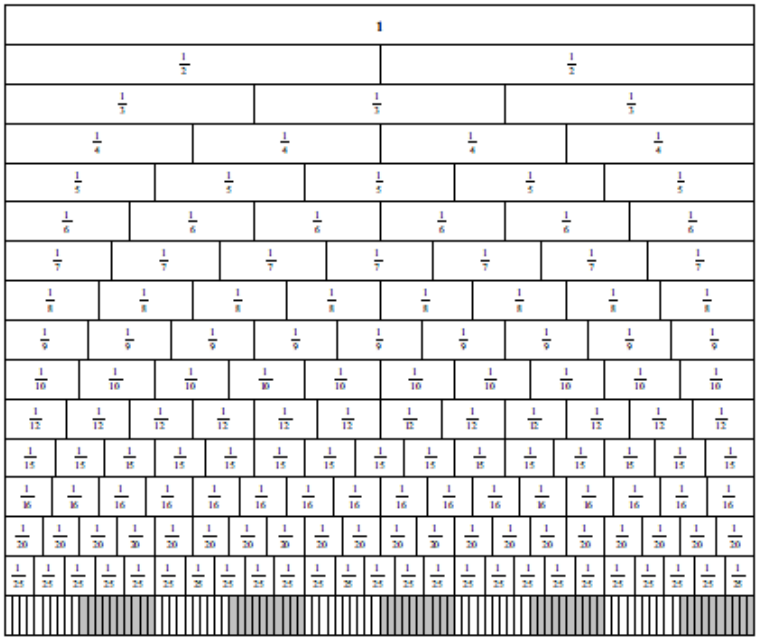
Building Understanding and Number Sense with Fractions



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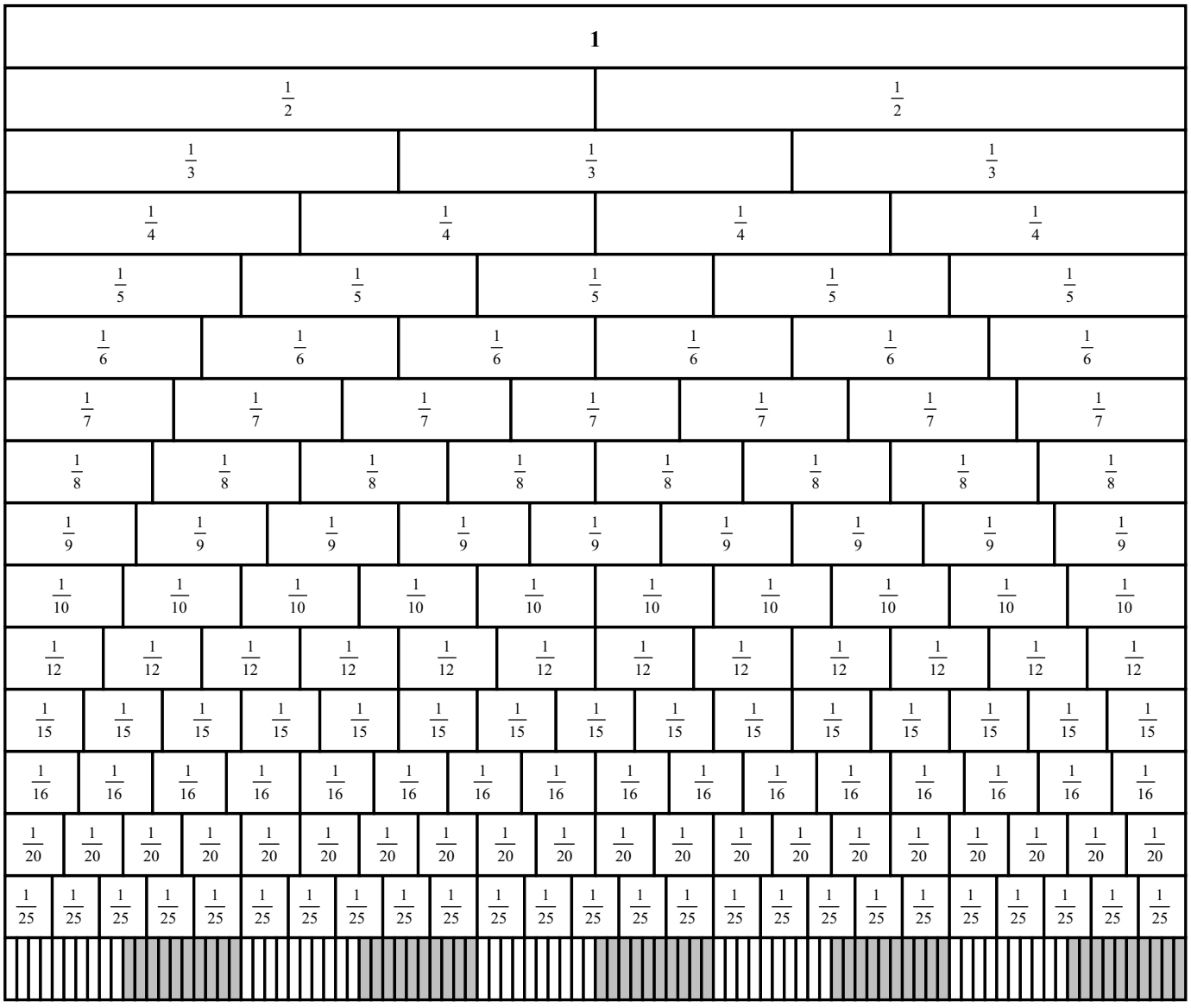
Fraction-Decimal Bars



