply: 60W - 230Vac
- Magnifier: 3 dioptre



Part No. 71EOVTLAMPLC • Price: \$26.50

ILLUMINATED MAGNIFIER

4" Dia., 110V Desk Lamp, Glass Lens Requires 60W Bulb (Not included), 39" Flexible Arm with Desk Mounting Assembly, Black Color, 2X Power.



Part No. 71SOMC327B • Price: \$16.15

ILLUMINATED TABLE MAGNIFIER

5" Dia., 2X Power, Glass Lens, Circular Table, UL Approved.



Part No. 71SOMC333B • Price: \$76.50

FOLDING MAGNIFIER IN ALUMINUM CASE

Single folding magnifier in plastic case. One lens, 25 mm diameter, 10x magnification.



Part No. 71SUMPF0375 • Price: \$3.40

FOLDING MAGNIFIER IN POUCH

50mm dia., 2.5x magnification.



Part No. 71SUMPF0415 • Price: \$1.85

FOLDING MAGNIFIER SINGLE

Single folding magnifier in plastic case. One lens, 25 mm diameter, 5x magnification.



Part No. 71SUMPS0375 • Price: \$1.89

FOLDING MAGNIFIER DOUBLE

Double folding magnifier in plastic case. Two lenses, 10x total magnification.



Part No. 71SUMPD0375 • Price: \$2.38

FOLDING MAGNIFIER TRIPLE

Triple folding magnifier in plastic case. Three lenses, 15x total magnification.



Part No. 71SUMPT0375 • Price: \$2.98

LARGE POCKET MAGNIFIERS

These pocket magnifiers feature 38mm diameter lenses, and offer a much larger (almost twice!) field of view compared with regular pocket magnifiers (MPSO10, etc). Sturdy plastic frames, glass lenses. These magnifiers are very versatile, and magnify objects up to 15x.



Part No.	Description	Price
71SUMPS0403	Single, 5x, each	\$2.52
71SUMPD0403	Double, 10x	3.18
71SUMPT0403	Triple, 15x	3.93

POCKET LOUPE

Compact pocket loupe, in a sturdy folding metal case. 10x magnification.



Part No. 71SUMFC0375 • Price: \$4.41

OPTICAL SCIENCE AND ART

THE SCIENCE OF LIGHT, OPTICS AND VISUAL PERCEPTION



Astonish yourself with optical illusions and amazing visual phenomena as you explore the science of human perception in this fascinating kit. Experiment with light and the color spectrum by building a color wheel, a fiber optic peacock and diffraction glasses. Learn how the eye and a camera are similar and how they are different. Build a camera obscura and pinhole glasses. Investigate lenses and light refraction. Experiment with spatial vision and depth perception with 3D glasses and an Ames room model. Find your blind spot and watch things disappear.

View stunning optical illusions involving shapes, color, depth and scale. Make a curved line look straight. Turn cardboard transparent. See the world shrink. Make white by mixing red, green and blue and see colors in black and white. Learn about how optical illusions relate to techniques commonly used by artists. See firsthand how your eye and brain work together to perceive color, light, depth, perspective, size, shape and motion.

Conduct over 24 experiments, guided by the 48-page, full-color experiment book. Ages 8 and up.

Part No. 78KT663977 • Price: \$30.63

LASER POINTER EDUCATION EXPERIMENT KIT

This kit offers suggestions for activities, demonstrations and experiments that can be performed with our laser pointers.

Typical experiments such as measuring the wavelength of laser light and determining the effects of polarization are also explained. The manual even includes the basic theory on laser pointer operation.

Kit Includes:

- 1 Holographic Diffraction Grating
- 1 Polaroid Filter
- 2 First Surface Mirrors
- 2 Lenses (1 Short F.I., 1 Long F.I.)
- 1 Cylindrical Lens
- 1 Solar Cell
- 1 Rectangular Prism
- 3 Color Filters (Red, Blue, Green)



The 28 pages instruction manual covers topics involving reflection, refraction, light absorption and more. A laser pointer is needed (not included.)

Part No. 78SE3053195 • Price: \$67.43

LIGHT AND COLOR KIT

This kit allows students to become familiar with light waves and the electronic spectrum.

Part No. 78SF569201381 • Price: \$160.65



DEMONSTRATION LENS SETS- GLASS

The set contains 6 lenses, one each of double convex, plano-convex, concavo convex, double concave, plano-concave, and convexo-concave lens. Comes in are-usable cardboard storage box.



