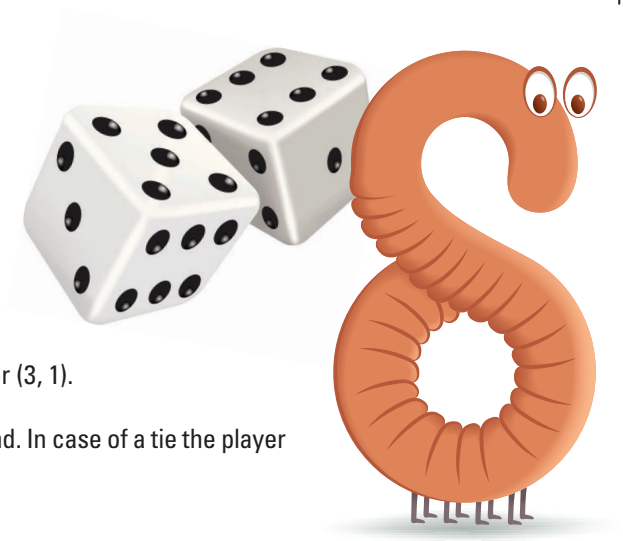
# Pieces of Eight



**Building Fluency:** coordinates and compare decimals

**Materials:** pair of dice, gameboard, paper

**Number of Players:** 2-4

**Directions:**

1. Each player rolls dice and chooses coordinate on the grid.
   Example: if the player rolls a 1 and 3, the player may choose, (1, 3) or (3, 1).
2. After each player is on a coordinate, they compare numbers.
3. The player with the 8 in the place with the largest value wins the round. In case of a tie the player with the largest number wins.
4. Play 10 rounds.
5. The player who wins the most rounds wins the game.

**Variation/Extension:** Students can record the value of the eight and total the 10 rounds, student with the highest sum wins or lowest sum wins.

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | 284.935 | 453.829 | 359.842 | 259.348 | 895.432 | 935.428 |
| 5 | 245.893 | 529.438 | 389.452 | 594.832 | 485.392 | 423.985 |
| 4 | 948.325 | 942.385 | 843.529 | 938.425 | 824.593 | 284.953 |
| 3 | 823.459 | 538.924 | 325.984 | 829.534 | 532.984 | 593.824 |
| 2 | 982.453 | 954.823 | 342.958 | 583.249 | 935.248 | 358.294 |
| 1 | 423.589 | 498.235 | 358.924 | 394.285 | 459.238 | 834.529 |
| | 1 | 2 | 3 | 4 | 5 | 6 |

# Parts of a Whole



**Building Fluency:** multiplication of whole number by a fractions

**Materials:** whole number die (1-6), fraction circle, and fraction cards or fraction die or spinner

**Number of Players:** 2

**Directions:**

1. Player rolls a standard whole number die, and spins the spinner.
2. The standard die represents the number of groups, and the spinner represents the fraction in each group.
   Example: A roll of 3 on the standard die, and spin $\frac{1}{4}$ on the spinner would be represented 3 groups with $\frac{1}{4}$.
3. Use fraction circles to help determine the product for each round.
4. If your result is 1 or more, you receive a star.
5. Play several rounds and count the stars you have collected.
6. The player with the most stars collected is the winner.

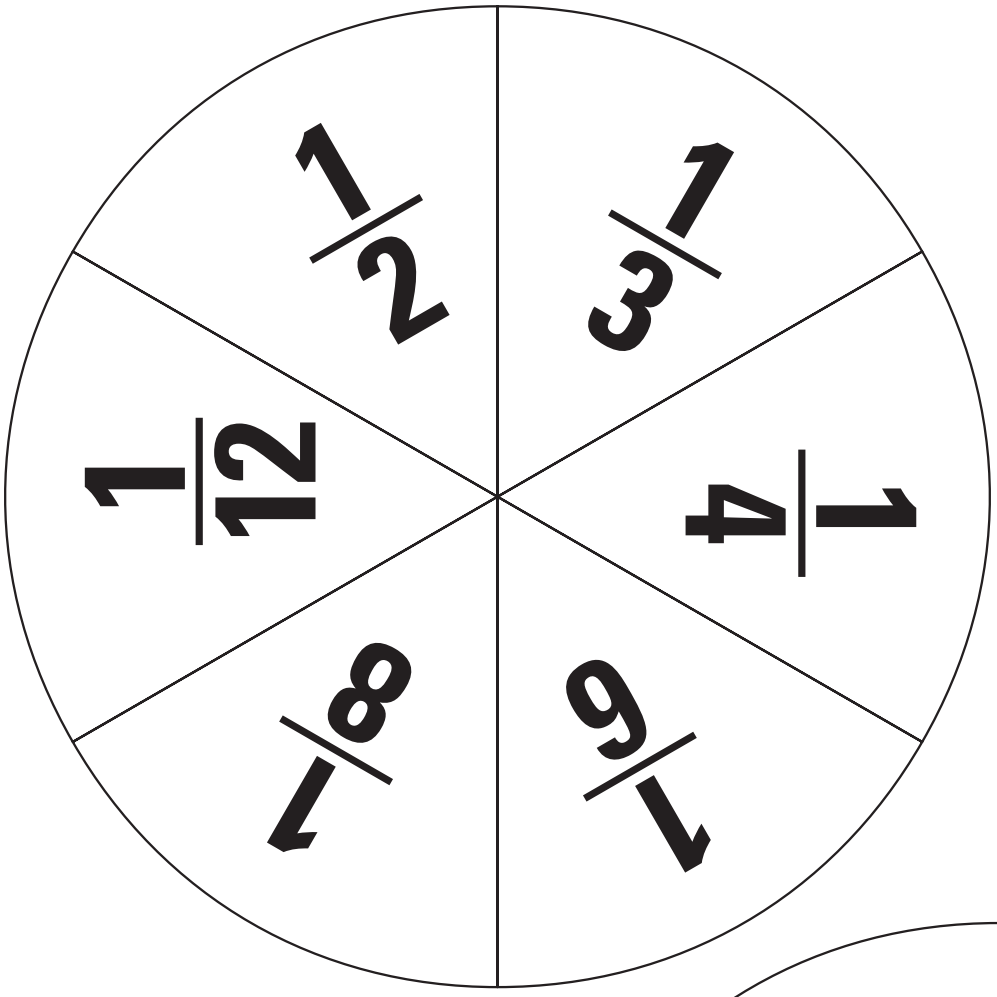
**Variation/Extension:** Student may want to modify fractions on spinner or use a die 0-9. A blank spinner and fraction circles are added for your convenience. Teacher may also want students to add the products. Students may want to write coordinating problems to fit each equation.

