

Rational Number Project

Level 1 / Lesson 15 / Overview

Students explore fraction equivalence using chips.

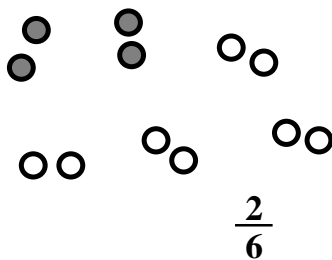
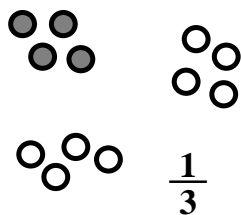
Materials

- Chips for students
- Display chips for teacher
- Student Pages A-E

Teaching Actions

1. Tell the students this story:
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?
2. Have students model with chips William's share of 12 pieces of candy.

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).
3. Repeat for Sonya's share.
4. Have students look at each model and ask how they are alike and different. Ask again: who ate more?



Comments

1. This will be a challenging lesson for students. You may want to use two class periods to cover this material.

Teaching Actions

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

- Show:



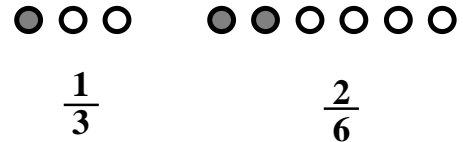
You may want chips in the same group to touch



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

Comments

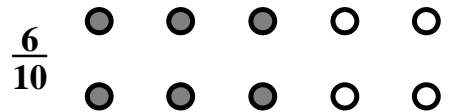
- Comparing fractions with chips depends on using the same number of chips in each unit. You cannot compare $1/3$ and $2/6$ if the units are different. For example:



Here it seems that $2/6 > 1/3$.

- Now reorganize groups to resemble arrays. You may still need to spread out groups to help children see different groups.

Ex:



Teaching Actions

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?

10. Repeat for $\frac{2}{4}$, using 8 chips as unit; $\frac{4}{6}$ using 24 chips as unit; $\frac{1}{2}$ using 12 chips as unit.

11. Assign Student Pages A-E.

- You may want to do pages D and E in a large group setting.

12. End lesson by asking for their thoughts on this story:

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.

Comments

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

5. Have children work together so they can discuss more than one way to name each fraction amount. Encourage children to use their chips.

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 chips

3 chips

5 chips

4 chips

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.

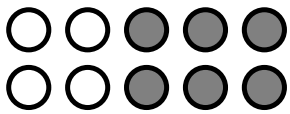
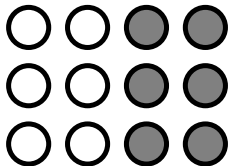
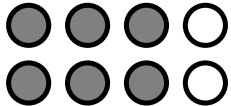
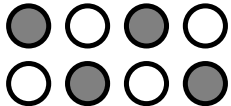
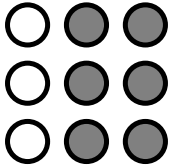
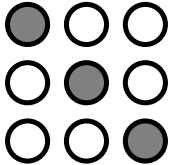
5. Show three fractions greater than $\frac{1}{2}$ with your chips. Show three fractions less than $\frac{1}{2}$ with your chips. Draw pictures of your models and name each one.

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

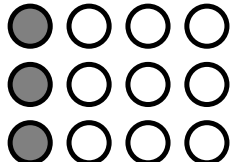
Fractions less than $\frac{1}{2}$

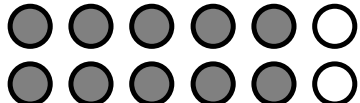
Directions:

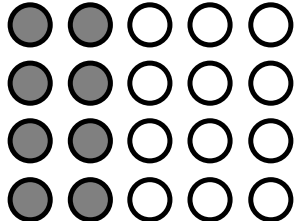
In the pictures below ○ represents the white side of the chip. ● represents the tan side of the chip. Give two fractions in symbols which tell the fraction of the chips which are tan. For each exercise complete the number sentence.

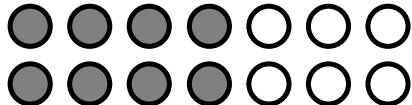
	Fraction 1	Fraction 2	Number Sentence
1. 	_____	_____	_____ = _____
2. 	_____	_____	_____ = _____
3. 	_____	_____	_____ = _____
4. 	_____	_____	_____ = _____
5. 	_____	_____	_____ = _____
6. 	_____	_____	_____ = _____

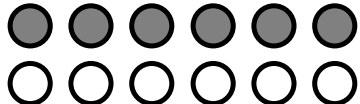
For exercises 7-11, write the equivalent fractions which are shown by the diagram.

7.  _____ = _____

8.  _____ = _____

9.  $\frac{2}{4} = \frac{4}{8} = \frac{8}{16}$

10.  _____ = _____

11.  $\frac{1}{6} = \frac{2}{12} = \frac{3}{18} = \frac{4}{24}$

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: