
Rational Number Project

Level 1 / Lesson 10 / Overview

Students explore equivalence ideas with paper folding.

Materials

- Strips of paper (8.5" x 1") for folding for each student
- Student Pages A- F
- Scissors and glue

Teaching Actions

1. Throughout this activity, teacher and students do the examples. Teacher may choose to use larger strips of paper for demonstration purposes.
2. Ask students to fold strips of paper into thirds and shade $\frac{2}{3}$ of the paper. Write the symbol for amount shaded on that strip.
3. Now have students fold the same strip to show 6 equal parts. Before they actually open up the folded paper, ask them to guess the number of shaded parts.
4. Open up and name the amount and record on the paper strip.
5. Ask: Do you have more than 1 fraction written on your paper? Explain why.
6. Ask students to refold and create 12 equal parts. Unfold and note how many total equal parts; how many parts are shaded? Record that amount.
7. Ask: In what way are $\frac{2}{3}$, $\frac{4}{6}$, and $\frac{8}{12}$ alike? different?
8. Replicate the above starting with $\frac{1}{2}$; go to $\frac{2}{4}$, $\frac{4}{8}$.
9. Practice is provided in Student Pages A-F.

Comments

1. Students will benefit from seeing equivalent fractions with more than one manipulative.
2. Remember all this work with manipulatives is an investment that will pay off later as children learn to operate with fractions. The manipulative experiences will give them the mental images they need to operate ($+$, $-$, \times , \div) on fractions in a meaningful way.
3. Notes regarding Student pages:

B and C: After cutting out rectangles and sorting into equivalent groups, you may want students to paste groups onto paper and record fraction names on that paper, omitting Student Page C.

D and E: Students may want to just draw lines on paper strips instead of folding.

Directions:

Work through each step:

1.

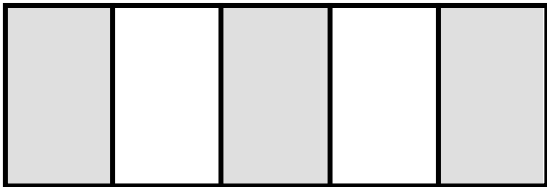


A. Fraction shaded: _____

B. Make into six equal-size parts by drawing in lines on picture.

C. Fraction shaded now: _____

2.



A. Fraction shaded: _____

B. Make into 15 equal-size parts by drawing in lines on picture.

C. Fraction shaded now: _____

3.

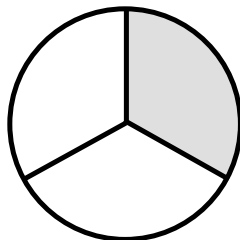


A. Fraction shaded: _____

B. Make into 12 equal-size parts by drawing in lines on picture.

C. Fraction shaded now: _____

4.



A. Fraction shaded: _____

B. Make into six equal-size parts by drawing in lines on picture.

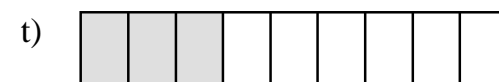
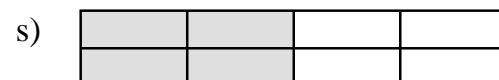
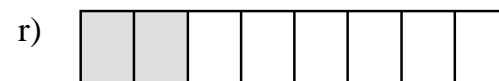
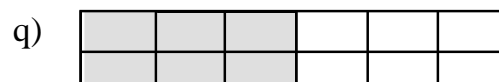
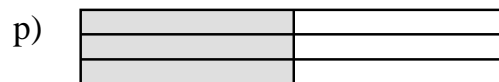
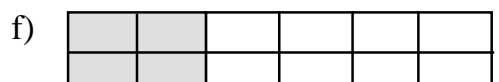
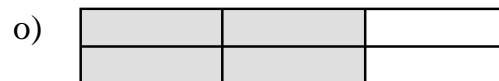
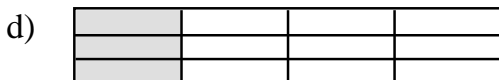
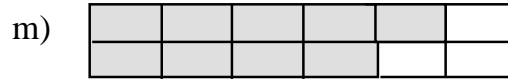
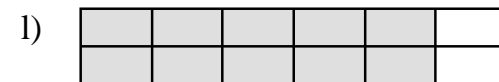
C. Fraction shaded now: _____

Name _____

Directions:

Cut out the rectangles. Put the rectangles together into groups so that each rectangle in a group has the same amount shaded. After you have grouped them, fill in the table by writing the fraction name for each rectangle in a group.

Fractions in the same group are called equivalent fractions.



Record Sheet for Student Page B

Write equivalent fractions for each group you made.

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

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

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

$$\frac{1}{4}$$

$$\frac{3}{4}$$

$$\frac{5}{6}$$

PAPER FOLDING AND EQUIVALENT FRACTIONS

Cut the strips on Student page E so you can fold them to solve these problems.

1. Write the symbol for the fraction shaded on strip A: _____
Fold to make **8 equal sized parts**.
Write the symbol for the fraction which is now shown: _____
2. Write the symbol for the fraction shaded on strip B: _____
Fold to make **12 equal sized parts**.
Write the symbol for the fraction which is now shown: _____
3. Write the symbol for the fraction shaded on strip C: _____
Fold to make **6 equal sized parts**.
Write the symbol for the fraction which is now shown: _____
4. Write the symbol for the fraction shaded on strip D: _____
Fold to make **12 equal sized parts**.
Write the symbol for the fraction which is now shown: _____
5. Be careful! Think! Take folding strip E.
Fold to make 3 equal parts.
Shade 2 of the 3 equal parts.
Write the fraction for the amount shaded in strip E: _____

Name _____

Lesson 10
Student Page E

A			
---	--	--	--

B		
---	--	--

C	
---	--

D					
---	--	--	--	--	--

E			
---	--	--	--

Paper Folding and Equivalent Fractions

- 1) Show 3 fractions equal to $\frac{1}{2}$. (Hint: you will need to start with 3 sheets of paper folded into 2 equal parts with one part shaded.) Draw a picture to show your answers.

- 2) Use paper folding to find out which of these are true statements.

$$\frac{1}{3} = \frac{2}{6} \qquad \frac{1}{4} = \frac{2}{6}$$

$$\frac{3}{4} = \frac{9}{12} \qquad \frac{4}{6} = \frac{2}{3}$$

- 3) Use paper folding to find these equivalences.

$$\frac{1}{2} = \frac{\quad}{8} \qquad \frac{2}{6} = \frac{\quad}{3}$$

$$\frac{1}{4} = \frac{\quad}{12} \qquad \frac{3}{6} = \frac{\quad}{2}$$

Post Lesson Reflection

Lesson _____

1) Number of class periods allocated to this lesson: _____

2) Student pages used: _____

3) Adaptations made in lesson development part:
[For example: added extra problems, eliminated problems, changed fractions used]

4) Adaptations made on Student pages:

5) To improve lesson, next time I should: