

Ben Franklin's Kite

Reporting Category Number and Number Sense

Topic Exploring fractions

Primary SOL 1.3 The student will identify the parts of a set and/or region that represent fractions for halves, thirds, and fourths and write the fractions.

Materials

- 8 x 12 inch construction paper
- String or yarn cut into 8-inch lengths
- Cardstock
- Scissors
- Crayons
- Tape

Vocabulary

shapes, equal, part, whole, fraction, half, halves, one-half, two-halves, thirds, one-third, two-thirds, three-thirds, fourths, one-fourth, two-fourths, three-fourths, four-fourths, set, region

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Note: Before beginning this activity, prepare cardstock tracers for a kite, a bow, and a key, using the patterns found on page 3.

1. Begin the activity by recounting the story of Benjamin Franklin and the kite. Include descriptive details about the shape of a kite, the bows that are attached to a kite's tail, and the key that Franklin attached to the end of the tail during his experiment with lightning.
2. Distribute a sheet of construction paper to each student, and ask students to identify the shape of the paper (a rectangle—opposite sides are the same length). Pass out the kite tracers, and ask students to trace the kite shape on the construction paper and cut it out.
3. Direct students to place the kites on their desks and fold them carefully along the vertical axis. Model the folding, and assist students who need help. Then, have students open their kites. Ask, "How many equal parts of the whole shape are there? Are these equal parts the same shape? If they are, what shape are they?" Discuss the shapes, pointing out how the kite shape is now divided into two halves of the whole shape.
4. Direct students to decorate one-half of the kite with one color or pattern and the other half with another color or pattern so that they can clearly distinguish the two halves. Next, have the students label the two halves of the kite with the fraction $\frac{1}{2}$.
5. Show students how fractions can also be represented another way (i.e., by showing part of a set instead of part of a region). Ask the students to describe ways that the fractions $\frac{1}{3}$ or $\frac{1}{4}$ could be represented using kite bows. For example, to represent $\frac{1}{3}$ using a set model, you could color one of a set of three bows a different color than the other two, or to represent $\frac{1}{4}$, you could color one of a set of four bows a different color than the other three.

6. Provide 8-inch pieces of string or yarn, construction paper scraps of one color, crayons, tape, and cardstock tracers of a kite bow and a key. Direct students to trace and cut out three or four bows, depending on the fraction they want to represent: $\frac{1}{3}$ or $\frac{1}{4}$. Also, have them trace and cut out a key. Instruct students to color one of their bows on both sides a bright color that contrasts with the color of the construction paper. Also, have them write on both sides of the colored bow the fraction that bow represents: $\frac{1}{3}$ or $\frac{1}{4}$.
7. Guide students in taping their bows to the string at two-inch intervals and the key to one end of the string. Then, have them tape the other end of the string to the bottom tip of the kite. Hang the kites in the classroom or hallway to represent the fractions $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$.

