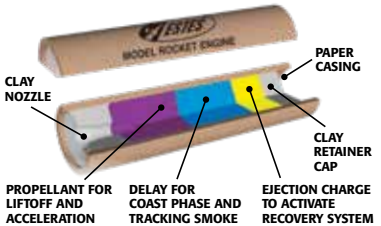
ESTES MODEL ROCKET ENGINES

The famous model rocket engines that made model rocketry the great activity it is today. Estes model rocket engines have been proven consistent and reliable in more than **500,000,000 launches.**

- The concept of a factory assembled model rocket engine is the foundation of this scientific and educational activity!
- 3% of all Estes engines are static-tested at the factory for reliability and adherence to performance specifications.
- All engines comply with the code requirements of the National Fire Protection Association and are certified by the National Association of Rocketry.

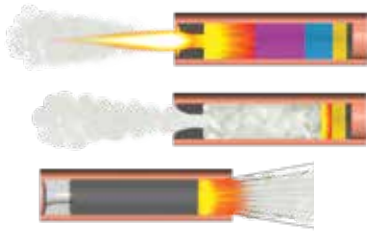


HOW DOES A MODEL ROCKET ENGINE WORK?

1. When engine is ignited, it produces thrust and boosts rocket into sky.

2. After propellant is used up, delay is activated, producing tracking smoke and allowing rocket to coast.

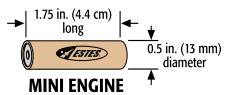
3. After delay, ejection charge is activated, deploying recovery system.



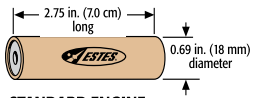
WHAT SIZES ARE AVAILABLE?

Estes engines are available in a wide variety of sizes and power levels:

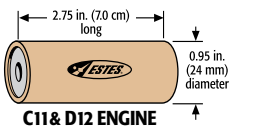
TYPE	TOTAL IMPULSE	ENGINE TYPES
1/4A	0.313 - 0.625	Mini
1/2A	0.626 - 1.25	Standard, Mini
A	1.26 - 2.50	Standard, Mini
B	2.51 - 5.00	Standard
C6	5.01 - 10.00	Standard
C11	5.01 - 10.00	D Size
D	10.01 - 20.00	D Size
E	20.01 - 30.00	E Size
F	45.01 - 50.00	F Size



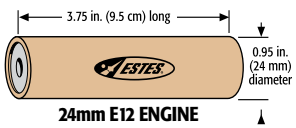
MINI ENGINE



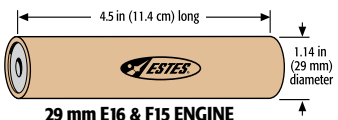
STANDARD ENGINE



C11& D12 ENGINE



24mm E12 ENGINE



29 mm E16 & F15 ENGINE

Each engine type is color coded.

- **Single Stage** - Green
- **Upper Stage** - Purple (Upper stage engines can be used as single stage engines in lightweight rockets.)
- **Booster** - Red (Booster engines contain no delay or ejection charge.)
- **Plugged** - Blue (Plugged engines are used for R/C gliders and contain no delay or ejection charge.)

Each engine has an alphanumeric code printed on it

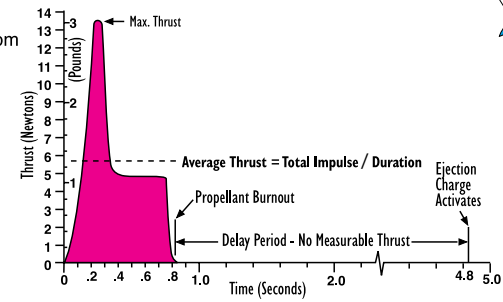
B = TOTAL IMPULSE
This letter is the total power (in Newton-seconds) produced by the engine. Each succeeding letter has up to twice the total power as the previous letter. (Example: "B" engines have up to twice the power of "A" engines, which results in approximately twice the altitude the rocket will reach.)

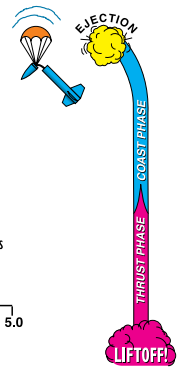
6 = AVERAGE THRUST
This number shows the engine's average push or how fast the engine powers the rocket to go. The higher the number, the faster the speed. It is measured in Newtons (4.45 Newtons = 1 lb.).

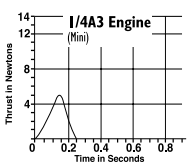
4 = TIME DELAY
This number gives you the time delay in seconds between the end of the thrust phase and ignition of the ejection charge. Engine types ending in "0" have no time delay or ejection and are used for booster stages and special purposes only. Engines ending in "P" have no time delay or ejection charge and the forward end is plugged.

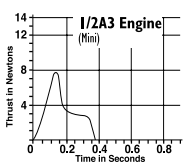
ENGINE TIME/THRUST CURVES

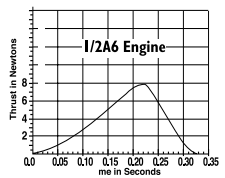
- Time/thrust curves are representative of random production samples
- Graphs are not drawn to the same scale

