Lesson 6

***Teacher Page* A**

Overview

Students observe with circles that as the unit is divided into more and more equal parts, the unit parts become smaller.

Materials

- Fraction Circles for students and teacher
- Student Pages A, B, C

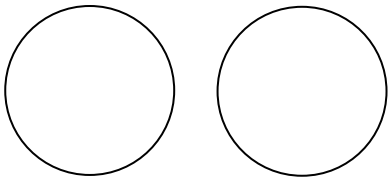
Teaching Actions

1. Start the lesson by reviewing ordering of whole numbers. For example, ask a student to select the larger of these 2 numbers, 720 or 702, and to explain his/her strategy for doing so.

2. Give another example using a context. José earns $42,175 a year. Mara earns $51,275 a year. Who earns more?

3. Introduce the idea of ordering fractions with this example. Kara entered the Pizza Factory. She saw 2 friends in 1 booth and 3 friends in another booth. Both groups have just been served a large pizza. Which group should she sit with so that she gets the most to eat?

4. Draw this diagram:



Comments

1. To think quantitatively about fractions, students should know something about the relative size of fractions. Lesson 6 is the first of several lessons to help students construct informal strategies for ordering fractions. At Level 1, we want to provide the concrete experiences that students need if they are ever to reason intuitively about fraction symbols.

2. Activities in this lesson will lead students to reason, for example, that $1/4 > 1/8$ because if you divide a circle into 8 equal parts, the parts will be smaller than if you divide the same unit into 4 equal parts.

Teaching Actions

4. Ask students to show Kara's share in booth 1 (with 2 friends) and in boot 2 (with 3 friends).

5. Which group has the most people? In which group does a person have the smallest share of pizza?

6. Conclude that 1/3 of the pizza is more than 1/4 of the pizza. [Repeat with 6 people at a table; 5 people at a table.]

7. Develop this idea of more implying less, by using Student Page A.

8. Ask students to use their fraction circles as you work together; name the black circle as the unit.

9. Ask: How many brown pieces cover the whole circle? How many orange? Which color takes more pieces to cover the whole unit? Which color has the smaller pieces?

10. Record that information in a chart.

Color	How many cover 1 circle	Which color takes more…	Which color has smaller…
1. Brown	3		
Orange	5	√	√
2.			

Comments

3. This notion of more and greater can lead to misunderstandings. Some students may want to say that 1/8>1/4 because 8>4 or because with eighths, you have more pieces than you do with fourths. Whole-number reasoning has a strong influence on how children think about fractions.

4. Children need to be reminded that to compare fractions, we look at the "size of piece," not the "number of pieces".

Teaching Actions

11. When completed, ask students if they see any patterns between the number of pieces to fill the whole unit and the size of the pieces.

12. As a group, write a rule similar to either of these:

- As the number of pieces needed to fill the whole decreases, the size of each piece gets larger.
- As the number of pieces needed to fill the whole increases, the size of each piece gets smaller.

13. Once the rule is generated use it in examples without the circular pieces.

Ex: 20 purples = 1 whole
80 greens = 1 whole
Which is larger, 1 purple or 1 green?

18 goos = 1 whole
12 boos = 1 whole
Which is smaller, 3 boos or 3 goos?

14. Conclude by asking: Does more always mean less with fractions?

15. Give this example: Imagine that it takes 10 maroon pieces to cover the whole circle. Which is smaller, 2 maroon pieces or 3 maroon pieces? How do you know?

16. Ask: How is this example different from all the rest we've talked about today?

17. Assign Practice Pages B and C to reinforce the day's lesson.

Comments

4. Students tend to over generalize. This lesson leads children to order fractions with the same numerator, but different denominators (1/3 vs. 1/2, 2/5 vs. 2/10, 40/100 vs. 40/90). The same reasoning will not work for comparing fractions with the same denominator but different numerators (3/4 vs. 2/4). Since a circle is divided into the same size pieces (4ths) an ordering decision is made by looking at the numerator –"2 of same-sized pieces is greater than 2 of same-sized pieces." Now more does mean more. No wonder students have trouble with fractions!

Name: _____

Directions: **Use fraction circles to fill in the table.**

Color	How many cover 1 whole circle?	Which color takes MORE pieces to cover 1 whole?	Which color has SMALLER pieces?
1. Brown	**3**		
Orange	**5**	√	√
2. Orange			
White			
3. Purple			
White			
4. Gray			
Green			
5. White			
Green			
6. Orange			
Purple			
7. Gray			
Brown			
8. Brown			
Green			

Name: _____

Lesson 6

***Student Page* B**

<u>Directions</u>:
Use Fraction circles to compare the two fractions. Circle the <u>larger</u> fraction.

$\frac{1}{3}$	$\frac{2}{3}$
$\frac{4}{5}$	$\frac{3}{5}$
$\frac{6}{7}$	$\frac{2}{7}$
$\frac{8}{12}$	$\frac{11}{12}$
$\frac{2}{7}$	$\frac{2}{9}$
$\frac{4}{8}$	$\frac{4}{6}$
$\frac{2}{3}$	$\frac{2}{8}$
$\frac{7}{10}$	$\frac{7}{9}$

$\frac{1}{4}$	$\frac{3}{4}$
$\frac{2}{7}$	$\frac{2}{6}$
$\frac{4}{12}$	$\frac{4}{15}$
$\frac{6}{7}$	$\frac{3}{7}$
$\frac{9}{10}$	$\frac{3}{10}$

Try these without manipulatives.

$\frac{13}{100}$	$\frac{27}{100}$
$\frac{9}{10}$	$\frac{9}{100}$

Name: _____

Use fraction circles to solve problems.

1. Mr. Hickman made a large apple pie. His daughter ate $\frac{1}{2}$ of the pie. His son ate $\frac{1}{3}$ of the pie. Who ate less? Draw a picture to show your thinking.

2. Spinner A was divided into 6 equal parts shaded green. Spinner B was divided into 10 equal parts with 4 parts shaded green. Which spinner had the larger amount of green? Explain "in your own words" your reasoning.

3. Jessica and Kim shared a large pizza. Jessica ate $\frac{2}{6}$ of a pizza. Kim ate $\frac{3}{6}$ of the pizza. Who ate more? Draw a picture to show your thinking?

4. Mathew and Cassandra shared a bag of candy. Mathew ate $\frac{2}{3}$ Cassandra ate $\frac{2}{5}$. Who ate more? Explain your thinking.

5. Andrew spent $\frac{1}{2}$ of his allowance on candy. Ellen spent $\frac{1}{3}$ of her allowance on a movie. Is it possible that Ellen spent more than Andrew? Explain. [Use the back of the page].