Part No.	Description	Price
08LEMSET	38mm Demonstration Lens Set, Glass	\$8.50
08LEMSET50	50mm Demonstration Lens Set, Glass	12.00
08LEMSET75	75mm Demonstration Lens Set, Glass	14.00

MIRROR SUPPORTS

Plastic supports to securely hold a mirror in a vertical position on any flat surface.

Plastic Mirror Support.

Comes in a pack of 6.



Part No. 08LEMHOLD • Price: \$3.05

ECONOMY OPTICS KIT

Includes everything you need to demonstrate basic principles of light and color.

Shipping weight : 1.75 lbs.

Dimensions: 14 x 9.5 x 3.

Comes in a reusable storage box.

NOTE: kit includes 21 items that are essential in terms of proper conduction with the kit.

Part No. 78SEPOTKIT365 • Price: \$21.90



DIFFRACTION GRATING SLIDES

Our Holographic Diffraction Gratings are highly efficient embossed Holographic Optical Elements (H.O.E.). Diffraction Gratings are used for the direct viewing and analysis of spectra from different gas tubes and other light sources.

The quality of the spectrum produced from our gratings is the brightest possible with a minimum of distracting visual noise. Our gratings are the principal component in a spectroscope and are used for experiments pertaining to the study of light and color. Project a spectrum using an overhead projector or 35mm slide projector for spectrum demonstration purposes. Use in conjunction with colored film gels for additive and subtractive color demonstrations. 2" X 2".

IMPORTANT: Minimum order for this item is 50 pieces at .40 each. To receive the quantity discounts advertised, you must add the quantity you're ordering to the quantity box on the order page.

Part No.	Specifications	Price
08DFGT1	Linear 1000 Line/mm	\$1.00
08DFGT2	Linear 500 Line/mm	1.00
08DFGT3	Double Axis 13,500 Line/in	1.00



FIBER OPTICS

FIBER OPTIC DEMONSTRATION SYSTEM

The Fiber Optic Demonstration System is a state-of-the-art fiber optic technology module. This tried and proven academic module comes complete and ready to use. This curriculum recently has been revised and rewritten to include the latest in the rapidly changing fiber technology field. Additions to the curriculum include:

- Fusion splicing techniques
- Fiber connector technology
- Optical power splitters
- Wavelength division multiplexing
- Fiber termination tools and procedures
- Fiber optic testing and test equipment

The curriculum manual is precisely formatted into 10 independent activities in 144 pages with more than 60 real-world illustrations and industry photos. An extensive list of references and a working glossary of fiber optic terms is included. Each activity includes:

- Historical and technical reading assignments
- Hands-on working experience and experiments with fiber optics and associated components
- Problem solving and student worksheets
- Team activities
- Homework and investigative research
- Web fiber optic tours and projects

Hands-on activities immerse students in the technological aspects of:

- Voice transmission over fiber
- Analog and digital data transmission
- Morse Code over fiber optics
- Optical fiber characterization
- Fiber sensors and applications
- Bending losses in optical fibers
- Optical fiber termination and polishing
- Attenuation in optical fiber

Part No.	Description	Price
32IFDS100G	Demonstration System Glass Version	\$850.00
32IFDS100C	Student Manual	29.00

ADVENTURES IN FIBER OPTICS KIT

Introductory fiber optic technology kit. Contains 5 unique projects:

- Image Magnifier
- Lighted Constellation Map
- Fiber Optic Wand
- Fluorescent Holiday Wreath

Features 20 different experiments including:

- Bending a light guide
- Tyndall's Prestigious Experiment
- Making Your Own Image Conduit
- Art of Polishing Glass
- Fluorescence
- Special Fiber Optic Lighting

Kit comes complete with penlight, rubber light hood, 6 different optical fiber types, Ulexite fiber optic rock, 3 coherent fiber optic components, color filters, lens, star/constellation map, polishing film and other miscellaneous components

Part No. 32IFE60 • Price: \$36.00



RSR EXPERIMENTER'S KIT

Includes fiber optic components, cable, lab manual and experiments that can be breadboarded.

Part No. 3200OK100 • Price: \$8.95

OPTICAL AUDIO LINK

Easy to assemble voice link. Transmitter and receiver on separate PC boards. Great for learning the basics of fiber optic communications. Includes fiber optic devices, cable and connector.

Requires 2 – 9V batteries (not included).

Part No. 3200OK726 • Price \$13.90



SCIENCE PROJECT KIT

Learn fiber optics by experimenting and building projects with no prior experience needed. The practical 224-page text has theory, 8 experiments and 5 projects. After completion of this kit several useful projects will have been constructed, such as an analog voice link, and a light pen.