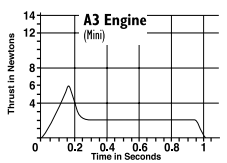


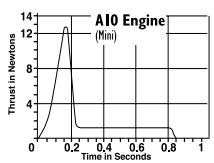


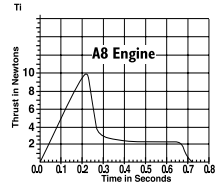


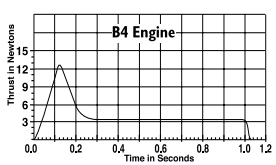


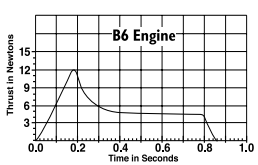


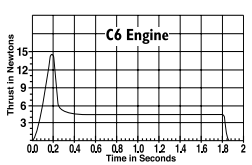


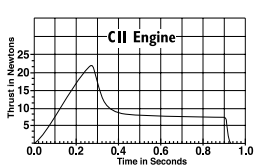


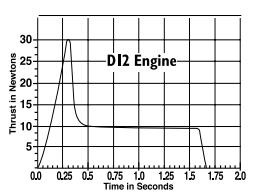


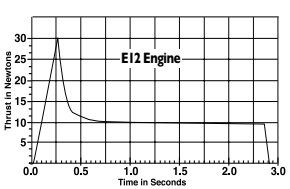


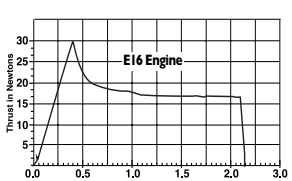


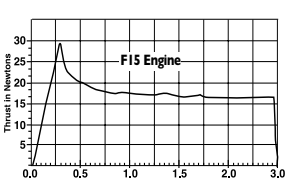










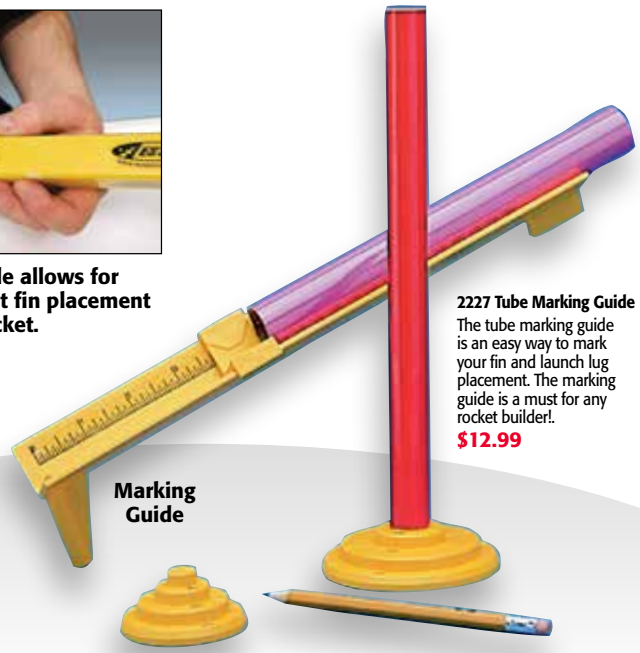


Take your rocketry hobby to the next level with Estes accessories!

The key to any successful rocket launch, whether it's a full-size rocket or a flying model rocket, is the accuracy with which the rocket is assembled. To accomplish this task, full-size rocket companies utilize many assembly jigs and fixtures to ensure accurate alignment of critical components. Here at Estes, we do our best to provide our rocketeer customers with useful jigs, fixtures, and templates for accurate alignment and assembly of our model rocket kits. In addition, we have a variety of useful tools and accessories that can make your model rocket building experience truly enjoyable. And equally important, the accuracy these tools provide will assure that your rocket performs at its ultimate potential.

The Tube Marking Guide allows for accurate and consistent fin placement when building your rocket.

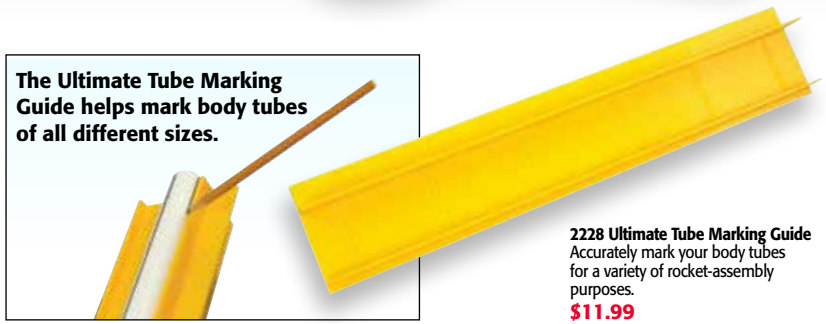
Set of 3 different building tools!



Marking Guide

2227 Tube Marking Guide
The tube marking guide is an easy way to mark your fin and launch lug placement. The marking guide is a must for any rocket builder!.
$12.99

The Ultimate Tube Marking Guide helps mark body tubes of all different sizes.



2228 Ultimate Tube Marking Guide
Accurately mark your body tubes for a variety of rocket-assembly purposes.
$11.99

2315 Tube Cutting Guides
Assorted sizes: BT-5, BT-20, BT-50, BT-55, and BT-60 (hobby knife not included)
$11.99

The Tube Cutting Guides come in different sizes and allow for straight and even lines when cutting and marking your body tubes.

BODY TUBE PACKS

High quality spiral wound paper tubes. Use tube couplers to connect tubes of the same diameter. Outer diameters listed. (not all body tube sizes shown)

3084 • BT-5 • 0.54 in./14 mm diameter • 18 in./45.7 cm long (4 pack) $7.49

3085 • BT-20 • 0.74 in./19 mm diameter • 18 in./45.7 cm long (4 pack) $8.49

3086 • BT-50 • 0.98 in./25 mm diameter • 18 in./45.7 cm long (3 pack) $8.49

3087 • BT-55 • 1.33 in./34 mm diameter • 18 in./45.7 cm long (3 pack) $8.99

3089 • BT-60 • 1.60 in./41 mm diameter • 18 in./45.7 cm long (3 pack) $9.49

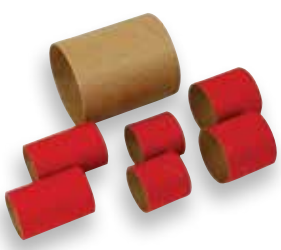
3090 • BT-80 • 2.60 in./66 mm diameter • 14 in./45.7 cm long (2 pack) $8.99

3176 BT-5, BT-20, BT-50 Tube Couplers (2 each) $3.99

3177 BT-55, BT-60 Tube Couplers (2 each) $5.49

3178 BT-80 Tube Couplers (2 each) $4.99

2320 Launch Lug Pack
Contains 4 each: 1/8 x 2 3/8 in (3 x 60 mm), 1/8 x 1 1/4 in. (3 x 32 mm), 3/16 x 2 in. (5 x 51 mm) and 1/4 x 1 in (6 x 25 mm) launch lugs
$5.99



3196 Large Tube Coupler Pack
Includes two couplers for BT-55, BT-56 and BT-60; One for BT-80
$6.99

9750 PS II™ 29 mm Engine Retainer Set (2 sets) $8.99

9751 24 mm Engine Retainer Set (2 sets) $7.99

3187 18 mm Engine Retainer Set (3 sets) $6.99

For complete size and specifications of all these parts, go to estesrockets.com.

3175 BT-5 through BT-55 Centering Ring Assortment $5.99

2278 Shock Cords & Mount Pack
Includes three 1/8 in. x 36 in. (3 mm x 914 mm) and one 1/4 in. x 36 in. (6 mm x 914 mm) rubber shock cords (enough for four shock cords). Includes shock cord mounts and instructions.
$5.99

3171 Clear Payload Assortment $17.99

3180 Clay Nose Cone Weights $5.99

NOSE CONE ASSORTMENTS

Each package of nose cones may contain a variety of shapes. Some are one piece, others two piece. All have eyelets for shock cord and shroud line attachments.