Four Digit Fun with Fractions

You will be given four digits.
You must create problems which meet the following specifications

A. Use all four digits to create a fraction as close to zero as possible.
B. Use all four digits to create a fraction that is about one half.
C. Use all four digits to create two fractions that sum as close to 1 as possible.

Example: Use the four digits: 3, 5, 7, 8

Part A:

In forming the fractions for part 1 you would only want to consider $\frac{3}{579}, \frac{3}{759}, \frac{3}{957}, and\ \frac{3}{975}$.

Think about why these are the only ones you want to consider.

Think about why $\frac{3}{975}$ is closest to zero.

Part B:

In forming the fractions it makes sense to only consider $\frac{35}{79}, \frac{35}{97}, \frac{53}{79}, \frac{53}{97}, \frac{37}{59}, \frac{37}{95}, \frac{39}{75} and \frac{39}{57}$

Explain why only these should be considered.

How would you determine which of these is about $\frac{1}{2}$?

Can you think why $\frac{39}{75}$ is closest to $\frac{1}{2}$?

Part C:

In forming the fractions, it makes sense to only consider $\frac{3}{7}+\frac{5}{9}, \frac{3}{9}+\frac{5}{7}, and\ \frac{7}{9}+\frac{3}{5}$.

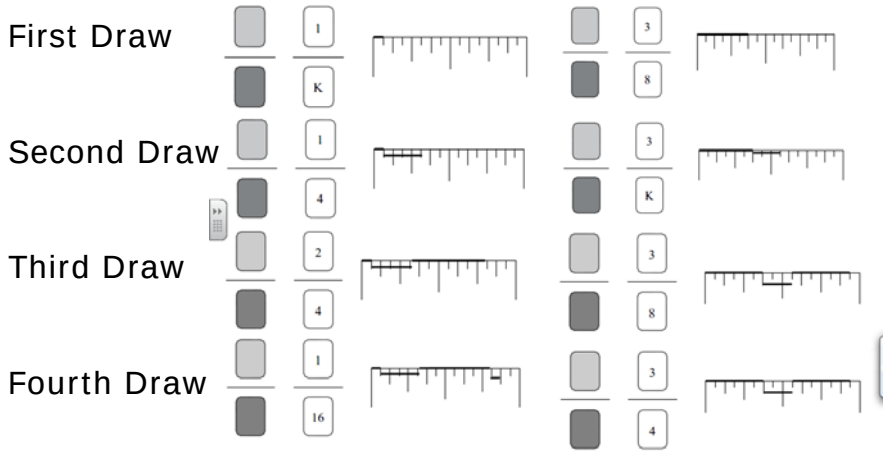
Can you think why these are the only ones you want to consider?

Can you think why $\frac{3}{7}+\frac{5}{9}$ is closest to 1?

