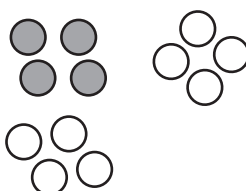
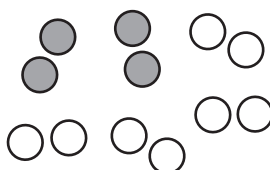


Rational Number Project

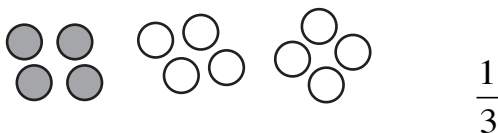
Initial Fraction Ideas Lesson 15: Overview	Materials
Students explore fraction equivalence using chips.	<ul style="list-style-type: none"> ∞ Chips for students ∞ Display chips for teacher ∞ Student Pages A-E

Teaching Actions	Comments
<p>Warm Up</p> <p>Jess ate $\frac{2}{3}$ of the peanuts in the bag. There are 7 peanuts left. How many did Jess eat? How many were there in the bag originally?</p> <p>Large Group Introduction</p> <p>Tell the students this story:</p> <ol style="list-style-type: none"> There are 12 pieces of hard candy in a bag. William ate $\frac{1}{3}$ of the candy. Sonya ate $\frac{2}{6}$ of the same-size bag of hard candy. Who ate more? Have students model with chips William's share of 12 pieces of candy. <p>Ask: What fraction of the bag did William eat? How many equal-sized groups will I divide 12 into? How can I show 1 of 3 equal-sized groups? (Turn chips to tan side).</p> <ol style="list-style-type: none"> Repeat for Sonya's share. Have students look at each model and ask how they are alike and different. Ask again: who ate more? <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  <p>$\frac{1}{3}$</p> </div> <div style="text-align: center;">  <p>$\frac{2}{6}$</p> </div> </div>	<p>This will be a challenging lesson for students. You may want to use two class periods to cover this material.</p>

Teaching Actions

5. Explain that you can name a fraction in more than one way. These two examples show that $\frac{1}{3}$ and $\frac{2}{6}$ are equal because the same unit is used to show both fractions, and the same number of chips are tan.

6. Show 12 chips grouped into thirds:



Say: This shows 1 of 3 equal-sized groups. If I reorganize the chips into different groups, then I can see a different name.

7. Show:



1 of 3 groups

[You may want chips in the same group to touch].



2 of 6 groups

The second picture shows 2 of 6 equal-sized groups are tan or $\frac{2}{6}$. Since the same number of chips is tan as in the previous model, $\frac{1}{3}$ and $\frac{2}{6}$ are equal.

8. Show



Say: I separated 12 chips into 12 groups with one chip in each group. What fraction is tan? The amount of tan chips is the same for $\frac{1}{3}$, $\frac{2}{6}$, and $\frac{4}{12}$.

What is true about these fractions?

9. Let's show $\frac{3}{5}$ with 10 chips. Can you give me another name for the fraction? How can you tell?

Comments

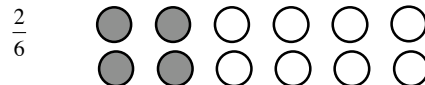
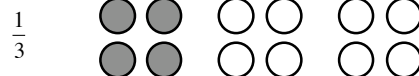
Comparing fractions with chips depends on using the same number of chips in each unit. You cannot compare $\frac{1}{3}$ and $\frac{2}{6}$ if the units are different. For example:



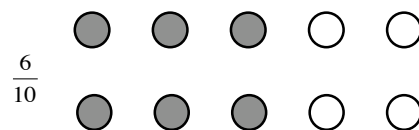
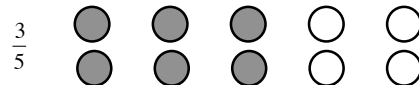
Here it seems that $\frac{2}{6} > \frac{1}{3}$.

Reorganize groups to resemble arrays. You may still need to spread out groups to help children see different groups.

Ex:



Emphasize the physical reorganization of the chips as a strategy for seeing different ways of grouping and naming fractional amounts.



