Fabulous Fractions

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Presented by

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Favorite Quote:

I've come to the frightening conclusion that I am the decisive element in the classroom. It's my daily mood that makes the weather. As a teacher, I possess a tremendous power to make a child's life miserable or joyous. I can be a tool of torture or an instrument of inspiration. I can humiliate or humor, hurt or heal. In all situations, it is my response that decides whether a crisis will be escalated or de-escalated and a child humanized or de-humanized.”

Haim Ginott, 1922-1973
Fraction Problems

For each problem below,

1. Use manipulatives to model this problem.
2. Draw a pictorial.
3. Write the equation.
4. Solve the problem.
5. Write a sentence including the answer.

1. Grandma is making cornbread and gingerbread for dinner. She needs $1 \frac{5}{8}$ cups of buttermilk for one recipe and $1 \frac{1}{8}$ cups for the other recipe. How much buttermilk does she need for both recipes?

2. Xavier works in a plant nursery and creates flower arrangements in pots of different sizes. One pot needs $\frac{3}{8}$ cubic feet of dirt and another one need $\frac{1}{4}$ cubic feet of dirt. How much dirt will Xavier need for both pots?
3. Wesley filled 5 glasses with \( \frac{2}{3} \) liter of soda in each glass. How much soda did Wesley use?

4. Maria is going to have a birthday party. Her mom orders 6 pints of ice cream from Mitch and Bob's Ice Cream Factory. If she serves \( \frac{1}{4} \) of a pint of ice cream to each guest, how many guests can be served?
Fractions

Materials:
- 4 different colors of paper, one-half sheet of each color for each student
- Scissors
- Marker

Directions:

ONE WHOLE

Model and ask each student to take the first color of the half-sheet of paper and write 1 on it. This is one whole.

HALVES

Students take a second color and fold the half-sheet of paper into two equal pieces. Cut and label each piece $\frac{1}{2}$. Ask students to lay the two pieces on top of the whole and to hold up the pieces and say aloud with you:

\[
\begin{align*}
\frac{1}{2} & \quad \text{"I have in my hand one piece when 2 equal pieces are needed to make one whole."} \\
\frac{2}{2} & \quad \text{"I have in my hand two pieces when 2 equal pieces are needed to make one whole."}
\end{align*}
\]

FOURTHS

Students take the third color and fold the half-sheet of paper into four equal pieces. Cut and label each piece $\frac{1}{4}$. Ask students to lay the four pieces on top of the whole and to hold up the pieces and say aloud with you:

\[
\begin{align*}
\frac{1}{4} & \quad \text{"I have in my hand one piece when 4 equal pieces are needed to make one whole."} \\
\frac{2}{4} & \quad \text{"I have in my hand two pieces when 4 equal pieces are needed to make one whole."} \\
\frac{3}{4} & \quad \text{"I have in my hand three pieces when 4 equal pieces are needed to make one whole."} \\
\frac{4}{4} & \quad \text{"I have in my hand four pieces when 4 equal pieces are needed to make one whole."}
\end{align*}
\]
Students take the fourth color and fold the half-sheet of paper into eight equal pieces. Cut and label each piece \( \frac{1}{8} \). Ask students to lay the eight pieces on top of the whole and to hold up the pieces and say aloud with you:

\[
\begin{align*}
\frac{1}{8} & \quad \text{"I have in my hand one piece when 8 equal pieces are needed to make one whole."} \\
\frac{2}{8} & \quad \text{"I have in my hand two pieces when 8 equal pieces are needed to make one whole."} \\
\frac{3}{8} & \quad \text{"I have in my hand three pieces when 8 equal pieces are needed to make one whole."} \\
\frac{4}{8} & \quad \text{"I have in my hand four pieces when 8 equal pieces are needed to make one whole."} \\
\frac{5}{8} & \quad \text{"I have in my hand five pieces when 8 equal pieces are needed to make one whole."} \\
\frac{6}{8} & \quad \text{"I have in my hand six pieces when 8 equal pieces are needed to make one whole."} \\
\frac{7}{8} & \quad \text{"I have in my hand seven pieces when 8 equal pieces are needed to make one whole."} \\
\frac{8}{8} & \quad \text{"I have in my hand eight pieces when 8 equal pieces are needed to make one whole."}
\end{align*}
\]

In solving problems with the fractions, two students work together using the paper fractions. Each student participates in combining or subtracting fractions, by adding or taking away fractional pieces of the problem.
Meaning of Fractions

\[
\frac{1}{2}, \frac{2}{2}, \frac{3}{2}, \frac{4}{2}, \frac{5}{2}, \frac{6}{2}, \frac{7}{2}, \frac{8}{2}, \frac{9}{2}
\]

\[
\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{5}{5}, \frac{6}{5}, \frac{7}{5}, \frac{8}{5}, \frac{9}{5}
\]

\[
\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}, \frac{11}{10}, \frac{12}{10}, \frac{13}{10}
\]

Turn to your partner and discuss the following:

1. How are the fractions alike?
2. How are the fractions different?
3. What part of each row is like counting?
4. Why does the bottom number stay the same as you count halves, fifths, or tenths?

Write on your paper.

5. What does the top number, the numerator, in a fraction tell you?

6. What does the bottom number, the denominator, in a fraction tell you?
Number Lines

Fractions

1. Label the extremes with “0” and “1.”

2. Write different fractions on index cards (e.g., \(\frac{1}{8}, \frac{1}{4}, \frac{3}{8}, \frac{5}{8}, \frac{1}{2}, \frac{3}{8}, \frac{7}{8}, \frac{5}{6}\) as well as their equivalent fraction names). Choose only 2 or 3 fractions to work with each time you do this routine. Make multiple copies of the same numbers. Give a card to each pair of students. Give them time to discuss where their number would make sense on the number line.

3. Have one pair of students place their card where they think their number belongs on the number line. Students must give a mathematically convincing argument as to why they are placing the number at this location.

4. Students discuss with their partners whether they agree or disagree with the placement of the card and why.

5. Class asks clarifying questions to the pair in the front of the room.

6. Students share other strategies.

7. Leave the numbers on the number line from one day to the next so that students can look at the decimals relative to other decimals with which they have worked.

Extensions for Fractions:

- Use a label other than 1 for the right-hand extreme (e.g., 2 or 3).

- Include mixed numbers and improper fractions in the numbers you place on the index cards.

Guiding questions for Fractions:

- Explain why you placed your fraction where you did.

- Name a fraction less/greater than yours. Prove it on the number line.

- How do you know your fraction is less/greater than one half?

- Name another fraction equivalent to yours.