World Space Week OCTOBER 4-10

ROCKET REVOLUTION

TOOLKIT 2026

Launch. Learn. Explore.

Activities and resources for classrooms, families, clubs, and communities around the world.

Brought to you by

ESTES education

Welcome to the Rocket Revolution

World Space Week 2026 is calling on classrooms, families, clubs, and communities worldwide to launch rockets together during October 4 to 10!

This year's theme, **Rocket Revolution,** celebrates the changing world of space launch and the many ways people can explore rocketry today.

For participants with the right age range and local permissions, a model rocket launch can be a memorable way to take part. Estes rocket activities bring the full launch process into the experience: building the rocket, preparing for liftoff, testing the flight, and recovering it after landing.

This toolkit also includes simple rocket activities such as balloon rockets, baking soda rockets, stomp rockets, coloring pages, classroom lessons, and community challenges, so everyone can take part at home, at school, or in their communities.

Pick an activity that works for your group. Build it. Test it. Launch it during World Space Week.

For additional rocketry resources beyond this toolkit, visit Estes Education: https://edu.estesrockets.com/.

Don't let your launch disappear after liftoff!

Register it at www.worldspaceweek.org and add your rocket activity to the official World Space Week map. Your classroom, home, club, or community event will stand alongside rocket activities happening around the world during October 4 to 10.

Join the Rocket Revolution Photo & Video Contest during World Space Week 2026!

World Space Week Association will also run a Rocket Revolution Photo and Video Contest during World Space Week 2026.

Here is how to enter:

1. Launch your rocket between October 4 and 10. You can use any rocket activity from our official toolkit.

2. Have a physical "World Space Week" poster, logo, or handwritten text visible in your photo or video (digital text overlays do not count).

3. Post your launch on Instagram or TikTok and tag us using @worldspaceweek on Instagram or @world.space.week on TikTok.

4. Register your event at www.worldspaceweek.org.

Selected winners will receive a rocket from **Estes!** *

Launch something, register your event, and show the world how you joined the Rocket Revolution.

** Terms and conditions apply.*

* World Space Week Association reserves the right to substitute any prize if shipping the original prize to the winner's location is legally restricted or logistically unfeasible.

The History of Rockets

Time 40 minutes

Materials

- YouTube Video - Mission: Rocket Science - Intro to Rocket History
- History of Rockets PPT
- Interactive Timeline Cards (see below) - one set for each group, shuffled out of order

Description

Explore the origins and evolution of rocketry, understanding key milestones and innovations.

Outline

Introduction (10 minutes):

- Watch Mission: Rocket Science - Intro to Rocket History video
- Review the History of Rockets PPT

Interactive Timeline Activity (30 minutes):

- Get into small groups and have each group receive a set of printed timeline cards out of order.
- Groups work together to place the cards in chronological order.
- Discuss each milestone briefly, connecting past innovations to today.

Fire Arrows

Chinese Fire Arrows

President Kennedy's Moon Speech

John F. Kennedy, US

Successful rocket launch with liquid fuel

Robert Goddard, US

"That's one small step for a man, one giant leap for mankind."

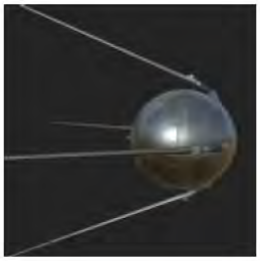
First 2 U.S. astronauts step on the moon.

Neil Armstrong, US

V-2 Rocket reaches the edge of space

Wernher von Braun, Germany

Sputnik 1 is launched into orbit!



Soviet Union

The Future of Rockets

Time 45 minutes

Materials

- YouTube Video - Mission: Rocket Science - Intro to Rocket History
- Future of Rockets PPT
- Poster paper, pens / pencils, and coloring materials

Description

Discuss and imagine the future of rocketry, focusing on Moon and Mars missions, reusable rockets, and space exploration technology.