Assessment

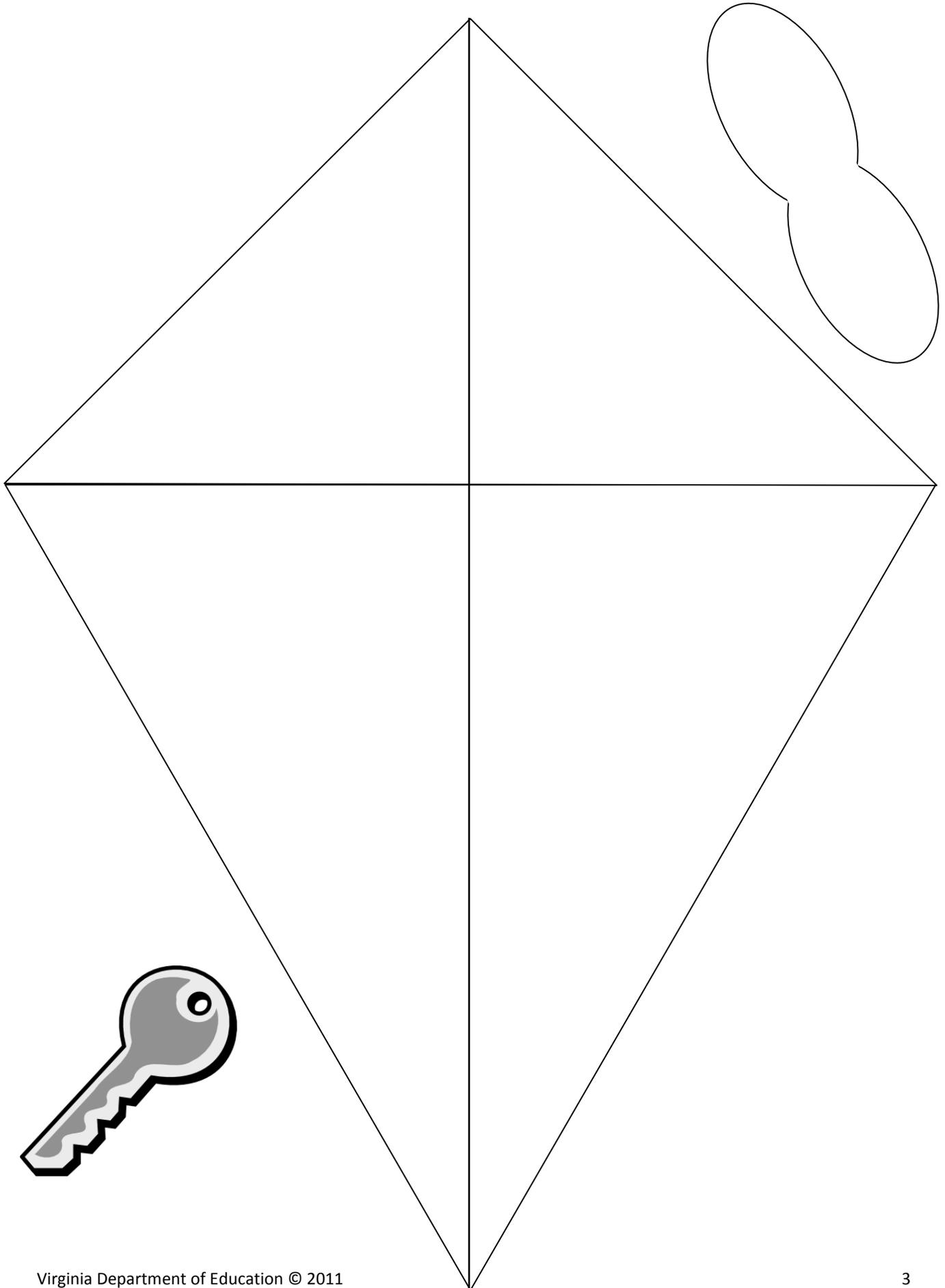
- **Questions**
 - “When you made your kite, you showed two different fractions in two different ways. How did you show one-half? What fraction is represented by your bows?”
 - “How can you fold a sheet of construction paper to represent one-half? How can you fold another sheet of paper to show one-fourth? Which is larger, one-half or one-fourth? How do you know?”
- **Journal/Writing Prompts**
 - “Draw and tell how you created two different fractions with your kite. Make sure you label your picture to show the fractions you made.”
 - “Tell how the fraction showing one-half of the kite and the fraction showing one-third or one-fourth of the bows are alike and different.”
- **Other**
 - Analyze student questions and observations, either verbal or written, as a means of assessing student learning. Can each student identify, represent, and write the fractions correctly?

Extensions and Connections (for all students)

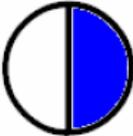
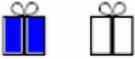
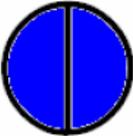
- Set up a math center in which students can create shapes from clay with cookie cutters and then cut these shapes into halves, thirds, and fourths with craft sticks.
- Have students glue a picture of Benjamin Franklin in the center of their kites with the labels, “Statesman,” “Inventor,” “Scientist,” “Writer,” around the picture.
- Have students create kites whose bows represent yet more fractions, such as $\frac{2}{4}$ (two red bows out of four) or $\frac{3}{3}$ (three bows of one color).
- Distribute copies of the charts found on pages 4 and 5, and discuss how each fraction is represented in two ways—by part of a region and by part of a set. Ask what is represented by a fraction whose upper and lower numbers are the same: $\frac{2}{2}$, $\frac{3}{3}$, $\frac{4}{4}$ (a whole). Post large copies of these charts for students to reference.

Strategies for Differentiation

- Allow students to explore ways to represent the fractions $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$, using concrete objects such as pattern blocks, linking cubes, or two-colored counters.
- Allow students to use fraction cards to match to given region models and set models.



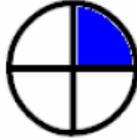
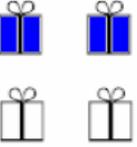
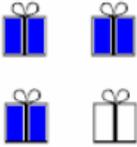
Halves

$\frac{1}{2}$		
$\frac{2}{2}$		

Thirds

$\frac{1}{3}$		
$\frac{2}{3}$		
$\frac{3}{3}$		

Fourths

$\frac{1}{4}$		
$\frac{2}{4}$		
$\frac{3}{4}$		
$\frac{4}{4}$		