

Size of Divisor and Size of Quotient

Let's explore quotients of different sizes.

1.1

Math Talk: Size of Dividend and Divisor

Find the value of each expression mentally.

- $5,000 \div 5$
- $5,000 \div 2,500$
- $5,000 \div 10,000$
- $5,000 \div 500,000$

1.2 All Stacked Up

1. Here are several types of objects. For each type of object, estimate how many are in a stack that is 5 feet high. Be prepared to explain your reasoning.

Cardboard boxes



Notebooks



Egg cartons



Coins



2. A stack of books is 72 inches tall. Each book is 2 inches thick. Which expression tells us how many books are in the stack? Be prepared to explain your reasoning.

$72 \cdot 2$

$72 - 2$

$2 \div 72$

$72 \div 2$

1.3 All in Order

Your teacher will give you two sets of papers with division expressions.

- Without computing, estimate the quotients in each set and order them from greatest to least. Be prepared to explain your reasoning.

Pause here for a discussion.

Record the expressions in each set in order from the greatest value to the least.

a. Set 1

b. Set 2

- Without computing, estimate the quotients and sort them into the following three groups. Be prepared to explain your reasoning.

$$30 \div \frac{1}{2}$$

$$9 \div 10$$

$$18 \div 19$$

$$15,000 \div 1,500,000$$

$$30 \div 0.45$$

$$9 \div 10,000$$

$$18 \div 0.18$$

$$15,000 \div 14,500$$

◦ Close to 0

◦ Close to 1

◦ Much larger than 1



 **Are you ready for more?**

Write 10 expressions of the form $12 \div ?$ in a list ordered from least to greatest. Can you list expressions that have value near 1 without equaling 1? How close can you get to the value 1?



Lesson 1 Summary

Here is a division equation: $60 \div 4 = 15$. In this equation, we call 60 the *dividend* and 4 the *divisor*. We call the result of the division, 15, the *quotient*.

$$60 \div 4 = 15$$

dividend divisor quotient

We don't always have to make calculations to have a sense of what a quotient will be. We can reason about it by looking at the size of the dividend and the divisor. Let's look at some examples.

$$20 \div 9$$

The divisor, 9, is very close to 10. We know that $20 \div 10$ is 2, so $20 \div 9$ is a little more than 2.

$$99 \div 101$$

The dividend, 99, is very close to 101. Because $101 \div 101$ is 1, $99 \div 101$ is a little less than 1.

$$5 \div 98$$

The divisor, 98, is very close to 100. We know that $5 \div 100$ is $\frac{5}{100}$ or 0.05, so $5 \div 98$ is around 0.05.

In general:

- When a larger number is divided by a smaller number, such as $20 \div 9$ or $86 \div 80$, the quotient is greater than 1.
- When we divide two numbers that are nearly equal to each other, such as $99 \div 101$ or $75 \div 74$, the quotient is close to 1.
- When a smaller number is divided by a larger number, such as $5 \div 98$ or $27 \div 300$, the quotient is less than 1.