Outline

Introduction (10 minutes):

- Watch Mission: Rocket Science - Intro to Rocket History video
- Review the Future of Rockets PPT, which includes NASA's Artemis program and SpaceX's reusable rockets

Design Phase (20-25 minutes): Create a poster about a Moon or Mars Mission that answers the following:

- Mission Name: What will you call your mission?
- Rocket Design: Draw the rocket and explain how it will work.
- Mission Goals: What will your mission do on the Moon (e.g., explore water, ice, build habitats, test new technology)?
- Crew and Equipment: Who's going and what will they bring?
- Future Vision: How will your mission prepare for Mars or beyond?
- Decorate your poster with drawings, diagrams, or even cutouts from magazines (optional).

Presentation (10-15 minutes):

- Present your poster to the group, explaining your mission plans.

Resources

The Artemis campaign :

NASA Artemis website
NASA SLS STEM Activities

Newton's Laws and Rocketry

Time 30 minutes

Materials

- YouTube Video - Mission: Rocket Science – Newton's Laws
- Newton's Laws and Rocketry PPT
- Film Canisters, effervescent tablets (such as Alka Seltzer), paper towels, water, timer, safety glasses
- Optional Film Canister Rockets Reflection

Description

Learn how Newton's three laws of motion apply to rockets and test these concepts in a hands-on experiment.

Outline

Introduction (5 minutes):

- Watch Mission: Rocket Science – Newton's Laws video
- Review the Newton's Laws and Rocketry PPT

Hands-On Activity: Film Canister Rockets (20 minutes):

- Wear safety glasses.
- Fill the canister half full of water.
- Break an effervescent tablet into close to 2 equal pieces.
- For Trial 1, drop 1 of the tablet pieces into the canister, quickly seal the lid, set upside down on the table, and step back to observe.
- Clean and reset the canister half full of water.
- For Trial 2, use 2 of the tablet pieces, quickly seal the lid, set upside down on the table, and step back to observe.
- Compare the two launches and record your observations.

Reflection (5 minutes):

- Discuss: "Which of Newton's laws was most obvious in this activity? How do these laws explain how real rockets work?"

Newton's Laws and Rocketry
Countinued

Reflection Talking Points

Focus on **Newton's Third Law of Motion** with simple connections to rockets: **"Every action has an equal and opposite reaction."**

- The gas produced pushing the lid downward is the "action," and the canister flying upward is the "reaction."
- In a real rocket, gases pushing downward out of the engine create an upward push that lifts the rocket, just like film canister rocket.

Name:_____ Date:_____ Class:_____

Film Canister Rockets Reflection

Objective: Explore how chemical reactions produce gas and how gas pressure can create propulsion, demonstrating Newton's Laws of Motion.

How It Works: When the Alka-Seltzer reacts with water, it creates carbon dioxide gas. This gas builds up pressure inside the sealed canister until the lid pops off. **Newton's Third Law of Motion** explains what happens next: **For every action, there is an equal and opposite reaction.** The gas pushes the lid one way, and the canister is propelled in the opposite direction, just like a real rocket!

Understand the Activity:

1.Describe what you did during the activity.

What steps did you take to prepare and launch your rocket?

2.What did you observe during the launches?

Describe what happened with each trial, including any differences between launches.

3.How did the amount of Alka-Seltzer affect the launch?

What changes did you notice in the height or force of the launches when you used different amounts of Alka-Seltzer?

4.Which of Newton's laws was most obvious in this activity?

Explain how this law applies to the rocket launch.

5.How do Newton's laws explain how real rockets work?

Connect what you observed to how rockets launch into space.

Rocket Parts Matching and Coloring

Time 15-20 minutes

Materials

- Parts of a Model Rocket PPT
- Coloring materials and Model Rocket Parts Diagram
- **Optional:** Assembled model rocket, or Phantom display rocket

Description

Learn the different parts of a model rocket.

