Rocket Strips

Dividing a Whole into Fractional Parts

WARM UP

1. If two people equally split one donut, how much of the donut does each person receive?
2. If three people equally split one donut, how much of the donut does each person receive?
3. If *n* people equally split one donut, how much of the donut does each person receive?

LEARNING GOALS

• Create equal parts of a whole.
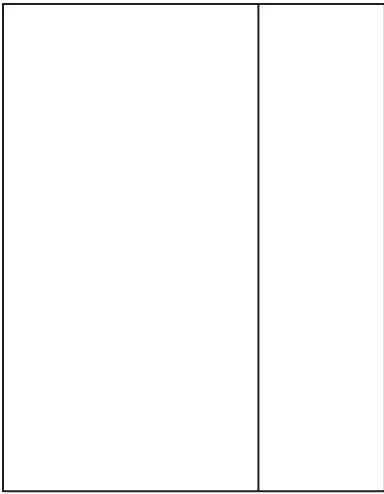• Determine whether fractions are equal.

KEY TERMS

• unit fraction
• equivalent fractions

You have used concrete models to determine factors and multiples. How can you use strip diagrams to represent and compare fractions with different denominators?

Newspaper Column Preparation

You signed up to participate in the school newspaper club. During the first meeting, faculty advisors Ms. Foster and Ms. Shu showed everyone copies of last year's publication of the *Rocket*. The teachers have already planned out the sections for this year's *Rocket*.

Matthew volunteered to create the "Random Acts of Kindness" section of the school newspaper, the *Rocket*. The section will appear along the right side of the paper's back page. The newspaper is printed on $8\frac{1}{2}$-inch by 11-inch paper.

Matthew plans to put a box in each homeroom and ask students to nominate classmates for the monthly recognition of random acts of kindness. Students must tell what nice act their nominee performed on a nomination slip.

In preparation for completing his section, help Matthew plan the layout of the column; do not worry about the top or bottom margin of the page.

> The paper strips are provided for you at the end of this lesson.
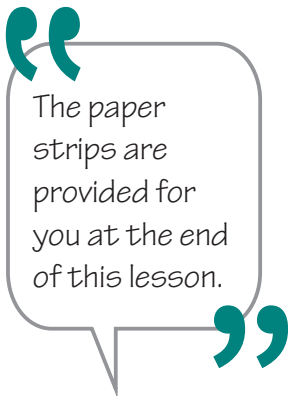
1. **To begin, cut eight strips of paper the length of a newspaper page. Remember, the *Rocket* is printed on $8\frac{1}{2}$-inch × 11-inch paper. Each strip of paper should be 1 inch wide. The strip represents one whole column. Do not fold the first strip, and label it as "1," to represent one whole.**

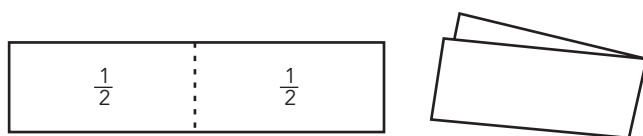2. **How many students can be recognized on a whole strip?**

Building and Comparing Strip Diagrams

Let's consider the number of students that can be recognized in different columns.

1. Take one of your paper strips and fold it carefully in half to divide the strip into two equal parts like the one shown. Label each folded part of the paper strip with the appropriate fraction, and draw a line to mark your fold. How many students can be recognized in this column?

2. Take another paper strip and fold it carefully in half two times. Unfold and draw lines to mark your folds. Then, label each folded part of the paper strip with the appropriate fraction. How many students can be recognized in this column?

3. Take another paper strip and fold it in half three times. Be very careful to fold accurately. Unfold and draw lines to mark your folds. Then, label each folded part of the paper strip with the appropriate fraction. How many students can be recognized in this column?

4. Take another paper strip and fold it very carefully in half, four times. Unfold and draw lines to mark your folds. Then, label each folded part of the paper strip with the appropriate fraction. How many students can be recognized in this column?

5. Take another paper strip and fold it carefully into three equal sections. Unfold and draw lines to mark your folds. Then, label each folded part of the paper strip with the appropriate fraction. How many students can be recognized in this column?

6. Take the next paper strip and fold it into thirds, and then fold the strip in half. Unfold and draw lines to mark your folds. Then, label each folded part of the paper strip with the appropriate fraction. How many students can be recognized in this column?

7. Finally, take your last paper strip and fold it into thirds. Then, fold in half, and then fold in half once more. Unfold and draw lines to mark your folds. Then, label each folded part of the paper strip with the appropriate fraction. How many students can be recognized in this column?

Arrange your paper strips in a column so that all of the left edges are lined up and the strips are ordered from the strip with the smallest parts to the strip with the largest parts.

8. As the number of students who can be recognized in the column increases, describe what happens to the space for each student.

> To list a set in ascending order means to list the set from least to greatest. To list a set in descending order means to list the set from greatest to least.

A **unit fraction** is a fraction that has a numerator of 1 and a denominator that is a positive integer.