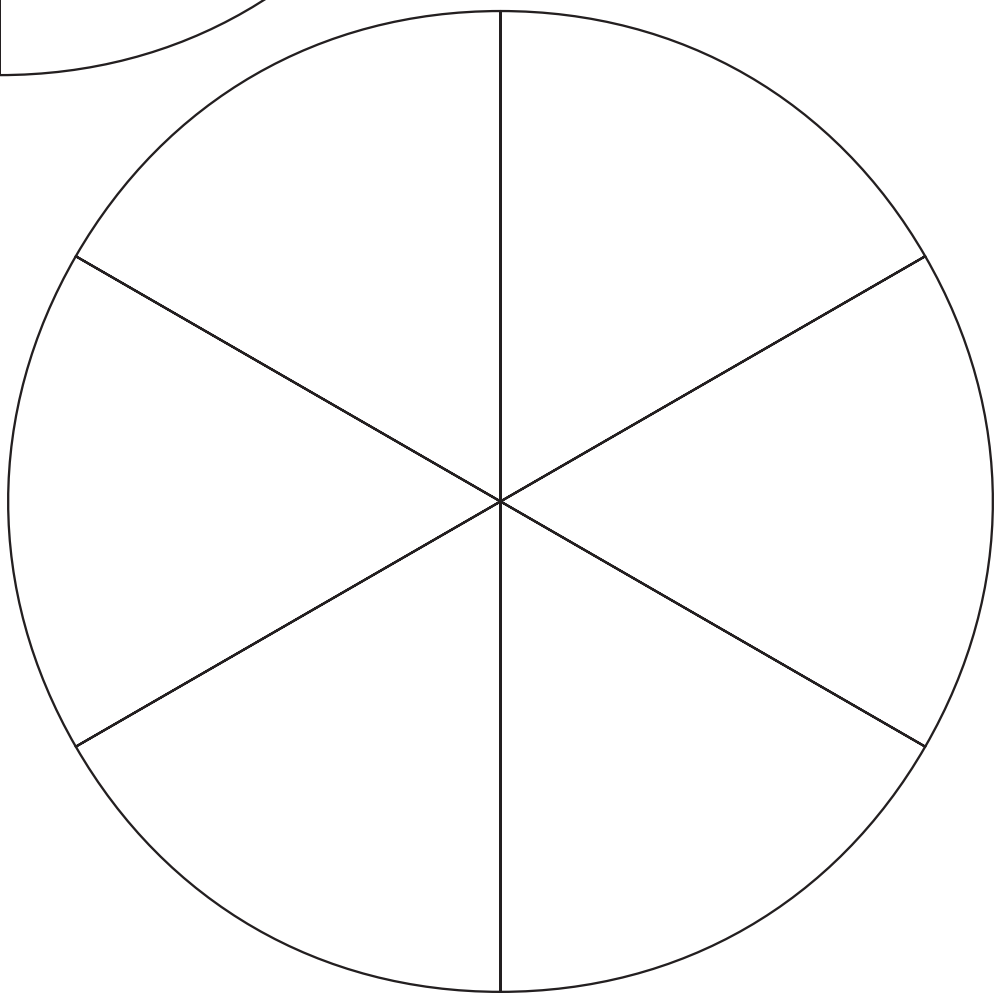
## PLAYER 1

| ROLL | SPIN | EQUATION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

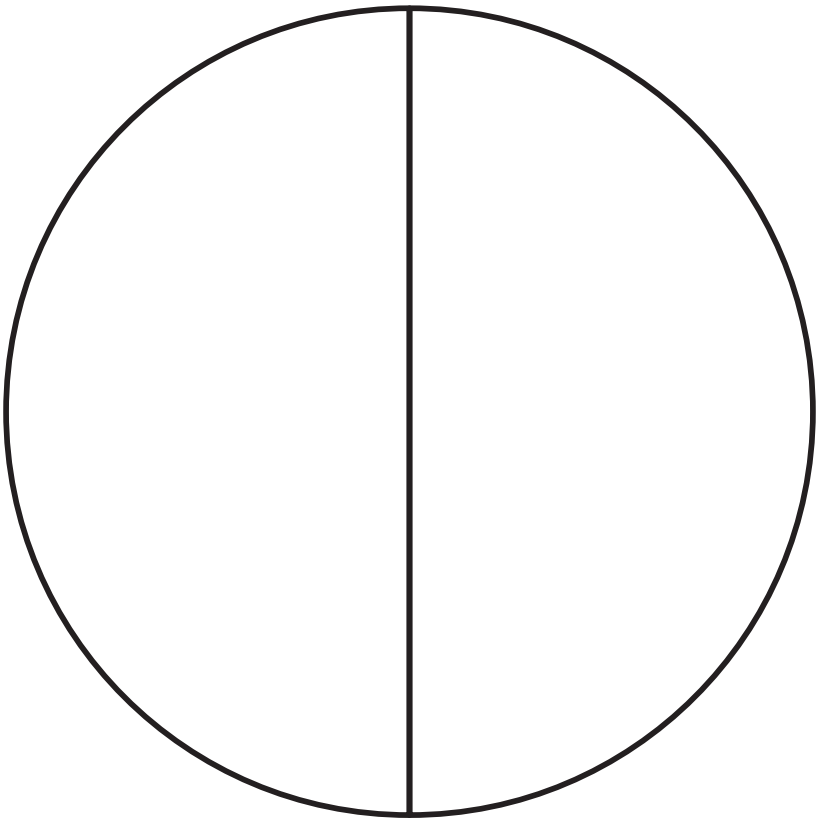
## PLAYER 2

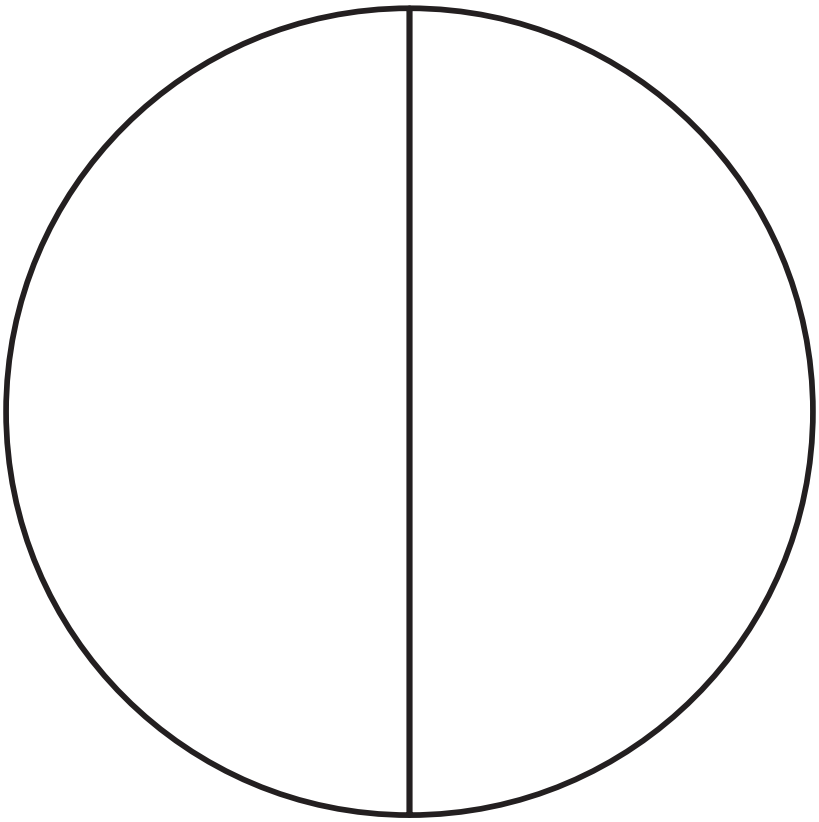
| ROLL | SPIN | EQUATION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

