

Chapter 6 Project: Go Fly a Kite

Beginning the Chapter Project

If you think kites are mere child’s play, think again. From ancient China to modern times, geometric arrangements of fabric and rods have helped people rescue sailors, vanquish enemies, predict the weather, invent the airplane, study wind power, and entertain themselves with displays of aerodynamic artistry.

In your project for this chapter, you will turn a sheet of paper and a couple of staples into a fully functioning kite. You will explore how weight and form determine whether a kite sinks or soars. Finally, you will design, build, and fly your own kite. You will see how geometry can make a kite light and strong—spelling the difference between flight and failure.

Activities

Activity 1: Doing

Building a kite usually takes a lot of time, patience, and care. You can build a simple paper kite by following these directions.

Draw diagonals to find the center of an $8\frac{1}{2}$ -in. by 11-in. sheet of paper. Then fold the paper, creasing only about a half-inch past the center, to form the keel.

Bend each of the front corners of the paper out over to the keel. With a single staple, attach both corners to the keel and to each other about 1 in. from the front of the kite.

Attach one staple perpendicular to the keel as shown, and tie one end of a spool of thread to it. Your kite is ready to fly.

Write a paragraph that describes how your kite flew and any modifications you might make to your kite to make it fly better.

Activity 2: Analyzing

Weight and area exposed to the wind are key factors in kite design. The greater the *effective area* facing the wind and the lighter the kite, the less wind you need to get the kite off the ground.

1. In Figure 1, a face of the square box kite is perpendicular to the wind. Describe the shape of the effective area.
2. In Figure 2, a diagonal brace of the square box kite is perpendicular to the wind. Describe the shape of the effective area and the difference between this effective area and the effective area in Figure 1.
3. Where on a box kite would you tie the string to get the greatest effective area? Explain.

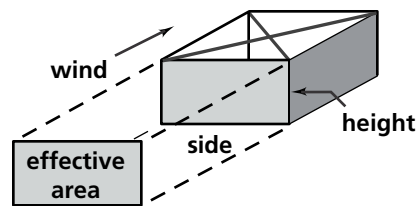
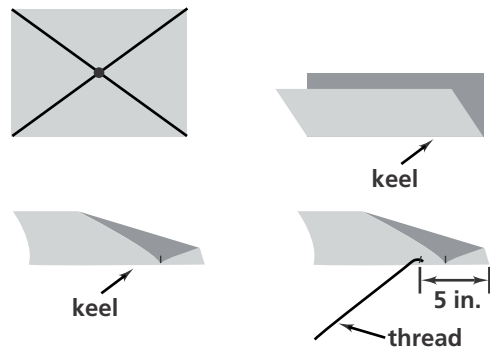


Figure 1

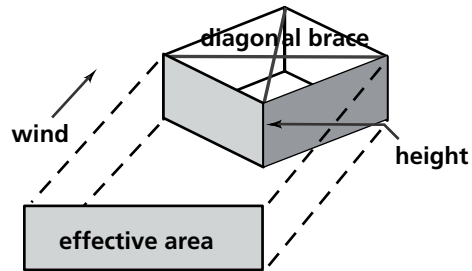


Figure 2

Chapter 6 Project (continued)

4. If you use two different lengths of wood for the diagonal braces of a box kite, you can make a rhomboid box kite. Explain why changing a square box kite to a rhomboid box kite can increase the effective area.

Activity 3: Researching

To help you decide what kind of kite you will design and build for this project, research at least three different kinds of kites. Books, magazines, and the Internet are good sources of information. Summarize your research. Include the following in your report:

- a description and sketch of each kite
- a list of materials needed to build each kite
- the wind conditions for which each kite is suited

Finishing the Project

Design and construct a kite, and then fly it. Include complete plans for building the kite, specifying the size, shape, and material for each piece. Use geometric terms in your plans. Experiment with different designs and models. Describe how your model performs and what you would do to improve it.

Reflect and Revise

Ask a classmate to review your project with you. Together, check that the diagrams and explanations are clear, complete, and accurate. Have you tried several designs and kept a record of what you learned from each? Could your kite be stronger, more efficient, or more pleasing to the eye? Revise your work as needed.

Extending the Project

Research the history of kites. Try to find examples of each use mentioned in the opening description of the project. You might make an illustrated time line to show special events, such as Benjamin Franklin’s discovery about lightning and electricity and Samuel Cody’s man-lifting kite.



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