Lesson 12: Overview

Students are introduced to chips as a fraction model. They learn to represent a given fraction using different sets of chips as a unit.

Materials

- Chips or tiles with a different color on each side
- Paper strips for folding
- Display chips or overhead chips for teacher
- Student Page A

Teaching Actions

Warm Up

Which fraction is larger? Share your answer and rationale to a partner. Did you both agreed on the larger fraction? Did you think about it in the same way or differently?

\[
\frac{3}{4}, \frac{11}{12}
\]

1. Turn over 2 of the 3 equal groups of chips to show the tan side of the chips. Ask children to model this action on their paper strips by shading 2 of 3 equal parts.

Common error: Students model \( \frac{2}{3} \) by making groups of three instead of three equal groups.
**Teaching Actions**

Say: I made 2 of 3 equal-sized groups tan.

Ask: What fraction of the chips is tan?

Ask: How are the chips and paper folding models alike? Different?

4. Summarize what you did by writing on the board.

   I started with a unit of _____ white chips.

   I divided the unit into _____ equal groups.

   I made _____ groups tan.

   _____ of _____ equal-sized groups are tan.

   What fraction of the groups is tan? (\(\frac{2}{3}\))

5. Ask students to verbalize what they did with paper in a similar way. Conclude that there are many different models to show fractions.

6. Model other fractions using chips. Students should have their own chips. For the sake of consistency, use the white side to show the unit and use the tan side to show “amount shaded.”

7. SAY: I have 18 chips. I want to show \(\frac{4}{6}\) using these chips as my unit.

   ASK: How many equal-sized groups will I need? (six). Now divide the 18 chips into 6 equal groups.

   \[
   \begin{array}{ccc}
   \bigcirc & \bigcirc & \bigcirc \\
   \bigcirc & \bigcirc & \bigcirc \\
   \bigcirc & \bigcirc & \bigcirc \\
   \end{array}
   \]

**Comments**

Students often need to exaggerate the grouping of the chips to highlight the separate groups.

Ex: \(\frac{2}{3}\)

They will spread out the sets and arrange the chips to touch to show a group. At this point don’t use the array-model.

Some students say that \(\frac{4}{6}\) is covered. Informal discussion of equivalence is encouraged, but don’t rush the idea.

Student verbalization is important. You might ask them to write a description for showing a fraction with chips.
Teaching Actions

ASK: To show $\frac{4}{6}$, how many equal groups must I make tan? (four)

8. Repeat for several more fractions.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{2}{3}$</td>
<td>15</td>
</tr>
<tr>
<td>$\frac{2}{3}$</td>
<td>21</td>
</tr>
<tr>
<td>$\frac{6}{7}$</td>
<td>7</td>
</tr>
<tr>
<td>$\frac{3}{4}$</td>
<td>20</td>
</tr>
</tbody>
</table>

Small Group/Partner Work


Wrap Up

10. Present these two stories to students. Ask them to decide which model, paper folding or chips, would be best to show the fraction the story.

Story 1: Devan had 15 m & m’s. She shared them equally between herself and 2 friends. What fraction of candy did she get?

Story 2: Lianna has a Nestle Crunch bar. She plans to share it between herself and 2 friends. What fraction of the candy bar will each get?

Translations:

∞ Manipulative to manipulative
∞ Verbal (written words) to manipulative to pictures

Students will struggle a bit. As you move from group to group you may want to model the fraction using paper folding, going through each step as the students use the chips to copy your steps.

Students confuse the number of groups with the number of chips in each group so emphasize that $\frac{3}{4}$ means 3 out of 4 equal-sized groups. It does not mean to put 4 chips into a group.
Which fraction is larger? Share your answer and rationale to a partner.

Did you both agreed on the larger fraction?

Did you think about it in the same way or differently?

\[
\frac{3}{4} \quad \frac{11}{12}
\]
Modeling Fractions with Chips

1. Show 3-fourths with chips. Use 20 chips in all. Draw a picture of your display.

2. Show 3-fourths with chips. Use 8 chips in all. Draw a picture of your display.

3. Show 2-sixths with chips. Use 12 chips in all. Draw a picture of your display.

4. Show 2-sixths with chips. Use 6 chips in all. Draw a picture of your display.

5. Show 4-fifths with chips. Use 20 chips in all. Draw a picture of your display.

6. On the back of this page, describe steps you would take to show $\frac{3}{7}$ using 21 chips.