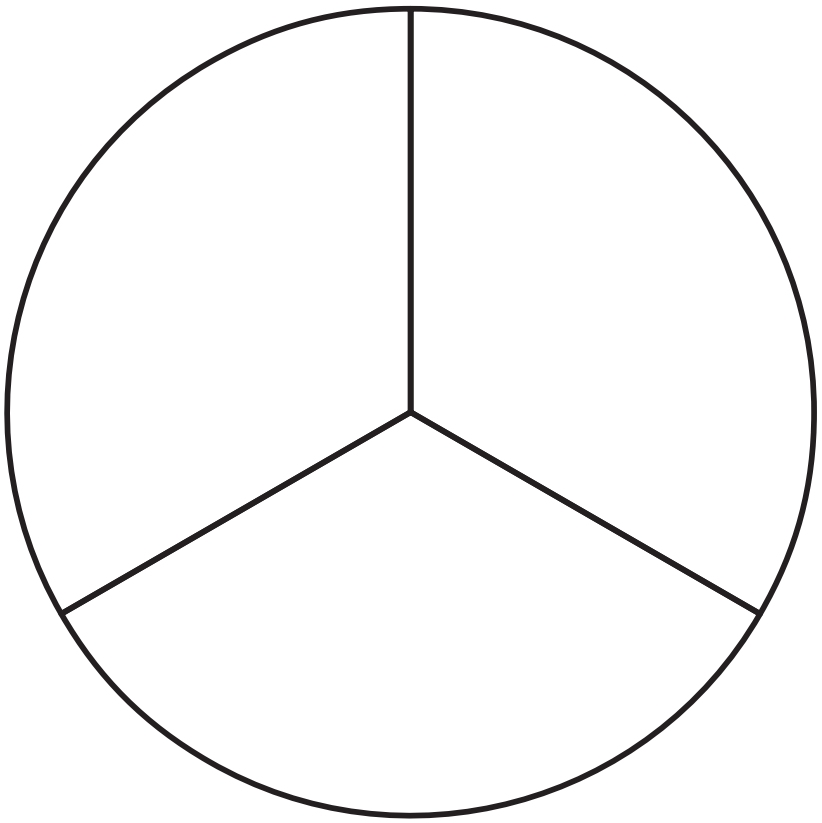

1/2
1/3
1/12
1/4
1/8
1/9

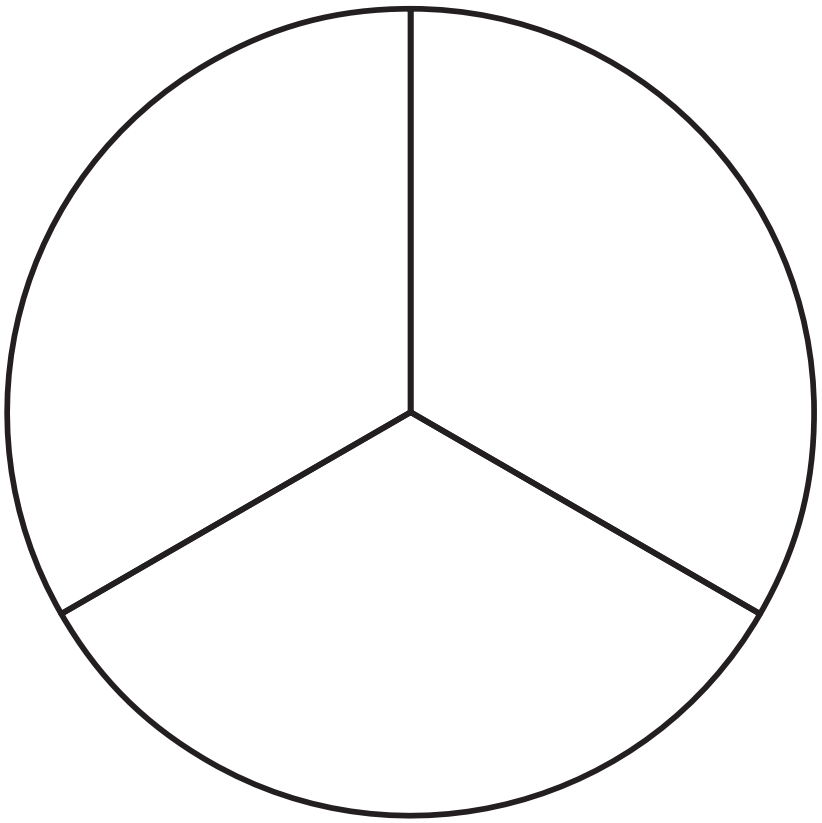


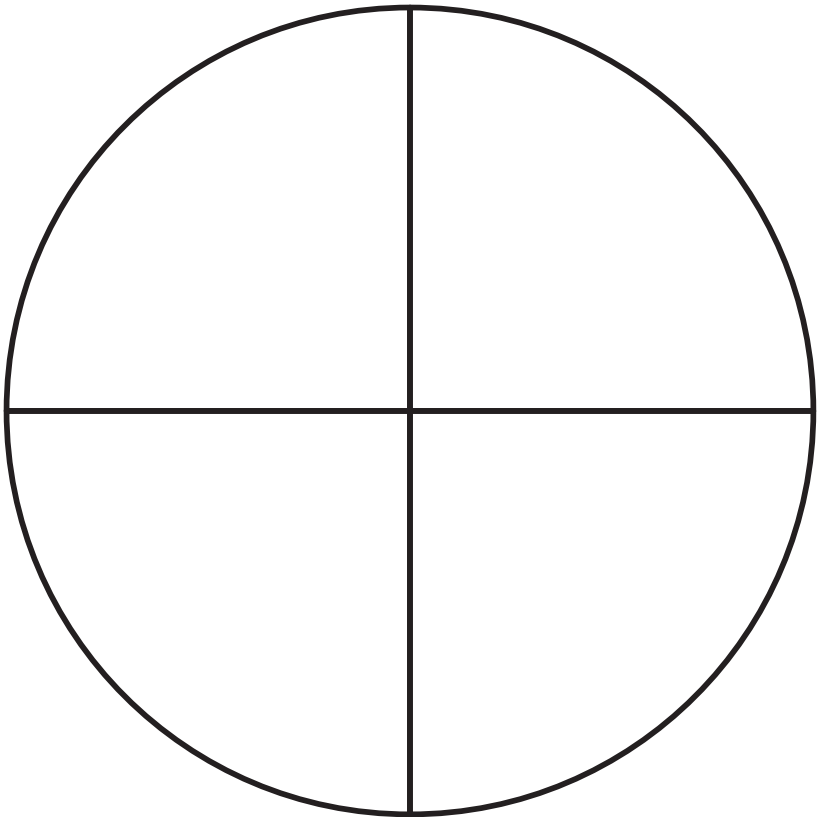
| | | |
|---|---|---|
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |

