

# Rational Number Project

<b>Initial Fraction Ideas</b> <b>Lesson 17: Overview</b>	<b>Materials</b>
Students name fractions greater than 1 with fraction circles. Students name fractions using both mixed numbers and improper fractions.	∞ Fraction Circles for students and teacher ∞ Transparency 1 ∞ Student Pages A, B, C

## Teaching Actions

### Warm Up

Imagine a tower made of 1- inch cubes. You can't see my tower but I will tell you that 12 cubes would be  $\frac{2}{3}$  the height of my tower. How many cubes in my tower?

### Large Group Introduction

1. Ask students to use their fraction circles with the black circles as the unit to show  $\frac{2}{2}$ ,  $\frac{4}{4}$ ,  $\frac{5}{5}$  and  $\frac{12}{12}$ . In each example, ask for another name for the amount shown (1 whole or just 1).
2. Have students show  $\frac{6}{8}$  using the whole circle as the unit. Ask if  $\frac{6}{8}$  is greater or less than 1 whole or 1?
3. Present this story and ask students to model it with their circles. Again, use whole circles as the unit.

*Last night Margo ate  $\frac{3}{4}$  of a large pizza. (Show that with circles). In the morning she ate some leftover pizza that equaled  $\frac{2}{4}$  of a pizza.*

4. Ask students to try and show the extra  $\frac{2}{4}$ . They realize that they don not have enough pieces. Have them work with a partner and use 2 sets of fractions circles to model the story.

## Comments

Modeling fractions greater than one using fraction circles, is easier than with chips, so we concentrate on developing the concept of changing improper fractions and vice versa with fraction circles.

Accept both names: 1 and  $\frac{1}{4}$  or  $\frac{5}{4}$ .

Do not rush any rules about changing improper fractions to mixed fractions. Our goal is for students to change from one notation to another using circles and then just with mental images of circles. No paper/pencil rules.

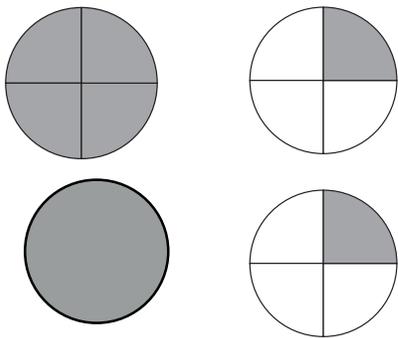
## Teaching Actions

5. Continue with the story: How much pizza did Margo eat altogether?



Questions to lead discussion for naming amount of pizza:

- ∞ Did Margo eat more than 1 whole pizza? How do you know?
  - ∞ Let's count how many fourths she ate:  $\frac{1}{4}$ ,  $\frac{2}{4}$ ,  $\frac{3}{4}$ ,  $\frac{4}{4}$ ,  $\frac{5}{4}$ .
  - ∞ From the picture I see that  $\frac{5}{4}$  equals  $\frac{4}{4}$  and \_\_\_\_\_.
  - ∞ What's another name for  $\frac{4}{4}$ ?
  - ∞ What's another way of describing the amount of pizza Margo ate?
6. Draw a picture of what you did and restate how  $\frac{5}{4} = 1\frac{1}{4}$ .



This shows  $\frac{5}{4}$ ;  
point to  $\frac{4}{4}$  and  
 $\frac{1}{4}$  more.

This shows  $\frac{5}{4}$ ;  
1 whole and  $\frac{1}{4}$   
of another circle.

## Comments

You may want to label 1 and  $\frac{1}{4}$  a "mixed fraction;"  $\frac{5}{4}$  an "improper fraction." Ask students why these names "make sense."

Students may try to name the picture of two circles with 5 parts shaded as  $\frac{5}{8}$ . If they do this, ask: What is the unit?

Since the unit is one pizza, each part is named by comparing it to one pizza or one circle.