Teaching Actions	Comments
<p>10. Repeat for $\frac{2}{4}$, using 8 chips as the unit; $\frac{4}{6}$ using 24 chips as the unit; $\frac{1}{2}$ using 12 chips as the unit.</p> <p>Small Group/Partner Work</p> <p>11. Assign Student Pages A-E. (You may want to do pages D and E in a large group setting).</p> <p>Wrap Up</p> <p>12. End the lesson by asking for their thoughts on this story:</p> <p style="padding-left: 40px;">Mark receives \$8 a month for an allowance. Janna receives \$12 a month for an allowance. Mark spent $\frac{1}{4}$ of his allowance. Janna spent $\frac{1}{6}$ of her allowance. Since $\frac{1}{4} > \frac{1}{6}$, Janna spent more. Do you agree?</p>	

Translations:

- ∞ Real life to manipulative
- ∞ Manipulative to manipulative to verbal
- ∞ Written symbols to manipulative to written symbols to pictures

Jess ate $\frac{2}{3}$ of the peanuts in the bag.

There are 7 peanuts left.

How many did Jess eat?

How many were there in the bag originally?

Use your chips to do these problems. Name each fraction amount in more than one way if possible.

1. 8 chips is the unit. What is the value of each of these sets of counters?

1 chip

4 chips

2 chips

6 chips

2. 4 chips is the unit. What is the value of each of these sets of counters?

1 chip

3 chips

2 chips

5 chips

3. 6 chips is the unit. What is the value of each of these sets of counters?

2 chip

3 chips

5 chips

4 chips

Counters and Fractions

1. Show $\frac{1}{4}$ with chips. Use 8 chips as your unit. Draw a picture of your model. Give another name for $\frac{1}{4}$.
2. Show $\frac{2}{3}$ with your chips. Use 15 chips as your unit. Draw a picture of your model. Give another name for $\frac{2}{3}$.
3. Show $\frac{1}{6}$ with chips in two different ways. Use 6 chips and 12 chips as your units. Draw a picture of each model.



4. Show $\frac{1}{2}$ with 12 chips as the unit. Then show $\frac{1}{2}$ with 3 other units. Draw pictures of your models and name each one in more than one way if possible.

5. Show three fractions greater than $\frac{1}{2}$ with your chips. Show three fractions less than $\frac{1}{2}$ with your chips. Draw pictures of your models and name each one.

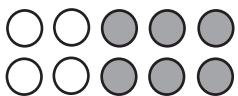
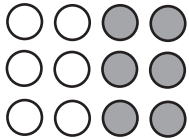
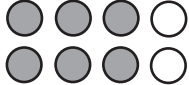
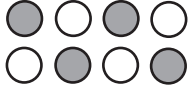
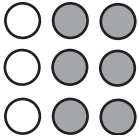
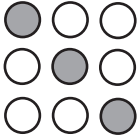
Fractions greater than $\frac{1}{2}$

Fractions less than $\frac{1}{2}$

Directions:

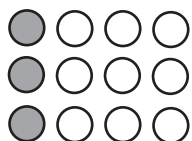
In the pictures below,  is the light side of the chip and  is the dark side.

Give two fractions in symbols which tell the fraction of the chips which are light. For each exercise, complete the number sentence.

		Fraction 1	Fraction 2	Number Sentence
1.		_____	_____	_____ = _____
2.		_____	_____	_____ = _____
3.		_____	_____	_____ = _____
4.		_____	_____	_____ = _____
5.		_____	_____	_____ = _____
6.		_____	_____	_____ = _____

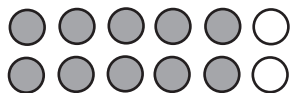
For exercises 7-11, write the equivalent fractions which are shown in the diagram.

7.



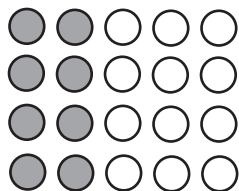
$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

8.



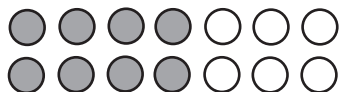
$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

9.



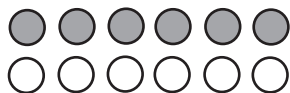
$$\frac{2}{\quad} = \frac{4}{\quad} = \frac{8}{\quad}$$

10.



$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

11.



$$\frac{1}{\quad} = \frac{\quad}{4} = \frac{\quad}{12} = \frac{\quad}{6}$$