

Help

Gravity & Parachutes



A story-connected science investigation for elementary learners

At a glance Grades: 2–4 • Time: 45–55 minutes • Subjects: Science, design, speaking and listening

In this investigation, students connect the story *Help* to a safe test of gravity and air resistance. They design a small parachute, make a prediction, observe repeated drops, and use evidence to explain which design choices affected the fall.

Learning goals

Students will describe gravity as a force that pulls objects toward Earth, identify air resistance as a force that can slow a falling object, and use observations to compare parachute designs.

Success looks like

Students make a testable prediction, record observations, and support a conclusion with evidence from at least two trials.

Story connection Read the supplied *Help* story, or revisit the moment when Rocket uses a parachute to return to the ground. Tell students: “Our classroom test will investigate the parachute idea safely. We will use a lightweight object, not an animal or a person.”

Teacher Guide

Vocabulary

- **gravity:** A force that pulls objects toward Earth.
- **air resistance:** A force from the air that can slow a moving object.
- **parachute:** A canopy that uses air resistance to slow a descent.
- **variable:** One feature that can be changed or observed in a test.

Materials per group

- One square of lightweight plastic or tissue paper, about 25 cm by 25 cm.
- Four equal lengths of string, about 30 cm each.
- Tape, scissors, a paper cup or small paper clip as a test mass, and a ruler or meter stick.
- Student investigation page and pencil.

Preparation

Prepare a clear drop zone. Students should release parachutes from a teacher-approved height while standing on the floor or beside a stable step platform. Keep the test mass very light. Do not drop objects toward people, animals, windows, or breakable equipment. For a fair comparison, have students change only one design feature at a time when possible.

Procedure

1. **Notice and wonder — 5 minutes.** Ask students what happened to Rocket when the parachute opened in the story. Collect ideas about falling, slowing down, and the movement of air.
2. **Introduce the science — 7 minutes.** Explain that gravity pulls the parachute and test mass downward. The canopy pushes against the air as it moves, creating air resistance that can slow the fall. Gravity still acts while the parachute is open.
3. **Design — 8 minutes.** In groups, students attach four strings to the corners of the canopy and connect the strings to the test mass. Check every connection before testing.
4. **Predict — 5 minutes.** Students predict what will happen if the canopy is larger, smaller, opened, or crumpled. Emphasize that a prediction is an idea to test, not a guess that must be correct.

5. **Test — 15 minutes.** Groups conduct at least three drops of the same design. They release the parachute without pushing it and record whether the fall was fast, medium, or slow. If time allows, groups test one changed feature and compare the results.
6. **Explain — 8 minutes.** Students use their data to complete the conclusion. Ask them to name the design feature they changed and the evidence that supports their claim.

Safety checkpoint Students release parachutes from a safe height. They never jump, climb on furniture, attach a parachute to a person or animal, or drop materials over a stairwell. A teacher or adult controls any elevated testing location.

Discussion prompts

- What force pulled the parachute downward?
- What did the canopy do to the air?
- Which design change made the biggest difference?
- How did repeated trials make your conclusion stronger?

Student Investigation Page

Name: _____

Date: _____

Your challenge Design and test a parachute for a lightweight object. Your goal is to make a fair test and use evidence to explain how gravity and air resistance affected the fall.

1. Predict

I predict that the parachute will fall ...

My prediction and reason:

2. Record your trials

Trial	Design used	Fast, medium, or slow?	What I noticed
1			
2			
3			
4			

3. Compare

The design feature we changed was ...

What changed in the design?

The parachute with the slower fall had ...

Describe the canopy, strings, or test mass.

4. Explain with science

Gravity pulled the parachute ...

Complete the sentence.

Air resistance ...

Complete the sentence.

Teacher Check & Extension

Suggested evidence-based answer

A parachute falls because gravity pulls it toward Earth. Its canopy meets the air and creates air resistance, which can slow the descent. A larger, more open canopy often creates more air resistance than a smaller or crumpled canopy, but students should use their own trial results as evidence because design details and testing conditions matter.

Fair-test reminders

For a useful comparison, students should keep the test mass, drop height, release method, and number of trials as consistent as possible. They should change only one main design feature at a time. If two trials produce different results, students can repeat the test and explain that real investigations include variation.

Formative assessment

Look for three ideas: students identify gravity as the downward pull, students describe air resistance as a force that can slow the fall, and students refer to recorded observations rather than saying only that one design “worked better.” Ask, “What did you observe that makes you think that?”

Optional extension: Design challenge

Give groups a new constraint, such as using a smaller canopy or fewer pieces of tape. Students revise one feature, explain why they changed it, and compare the revised design with the original. They should keep the test safe and use the same test mass and drop height.

Teacher language for a closing conversation “In the story, the parachute helps Rocket return to the ground. In our investigation, the parachute did not remove gravity. It changed how strongly the air resisted the falling object.”