3160 NC-5 Nose Cone Assortment (5 pack) $5.49

3161 NC-20 Nose Cone Assortment (4 pack) $5.49

3162 NC-50 Nose Cone Assortment (5 pack) $8.99

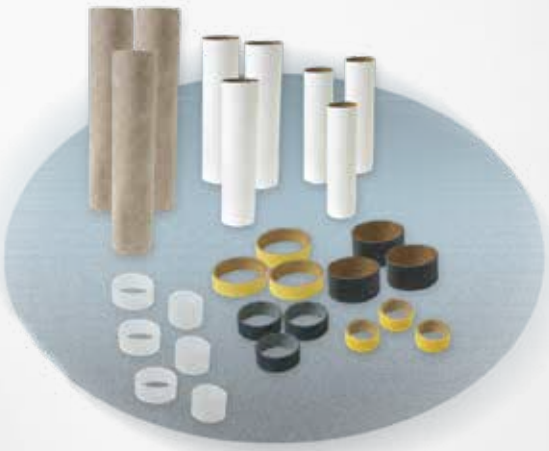
3163 NC-55 Nose Cone Assortment (4 pack) $7.99

3164 NC-56 Nose Cone Assortment (4 pack) $7.99

3165 NC-60A Nose Cone Assortment (3 pack) $8.99

3168 NC-80B Nose Cone (1 Pack) $4.49

3173 Sci-Fi Nose Cone Assortment (5 pack) $16.99



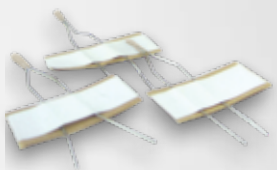
3181 Engine Mount Parts Assortment
3 each engine mounts for mini-engines, standard engines, and D engines.
$8.49

2316 Mini to Standard Engine Adapters
Two simple steps transform a mini-engine into a standard size. Insert a mini-engine into the adapter, and insert the adapter into a rocket. 3 adapters per pack. Reusable. (Engines not included.) **$5.99**

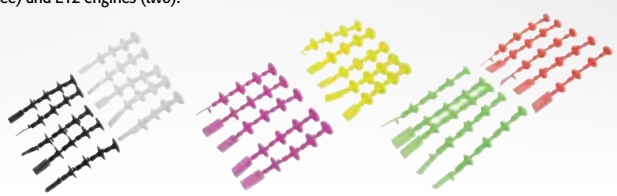
2317 Standard to D Engine Adapters
Two simple steps transform a standard engine into a D size. Insert a standard engine into the adapter, and insert the adapter into a rocket. 3 adapters per pack. Reusable. (Engines not included.)
$5.99

2274 Recovery Wadding
Flame-resistant wadding protects recovery system. Required in most Estes rockets. Contains approximately 72 sheets – enough for about 18-25 flights!
$5.49

3143 Engine Hook Accessory Pack
Hooks fit mini engines (two), regular and D engines (three) and E12 engines (two).
$5.49



2302 Model Rocket Starters
Easy-to-use Estes starters in a convenient six pack. It's always good to have spares.
$5.49



2250 1/4A3, 1/2A3, A3 and A10 Engine Plugs (20 pack) **$5.99**
2251 1/2A6, A8, B4, B6, and C6 Engine Plugs (20 pack) **$5.99**
2252 C11, D12, E9, E12, E16 and F15 Engine Plugs (20 pack) **$5.99**

3158 Standard Engine Mount Kit
Fits BT-50, 55 and 60 tubes. Can also be used to make a conversion mount for lightweight D powered rockets.
$7.49

3170 Waterslide Decal Set
$12.99

3179 2x Laser Cut Centering Rings and 2x Shroud Templates
$8.49

3159 D And E12 Engine Mount Kit
Heavy duty engine mounts for D and E12 engines. Fits BT-55, 60 and 80 tubes.
$10.99

How High Did It Fly?

Altitrak: The single most often asked question regarding launching a model rocket is; how high did it fly? Human estimation of heights can range from awful to "Who Knows?" However, fairly accurate measurement of the maximum launch height is possible. Over the years, model rocketeers have most often used one of two methods (geometric or electronic based) to measure altitude.

The geometric process requires a baseline (or leg of a right triangle) from the launch pad and a protractor-based instrument like the Estes Altitrak, it is used to determine the maximum height at apogee of the rocket.

The geometric method requires a team approach (usually a launcher and a helper). After the launcher places the rocket on the pad, the helper with Altitrak in hand, paces off 300 feet from the launch pad. As the launcher begins the countdown, the helper lines up the crosshair of the Altitrak on the rocket and pulls the trigger. At ignition the helper follows the flight path of the rocket in the crosshair and releases the trigger when the rocket reaches apogee. The Altitrak swing arm aligns with numbers that are painted on the side of the Altitrak. The helper reads the number from the Altitrak, which is displayed as height in meters and can be converted to feet by multiplying meters by 0.3048.

2232 Altitrak™
Measure altitude with this easy to use device. Follow the rocket in the sights to apogee, and release the trigger to lock the reading.
$21.99

Now you can know!

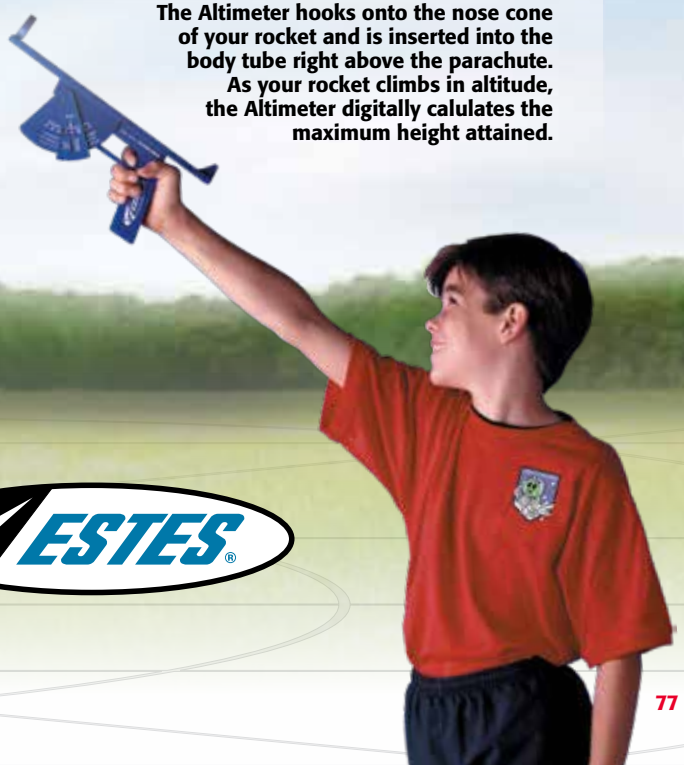
Altimeter: Another method for measuring the altitude without the need for a helper is by using the electronic Altimeter. These onboard electronic devices can attach to the nose cone or be inserted into a payload bay. Altimeters incorporate a highly sensitive barometric sensor and an electronic triggering logic that provides maximum altitude at apogee.

2246 Altimeter
Record up to 10 flights. LCD display, battery included.
$39.99

The Estes 2246 Electronic Altimeter provides a direct LCD readout and can record heights in one-foot increments up to 10,000 feet (+/- 3 feet) and can store up to 10 launches in the unit's memory. The Estes Altimeter weighs about ½ oz. and is slightly over 5/8" in. in diameter.

The Altimeter hooks onto the nose cone of your rocket and is inserted into the body tube right above the parachute. As your rocket climbs in altitude, the Altimeter digitally calulates the maximum height attained.

The hand-held Altitrak quickly tells how high your rocket flies!