Outline

Introduction (10 minutes):

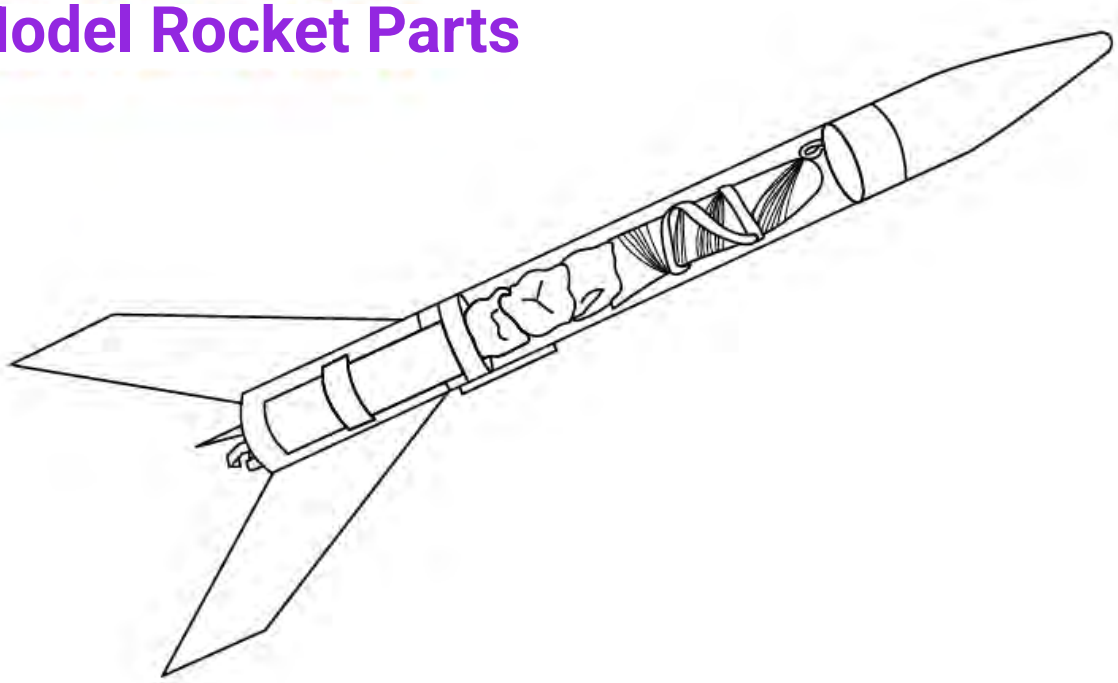
- Review the Parts of a Model Rocket PPT.

Model Rocket Parts Activity (10 minutes):

- Complete the Rocket Diagram Handout using crayons or colored pens, and match each part to its description and location on the rocket.

Name:_____ Date:_____ Class:_____

Model Rocket Parts



Instructions:

Write the letter for the correct description of each part. Then choose a color for the part and color in the box. Then, use that color to indicate the part in the Model Rocket Parts diagram.

1.Nose Cone ___ ☐

2.Body Tube ___ ☐

3.Engine ___ ☐

4.Fins ___ ☐

5.Recovery Wadding ___ ☐

6.Recovery System (Parachute) ___ ☐

7.Launch Lug ____ ☐

a. A material inside the body tube that protects the parachute from the engine's heat.

b. Flat parts at the bottom of the rocket that help keep it flying straight.

c. The pointed top of the rocket that helps it move smoothly through the air.

d. The main frame for the rocket.

e. Helps slow descent, so the rocket lands safely.

f. A small, hollow tube that slides over the launch pad rail for a straight liftoff.

g. Contains propellant to give the rocket power to lift off the launch pad

How To:

Build a Baking Soda and Vinegar Rocket

A fun and simple rocket activity project you can try at home!

Materials

- 1 Plastic Bottle
- 2-3 tablespoons of Baking Soda
- Vinegar (100-150 ml)
- Cork or rubber stopper
- Tape
- Card stock or foam fins

Safety First!

- Launch outside in an open area.
- Never point the rocket at people, animals, or objects.
- Wear eye protection.
- Adult supervision required.

Why Does It Work?

When baking soda (*sodium bicarbonate*) mixes with vinegar (*acetic acid*), a chemical reaction occurs that produces carbon dioxide gas. The gas builds up pressure inside the bottle. When the cork pops out, the gas rushes out, pushing the rocket upward!

