

## Home Connection

In Chapter 5, your child will further their understanding of the standard algorithm for division by estimating the quotient, then dividing up to a four-digit number by a one-digit number. Students begin this dive into division with some mental math strategies.

## Mental Math for Division

$$420 \div 3$$

$$\begin{array}{r} 42 \div 3 \\ \hline 30 \quad 12 \end{array}$$



$$30 \text{ tens} \div 3 = 10 \text{ tens or } 100$$

$$12 \text{ tens} \div 3 = 4 \text{ tens or } 40$$

$$42 \text{ tens} \div 3 = 14 \text{ tens or } 140$$

We can think about larger numbers by using facts we know without the zeroes:

$$\begin{array}{r} 96,000 \div 6 \\ \hline 60,000 \quad 36,000 \end{array}$$



$$60 \text{ thousand} \div 6 = 10 \text{ thousand}$$

$$36 \text{ thousand} \div 6 = 6 \text{ thousand}$$

$$96,000 \div 6 = 16 \text{ thousand or } 16,000$$

Mastering these mental math skills will help students estimate the quotient in division problems.

## Division Algorithm

Your child will learn to estimate the answer to a division problem first.

$$6,174 \div 4$$

6,000 is between 4,000 ( $4 \times 1,000$ ) and 8,000 ( $4 \times 2,000$ ), so the answer is between 1,000 and 2,000.

We can also think  $60 \div 4 = 15$ , so  $6,000 \div 4 = 1,500$ . The answer will be close to 1,500.

Students then use the “long” division algorithm they have already learned.

Divide 6 thousands by 4.

6 thousand  $\div$  4 is 1 thousand with 2 thousands left over.

Regroup the remaining 2 thousand as hundreds and

divide 21 hundreds by 4.

21 hundreds  $\div$  4 is 5 hundreds with 1 hundred left over.

Regroup the remaining 1 hundred as tens and divide 17 tens by 4.

17 tens  $\div$  4 is 4 tens with 1 ten left over.

Regroup the 1 ten as ones and divide 14 ones by 4.

14 ones  $\div$  4 is 3 ones with 2 ones left over.

6,174  $\div$  4 is 1,543 with a remainder of 2.

The quotient is close to our estimate of 1,500.

Students can check their work, if necessary, by multiplying the quotient by 4 and adding the remainder:  $1,543 \times 4 + 2 = 6,174$

Your child will have ample opportunity to practice this process of estimating and then calculating long division with word problems.

$$\begin{array}{r}
 1,5 \\
 4 \overline{) 6,174} \\
 \underline{4} \phantom{00} \\
 21 \\
 \underline{20} \\
 1 \\
 \downarrow \\
 1,54 \\
 4 \overline{) 6,174} \\
 \underline{4} \phantom{00} \\
 21 \\
 \underline{20} \\
 17 \\
 \underline{16} \\
 1 \\
 \downarrow \\
 1,543 \\
 4 \overline{) 6,174} \\
 \underline{4} \phantom{00} \\
 21 \\
 \underline{20} \\
 17 \\
 \underline{16} \\
 14 \\
 \underline{12} \\
 2
 \end{array}$$

## What can we do at home?

- Ensure your child has mastered their multiplication and division math facts. Students who don't know these will struggle with both the estimating and the numerous calculations involved in this division process. In Dimensions Math 5, students will move to dividing by a two-digit number.
- Using graph paper or wide-ruled notebook paper turned sideways are great ways to help your child keep numbers lined up properly in columns when calculating their answers.