



Fraction Division with Equation Strings

- These problems are arranged so that as students move down the column, they can extend their reasoning on one problem to solve the next, more challenging problem.

$$6 \div 2 = t$$

$$6 \div \frac{1}{2} = w$$

$$3\frac{1}{2} \div \frac{1}{2} = j$$

$$\frac{3}{4} \div \frac{1}{2} = m$$

$$6\frac{3}{4} \div \frac{1}{2} = y$$

$$6\frac{3}{4} \div 1\frac{1}{2} = h$$

$$6\frac{1}{5} \div 1\frac{1}{2} = n$$



It's Friday and Alex knows his mom has made brownies for him and his friend Brian. She cuts the pan of brownies into six equal sized portions. If Alex shares the brownies with his friend Brian, how many can each have?



$$6 \div 2 = t$$

Please use an area model to illustrate your thinking. You might want to try grid paper.



Carla has just returned home from the store with six dozen eggs. She must repackage them so that they are ready to make family-size omelets that require a $\frac{1}{2}$ dozen eggs. How many omelets will she be able to make?

$$6 \div \frac{1}{2} = w$$

***Please use a set model to illustrate your thinking.
You might want to try two color counters.***



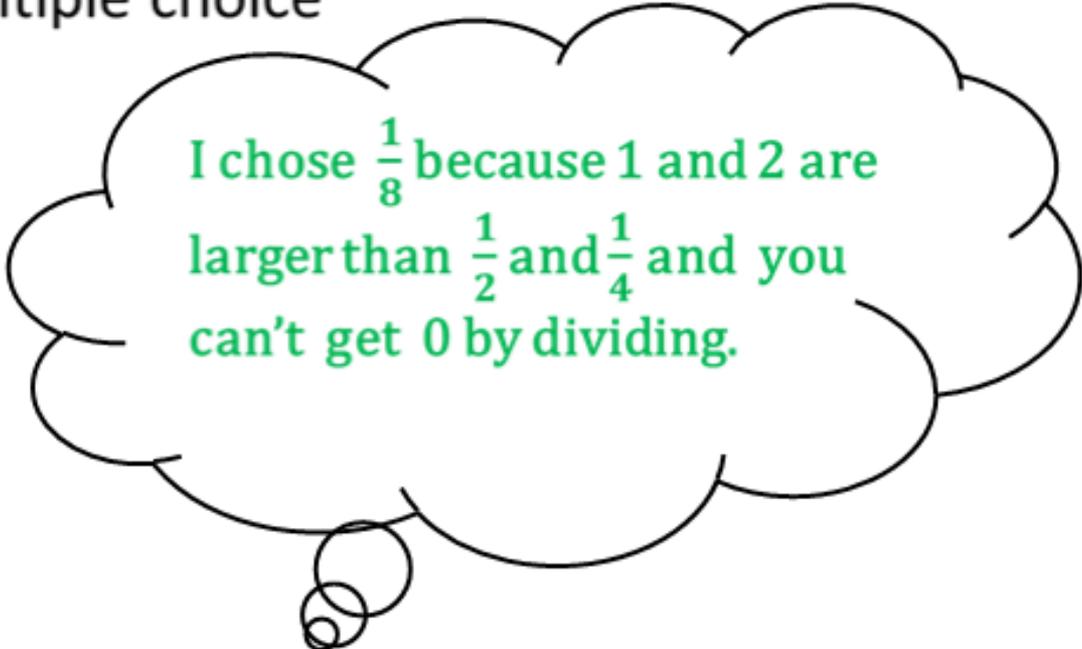
Counterintuitive ? ?

The idea that the answer to a division problem can be greater than the number being divided (or that multiplication can result in a smaller number) is counterintuitive. Students will only come to realize this understanding after many opportunities to visualize the impact of dividing (and multiplying) by a fraction less than 1.

Glen's response to a multiple choice question:

$\frac{1}{2} \div \frac{1}{4}$ is closest to?

- (a) $\frac{1}{8}$
- (b) 0
- (c) 1
- (d) 2



I chose $\frac{1}{8}$ because 1 and 2 are larger than $\frac{1}{2}$ and $\frac{1}{4}$ and you can't get 0 by dividing.

Glen chose the non-zero number less than $\frac{1}{2}$ and $\frac{1}{4}$ using his whole number understanding of the impact of division on a quotient.

David wants to enter his team into a $3\frac{1}{2}$ mile relay. Each runner must run a $\frac{1}{2}$ mile leg. How many runners will David have to put on his team to complete the relay?



$$3\frac{1}{2} \div \frac{1}{2} = j$$

***Please use a length model to illustrate your thinking.
You might want to try a number line.***



Francesca has $\frac{3}{4}$ cups of flour left in her canister. She needs $\frac{1}{2}$ cups to make a batch of cookies.

How many batches will she be able to make with the flour on hand?

$$\frac{3}{4} \div \frac{1}{2} = m$$

Please use an area model or pattern blocks to illustrate your thinking.



Greg is preparing medals for his Special Olympics team. Each medal requires half a yard of ribbon. He has $6\frac{3}{4}$ yards of ribbon left. How many medals can he make?

$$6\frac{3}{4} \div \frac{1}{2} = y$$



Please use a length model to illustrate your thinking. You might want to try fraction strips.



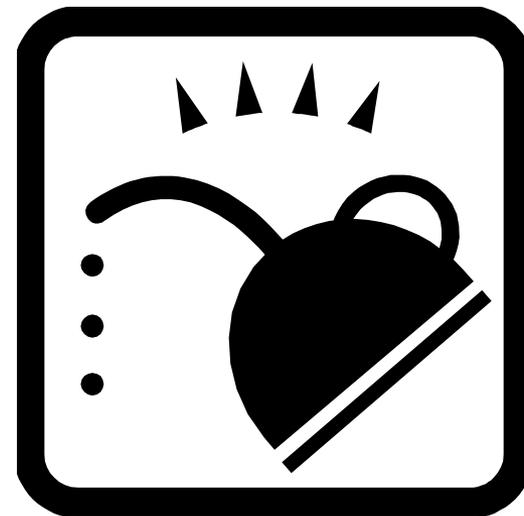
Hanna has $6\frac{3}{4}$ pounds of candy.
She wants to separate it into
bags of $1\frac{1}{2}$ pounds each.
How many bags will she have?

$$6\frac{3}{4} \div 1\frac{1}{2} = h$$

Use your choice of models.



You have $6\frac{1}{5}$ gallons of gas left in your can. It takes $1\frac{1}{2}$ gallons of gas to mow a lawn. How many lawns can you mow with the gas remaining?



$$6\frac{1}{5} \div 1\frac{1}{2} = n$$

Use your choice of models.

With your partner, create a “real life” word problem and model it.

What are the advantages of teaching fraction division this way? Disadvantages?

Were there limitations of specific models?