The Process

1. Position the bottle upside down (the cap location will be the bottom of the rocket) and decorate by adding fins and a nose cone, if you would like.

Pro Tip: When adding fins, it might useful to engineer them so they act as "legs" for the rocket to stand on while launching.

2. Test fit the cork so it fits snugly in the mouth of the bottle. You might need to trim it a bit depending on cork size. It should be snug, not forced in.
3. Add 2-3 tbsp of baking soda into the bottle.
4. Add 100-150 ml of vinegar. **Quickly** place the cork in the bottle, place the bottle on the ground, and then step back.
5. The pressure builds, the cork pops out, and your rocket launches!

Tips and Ideas

- Try different amounts of baking soda or vinegar.
- Change the shape and size of the fins.
- Decorate your rocket and make it your own!

Share your launches!

Tag us with **#WSW2026** during World Space Week (Oct 4–10)!

How To:

Make a Balloon Rocket

A simple rocket activity for children!

Materials

- 1 Balloon
- String
- 1 Straw
- Scissors
- Tape
- 2 chairs or objects to attach string to

Safety First!

- Ask an adult to help with scissors and tape.
- Keep the string away from faces.

Why Does It Work?

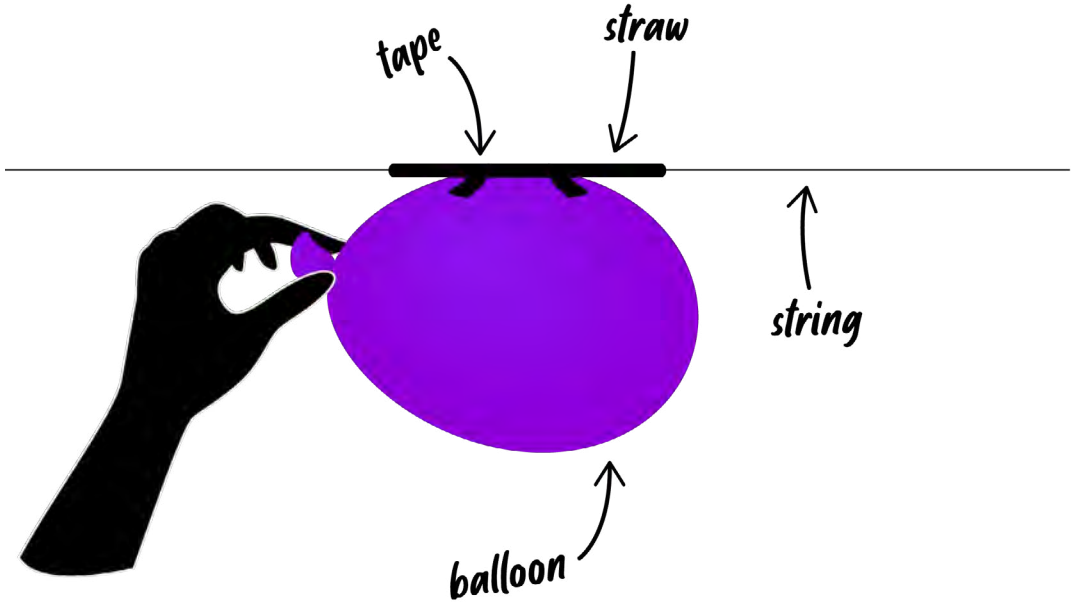
Air rushes out of the balloon in one direction. That push sends the balloon rocket in the opposite direction.

