

Fraction

Games & Activities

with **Dice!**



Fun and Engaging Activities
to Build Fraction Fluency



$$\frac{\begin{array}{|c|} \hline \cdot \\ \hline \end{array}}{\begin{array}{|c|} \hline \cdot \cdot \\ \hline \end{array}} = \frac{3}{4}$$

$$\frac{\begin{array}{|c|} \hline \cdot \\ \hline \end{array}}{\begin{array}{|c|} \hline \cdot \cdot \cdot \cdot \\ \hline \end{array}} = \frac{1}{6}$$

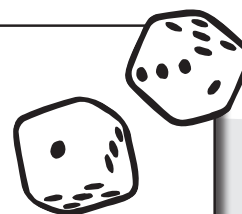
$$\frac{\begin{array}{|c|} \hline \cdot \\ \hline \end{array}}{\begin{array}{|c|} \hline \cdot \cdot \\ \hline \end{array}} = \frac{2}{3}$$



Rowley, Massachusetts

Fraction Activities with Dice

Contents



Introduction	iv
Correlation to Current Math Standards.....	v
Identifying Kinds of Fractions	1
Lesson 1: Proper and Improper Fractions	3
Lesson 2: Mixed Numbers	4
Activity Charts.....	6
Finding Ones/Renaming Fractions Activities	11
Lesson 3: Fraction Names for One (1)	12
Lesson 4: One (1) as the Identity Element in Multiplication	13–14
Activity Charts.....	15–33
Fraction Bar Activities	35
Lesson 5: Using Fraction Bars to Add/Multiply Fractional Parts	36
Lesson 6: Using Fraction Bars to Subtract Fractional Parts	37
Lesson 7: Using Fraction Bars to Divide Fractional Parts	37
Activity Charts.....	38–55
Fraction Number Line Activities	57
Lesson 8: Using a Number Line to Add/Multiply Fractional Parts	58
Lesson 9: Using a Number Line to Subtract Fractional Parts	59
Lesson 10: Using a Number Line to Divide Fractional Parts	59
Activity Charts.....	60–76
Equalities/Inequalities Activities	77
Improper Fractions to Mixed Numbers Activities	89
Equivalent Fractions Graph Activities	101
Inequality/Equality Challenge Activities	109
Appendix: Fraction Bar Chart.....	120

Renaming One-Half

Four-Grid Tic-Tac-Toe

How to Play

- Each team chooses a colored token.
- Teams toss a die. Higher number goes first.



- Toss a die. Make a fraction that equals 1. **Example:** Toss 3, make the fraction $\frac{3}{3}$.
- Multiply the fraction that equals 1 by $\frac{1}{2}$ to make an equivalent fraction for $\frac{1}{2}$. **Example:** $\frac{3 \times 1}{3 \times 2} = \frac{3}{6}$
- Place a marker on $\frac{3}{6}$ on any of the 4 Tic-Tac-Toe grids.
- If the fraction is not available, lose that turn.
- The team with the most “threes in a row” wins.

$\frac{2}{4}$	$\frac{5}{10}$	$\frac{4}{8}$		$\frac{1}{2}$	$\frac{6}{12}$	$\frac{3}{6}$
$\frac{4}{8}$	$\frac{1}{2}$	$\frac{3}{6}$		$\frac{6}{12}$	$\frac{4}{8}$	$\frac{5}{10}$
$\frac{3}{6}$	$\frac{2}{4}$	$\frac{6}{12}$		$\frac{5}{10}$	$\frac{2}{4}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{3}{6}$	$\frac{4}{8}$		$\frac{5}{10}$	$\frac{6}{12}$	$\frac{2}{4}$
$\frac{6}{12}$	$\frac{5}{10}$	$\frac{1}{2}$		$\frac{2}{4}$	$\frac{3}{6}$	$\frac{4}{8}$
$\frac{2}{4}$	$\frac{4}{8}$	$\frac{3}{6}$		$\frac{6}{12}$	$\frac{5}{10}$	$\frac{1}{2}$

Renaming One-Half Four in a Row/Crossover

How to Play

- Each team chooses a colored token.
- Teams toss a die. Higher number goes first.