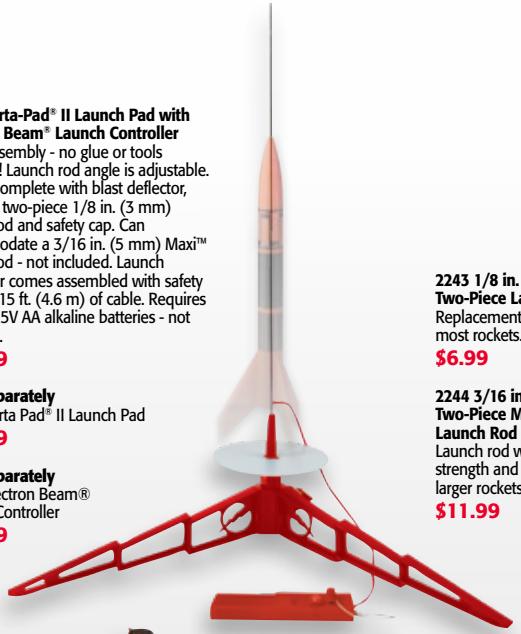


ESTES®

2222 Porta-Pad® II Launch Pad with Electron Beam® Launch Controller
Quick assembly - no glue or tools required! Launch rod angle is adjustable. Comes complete with blast deflector, standoff, two-piece 1/8 in. (3 mm) launch rod and safety cap. Can accommodate a 3/16 in. (5 mm) Maxi™ launch rod - not included. Launch controller comes assembled with safety key and 15 ft. (4.6 m) of cable. Requires 4 new 1.5V AA alkaline batteries - not included.
$29.99

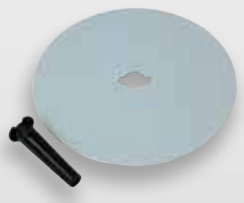
Sold Separately
2215 Porta Pad® II Launch Pad
$21.99

Sold Separately
2220 Electron Beam® Launch Controller
$24.99



2243 1/8 in. (3 mm) Two-Piece Launch Rod
Replacement rod ideal for most rockets.
$6.99

2244 3/16 in. (5 mm) Two-Piece Maxi™ Launch Rod
Launch rod with extra strength and length for larger rockets.
$11.99



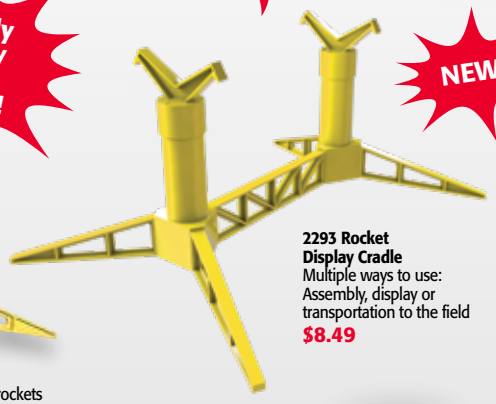
2241 Blast Deflector Plate
Replaces that worn-out deflector. For use with Porta Pad II PN 2215
$5.99

2230 E™ Launch Controller
Comes assembled with safety key and 30 ft. (9 m) of cable. Requires 4 new 1.5V AA alkaline batteries - not included.
$32.99

2238 Porta-Pad® E Launch Pad
Quick assembly - no glue or tools required. Launch rod angle is adjustable. Includes a 1/4 in (6 mm) launch rod, but can accommodate a 3/16 in. (5 mm) Maxi™ launch rod - not included.
$30.99

Proudly display your rockets!

NEW!



2293 Rocket Display Cradle
Multiple ways to use: Assembly, display or transportation to the field
$8.49

2290 Rocket Display Stand
For mini-engine rockets (3 pack)
$7.49

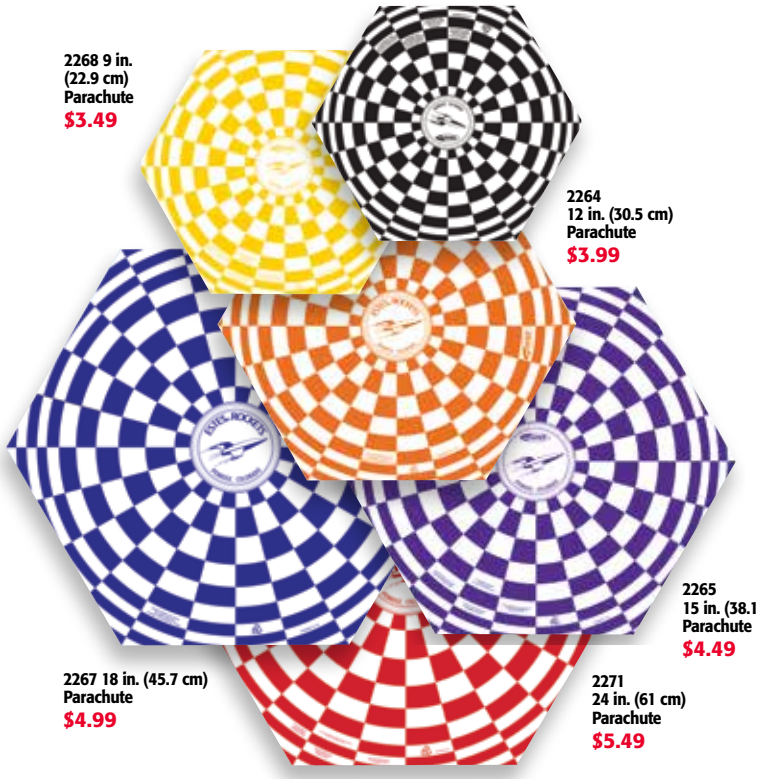
Never misalign your rocket fins again; use the Estes Fin Alignment Guide!

2291 Rocket Display Stand
For standard engine rockets (3 pack)
$7.49

2292 Rocket Display Stand
For C-11, D, and E engine rockets (3 pack)
$7.49

2231 Fin Alignment Guide
Fast and accurate fin alignment for three- or four-finned rockets.
$21.99

Recovery parachutes



2262 6 in. (15.2 cm) Parachute
$2.99

2268 9 in. (22.9 cm) Parachute
$3.49

2264 12 in. (30.5 cm) Parachute
$3.99

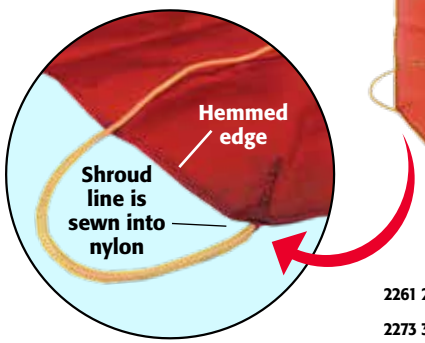
2265 15 in. (38.1 cm) Parachute
$4.49

2267 18 in. (45.7 cm) Parachute
$4.99

2271 24 in. (61 cm) Parachute
$5.49

All parachutes are fully-assembled

Sturdy sewn fabric chutes for your biggest, heaviest rockets.



2261 24 in. (61 cm) Nylon Parachute $12.99

2273 30 in. (76.2 cm) Nylon Parachute $16.99

Challenge your imagination!

Contains 100+ parts. Design and build the rockets of your dreams!