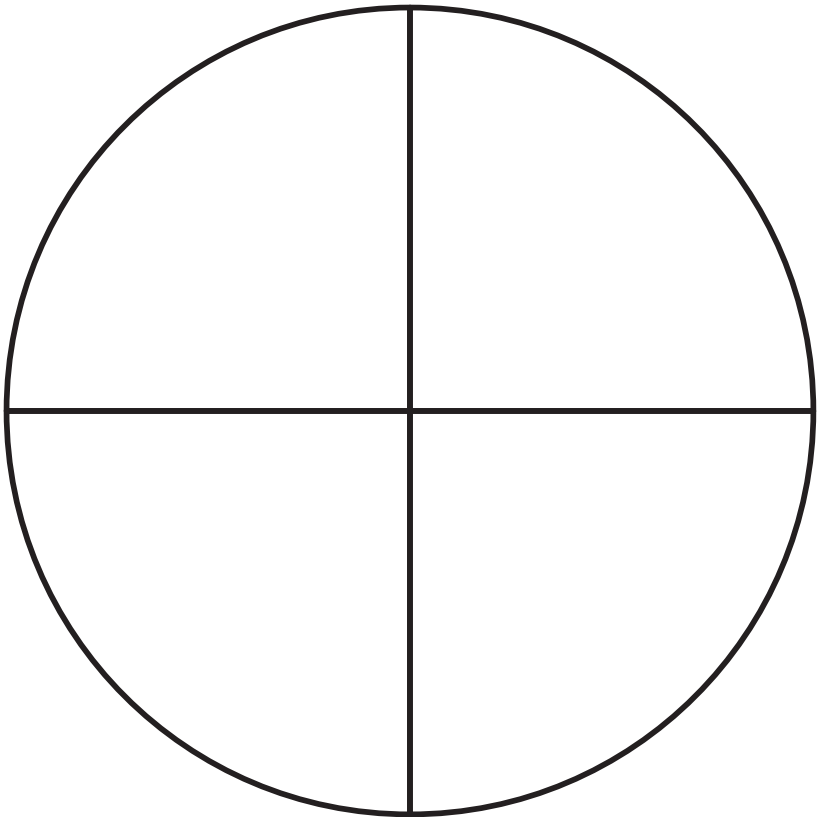


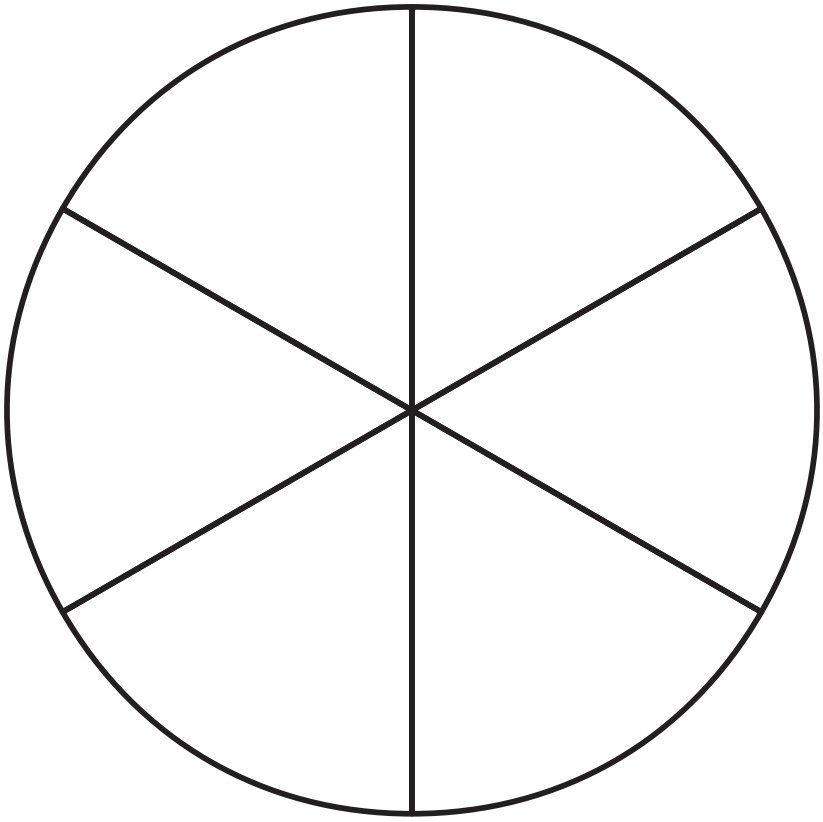


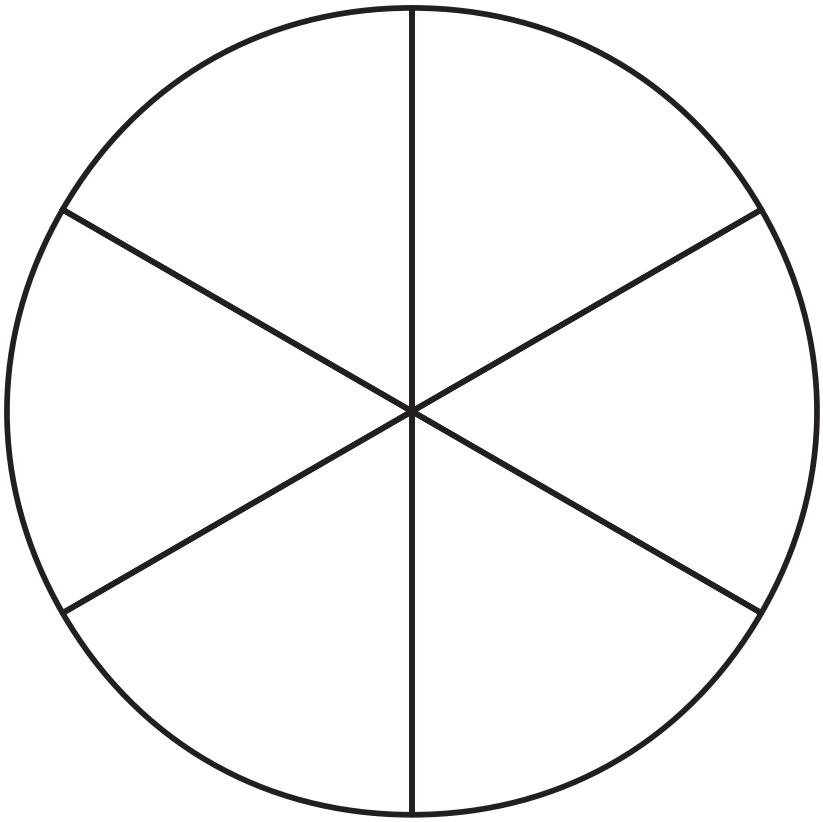


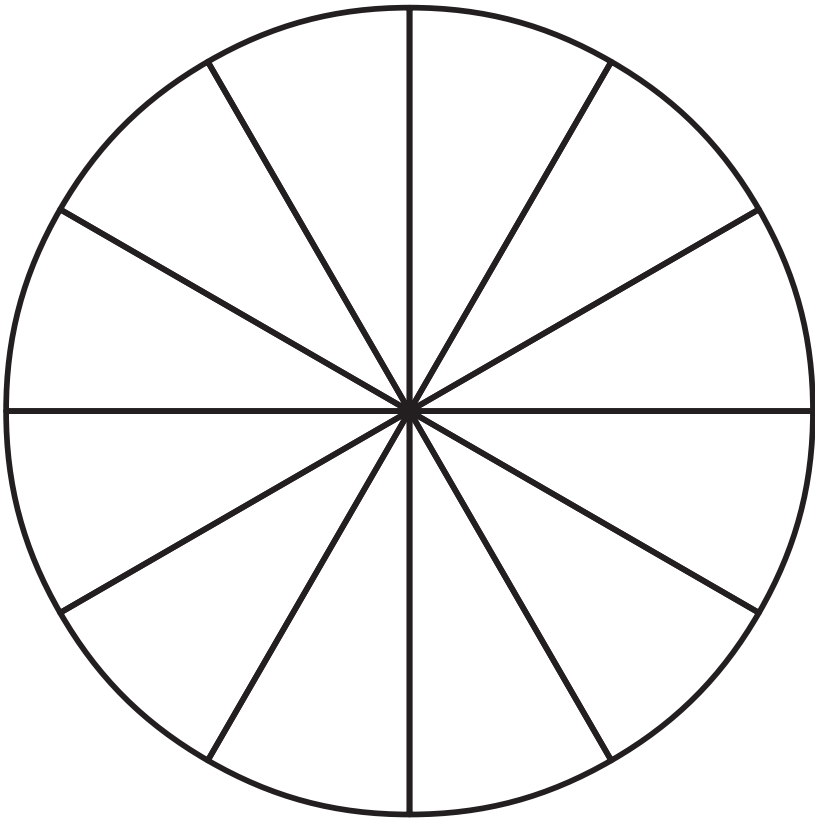


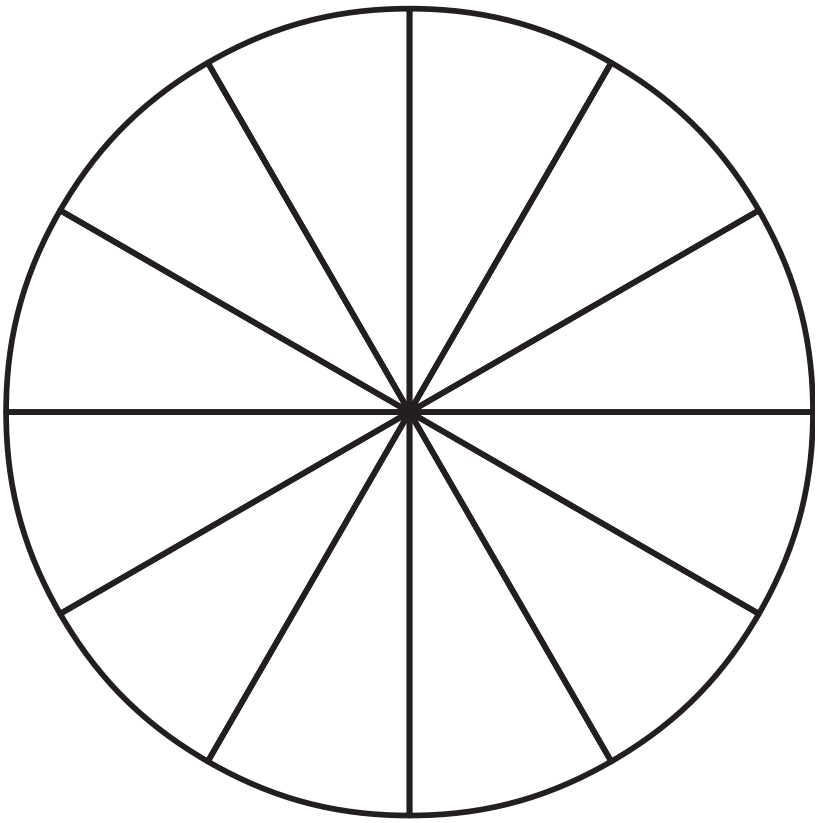


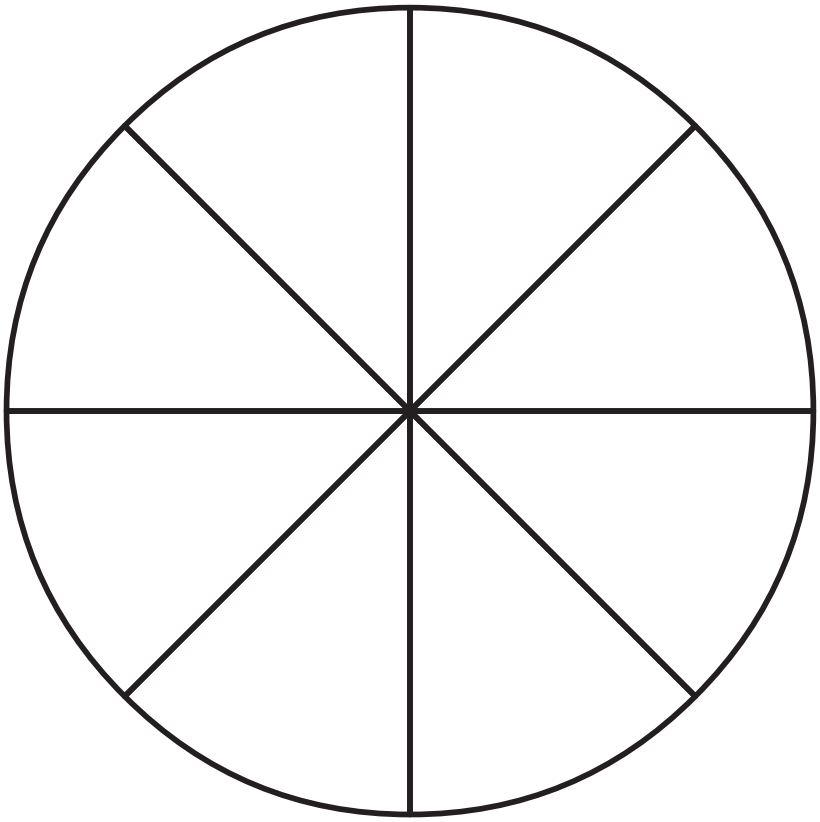


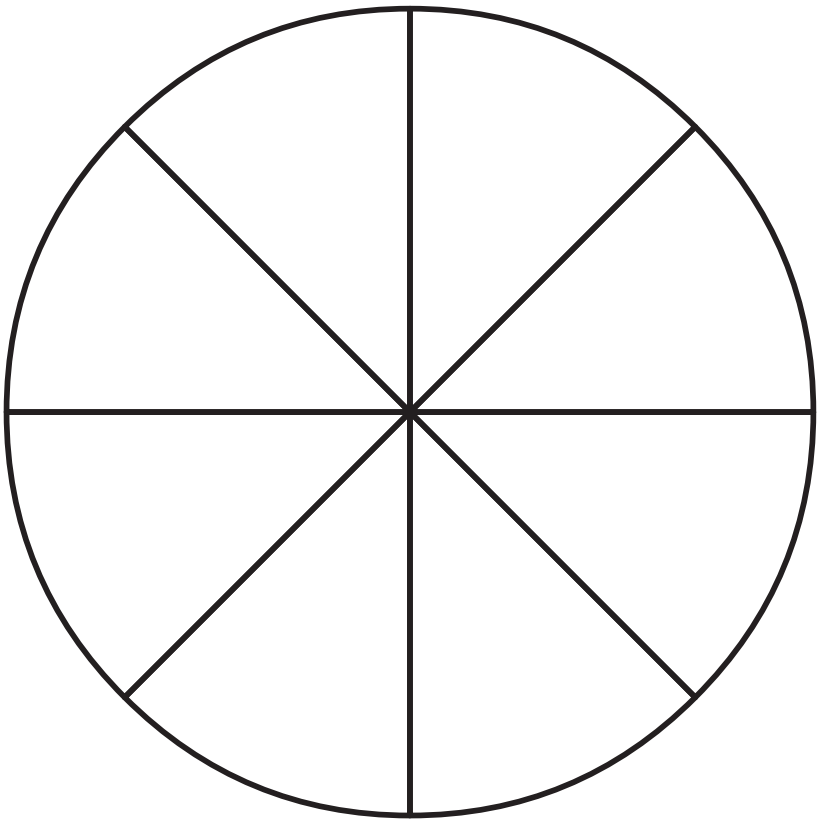




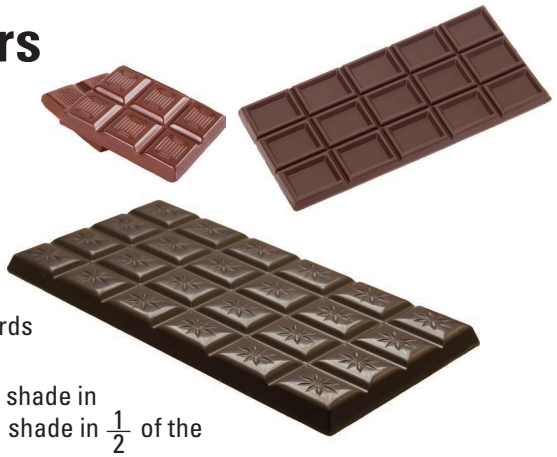








# The Whole Matters



**Building Fluency:** multiply fractions

**Materials:** gameboard per person and fraction cards or fraction die or spinner

**Number of Players:** 2 or more

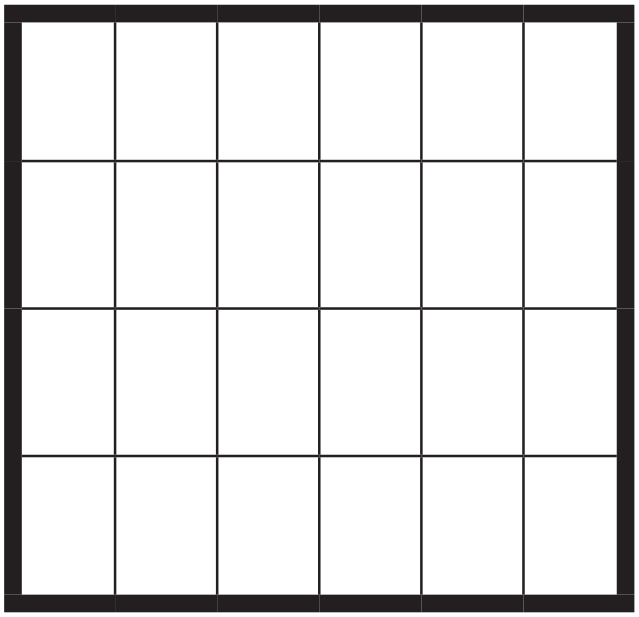
**Directions:**

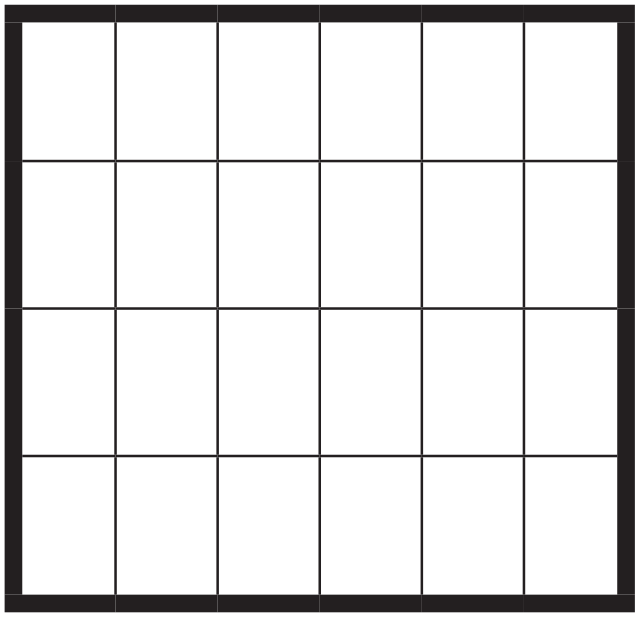
1. Give each player a game board (divided into 24 equal parts), and fraction cards or fraction die or spinner