Only Sixteenths Game

- Sort through a standard deck of playing cards, putting the 4s, 8s and kings in one stack and the aces, 2s and 3s in the other stack. The kings will represent sixteenths.
- The 4s, 8s and kings stand for the denominator, or bottom number of the fraction.
- The aces, 2s and 3s will stand for the numerator, or top number of a fraction.
- Each player places the magnified inch template in a Communicator®.
- The numerator and denominator cards are placed face down in two separate piles.
- Players alternately choose a numerator and denominator card from the top of the deck.
- If the fraction is not in sixteenths, they change the fraction to an equivalent form using sixteenths.
- They then mark that distance of sixteenths on the giant inch, each time starting where they left off the last time.
- The first player to have their mark extend beyond an inch wins the round.
- The first player to win 12 rounds (a foot) wins the game.
- When the cards are all used, each stack is reshuffled and the numerator and denominator piles are once again created.

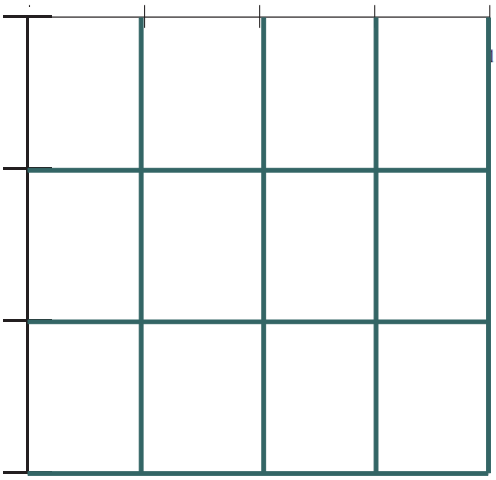
Example: Student A Student B



Student B wins in the fourth draw because their line passes 1 inch.

Using the Area Model to Understand Multiplication of Fractions

Suppose we want to multiply $\frac{1}{4}\times\frac{1}{3}$. This can be represented as an area of a rectangle.



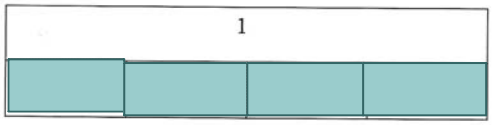
- To represent $\frac{1}{4}$ draw a horizontal line segment on the Communicator® and divide it into four equal parts
- To represent $\frac{1}{3}$ draw a vertical unit segment and mark the segment into thirds.
- Draw the vertical and horizontal lines to form rectangles.
- If the area of the large square is 1, what is the area of each of the smaller rectangles?
- What are the dimensions of each rectangle.
- Each rectangle measures $\frac{1}{4}by\frac{1}{3}$ so the area is the multiplication of these two fractions. Each rectangle is $\frac{1}{12}$ of the unit square.

  Therefore, $\frac{1}{4}\times\frac{1}{3}=\frac{1}{12}$

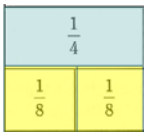
Using Fraction Bars to Understand Division of Fractions

Suppose we want to multiply $1 \div \frac{1}{4}$. What question is this asking?

The statement is asking how many $\frac{1}{4}$'s are in 1. This can be visualized with fraction bars. Locate the bar labeled 1 and the bars labeled $\frac{1}{4}$. How many of the $\frac{1}{4}$ bars fit in the unit bar? (4)



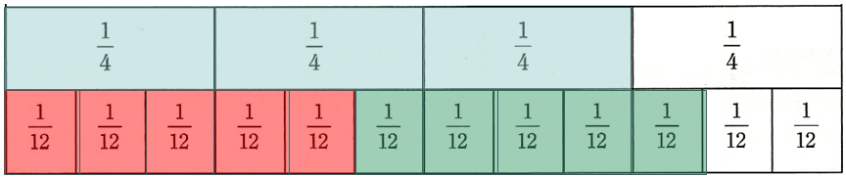
Use the fraction bars to answer $\frac{1}{4} \div \frac{1}{8}$.



The bars show that $\frac{1}{8}$ fits in the $\frac{1}{4}$ twice, so the answer is 2.