Experiment with your own designs. Includes enough parts to build at least 8 complete rockets. Just add imagination.

1980 Designer's Special™
$86.99

Designs shown are for inspiration only and may include other imaginative parts not included in your Designer's Special.

EXPLORE IT, ENGINEER IT, LAUNCH IT!

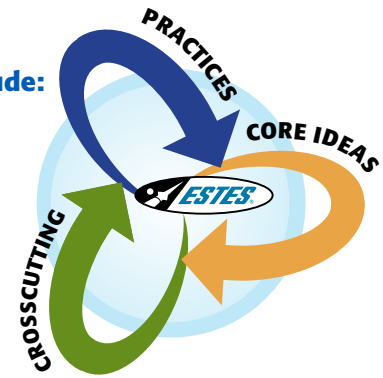
Inspiring students, young and old – that's the focus of Estes Education! Log onto Estesrockets.com/education to find everything you need for your classroom or youth organization.

Estes Makes it EASY!

"Building Estes model rockets is the best hands-on activity I have ever done with kids."

Mary Roberts,
longtime Estes employee
& former 4-H rocketry leader

TEACHING WITH ESTES ROCKETRY IS REAL-WORLD STEM



Estes Curriculum & Lesson Plans Include:

- NGSS standards
- 3-D Practices, Core Ideas, Crosscutting
  - **Engage:** Interact with STEM curriculum with proven methods.
  - **Explore:** Use authentic materials to engineer and experience the model rocket phenomenon with crosscutting adventures.
  - **Explain:** Students gather data and summarize experiences by interpreting results and communicating possible improvements, successes and challenges.
  - **Elaborate:** Take the student's understanding to the next level, digging deeper, reaching higher, applying concepts in self-directed learning.
  - **Evaluate:** Students evaluate their engineering design process and scientific explorations relating to real-world applications.

FREE ONLINE RESOURCES

At EstesRockets.com/education you can find useful information about:

- **Classroom Activities:**
  - Close reading
  - Journaling
  - Games
- **Model Rocket Basics for:**
  - Youth Groups
  - Homeschooling
  - Enrichment
- **How to Choose a Launch Site**
- **Videos, Animation, and More!**

SPECIAL BULK PACKS FOR EDUCATORS

Estes offers 12-piece rocket bulk packs especially for educators and youth group leaders. (Rocket engines, recovery wadding, starters, and engine plugs are sold separately.)

HOW TO CHOOSE THE RIGHT ROCKET FOR YOUR GROUP

Consider these four things when making your plan

Age

Younger kids (Grades 5-8) need rockets that are simpler to assemble. They're not quite ready for the challenge of gluing on individual fins yet, so choose one of our kits with a one-piece plastic fin unit and fewer assembly steps. Older kids do a better job of reading, understanding and following assembly instructions. They will have the hand-eye skills to glue wood fins to the body tube.

Staff

Conducting a build session with 30 kids yourself is a challenge. We recommend that you get helpers for both your build session and on your launch. Short on adult volunteers? Recruit kids from higher grade levels.

Time

Do you have a single session to both build and fly the rocket? Consider the amount of time needed for glue to dry and how much time it will take to prep the rockets before launch.

Flying Field Size

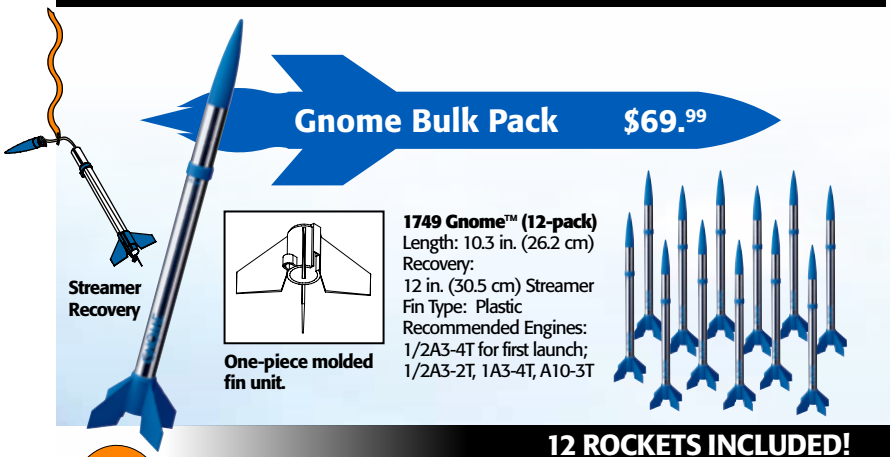
Recovery method (parachute or streamer), engine size (A, B, C) and wind all play a role in what rocket is best suited for the size field you may have. You can't make your field bigger, but you can choose the right size rocket to fly on it!

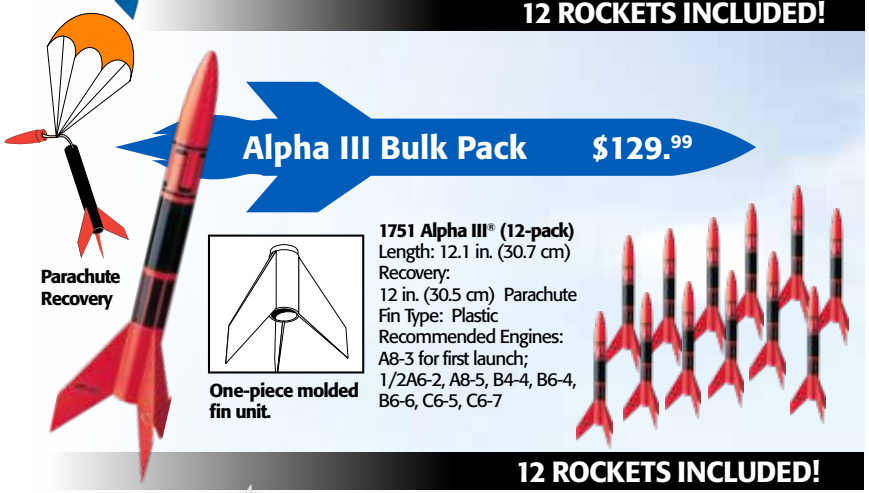
Parachutes drift farther and come down slower, so you'll need a bigger field.

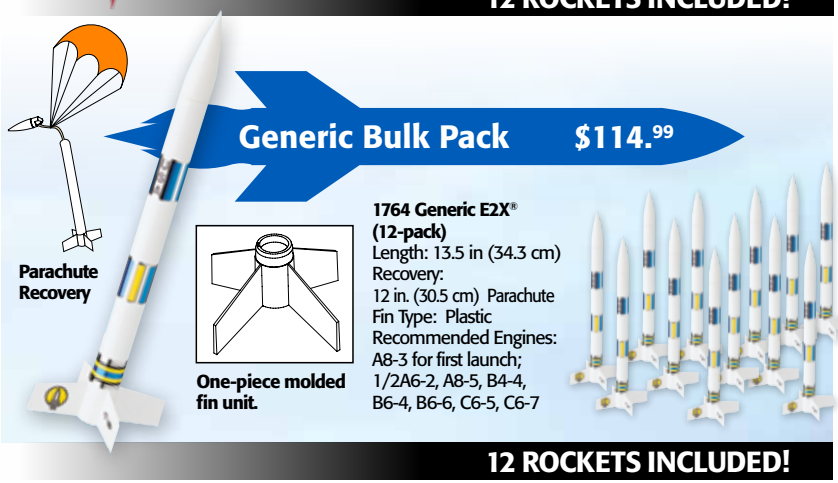
Streamers have very little drift and mostly come down within a small radius of your launch pad.

