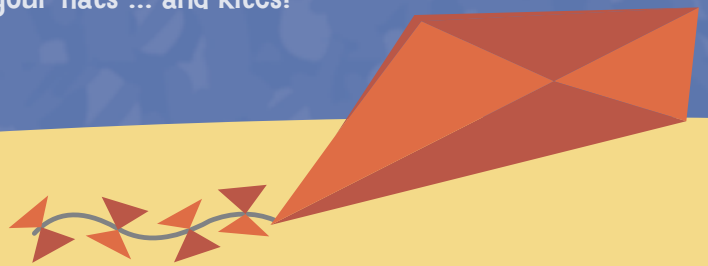
Go Fly a Kite

Activity 5

Airplanes, butterflies, and birds. How do they stay up while gravity pulls them down? In this activity, kids build kites out of household materials and explore how kites use wind to overcome gravity—even indoors! Hang on to your hats ... and kites!



Prepare Ahead

- Prepare a table with kite-making materials.
- Make a sample kite, following the directions on the kids' activity sheet.

Lead the Activity

1 **Introduce Ruff's challenge.** (10 minutes) Explain that today's challenge is to make kites that catch enough air to fly indoors. Most of the time, we don't notice air. Have kids hold up their hands, keeping them still. Then have them wave their hands back and forth. Ask kids what they feel when they move their hands. *(They feel the air making contact with their hands.)* Have them blow onto their hands and feel how forceful moving air can be.

Show kids an open sheet of paper and another sheet crumpled into a ball. Point out that the two sheets of paper are identical, but that you made one into a ball. Before dropping each one, ask:

- How will the ball of paper fall when I drop it? *(It will fall straight to the ground.)* How about the flat sheet of paper? *(It will drift to the ground.)*
- What is the name of the force that pulls the paper down? *(Gravity)*
- Why did the pieces of paper act so differently when I dropped them? *(Air is something! It is made of gas particles, such as oxygen, nitrogen, and carbon dioxide. The open sheet hits more of these particles, which slows it down.)*
- Kites are heavier than air. How do they stay in the air? *(When there's a wind, the air particles push on the kite, lifting it up.)*
- What features help a kite fly? *(Key features include being lightweight to minimize the pull of gravity; big enough to catch a lot of air; strong enough to handle the wind; and flying at an angle so the air can push on the kite and lift it up.)*

Materials

- Activity sheet for each kid
- Sheets of 8.5 x 11 paper (colored paper is fun)
- Wooden skewers
- Tail materials (e.g., paper streamers, ribbons)
- Scissors
- Hole punch
- Tape
- Rulers
- Lightweight string

National Science Education Standards

Grades K–4
Physical Science:
Position and motion of objects

Science and Technology:
Abilities of technological design

Grades 5–8
Earth and Space Science:
Earth in the solar system

Science and Technology:
Abilities of technological design

2 Make predictions. (5 minutes) Show the sample kite. Point out the sail, crosspiece, tail, and string attachment point. Ask kids to predict how each part helps a kite to fly. Record their ideas. *(Air pushes on the sail. The crosspiece keeps the sail stiff when the air pushes on it. The tail and attachment point keep the sail at an angle so the push of the air lifts the kite up.)*

3 Build kites. (15 minutes) Hand out the activity sheets. Have kids make their kites, following the directions. Give a two-minute warning before the end of the building time. As an alternative, lead the group step by step through the instructions. Doing each step together can minimize confusion and everyone will finish at the same time.

4 Test predictions by flying kites. (15 minutes) Have kids experiment with how fast they need to move to keep their kites flying. Challenge them to change one thing about their kites to make them fly better.

5 Discuss what happened. (10 minutes) Bring the group back together. Ask:

- When air pushes on the bottom of the kite, how does the kite move? *(Upwards)*
- How did you get air to push on the bottom of your kite? *(By pulling it through the air)*
- What are some ways to improve how a kite flies? *(You can increase the amount of air pushing on the kite by increasing the sail size or adjusting the flight angle. You can also minimize the effect of gravity by reducing weight.)*

6 Award points. (5 minutes) Time to rack up some points. Gather as a group. Review the activity's key ideas by asking everyone the following questions. Each question is worth 50 points. Whenever you hear an acceptable answer, award 50 points to the entire group.

- Do something that demonstrates gravity. *(Kids can drop a pencil or jump up and down.)*
- Name two things that depend on moving air to stay airborne. *(Birds, airplanes, kites, paper airplanes, hang gliders, etc.)*
- When you skip or walk faster, why does your kite go higher? *(It goes higher because there is more air pushing on the kite.)*
- What's a possible advantage and a possible disadvantage if you tripled the size of your kite? *(The larger size would catch more air, which could be an advantage. It would also weigh more, which might be a disadvantage.)*
- Doing science and engineering involves making predictions, testing them (which includes doing something, making observations, and drawing conclusions), and sharing your results. Give an example of how we did these steps today. *(Answers will vary.)*

Activity Tips

- Do this activity in a room with lots of space for moving around.
- Define a testing area where kids can safely move with their kites one at a time.
- To generate more wind for the kites, let kids walk quickly or skip.
- Kids' bodies will block the air a kite needs to fly properly. Have them start by holding their kites out to the side and walking or running with the kites away from their bodies.
- Tell kids to begin by holding the string lightly where it attaches to the kite and to let it out gradually when the kite tugs as it begins to fly.