2. The players take turns rolling their die. After each roll, the player rolling will shade in that fraction of their playing board. Example: if a player rolls $\frac{1}{2}$, they would shade in $\frac{1}{2}$ of the 24 boxes on the game board.
3. For all subsequent rolls, the fraction taken is of the amount remaining on the board after all previous rolls. Example: if a player has 12 boxes unshaded on his second roll, and they roll $\frac{1}{3}$, they would shade in 4 boxes, because $\frac{1}{3}$ of 12 is 4.
4. If you get a fraction that you are unable to divide, choose another fraction card.
5. The first player to have one unshaded box wins.

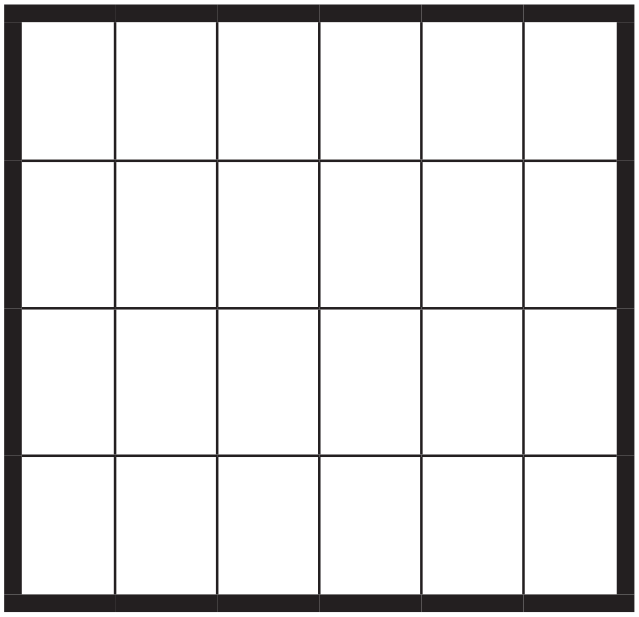
**Variation/Extension:** Students may change the fractions used, the gameboard, or the goal of the game. Additional game board are added for your convenience.