Rocket engines double in power with each succeeding engine letter. For example: B engines effectively fly your rocket twice as high as A engines.

THESE ARE OUR EASIEST TO BUILD ROCKETS







ASSORTED BULK PACK INCLUDES 3 STYLES OF ROCKETS!

Parachute or Streamer Recovery

AVG Bulk Pack $89.99

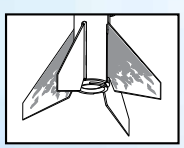
1753 AVG™ (12-pack)
Recovery: Streamer or Parachute
Fin Type: Plastic or Laser cut wood, or Cardstock
Recommended Engines: A8-3 for first launch; ½A6-2, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7

4 Alphas 4 Vikings 4 Generics

12-PACK WITH 4 OF EACH ROCKET!

Streamer Recovery

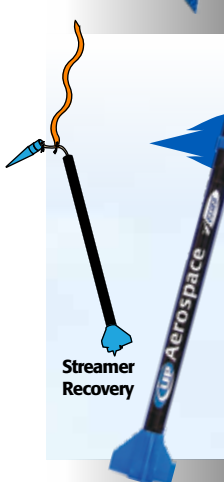
Firestreak Bulk Pack $104.99



Four separate molded fins that snap into body tube.

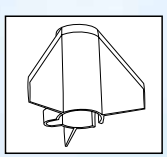
1794 Firestreak SST™ (12-pack)
Length: 10.2 in. (25.9 cm)
Quick Snap – No gluing!
Recovery:
12 in. (30.5 cm) Streamer
Fin Type: Plastic
Recommended Engines: 1/2A3-2T for first launch; 1/2A3-4T, A3-4T, A10-3T

12 ROCKETS INCLUDED!



Streamer Recovery

UP Aerospace SpaceLoft $69.99
Bulk Pack



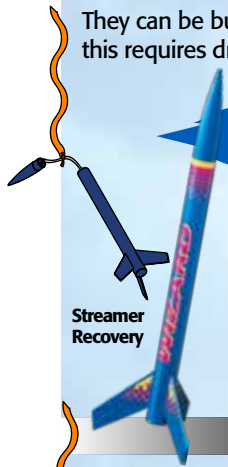
One-piece molded fin unit.

1793 UP Aerospace™ SpaceLoft (12-pack)
Length: 11.1 in. (28.2 cm)
Recovery:
12 in. (30.5 cm) Streamer
Fin Type: Plastic
Recommended Engines: 1/2A3-4T for first launch; 1/2A3-2T, A3-4T, A10-3T

12 ROCKETS INCLUDED!

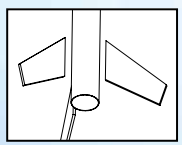
These Rockets Are More Challenging To Build

They can be built in two hours or less. Fins must be glued to the body tube and this requires dry time before launch. Painting and finishing will take more time.



Streamer Recovery

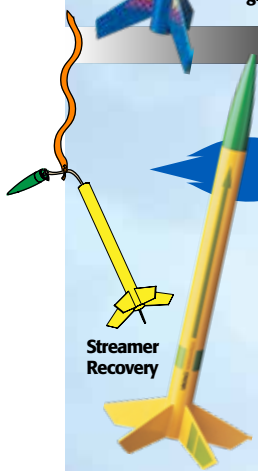
Wizard Bulk Pack $79.99



Three balsa fins that glue onto body tube.

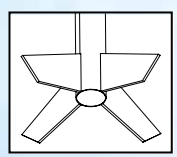
1754 Wizard™ (12-pack)
Length: 12 in. (30.5 cm)
Recovery:
18 in. (45.7 cm) Parachute
Fin Type: Laser cut wood
Recommended Engines: A8-3 for first launch; 1/2A6-2, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7

12 ROCKETS INCLUDED!



Streamer Recovery

Viking Bulk Pack $84.99



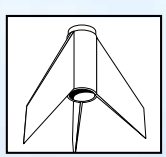
Cardstock fins that glue onto body tube in 48 possible configurations.

1755 Viking™ (12-pack)
Length: 12.1 in. (30.7 cm)
Recovery:
18 in. (45.7 cm) Streamer
Fin Type: Cardstock
Recommended Engines: A8-3 for first launch; 1/2A6-2, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7

12 ROCKETS INCLUDED!

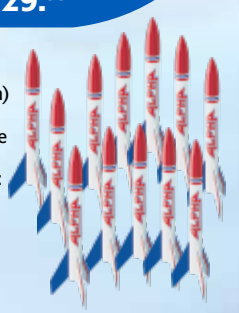
Parachute Recovery

Alpha Bulk Pack $129.99



Three balsa fins that glue onto body tube.

1756 Alpha® (12-pack)
Length: 12.3 in. (31.2 cm)
Recovery:
12 in. (30.5 cm) Parachute
Fin Type: Laser cut wood
Recommended Engines: A8-3 for first launch; 1/2A6-2, A8-5, B4-4, B6-4, B6-6, C6-5, C6-7



12 ROCKETS INCLUDED!

ROCKET ENGINE BULK PACKS

Every launch requires engines, recovery wadding, starters and plugs. These convenient engine bulk packs include enough of each for 24 launches. Choose from a variety of engine sizes. We advise using the smallest recommended engine for first launches.

1781	A8-3 Engines (24 each); 30 starters; 24 plugs; 72 sheets wadding	**$71.99**
1783	B6-4 Engines (24 each); 30 starters; 24 plugs; 72 sheets wadding	**$72.99**
1784	B6-0 & B6-6 Engines (12 each); 30 starters; 24 plugs; 72 sheets wadding	**$80.59**
1788	½ A3-4T Engines (24 each); 30 starters; 24 plugs; 72 sheets wadding	**$57.79**
1789	A8-3; B6-4; C6-3; C6-5 Engines (6 each); 30 starters; 24 plugs; 72 sheets wadding	**$84.99**
1672	Blast-Off Flight Pack (12 each); 30 starters; 28 plugs; 72 sheets wadding	**$69.99**

Get more Blast Off for your buck with education pricing!

1672 Blast-Off® Flight Pack
Includes 6 each of A8-3, B6-4, C6-3, C6-5 engines, 30 starters, 28 starter plugs and 72 sheets of recovery wadding.

THE LIFETIME LAUNCH SYSTEM IS DESIGNED FOR TEACHERS (Includes Controller & Launch Pad).

