Rational Number Project

Initial Fraction Ideas
Lesson 13: Overview

Students continue practicing showing fractions with chips. They determine several units that can be used to model a fraction and what units can’t be used to model fractions.

Materials
• Chips for students and teacher
• Student Page A - C

Teaching Actions

Warm Up

Order these fractions from smallest to largest. Be ready to explain your thinking.
\[
\frac{1}{3}, \frac{1}{5}, \frac{1}{6}, \frac{1}{10}
\]

Large Group Introduction

1. Present this picture:

Say: I want to model this fraction using chips as my unit or whole instead of paper. What fraction is shown? If I use 12 chips as my unit, tell me the steps to show \(\frac{3}{4}\).

2. Vary the unit by asking students what they’d do if you used 4 chips as a unit and then 20 chips as the unit. Ask how these chip models are alike and how they are different.

3. Summarize by showing that to show \(\frac{3}{4}\) you used 4, 12, and 20 chips. Ask if you could have used other sets of chips as your unit.

4. Show \(\frac{2}{3}\) with the fraction circles. Ask students to model this fraction with chips. Allow them to choose the unit. Ask students to tell you the number

Comments

Flexibility of unit is emphasized with chips, as was done with the fraction circles. Students should know that to show \(\frac{2}{3}\), a number of sets can be used - 3 chips, 6 chips, 9 chips...

Regardless of the number of chips, the same action to model the fraction is used. (Partition into 3 equal groups and show, 2 of the 3 groups tan.

Students at times confuse the term “whole” and “unit”, thinking whole is the amount partitioned into equal groups while “units” are the equal parts.

Ask questions as you do this lesson: What is the unit you are using to show \(\frac{1}{4}\)? See if the student identifies all the chips as the unit or the number of chips in each equal part as the unit.
Teaching Actions

of tiles they use as the whole or unit.

5. Present this chart to students. Ask if the showed each fraction with paper folding strips, how many equal parts would they need.

6. Then ask them to imagine using chips to show each fraction. Ask: What are some possible sets of chips you can use as the whole (unit) to model each fraction? List 3 possible units that they could use as the unit for each fraction. Ask: How did you figure this out?

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Units you could use</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{5}$</td>
<td></td>
</tr>
<tr>
<td>$\frac{1}{2}$</td>
<td></td>
</tr>
<tr>
<td>$\frac{3}{4}$</td>
<td></td>
</tr>
</tbody>
</table>

6. Conclude the introduction by asking students to show the fraction $\frac{1}{4}$ with 14 chips. Discuss why this cannot be done. Ask for units that cannot be used to show the fractions in the above chart. [Make another column in the table].

Small Group/Partner Work

7. Assign Student Pages A - C as a way to practice showing fractions with chips.

Wrap Up

8. End this lesson with some problem solving using chips. Present these two problems and ask students to solve them using chips. Then have a few students share how they solved the problems.

Joe ate 4 jellybeans. This was $\frac{1}{5}$ of all the jellybeans in the bag. How many jellybeans were in the bag?

Comments

The possible units are multiples of the denominator.

$\frac{4}{5}$, 5, 10, 15, 20... are all possible units.

Small Group/Partner Work

7. Assign Student Pages A - C as a way to practice showing fractions with chips.

Wrap Up

8. End this lesson with some problem solving using chips. Present these two problems and ask students to solve them using chips. Then have a few students share how they solved the problems.

Joe ate 4 jellybeans. This was $\frac{1}{5}$ of all the jellybeans in the bag. How many jellybeans were in the bag?
<table>
<thead>
<tr>
<th>Teaching Actions</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marta ate 10 jellybeans. This was ( \frac{1}{4} ) of all the jellybeans in the bag. How many jellybeans in the bag?</td>
<td></td>
</tr>
</tbody>
</table>

**Translations:**
- Picture to manipulative to verbal
- Written symbols to manipulative
Order these fractions from smallest to largest. Be ready to explain your thinking.

\[
\frac{1}{3} \quad \frac{1}{5} \quad \frac{1}{6} \quad \frac{1}{10}
\]
Showing Fractions Using Chips

What fraction is shaded? _____________
Show that fraction using 6 chips as your unit. Draw a picture in the column to the right.

What fraction is shaded? _____________
Show that fraction using 12 chips as your unit. Draw a picture in the column to the right.

What fraction is shaded? _____________
Show that fraction using 12 chips as your unit. Draw a picture in the column to the right.
# Identify the fractional amount of chips shaded.

<table>
<thead>
<tr>
<th>Picture of chips</th>
<th>Fraction shaded</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image 1" /></td>
<td>How many groups? ______</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image 2" /></td>
<td>How many groups? ______</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image 3" /></td>
<td>How many groups? ______</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image 4" /></td>
<td>How many groups? ______</td>
</tr>
<tr>
<td><img src="image5.png" alt="Image 5" /></td>
<td>How many groups? ______</td>
</tr>
</tbody>
</table>
Show each fraction with chips in two ways. You decide on the unit. Draw a picture or your models.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{3}$</td>
<td><img src="image1" alt="Model 1" /></td>
<td><img src="image2" alt="Model 2" /></td>
</tr>
<tr>
<td>$\frac{1}{4}$</td>
<td><img src="image3" alt="Model 1" /></td>
<td><img src="image4" alt="Model 2" /></td>
</tr>
<tr>
<td>$\frac{1}{6}$</td>
<td><img src="image5" alt="Model 1" /></td>
<td><img src="image6" alt="Model 2" /></td>
</tr>
<tr>
<td>$\frac{3}{4}$</td>
<td><img src="image7" alt="Model 1" /></td>
<td><img src="image8" alt="Model 2" /></td>
</tr>
<tr>
<td>$\frac{1}{2}$</td>
<td><img src="image9" alt="Model 1" /></td>
<td><img src="image10" alt="Model 2" /></td>
</tr>
<tr>
<td>$\frac{2}{3}$</td>
<td><img src="image11" alt="Model 1" /></td>
<td><img src="image12" alt="Model 2" /></td>
</tr>
</tbody>
</table>