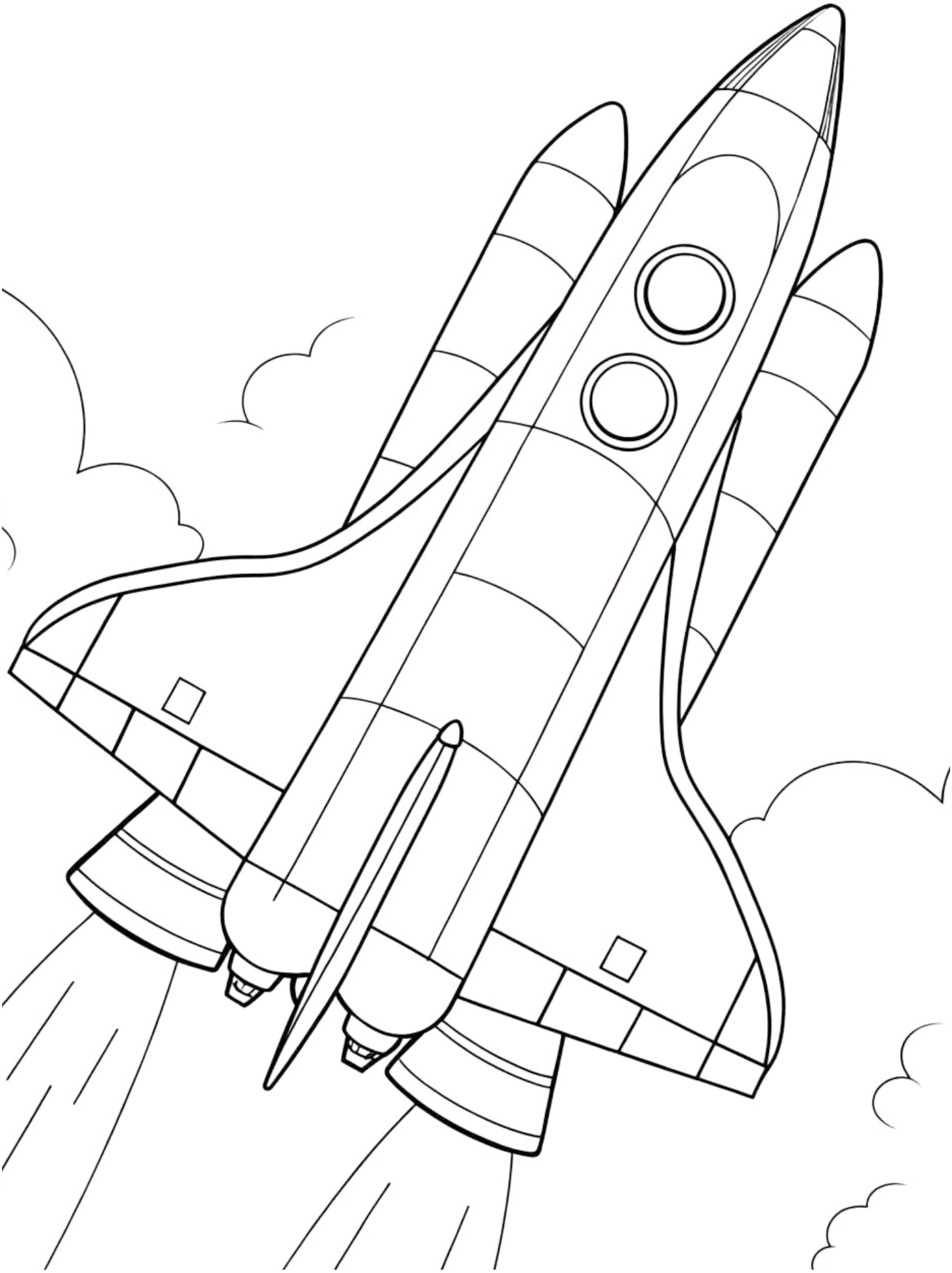
The Process

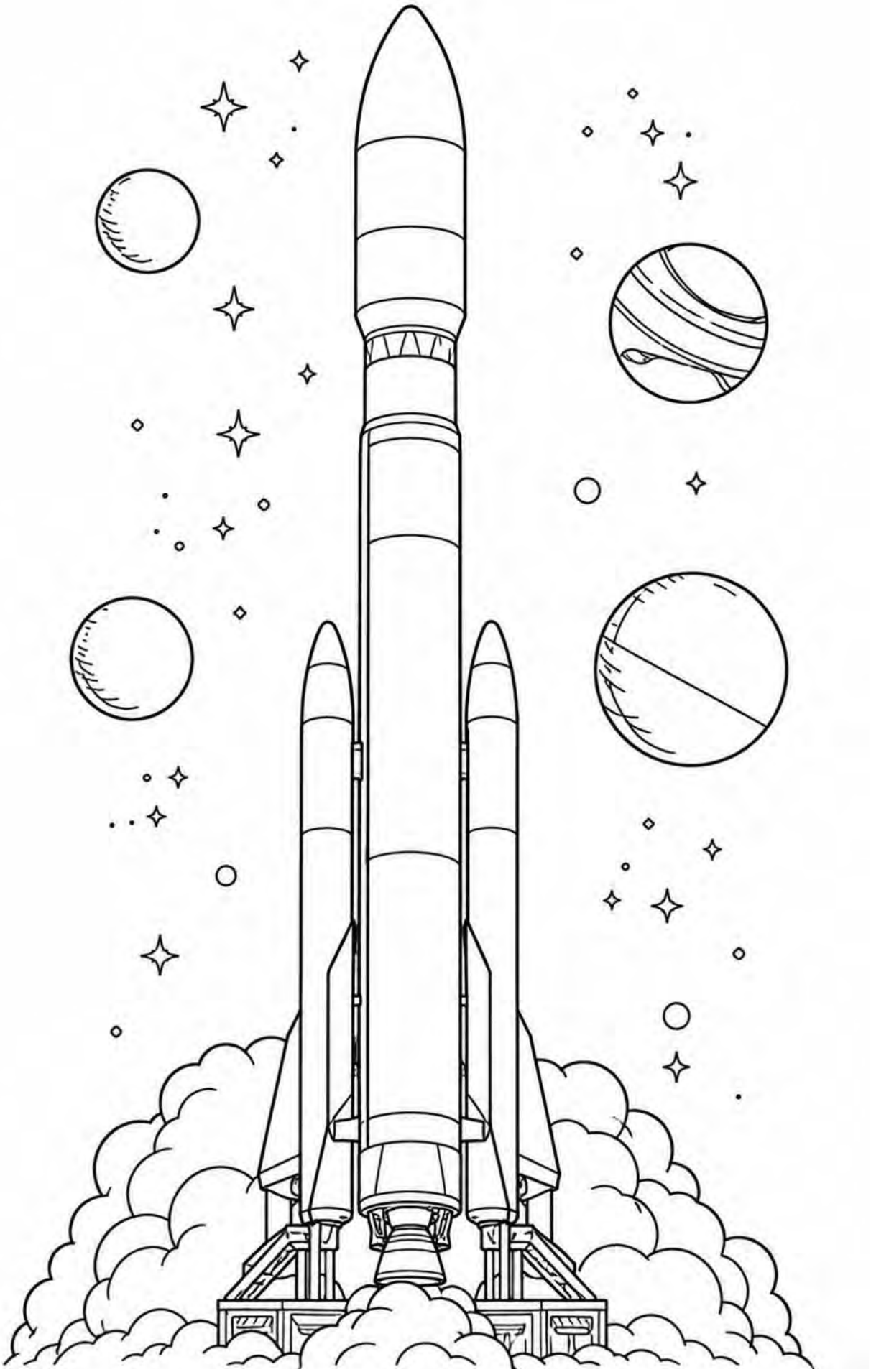
1. Tape one end of the string up high.
2. Blow up the balloon, but do not tie it. Hold the opening closed.
3. Tape the straw onto the balloon as shown.

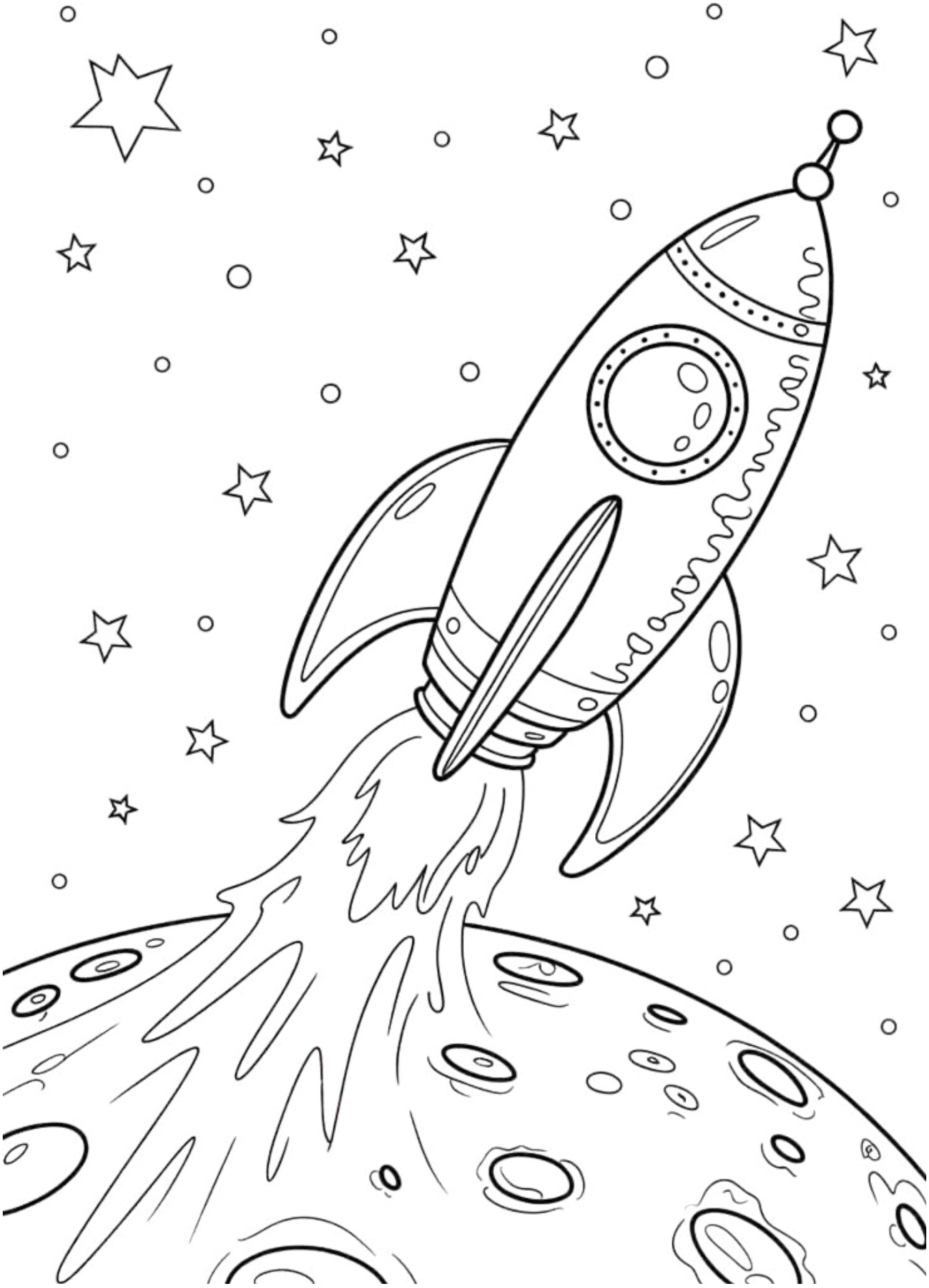
Pro Tip: Students can experiment with cutting the straw to different lengths as an additional engineering challenge to see which length works best.