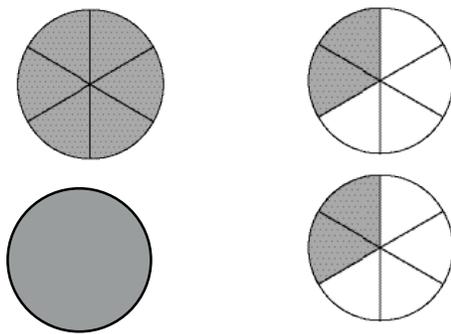
## Teaching Actions

6. Ask students to use their fraction circles to show these amounts. In each case, have the students name the amount in another way.

$$\frac{8}{6}$$
$$\frac{3}{4}$$
$$\frac{3}{2}$$
$$1\frac{1}{3}$$
$$1\frac{2}{4}$$
$$\frac{2}{3}$$

7. As students explain their models, ask if the amount is greater or less than one. Try to get them to verbalize concrete actions that show when a fraction is greater than one.
8. Select students draw pictures for a few examples showing two ways to name the fraction.

Ex:  $\frac{8}{6}$



10. To name fractions greater than 2, use pictures. Show transparency 1 and ask students to name each picture. [In each case, the unit is one circle or one rectangle.]

### Small Group/Partner Work

11. Assign Student Pages A, B, C.

## Comments

We want students to verbalize that, for example,  $\frac{8}{6}$  is greater than 1 because they need more than 1 whole circle to model it.  $\frac{4}{5}$  is less than 1 because they needed only 1 unit to model it.

You might want to make an overhead of Student Pages A and B to facilitate the review of answers.

Teaching Actions	Comments
<p data-bbox="203 226 337 262"><b>Wrap Up</b></p> <p data-bbox="203 302 909 472">12. Select students to share their pictures for problems on Student Page C at the board. Students should explain how the picture was used to solve each problem. Ask students to name the fractional answer in two ways.</p> <p data-bbox="203 512 909 615">13. Ask students to imagine each fraction noted below and from their mental image name the amount in another way.</p> <div data-bbox="300 655 462 709" style="text-align: center;"><math>\frac{7}{5}</math>   <math>\frac{13}{6}</math>   <math>\frac{11}{2}</math></div>	

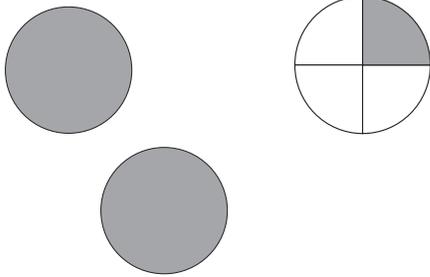
**Translations**

- ∞ Real world to manipulative to verbal
- ∞ Written symbols to manipulative to written symbols
- ∞ Written symbols to picture to verbal to written symbols
- ∞ Picture to written symbols
- ∞ Written symbols to pictures
- ∞ Written symbols to verbal

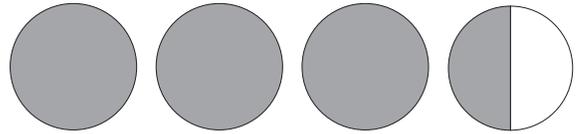
# Transparency 1

Write Two Fraction Names

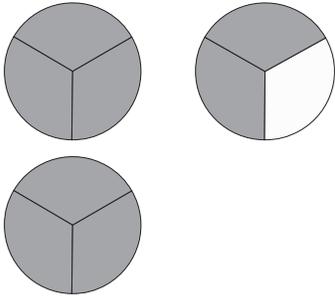
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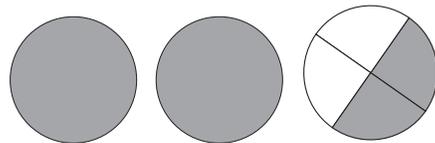
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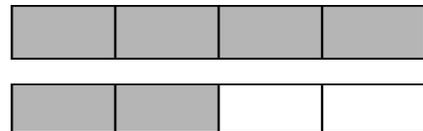
(2)



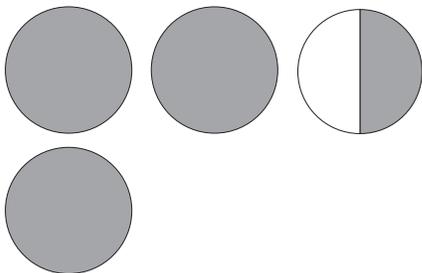
(6)