Part No. 3200FBIFE33 • Price: \$46.00



FIBER OPTIC LAB MANUAL AND LAB KIT

Features: 7 Experiments, Final Design Project, Glossary, Research Projects. Lab Manual is a complete 60 page technical manual, written in an easy to understand style.

It contains 7 ready to use experiments – Making a Light Pipe; Fiber Cable Transmission; Splices; Connectors and Terminations; Speed of Opto-Electronic Devices; Fiber Optic Transmitters; Fiber Optic Receivers; Star Coupler; Final-Design Project.

Part No.	Description	Prices
32FBLM	Lab Manual only	\$14.90
32FBLMKIT	Lab Manual w/ Kit	43.95
32IFMLA	Answer Guide	7.95



FIBER OPTIC MINI COURSE

This course is a package that can be integrated into any electronics class. Beginning with history through system design and applications.

Covers industrial and communication applications. The "Instructor's Edition" contains an additional reference book, answer guide, overhead transparencies, 10 demo pieces and the regular curriculum.

Part No.	Description	Prices
32FBMC10	Fiber Optic Mini Course	\$36.95
32FBMC10-IN	Instructor's Version	110.00



BLACKBOARD OPTICS KIT

The large lenses, mirror and prism. This light sources contained in the Blackboard Optics Kit can be secured to any classroom blackboard. Actual experiments and measurements are performed directly on the blackboard without darkening the room. The teacher can chalk in axes, normal, tangents, virtual rays, and other information.

Kit Includes:

- 2 Ray Projectors And Holders
- 3 Clamping Bars
- 1 Plano-convex Lens
- 1 Plano-concave Lens
- 1 Semi-circular Lens
- 1 Parallel-sided Block
- 1 Right Angle Prism
- 2 Plane Mirrors
- 1 Curved Mirror
- 1 Spare Projection Lamp.



Note: This kit requires a 12 V, AC power source.

Part No. 78SE3001555 • Price: \$1,613.25

INTERSTAR OPTICS CREATOR SET

BUILD YOUR OWN TELESCOPE, BINOCULARS, AND MAGNIFYING GLASS

Create three working optical instruments of your very own with this fun construction set. The 49 included pieces include real optical lenses to produce a telescope, magnifying glass, and binoculars that function properly.



Durable interlocking plastic pieces are easy to connect and stay securely in place once assembled. Have fun learning how optics work through the creation and following use of your own optical tools. Includes an educational guide.

Part No. 78SE3152146 • Price: \$47.18

OPTICAL VOICE LINK KIT

Kit assumes no previous knowledge or experience with fiber optics. Experience will be gained during assembly and while working with the electronic microphone, analog fiber optic transmitter and receiver and the fiber cable interface included in this kit. Once completed, you will use this device to hear your own voice after it has been converted into light and then coupled into, through and out of an optic fiber.

The Optical Voice Link Kit includes a 31-page manual with instructions, background information, references, glossary and ways to extend your fiber optic link up to 10 meters. 2- 9V batteries are required (not included).



Part No. 78SAP25665 • Price: \$67.43

RSR FIBER OPTIC TOOL KIT

GREAT VALUE \$135.00 (10+)



Kit Contents:

- 1. Fiber optic crimp tool
- 2. Precision stripper
- 3. Kevlar cutter
- 4. Carbide scribe
- 5. ST polish disc
- 6. SC polish disc
- 7. Epoxy application syringe 2 pieces
- 8. Two part epoxy for connectorization
- 9. Glass working pad 6" x 8"
- 10. Rubber working pad 6" x 6"
- 11. Cleanser
- 12. Fiber optic wipes (wet and dry)
- 13. 6µm brown diamond polish film 4" x 4"
- 14. 1µm purple diamond polish film 4" x 4"
- 15. 0.05µm white alum. oxide polish film 4"x4"

Includes most commonly used tools in crimping SC, ST type connectors to glass fiber optics cable.

Part No.	1-9	10+
3200FOPTK	\$140.00	\$135.00

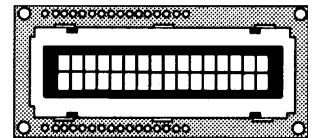
FIBER OPTIC CABLE GLASS / SIMPLEX

Standard 62.5/120µm multimode (MM), simplex glass fiber cable. Orange color outer jacket with 2.9mm diameter.