9. List the unit fractions for each strip diagram you created in ascending order.

10. **Explain how understanding the size of a unit fraction helps you determine the size of the whole.**

If you folded the paper strips carefully, you will notice that some of the folds line up with each other. Fractions that represent the same part-to-whole relationship are **equivalent fractions**.

11. **Show that $\frac{1}{2}$ is equivalent to $\frac{6}{12}$. Draw on the strip diagrams to represent halves and twelfths. Then, shade the strip diagrams to represent $\frac{1}{2}$ and $\frac{6}{12}$.**

12. **Make a collection of equivalent fractions using your strip diagrams. Then, complete the graphic organizer by writing all the equivalent fractions for each.**

$\frac{1}{2}$

$\frac{2}{3}$

Equivalent Fractions

$\frac{3}{4}$

1
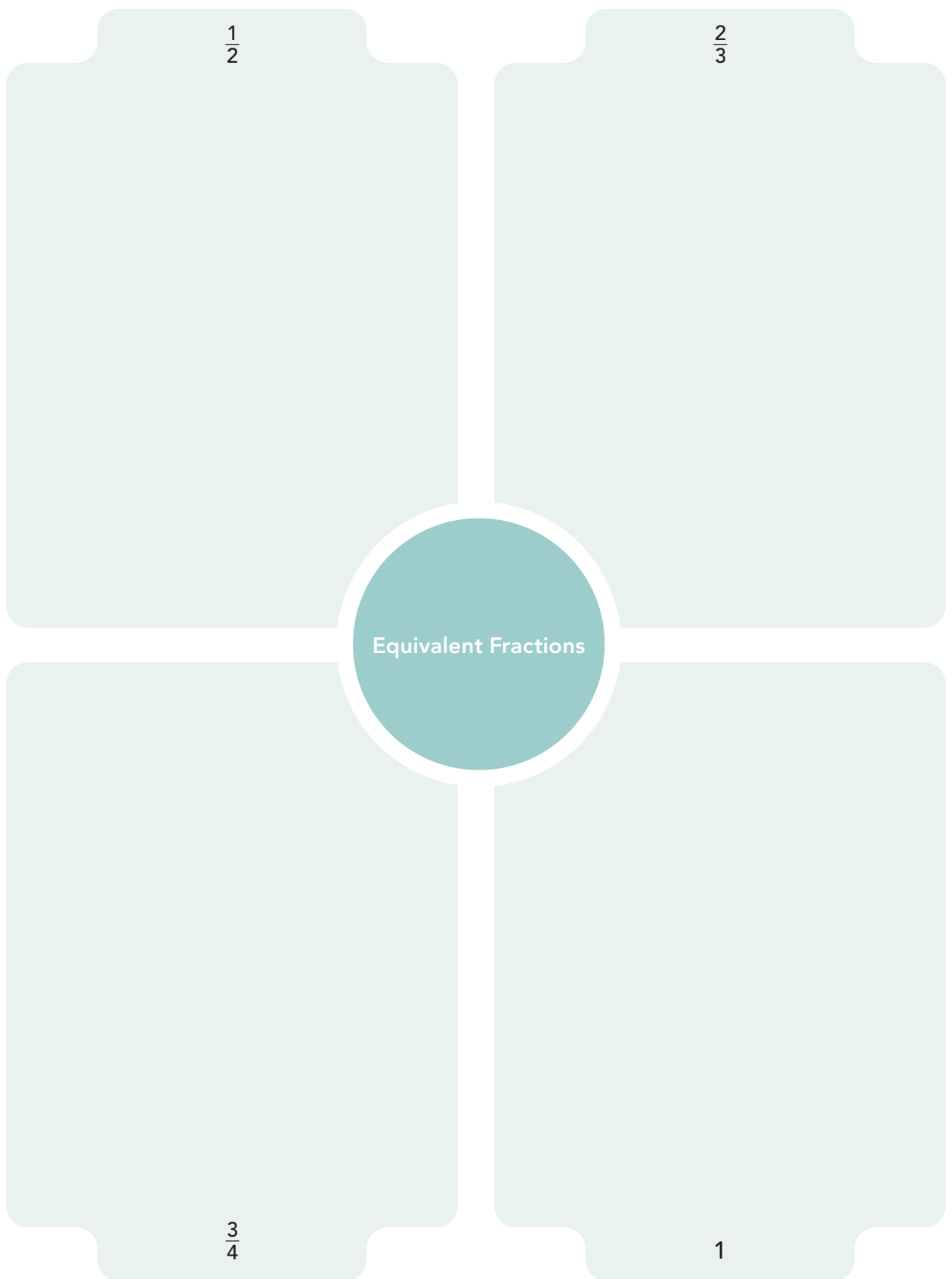
13. What do you notice in the collection of equivalent fractions? Give an example to justify your answer.

TALK the TALK

Numerate the Denomination

1. What do you notice about the numerator and denominator of the equivalent fractions?

2. What do you need to do to both the numerator and the denominator of a fraction in order to write another equivalent fraction?

Be prepared to share your solutions and methods.

Why is this page blank?

So you can cut out the paper strips on the other side.

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