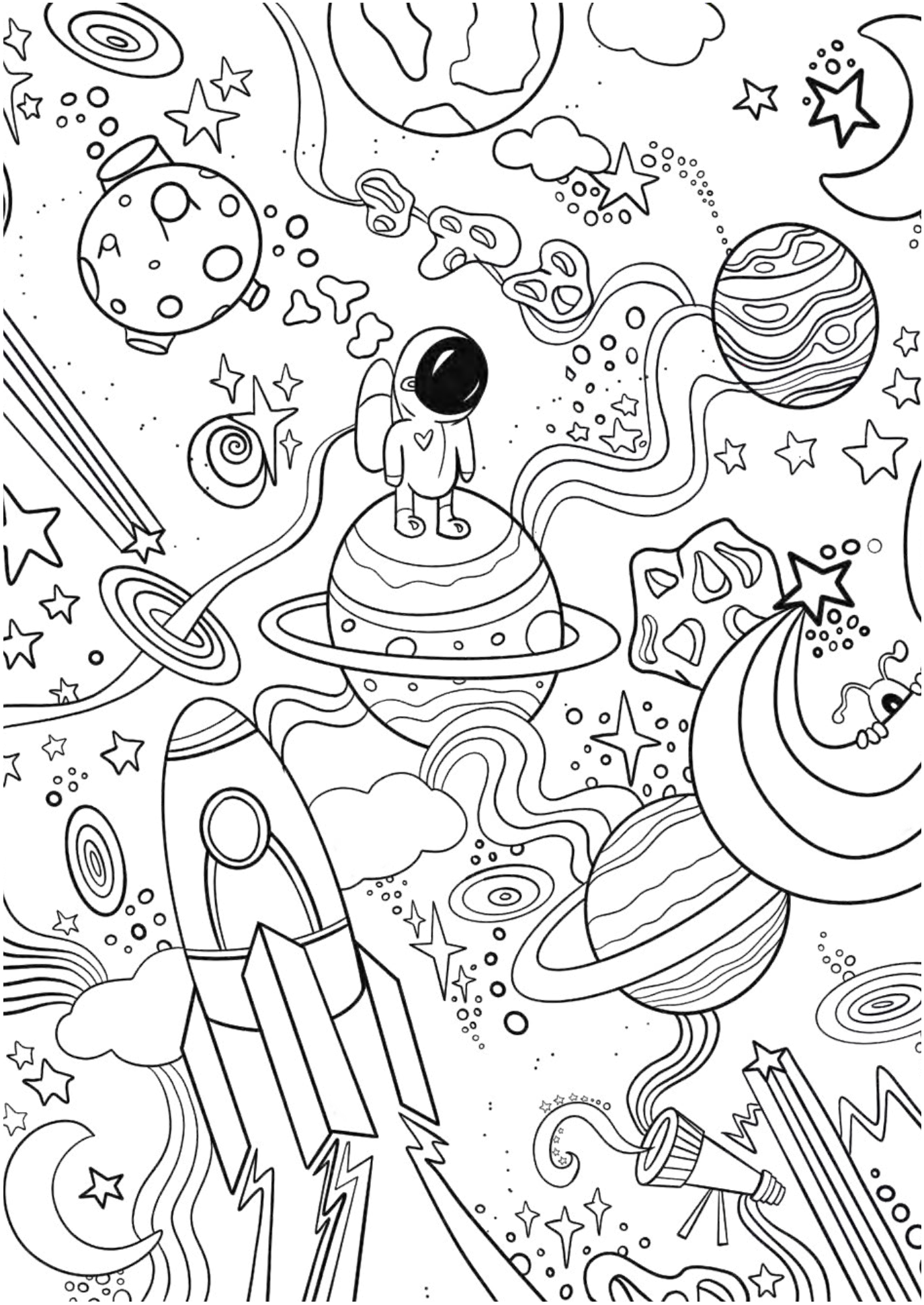
4. Thread the string through the straw. Tape the other end of the string lower, or ask someone to hold it.
5. Move the balloon to the low end of the string.
6. Let go and watch it zoom!











Additional Resources:

- Mini Missions: Estes Stomp Rockets
- Mini Missions: Estes Stomp Rocket Launcher
- New to Model Rocketry page

Answer Key

The History of Rockets

1. Fire Arrows - 1025 A.D.
2. President Kennedy's Moon Speech – 1962
3. First successful rocket launch with liquid fuel - 1926
4. First US Astronauts step on the Moon – 1969
5. V-2 Rocket reaches the edge of space – 1967
6. Sputnik 1 is launched into orbit - 1957

Model Rocket Parts

1. Nose Cone - c
2. Body Tube - d
3. Engine - g
4. Fins - b
5. Recovery Wadding - a
6. Recovery System (Parachute) - e
7. Launch Lug - f