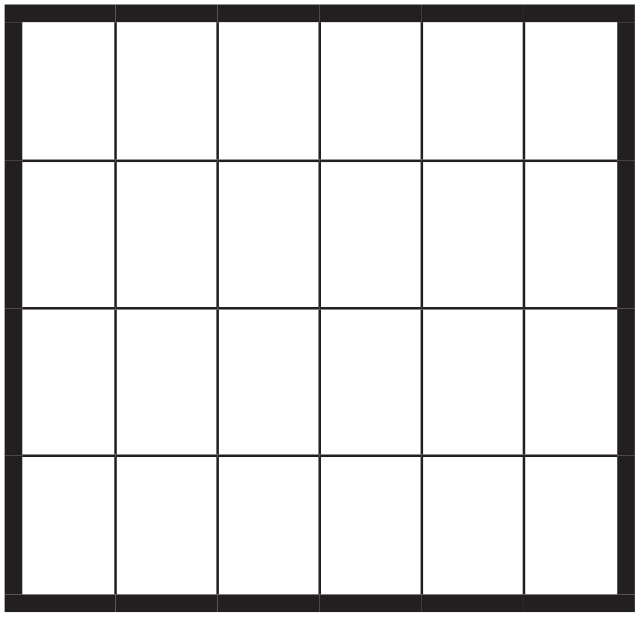
## PLAYER 1

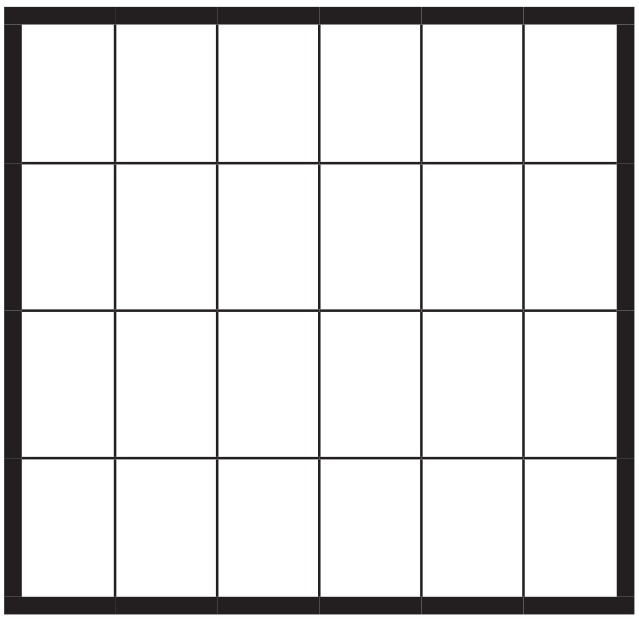
## PLAYER 2

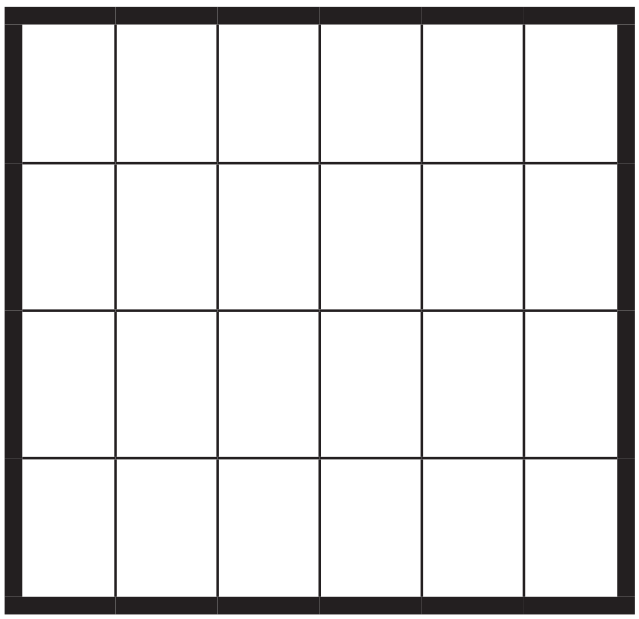


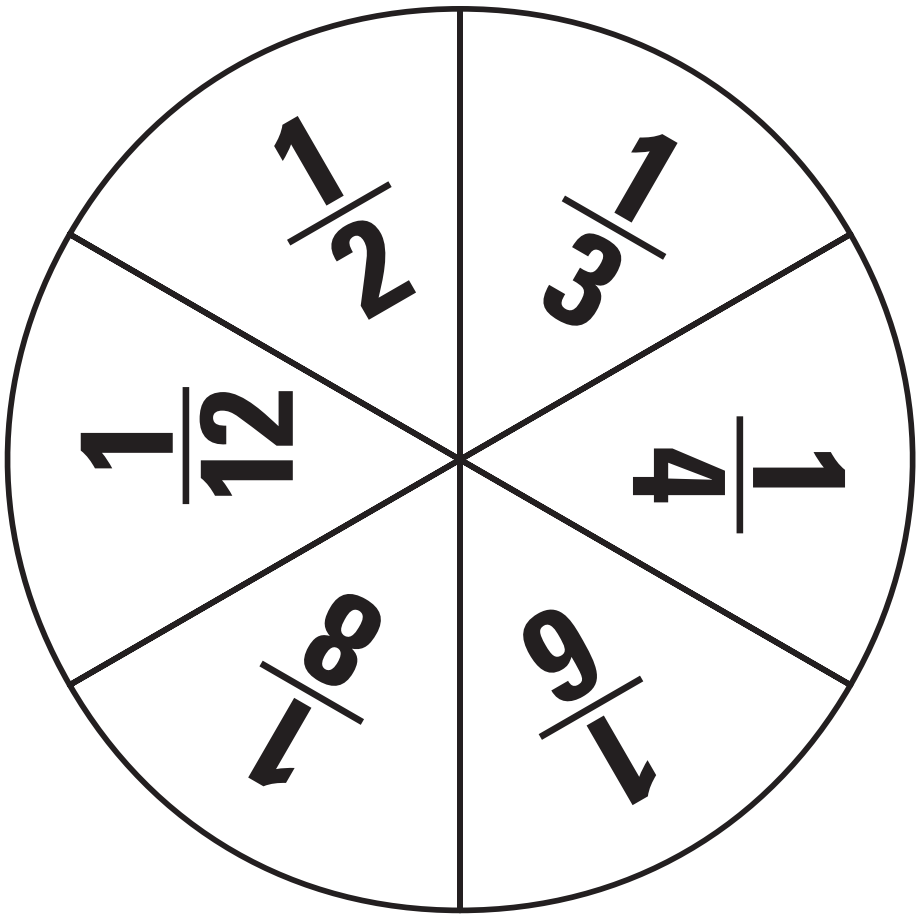


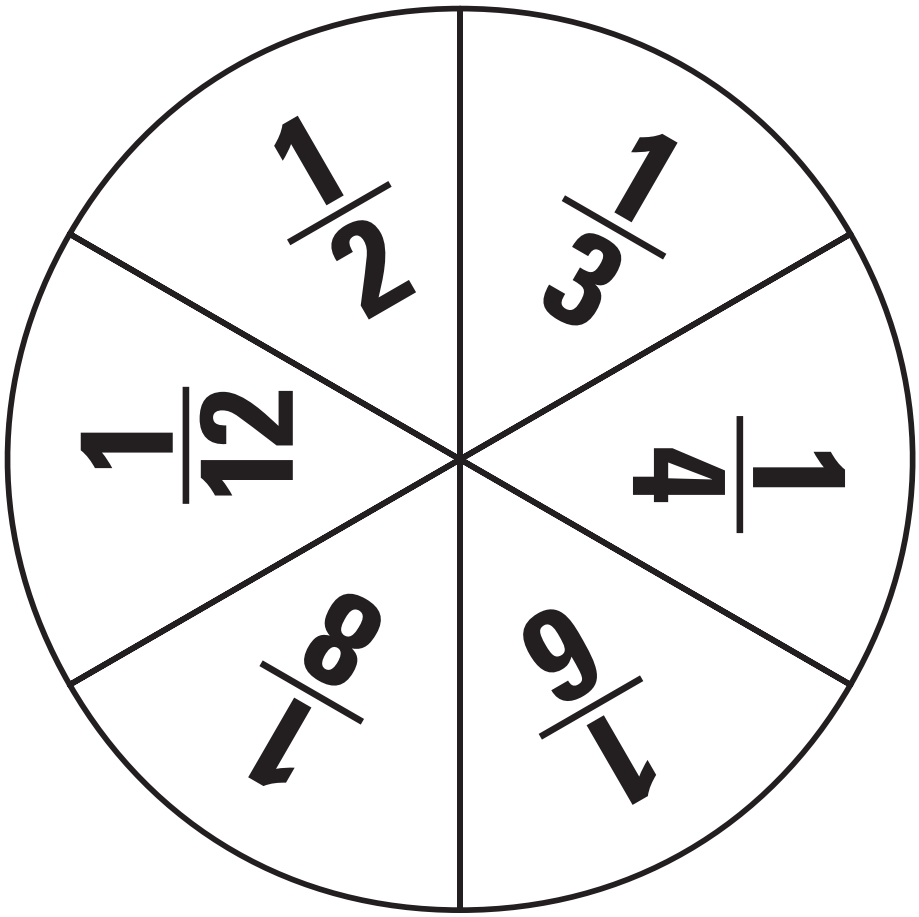









1/2
1/3
1/12
1/4
1/8
1/6


1/2
1/3
1/12
1/4
1/8
1/6

| | | |
|---|---|---|
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |

# Greatest Product

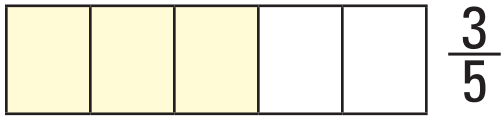
**Building Fluency:** multiply a fraction by a fraction

**Materials:** deck of cards; optional calculator with grid paper and colored pencils

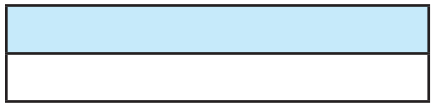
**Number of Players:** 2 or more

**Directions:**

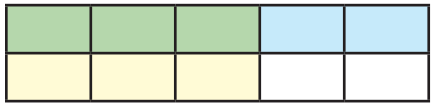
1. Use only the number cards from a deck of playing cards. Aces are worth one point each.
2. A fraction can be made by using two cards. One card is the numerator, and one card is the denominator.
3. Deal each player four number cards. Arrange the four cards to make a multiplication problem.
   Example: Let's say you were dealt [3], [1], [5], and [2] with these cards, you could make the fraction problem: $\frac{3}{5} \times \frac{1}{2}$
   (No fractions over one are allowed.)
4. Draw an area model to support your product.
   Example:



$\frac{3}{5}$



$\frac{1}{2}$



$\frac{3}{10}$

5. The player who forms the greatest product wins.
6. After you have played several rounds for the greatest product, play for the least product.

**Variation/Extension:** Student may want to record their work in their math notebook or use grid paper to create a model.

Allow students to create fractions over one – Why when multiplying a number by a fraction greater than 1 the results of the product is greater?

Another fun way to play the game is to allow the players to form their fractions first, and make their calculations before you say highest or lowest.

# Color the Door

**Building Fluency:** equivalence

**Materials:** recording sheet per player, fraction cards or fraction die or spinner

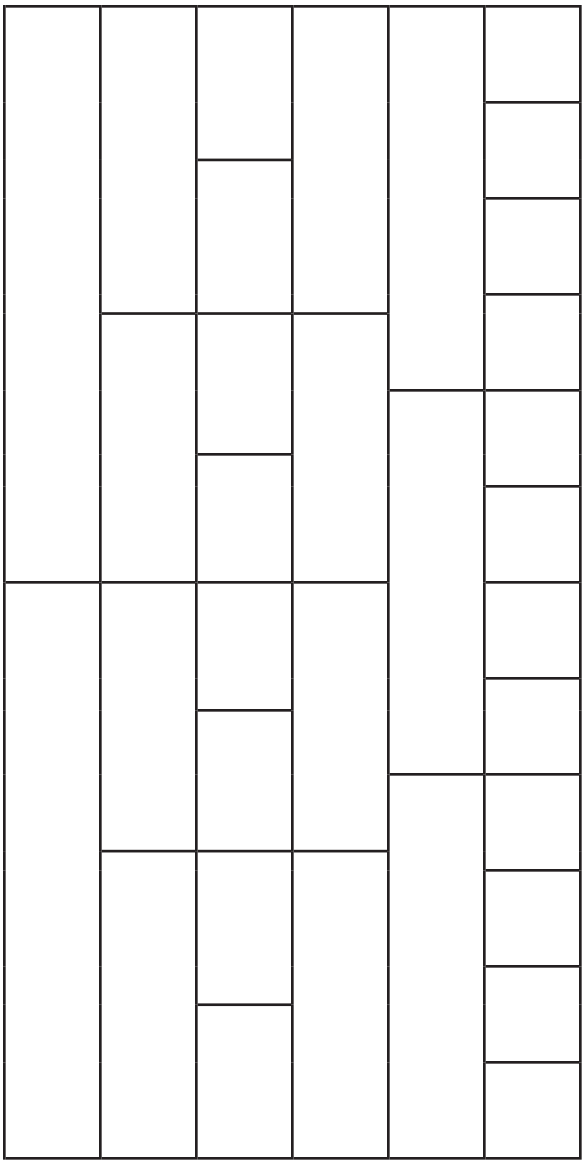
**Number of Players:** 2-4

**Directions:**

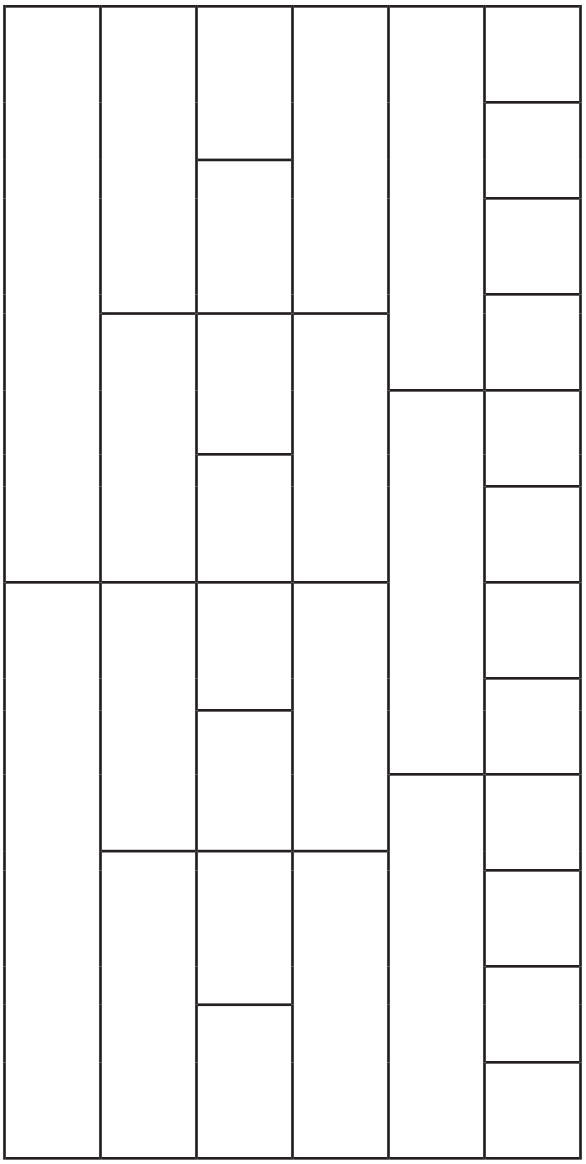
1. Each player takes turns drawing a card from the pile.
2. Player shades the door according to the value of the card drawn.
3. Players may shade in equivalent fractions if applicable.
4. If a player rolls a fraction, and not enough space is left on the front or back door for shading, the player loses their turn, and waits for the next roll of the die.
5. The first player to shade the front and back door wins.