Use the fraction bars to answer $\frac{3}{4} \div \frac{5}{12}$.

The bars show that $\frac{5}{12}$'s fits in $\frac{3}{4}$'s at least 1 time and almost 2 times. Studying the extra pieces we can see that there are only 4 out of the 5 pieces we are trying to find so the answer is $1\frac{4}{5}$.



Using Mental Math to Divide Fractions

Lesson 7, Activity 7E

Name: _____ Date: _____

Complete the problems below using mental math.

Row 1	$\frac{4}{9} \div \frac{2}{9}$	$\frac{4}{5} \div \frac{2}{5}$	$\frac{8}{15} \div \frac{2}{15}$	$\frac{3}{4} \div \frac{1}{4}$	$\frac{6}{7} \div \frac{3}{7}$
Row 2	$1 \div \frac{1}{5}$	$2 \div \frac{1}{4}$	$3 \div \frac{3}{16}$	$5 \div \frac{5}{8}$	$2 \div \frac{1}{16}$
Row 3	$\frac{3}{8} \div \frac{3}{16}$	$\frac{2}{3} \div \frac{4}{9}$	$\frac{4}{5} \div \frac{2}{15}$	$\frac{1}{4} \div \frac{1}{12}$	$\frac{9}{10} \div \frac{9}{20}$
Row 4	$\frac{8}{9} \div \frac{5}{9}$	$\frac{4}{5} \div \frac{3}{5}$	$\frac{7}{15} \div \frac{4}{15}$	$\frac{15}{16} \div \frac{7}{16}$	$\frac{4}{7} \div \frac{3}{7}$
Row 5	$\frac{2}{9} \div \frac{8}{9}$	$\frac{1}{5} \div \frac{4}{5}$	$\frac{7}{15} \div \frac{14}{15}$	$\frac{3}{16} \div \frac{5}{16}$	$\frac{3}{7} \div \frac{4}{7}$
Row 6	$\frac{13}{16} \div \frac{3}{8}$	$\frac{5}{9} \div \frac{1}{3}$	$\frac{14}{15} \div \frac{3}{5}$	$\frac{3}{4} \div \frac{5}{12}$	$\frac{9}{10} \div \frac{3}{5}$
Row 7	$\frac{2}{5} \div \frac{11}{15}$	$\frac{5}{9} \div \frac{2}{3}$	$\frac{7}{16} \div \frac{3}{4}$	$\frac{5}{6} \div \frac{11}{12}$	$\frac{3}{10} \div \frac{2}{5}$

Estimating Answers to Fractions

Transparency 39

1. $1\frac{3}{10} + \frac{4}{5} =$ A. $\frac{1}{2}$ B. $1\frac{7}{15}$ C. $2\frac{1}{10}$ D. $2\frac{1}{5}$

2. $\frac{1}{2} \times \frac{3}{4} =$ A. $\frac{1}{4}$ B. $\frac{3}{8}$ C. $\frac{2}{3}$ D. $1\frac{1}{4}$

3. $4 - 1\frac{3}{8} =$ A. $2\frac{5}{8}$ B. $3\frac{3}{8}$ C. $5\frac{3}{8}$ D. $5\frac{1}{2}$

4. $\frac{2}{3} \div \frac{2}{9} =$ A. $\frac{4}{27}$ B. $\frac{8}{9}$ C. 3 D. $6\frac{1}{4}$

5. $2\frac{1}{4} \times 3\frac{7}{8} =$ A. $1\frac{5}{8}$ B. $6\frac{1}{8}$ C. $6\frac{7}{32}$ D. $8\frac{23}{32}$

6. $9\frac{1}{10} - 3\frac{3}{4} =$ A. $5\frac{7}{20}$ B. $6\frac{13}{20}$ C. $12\frac{17}{20}$ D. $34\frac{1}{8}$

7. $\frac{8}{9} + \frac{2}{3} =$ A. $\frac{2}{9}$ B. $\frac{16}{27}$ C. $1\frac{5}{9}$ D. 4

8. $1 \div \frac{3}{5} =$ A. $\frac{3}{5}$ B. $1\frac{2}{5}$ C. $1\frac{3}{5}$ D. $1\frac{2}{3}$