(7)



(3)



(8)

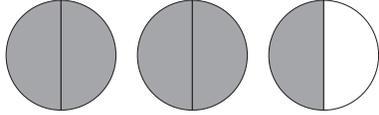
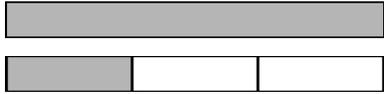
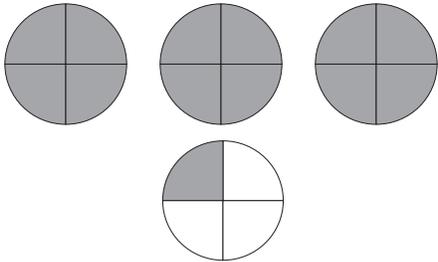
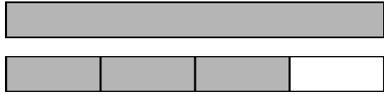
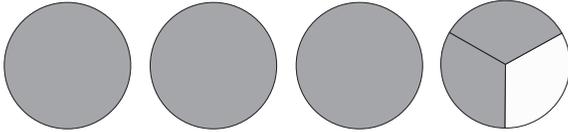
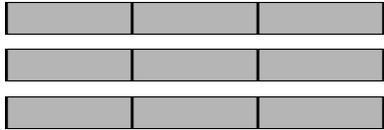


Imagine a tower made of 1- inch cubes.

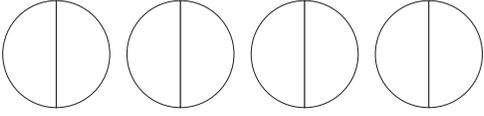
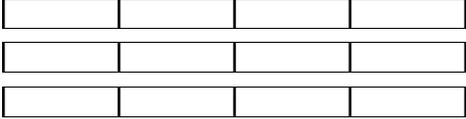
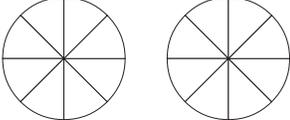
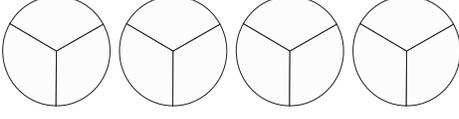
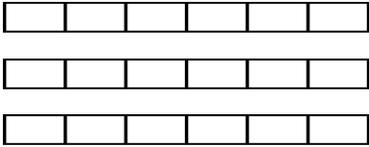
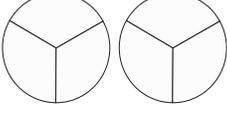
You can't see my tower but I will tell  
you that 12 cubes would be  $\frac{2}{3}$  the height  
of my tower.

How many cubes in my tower?

**Write two fraction names for each picture.**

Improper Fraction		Mixed Number
		
		
		
		
		
		

Shade in the pictures to show each fraction. Write another name for each amount

Mixed Number	Shade In	Improper Fraction
$3\frac{1}{2}$		
$2\frac{3}{4}$		
		$\frac{11}{8}$
		$\frac{10}{3}$
$2\frac{4}{6}$		
		$\frac{4}{3}$

Draw a picture for each story. Write the fraction name.

1. Brenda ate  $\frac{2}{3}$  of a candy bar for lunch. She finished it after lunch and ate  $\frac{1}{3}$  more of a second candy bar of the same type. How much candy did Brenda eat?

2. Marcia's dad was making pancakes. He added  $\frac{2}{3}$  cup milk to the pancake mix. He decided to make a bigger batch so he poured another  $\frac{2}{3}$  cup of milk in. How much milk did he use?

(Use  as a picture of a cup)

3. The dress designer needed some yellow ribbon for 3 dresses. He needs  $\frac{2}{3}$  yard for one dress,  $\frac{1}{3}$  for another, and  $\frac{2}{3}$  for the third. Draw a picture to show how many yards of ribbon he bought.

(  = 1 yard)