**Variation/Extension:** Students can create their own door and fraction playing cards.

## FRONT DOOR

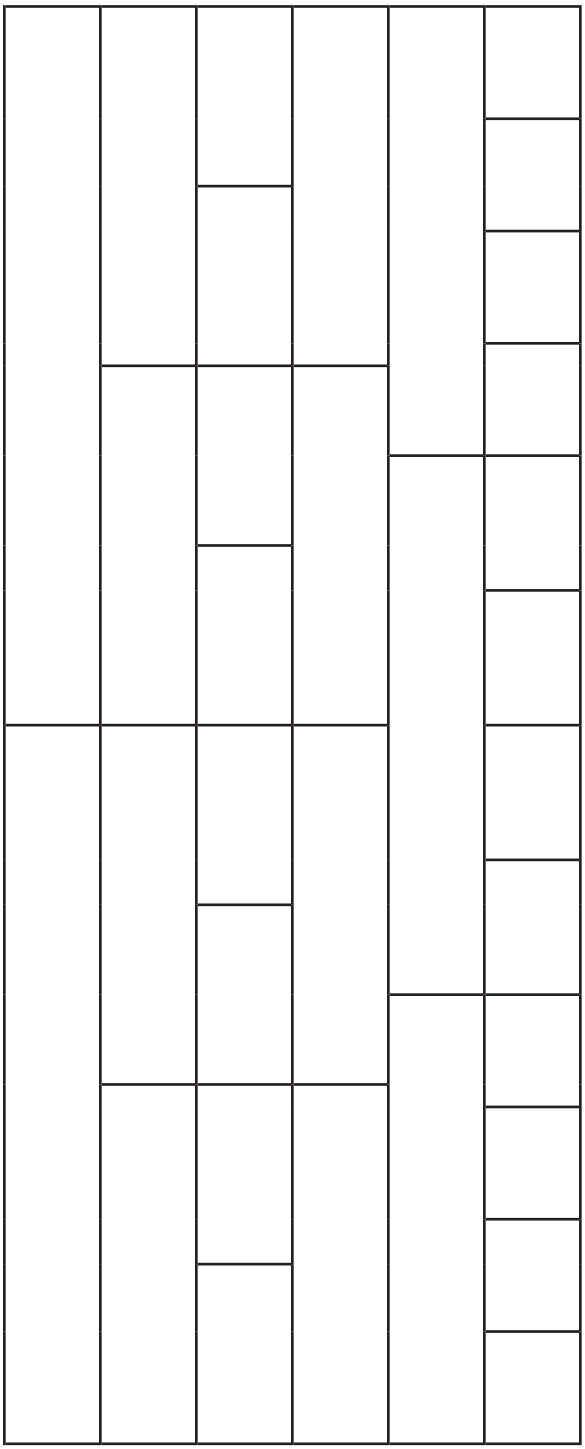


## BACK DOOR

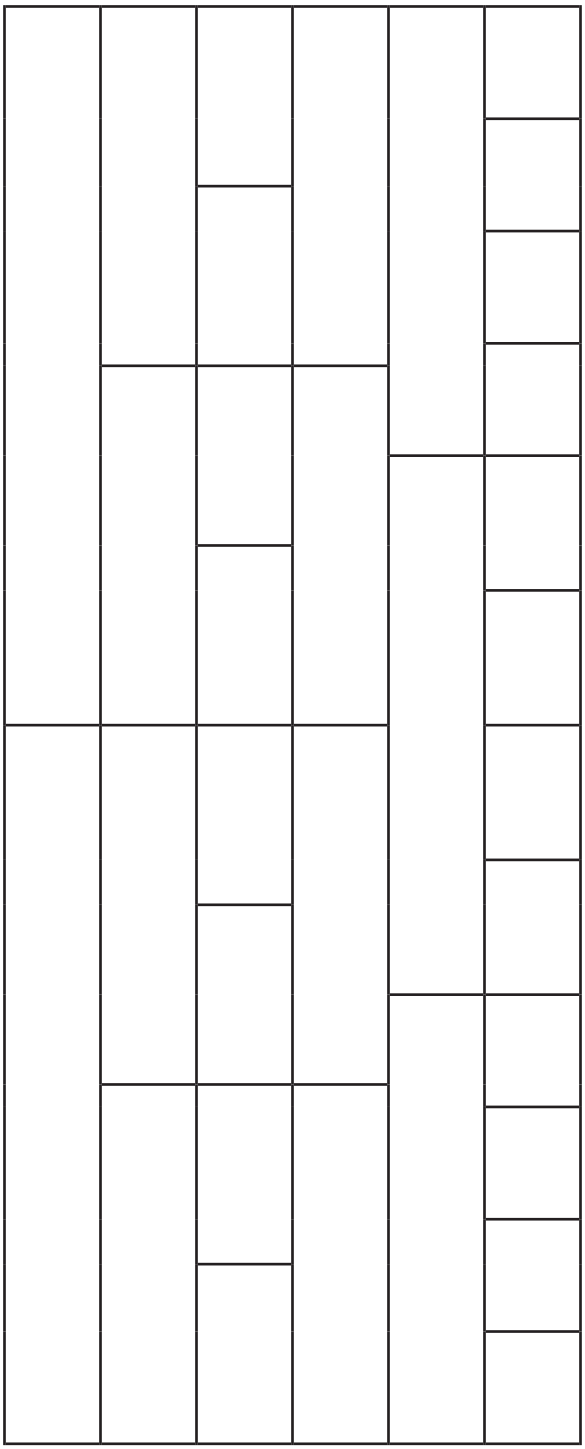


# PLAYER _____

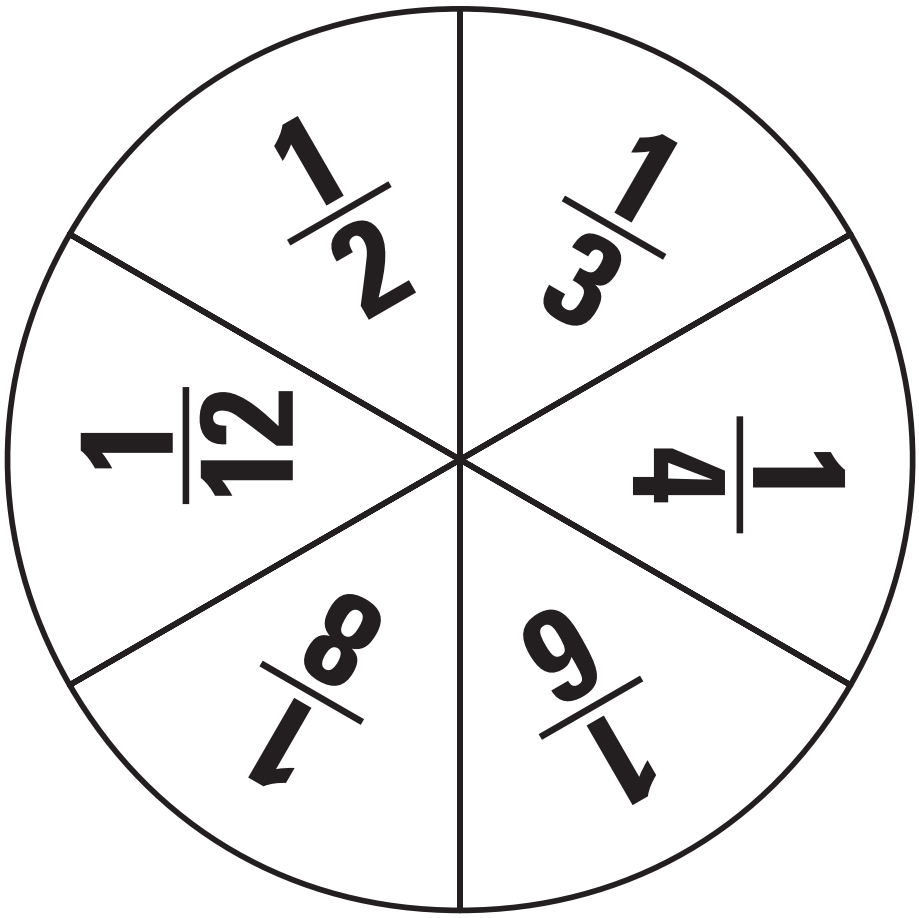
## FRONT DOOR

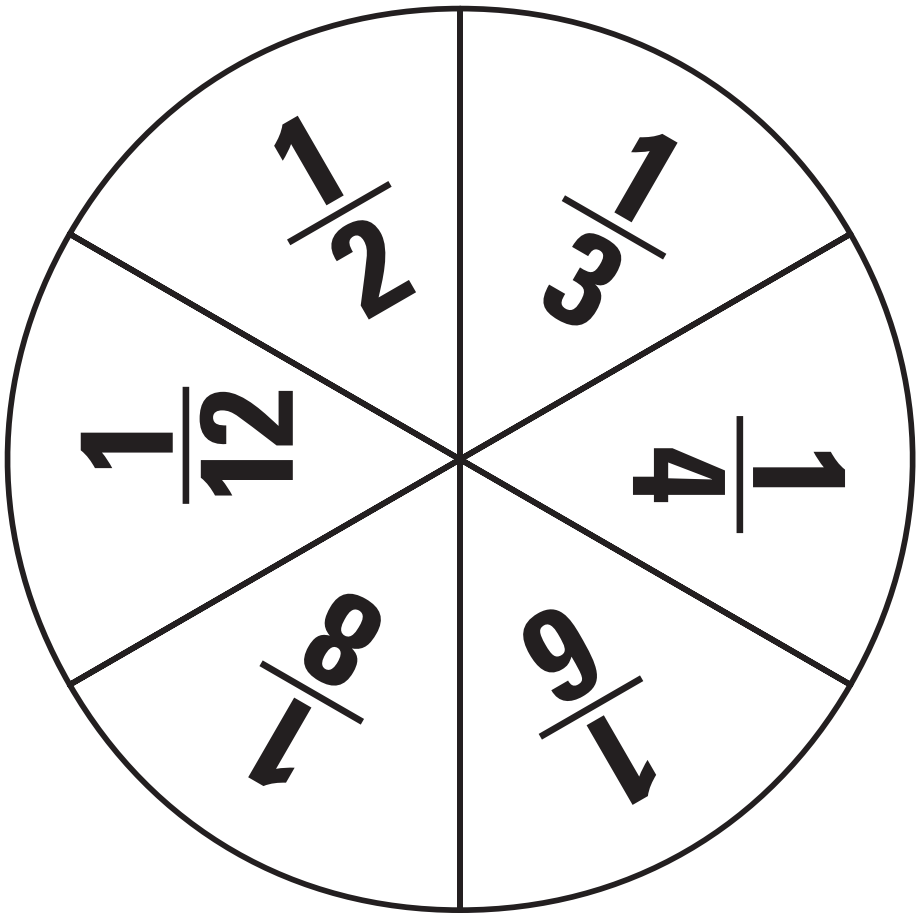


## BACK DOOR



| | | |
|---|---|---|
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |
| $\frac{1}{2}$ | $\frac{1}{3}$ | $\frac{1}{4}$ |
| $\frac{1}{6}$ | $\frac{1}{8}$ | $\frac{1}{12}$ |


1/2
1/3
1/12
1/4
1/8
1/6


1/2
1/3
1/12
1/4
1/8
1/6

# Rolling, Rolling, Rolling

**Building Fluency:** equivalence - review

**Materials:** gameboard, 10 markers of one color per person, and a pair of standard dice (1-6)

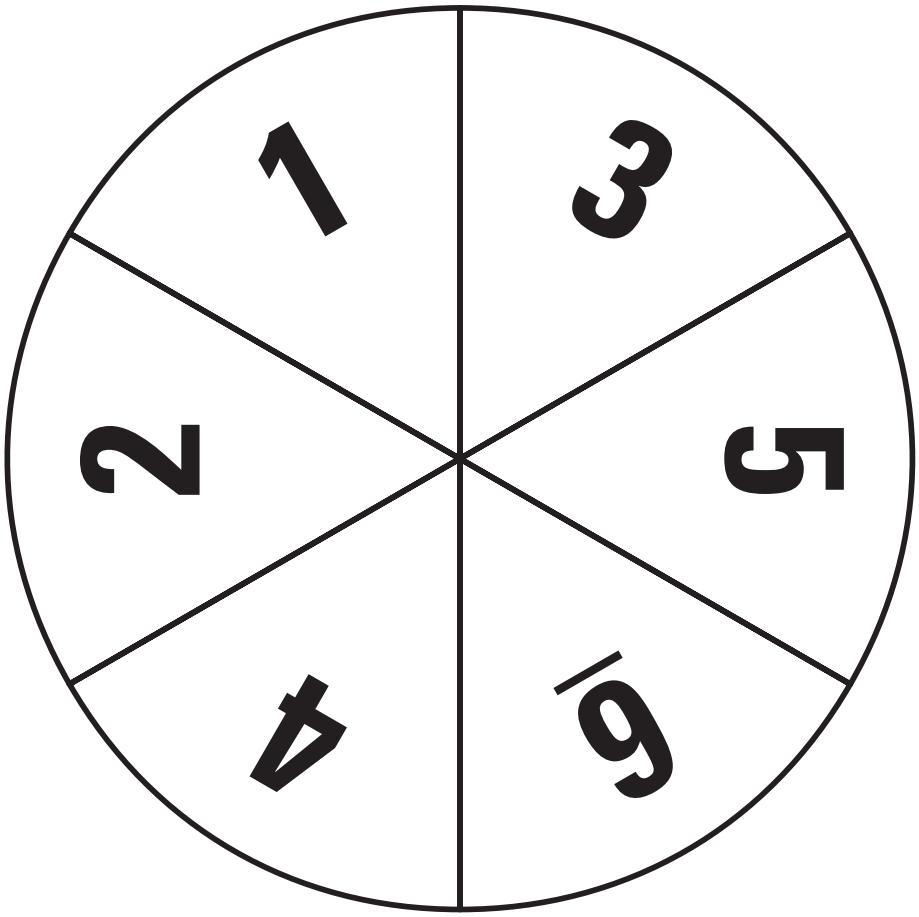
**Number of Players:** 2

**Directions:**

1. Each player needs 10 markers of one color.
2. Players take turns rolling 2 number cubes and making a fraction. The players may cover an equivalent fraction on the game board.
3. If a player rolls doubles, they may roll again and either cover the equivalent fraction rolled or remove an opponent's marker.
4. The first player to get 3 in a row in any direction wins.

**Variation/Extension:** Students may create their own fraction gameboards. Another way to modify the game is to change the die (1-9).

| | | | | |
|---|---|---|---|---|
| $\frac{4}{20}$ | $\frac{12}{16}$ | $\frac{6}{9}$ | $\frac{12}{20}$ | $\frac{6}{12}$ |
| $\frac{20}{30}$ | $\frac{12}{15}$ | $\frac{8}{20}$ | $\frac{20}{24}$ | $\frac{12}{24}$ |
| $\frac{3}{12}$ | $\frac{3}{18}$ | $\frac{4}{24}$ | $\frac{5}{15}$ | $\frac{4}{12}$ |
| $\frac{7}{14}$ | $\frac{4}{8}$ | $\frac{9}{12}$ | $\frac{5}{10}$ | $\frac{3}{9}$ |
| $\frac{10}{25}$ | $\frac{8}{12}$ | $\frac{15}{25}$ | $\frac{12}{18}$ | $\frac{9}{15}$ |


1
3
2
5
4
6

# Packing Blocks


**Building Fluency:** volume

**Materials:** game cards, calculator

**Number of Players:** 2

**Directions:** Tami and Natasha make baby toys for a local toy manufacturer. They are packing some baby blocks made into a shipping box. The shipping box has a volume of 1536 cubic inches. The dimensions of the blocks they are packing in the box are given below.

They must pack all of the same sized blocks into one box. Tami and Natasha want to decide before they actually pack the box. Which blocks might fit into the box with no space left over? Can you help Tami and Natasha decide which blocks could be packed into each box?