Pro Series II Launch Controller

Pro Series II Launch Controller

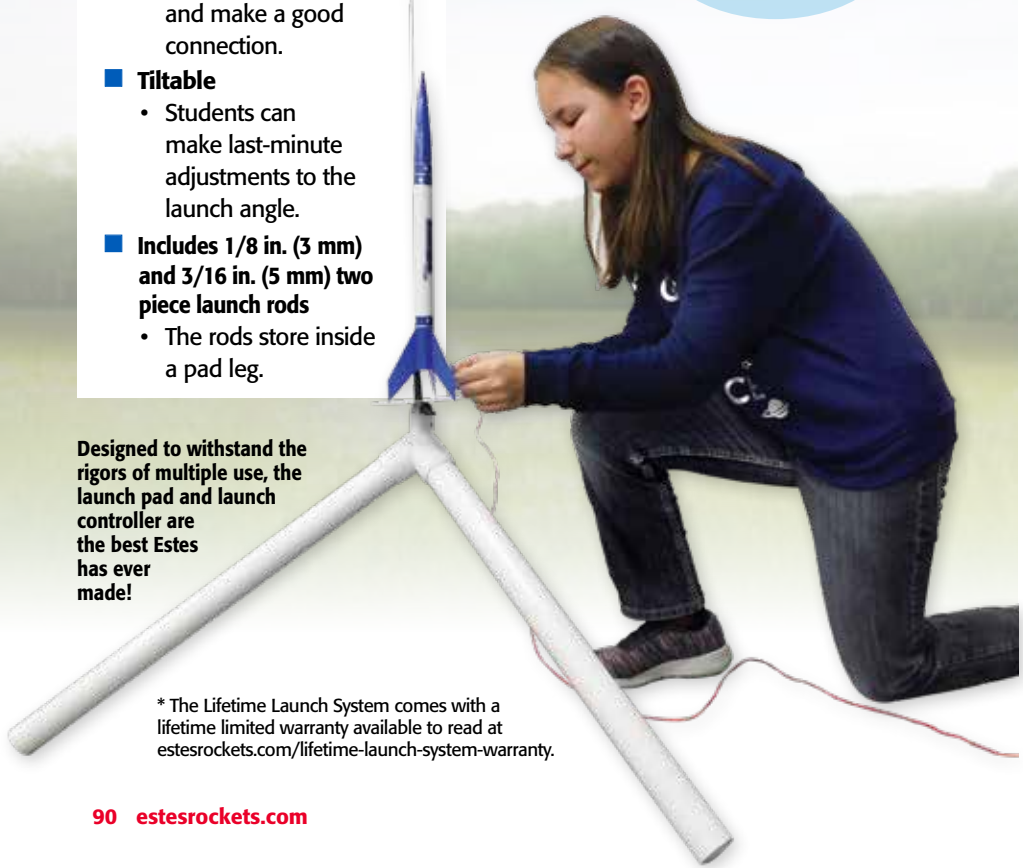
- **30 ft. (9.1 m) launch cable**
  - Students get a better launch view.
- **Audible Continuity**
  - Students can easily hear if the starter is connected correctly.
- **Two hands required for launch**
  - Even with the safety key left in, the rocket will not launch without both buttons pressed.
- **Requires 6 "C" size alkaline batteries**

Lifetime Launch System

- **Stands 18 in. (45.7 cm) off the ground!**
  - Students can easily see the starter wires and make a good connection.
- **Tiltable**
  - Students can make last-minute adjustments to the launch angle.
- **Includes 1/8 in. (3 mm) and 3/16 in. (5 mm) two piece launch rods**
  - The rods store inside a pad leg.

NEW!

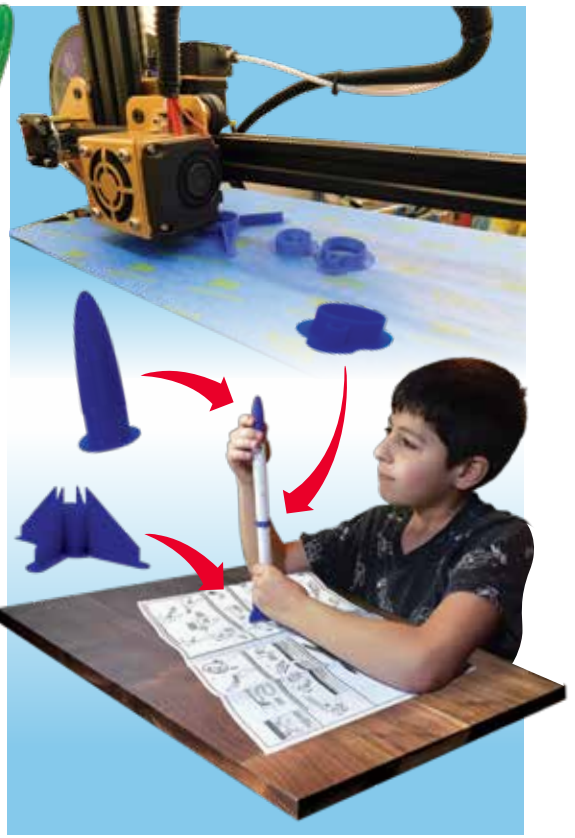
2310 Lifetime Launch System $79.99



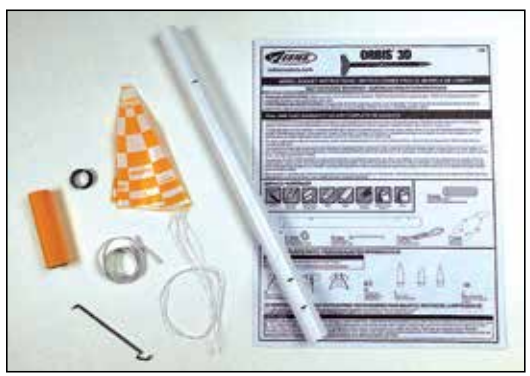
Designed to withstand the rigors of multiple use, the launch pad and launch controller are the best Estes has ever made!

* The Lifetime Launch System comes with a lifetime limited warranty available to read at estesrockets.com/lifetime-launch-system-warranty.

BRING NEXT GENERATION SCIENCE INTO YOUR CLASSROOM



Something new at ESTES! That's right, 3D printed model rockets. Buy the Orbis™ bulk pack and download the .stl files from the Estes website to print your 3D plastic parts, then you are ready to build your rockets! Our parts that you purchase + your parts that you grow = a great learning experience and lots of fun! Nine different designs and simple straightforward assembly! Build 12 rockets!



Students actively engage in scientific and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas in these fields.