Part No. 2705FOPG1 • Price: \$0.40/meter

RSR LCD MODULES

- Character dot matrix
- Reflective; positive; gray
- Duty cycle 1/16; 5x7 dots
- Includes driver and controller



- **Models* with LED backlight: 08LCD7; 08LCD9; 08LCD12; 08LCD15; 08LCD18**

Part No.	Display Format	Module Size (mm)	Character Size (mm)	1-9	10+
08LCD6	16x1	80x36x9.5	6.56x3.07	\$5.95	\$4.50
08LCD7*	16x1	80x36x9.5	6.56x3.07	7.95	6.80
08LCD8	16x2	80x36x9.5	4.35x2.95	7.95	6.95
08LCD9*	16x2	80x36x9.5	4.35x2.95	8.95	6.95
08LCD11	20x2	116x37x9.5	5.55x3.2	9.95	8.50
08LCD12*	20x2	146x43x9.5	4.84x9.22	15.50	13.50
08LCD14	20x4	98x60x9.5	2.95x4.75	15.95	14.95
08LCD15*	20x4	98x60x9.5	2.95x4.75	19.95	17.50
08LCD17	40x2	182x33.5x11	3.20x8.20	15.95	13.95
08LCD18*	40x2	182x33.5x11	3.20x8.20	19.50	17.00

LASER / FIBER OPTICS

LASER AUDIO TRANSMISSION PROJECT CLASS II LASER

Wow your students with a visual demonstration of sound being transmitted over light waves from a laser beam. Equipment set-up is less than five minutes and the sounds are sent across the room and recreated within nanoseconds.



The project's audio receiver features total solid state design, adjustable volume control, self-contained and durable surface-mount electronics design, 110 VAC operation, and impact-resistant enclosure. Inside the receiver are the sensitive optical semiconductor detector, amplifier, power conditioning electronics and 10cm (4 in.) speaker.

Package includes a choice of diode or helium neon laser, audio receiver, high-sensitivity electronic microphone, instruction manuals and two 110-VAC- to-DC power adapters. Also included is 3 meters of fiber optic cable for demonstrating the light- and information- carrying abilities of optical fiber.

Part No.	Description	Price
08IF512	Complete Project With 0.8mw, 635nm Class II Diode Laser	\$425.00
08IF511	Complete Project with .8mw Class II Helium Modulable Neon Laser	545.00

LIGHT RAY VIEWING KIT

This Kit is a small "liquid laboratory." When used with any lasers it creates underwater light ray patterns and diagrams that constitute the basics of all introductory optic studies.



In a complementary series of activities in the accompanying instruction guide, students can observe, and more readily understand, principles and equations such as:

- Snell's Law
- Total internal reflection
- Equal angles of incidence and reflection
- Brewster's Angle
- Critical angle of light

Set-up for each experiment requires less than five minutes and costs only a few pennies. ("Just add water!") Project equipment includes impact-resistant observation tank; four ounces of scattering solution; first-surface mirror; stirring rod; ruler; protractor; and eight full-color instruction guides.

Part No.	Description	Price
08IF548	Complete Kit w/o Laser	\$95.00
08IF549	Complete Kit with 0.5mw Helium Neon Laser	395.00

WBS LASER THE MOST VERSATILE LASER ON THE MARKET!

The WBS Laser is the ultimate educational laser and will be the last laser you'll need to purchase. Why? Because of its dual analog and digital input design and its very wide electrical modulation bandwidth.



The analog input accommodates signals as low as 100 Hz for laser audio communications experiments to as high as 70 MHz for simultaneous transmission of color video picture and sound. The digital input accepts all standard +5 volt logic levels for digital communications experiments. With such fantastic versatility, this one laser can perform all the following dynamic optical communication demonstrations:

- Voice communications
- Digital line-of-sight communications
- AM/FM radio transmission
- Video from camcorder
- RF video from VCR to receiver to TV



In addition, this laser can be used to conduct regular laser, optics and fiber optic experiments.

FEATURES:

- Semiconductor lasing element and solid-state design for a long, dependable life.
- Bright 635 nanometer laser light output.
- Standard RCA-type input jacks.
- Electrical overdrive protection on all inputs.
- Bright laser pilot light.
- Tamper-resistant screws for safety.
- Threaded mounts for holding lenses, filters and diffraction gratings.
- Operator's manual with safety information and common experiments.
- Labeling and safety requirements compliant with US CDRH regulations.

GROUP PACKAGE:

In addition to the **WBS Laser**, you will also receive a free optical RF video receiver, interconnecting cables, power adapters, and an instruction booklet for setting up a VCR-to-Laser-to-Receiver-to-TV link

Part No. 32IFUL08635X • Price: \$450.00

COMPLETE LASER COMMUNICATIONS PACKAGE:

You will receive all the items above, as well as a microphone, AM/FM radio, patch cords and an audio receiver.

Part No. 32IFUL08635Y • Price: \$695.00