

For Topic 5, the students should know:

The answer to a division problem is called a **quotient**.

The number being divided by is called the **dividend**. The number doing the dividing is called the **divisor**.

$$\begin{array}{ccc} 96 & \div & 2 = 48 \\ \uparrow & & \uparrow \\ \text{dividend} & & \text{divisor} & & \text{quotient} \end{array}$$

$$\begin{array}{r} 48 \leftarrow \text{quotient} \\ \text{divisor} \rightarrow 2 \overline{)96} \leftarrow \text{dividend} \end{array}$$

Any amount left over is called a **remainder**. *A remainder can never be higher than the divisor.*

When a division problem contains a lot of zeros, you can divide the basic fact and then add the zeros to your answer.

For example: $2,400 \div 3 =$

Use the basic fact $24 \div 3 = 8$ and then add the two zeros. The answer is 800.

You can also use compatible numbers to estimate the answers to division problems.

For example: $500 \div 7 =$

50 is not evenly divided by 7, but 49 is. $49 \div 7 = 7$. Add the zero, and your answer is about 70.

You can also use multiplication to estimate the answers to division problems.

For example, with the same problem above you can ask yourself "What number times seven is close to 50?" The answer would be $7 \times 7 = 49$. Add the zero. 490 is a good estimate for that problem.

These two methods can be done with larger numbers too.

You can estimate the answer to a problem like $5,570 \div 9 =$

A compatible number would be $5,400 \div 9 = 600$. Your answer would be about 600.

You can also use multiplication and ask yourself "What number times nine is close to fifty-five?" The answer would be 6. Add zeros for the remaining place value columns, and your answer would be about 600.

You can also draw pictures for division problems. Find equal groups.

For Example: $21 \div 3$



There are seven groups of 3. $21 \div 3 = 7$

If any squares were left over, they would be the remainder.

You can also use the distributive property to divide.

For example: $309 \div 3 = (300 + 9) \div 3$ (we are distributing 309 into 300 + 9, this is like break apart)

$$300 \div 3 = 100 \text{ and } 9 \div 3 = 3$$

$$100 + 3 = 103, \text{ which is our answer.}$$

You can also use partial quotients to divide.

For example: $963 \div 3 =$

$$\begin{array}{r}
 3 \\
 20 \\
 300 \\
 3 \overline{) 963} \\
 \underline{-900} \\
 63 \\
 \underline{-60} \\
 3 \\
 \underline{-3} \\
 0
 \end{array}$$

Think of how many 3s are in 900? Write that number on top and subtract.
 Think of how many 3s are in 60? Write that number on top and subtract.
 Think of how many 3s are in 3? Write that number on top and subtract.

Add the partial quotients to get the answer of 323.

You can set the above up as an array:

	300	20	3	= 323
3	963 <u>- 900</u> 63	63 <u>- 60</u> 3	3 <u>- 3</u> 0	

Think of how many 3s are in 900? Write that number on top and subtract.
 Think of how many 3s are in 60? Write that number on top and subtract.
 Think of how many 3s are in 3? Write that number on top and subtract.

You can do this with remainders too!

For example: $947 \div 5 =$

	100	80	9	= 189 with a remainder of 2
5	947 <u>- 500</u> 447	447 <u>- 400</u> 47	47 <u>- 45</u> 2	

And, of course, there is always the "old fashioned" algorithm of "Divide, Multiply, Subtract, Bring Down."

Don't forget, you can always check to see if your division is correct. Simply multiply your answer by the divisor and add in any remainders. You should come up with the dividend. If you do not, you made a mistake along the way.

It is always smart to check division problems with multiplication!

Divide:	$ \begin{array}{r} 2 \\ 3 \overline{) 75} \\ \underline{6} \\ 15 \end{array} $ <p>3 goes into 7 2 times... with some extra!</p>
Multiply:	$ \begin{array}{r} 2 \\ 3 \overline{) 75} \\ \underline{6} \\ 15 \end{array} $ <p>$2 \times 3 = 6$</p>
Subtract:	$ \begin{array}{r} 2 \\ 3 \overline{) 75} \\ \underline{-6} \\ 15 \end{array} $
Bring Down:	$ \begin{array}{r} 2 \\ 3 \overline{) 75} \\ \underline{-6} \\ 15 \end{array} $
Repeat:	$ \begin{array}{r} 25 \\ 3 \overline{) 75} \\ \underline{-6} \\ 15 \\ \underline{-15} \\ 0 \end{array} $ <p>$15 \div 3 = 5$ $5 \times 3 = 15$</p>