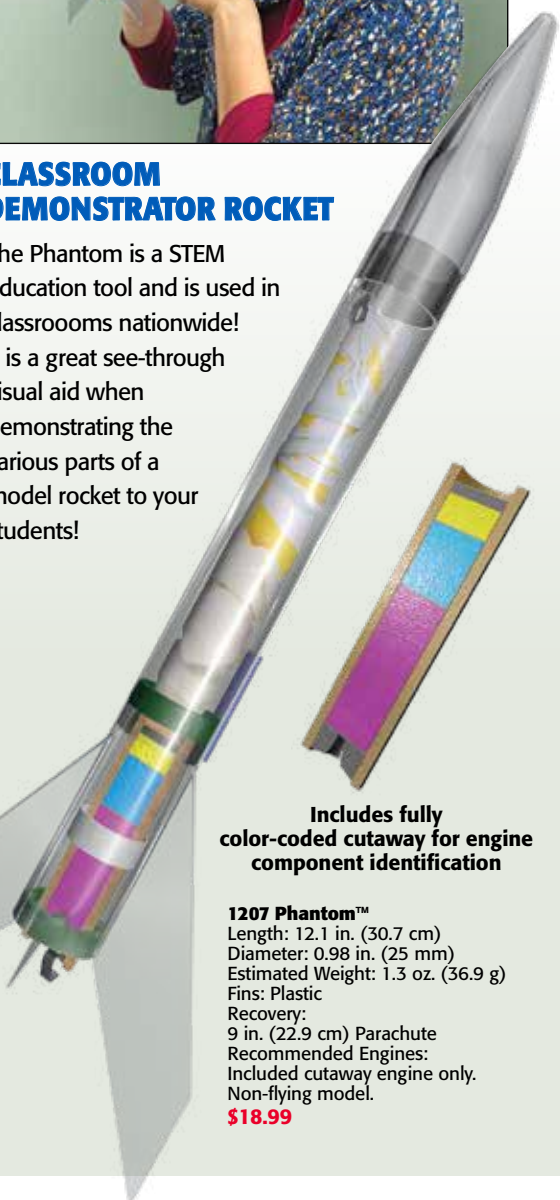
1706 Orbis
Length: 10 - 12 in. (25 - 30.5 cm)
Diameter: 0.74 in. (19 mm)
Estimated Weight: 0.76 oz. (21.5 g)
Fins: 3D Printed
Recovery: 9 in. (22.9 cm) Parachute
Projected Altitude: 400 ft (122 m)
Recommended Engines: A8-3 for first launch; B6-4, C6-5
$59.99

Students 3D print these parts!

PHANTOM

CLASSROOM DEMONSTRATOR ROCKET

The Phantom is a STEM education tool and is used in classroooms nationwide! It is a great see-through visual aid when demonstrating the various parts of a model rocket to your students!



Includes fully color-coded cutaway for engine component identification

1207 Phantom™
Length: 12.1 in. (30.7 cm)
Diameter: 0.98 in. (25 mm)
Estimated Weight: 1.3 oz. (36.9 g)
Fins: Plastic
Recovery:
9 in. (22.9 cm) Parachute
Recommended Engines:
Included cutaway engine only.
Non-flying model.
$18.99

Official Rockets and Engine Supplier for Space Camp!

Equipped with his five senses, man explores the universe around him and calls the adventure Science.

- Edwin Powell Hubble

5302 Rocket Science Starter Set

Discover the fun of science! Build the rocket, launch with one of the three included engines, and observe as a reaction occurs to make the rocket soar! Launch again with a different size engine and measure the difference in altitude.

Perfect for Science Fairs!

5302 ROCKET SCIENCE STARTER SET INCLUDES:
1 Rocket
1 Launch Pad
1 Launch Controller
1 12 in. (30.5 cm) Parachute
1 each A8-3, B6-4, C6-5 Single Stage Model Rocket Engine
4 Starters
8 Plugs
12 Sheets of Recovery Wadding
1 Altitude Tracker

Length: 12.8 in. (32.5 cm)
Diameter: .98 in. (25 mm)
Estimated Weight: 1.2 oz. (34 g)
Fins: Plastic
Recovery: 12 in. (30.5 cm) Parachute
Projected Altitude: 1100 ft. (335 m)
Recommended Engines: A8-3 for first launch; 1/2A6-2, B4-4, B6-4, B6-6, C6-5, C6-7

$34.99

National Association of Rocketry
MODEL ROCKET SAFETY CODE
(Basic Version, Eff. August 2012)

1. Materials. I will use only lightweight, non-metal parts for the nose, body, and fins of my rocket.

2. Motors. I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.

3. Ignition System. I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.

4. Misfires. If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

5. Launch Safety. I will use a count-down before launch, and will ensure that everyone is paying attention and is a safe distance of at least 15 feet away when I launch rockets with D motors or smaller, and 30 feet when I launch larger rockets. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance. When conducting a simultaneous launch of more than ten rockets I will observe a safe distance of 1.5 times the maximum expected altitude of any launched rocket.

6. Launcher. I will launch my rocket from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motor's exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or will cap the end of the rod when it is not in use.

7. Size. My model rocket will not weigh more than 1500 grams (53 ounces) at liftoff and will not contain more than 125 grams (4.4 ounces) of propellant or 320 N-sec (71.9 pound-seconds) of total impulse.

8. Flight Safety. I will not launch my rocket at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload in my rocket.

9. Launch Site. I will launch my rocket outdoors, in an open area at least as large as shown in the accompanying table, and in safe weather conditions with wind speeds no greater than 20 miles per hour. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.

LAUNCH SITE DIMENSIONS

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft.)
0.00-1.25	1/4A, 1/2A	50
1.26-2.50	A	100
2.51-5.00	B	200
5.01-10.00	C	400
10.01-20.00	D	500
20.01-40.00	E	1000
40.01-80.00	F	1000
80.01-160.00	G	1000
160.01-320.00	Two Gs	1500

10. Recovery System. I will use a recovery system such as a streamer or parachute in my rocket so that it returns safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rocket.

11. Recovery Safety. I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

www.nar.org

ESTES®

Our return policy

YOU'RE COVERED WITH THE ESTES FULL ONE-YEAR WARRANTY

Your Estes model rocket product is warranted against defects in materials or workmanship for one year from the date of the original purchase. If this Estes product, because of a manufacturing mistake, malfunctions or proves to be defective within the one-year warranty period, it will be repaired or replaced, at Estes' option and at no charge to you.

This warranty does not cover incidental or consequential damage to persons or property caused by the use, abuse, misuse, failure to comply with operating instructions or improper storage of the warranted products. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

For repair or replacement under this warranty, please contact us at www.estesrockets.com or by mail at Estes Industries, LLC, Customer Service Department, 1295 H Street, Penrose, Colorado 81240-9698.

INDEX

Rockets

General

Estes catalogs are highly collectible! We recommend keeping it but if you choose not to, please recycle.

Please Recycle This Catalog

Prices and availability are subject to change without notice. Color of product may vary.

Get Involved!

Below you'll find links to the web pages of respected groups and institutions who support our contributions to the development of young people. Like Estes, many of these organizations provide their own unique learning opportunities for students, youth leaders and teaching professionals. Together, we strive to create an environment rich with resources to keep your students interested, inquisitive, and inspired. Please take a moment to visit their sites today.

nar.org

rocketcontest.org

spacecamp.com

girlscouts.org

ymca.net

scouting.org

challenger.org

4-h.org

gocivilairpatrol.com

BOYS & GIRLS CLUBS OF AMERICA
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