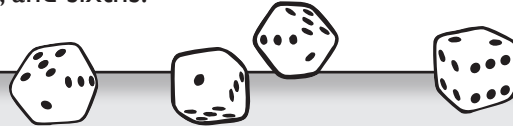
- Choose a game: **Four in a Row** or **Crossover**.
- Toss a die. Make a fraction that equals 1. Example: Toss 3, make the fraction $\frac{3}{3}$.
- Multiply the fraction that equals 1 by $\frac{1}{2}$ to make an equivalent fraction for $\frac{1}{2}$. Example: $\frac{3 \times 1}{3 \times 2} = \frac{3}{6}$
- Place a marker on $\frac{3}{6}$.
- If the fraction is not available, lose that turn.
- The first player to reach the goal of the game wins.

$\frac{2}{4}$	$\frac{4}{8}$	$\frac{5}{10}$	$\frac{3}{6}$	$\frac{6}{12}$
$\frac{5}{10}$	$\frac{1}{2}$	$\frac{3}{6}$	$\frac{6}{12}$	$\frac{4}{8}$
$\frac{1}{2}$	$\frac{3}{6}$	$\frac{6}{12}$	$\frac{5}{10}$	$\frac{2}{4}$
$\frac{5}{10}$	$\frac{2}{4}$	$\frac{4}{8}$	$\frac{3}{6}$	$\frac{1}{2}$
$\frac{3}{6}$	$\frac{6}{12}$	$\frac{1}{2}$	$\frac{2}{4}$	$\frac{4}{8}$

Notes to Teachers/Fraction Bar Activities

Objectives

- Using fraction bars as a visual model, students conceptually add/multiply (repeated addition), subtract, and divide (has how many) fractions.
- Students develop the concept of a whole equaling the sum of its equal parts, focusing on halves, thirds, fourths, fifths, and sixths.



Overview

Using fraction bars as a visual model, students toss a die to add/multiply, subtract, and divide fractional parts. They record their scores on a chart. Depending on the activity, the team with the highest or lowest score wins. Students are introduced to the concept of division through the term “has how many,” focusing on whole fraction bars to determine how many fractional parts there are in each bar.

Getting Started

- Direct discussion questions (below) to teams of students, with two students per team.
- Allow time for each team to discuss their thinking and agree on a solution.
- In a large-group discussion, ask student teams to share their thinking.
- Ask for different ways of arriving at their conclusions, if there were any.

LESSON 5: USING FRACTION BARS TO ADD/MULTIPLY FRACTIONAL PARTS

- Display the fraction bar chart for halves (page 39).
- Ask: *If I shade in 4 halves, how many whole bars have I shaded in? (2) Say: Discuss with your partner and explain your thinking.*
- Discuss class responses. Write on the board: $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 2$.
- Say: *Another way of saying “a half plus a half plus a half plus a half” is “4 of the halves.” Another way of writing this is to use the multiplication symbol, \times , for “of the”: $4 \times \frac{1}{2} = 2$.*
- Ask: *If I shade in 3 of the halves, how many whole bars are shaded in? (1) Is there any part of another whole bar that is shaded in? ($\frac{1}{2}$)*
- Say: *Discuss with your partner and explain your thinking. Discuss class responses.*
- Say: *A half plus a half plus a half equals one and a half. Write on the board: $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 1\frac{1}{2}$.*
- Say: *Three of the halves equal one and a half. Write on the board: $3 \times \frac{1}{2} = 1\frac{1}{2}$.*
- Use a similar introduction for adding/multiplying fourths, fifths, and sixths.

Students are now ready for the **Adding/Multiplying Fraction Bar** activities.