1. Correctly match the "Dimension of Block" cards with the correct "Volume of Box" cards.
2. Then match the "Maximum Number of Blocks."
3. Students may need a calculator.
3. Match the cards to find which blocks can be packed into Tami and Natasha's box with no space left over, (no remainder)?

**Variation/Extension:** Students create their own set of cards.

| | | |
|---|---|---|
| Dimensions of Block 1<br>**6 in by 6 in by 6 in** | The Volume of Box<br>**V = 125 cubic inches** | Maximum Number of Blocks<br>**7 blocks** |
| Dimensions of Block 2<br>**5 in by 5 in by 5 in** | Maximum Number of Blocks<br>**24 blocks** | The Volume of Box<br>**V = 27 cubic inches** |
| Dimensions of Block 3<br>**4 in by 4 in by 4 in** | Maximum Number of Blocks<br>**192 blocks** | The Volume of Box<br>**V = 64 cubic inches** |
| Dimensions of Block 4<br>**3 in by 3 in by 3 in** | The Volume of Box<br>**V = 8 cubic inches** | Maximum Number of Blocks<br>**12 blocks** |
| Dimensions of Block 5<br>**2 in by 2 in by 2 in** | The Volume of Box<br>**V = 216 cubic inches** | Maximum Number of Blocks<br>**56 blocks** |

## Answer Key

The following Rows go toether.

| | | |
|---|---|---|
| Dimensions of Block 1<br>**6 in by 6 in by 6 in** | The Volume of Box<br>**V = 216 cubic inches** | Maximum Number of Blocks<br>**7 blocks** |
| Dimensions of Block 2<br>**5 in by 5 in by 5 in** | The Volume of Box<br>**V = 125 cubic inches** | Maximum Number of Blocks<br>**12 blocks** |
| Dimensions of Block 3<br>**4 in by 4 in by 4 in** | The Volume of Box<br>**V = 64 cubic inches** | Maximum Number of Blocks<br>**24 blocks** |
| Dimensions of Block 4<br>**3 in by 3 in by 3 in** | The Volume of Box<br>**V = 27 cubic inches** | Maximum Number of Blocks<br>**56 blocks** |
| Dimensions of Block 5<br>**2 in by 2 in by 2 in** | The Volume of Box<br>**V = 8 cubic inches** | Maximum Number of Blocks<br>**192 blocks** |