LESSON 6: USING FRACTION BARS TO SUBTRACT FRACTIONAL PARTS

- Display the fraction bar chart for halves (page 45).
- Ask: *If I start with two whole bars (circle 2 whole bars) and remove one of the halves (cross out one of the halves), what is left? ($1\frac{1}{2}$)*
- Say: *Discuss with your partner and explain your thinking.* Discuss class responses.
- Say: *Two minus a half equals one and a half.* Write the equation on the board: $2 - \frac{1}{2} = 1\frac{1}{2}$.
- Ask: *If I start with three whole bars and remove one and a half bars, what do I have left? (Circle 3 bars and cross out $1\frac{1}{2}$ bars.)*
- Say: *Discuss with your partner and explain your thinking.* Discuss class responses.
- Say: *Three minus one and a half equals one and a half.* Write the equation on the board: $3 - 1\frac{1}{2} = 1\frac{1}{2}$.
- Use a similar introduction for subtraction with thirds, fourths, fifths, and sixths.

Students are now ready for the **Subtracting Fraction Bar** activities.



LESSON 7: USING FRACTION BARS TO DIVIDE FRACTIONAL PARTS

- Display the fraction bar chart for halves (page 51).
- Ask: *If I start with two whole bars divided into halves (circle two whole bars), how many halves are there altogether? Here's another way to think about this: Two whole bars has how many halves? (4)*
- Write the equation on the board: $2 \div \frac{1}{2} = ?$ Say: *We read the division sign as "has how many."*
- Say: *Discuss with your partner and explain your thinking.* Discuss class responses.
- Say: *So two whole bars have four halves: $2 \div \frac{1}{2} = 4$.*
- Ask: *If I start with four whole bars divided into halves (circle four whole bars), how many halves are there in four wholes? Or four has how many halves? $4 \div \frac{1}{2} = ?$ (8)*
- Say: *Discuss with your partner and explain your thinking.* Discuss class responses.
- Ask: *Six has how many halves? Make a prediction. (12)*
- Say: *Discuss your answer with your partner.*
- Use a similar introduction for division with thirds, fourths, fifths, and sixths.

Students are now ready for the **Division (Has How Many) Fraction Bar** activities.

Adding/Multiplying Fractional Parts – Score Chart

Die Toss	Fraction	Proper or Mixed Fraction	Score
Total – Game 1			

Die Toss	Fraction	Proper or Mixed Fraction	Score
Total – Game 2			

Die Toss	Fraction	Proper or Mixed Fraction	Score
Total – Game 3			

	Score
Game 1	
Game 2	
Game 3	
Total Score	

Fraction Bars – Adding/Multiplying Halves

- Each team gets a score chart, bar chart, die, and pencil.
- Toss a die.
- Make a fraction: Numerator = die toss, denominator = 2. (Example: Toss 5. Make the fraction $\frac{5}{2}$. Five-halves is $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$, or 5 of the halves.)
- Cross out that many halves on the fraction bar chart.
- On the score chart, record the die toss, the fraction created by the die toss, and the score.
- After 5 tosses, the teams total their scores. The team with the highest score wins.
- Play 2 or more games. First team to win 2 games is the winner.

How to Play



--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

Fraction Bars – Adding/Multiplying Thirds

How to Play

- Each team gets a score chart (page 38), bar chart, die, and pencil.
- Toss a die.
- Make a fraction: Numerator = die toss, denominator = 3. (**Example:** Toss 5. Make the fraction $\frac{5}{3}$. Five-thirds is $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$, or 5 of the thirds.)
- Cross out that many thirds on the fraction bar chart.
- On the score chart, record the die toss, the fraction created by the die toss, and the score.
- After 5 tosses, the teams total their scores. The team with the highest score wins.
- Play 2 or more games. First team to win 2 games is the winner.



--	--	--

--	--	--

--	--	--

--	--	--

--	--	--

--	--	--

--	--	--

--	--	--

--	--	--

--	--	--