

Name: _____

Date: _____

An Introduction to Partial Quotients

Partial quotients is a way to divide that uses your multiplication skills. First, you will set up your problem so the **dividend** (the number that is being divided) is inside a bracket. The **divisor** (the number of groups you are dividing into) is on the outside of the bracket.

It takes several steps to find the **quotient** (the answer to a division problem). At each step, you will find a **partial quotient** (a part of the answer).

As you go through each step, you will think, "What number times the divisor will get me close to the dividend?"

You can use numbers that are easy to multiply, like multiples of 10. In this example, 3×100 is an easy number to multiply with mental math. 100 is the partial quotient, which means 3 can go into 514 one hundred times.

Then, you'll subtract the product (300 in this example) from the dividend to find what is left to divide.

You will continue to multiply and subtract until you have divided the entire dividend. If you are left with a part that is smaller than the divisor, you will call that the **remainder**.

Add up all the partial quotients along the right side of the problem to find the quotient.

Why do we use this strategy?

Using partial quotients strengthens our foundational understanding of division, supports flexible thinking and number sense, connects to concepts of multiplication that we have learned, and builds our competency in mental math. This will help us in real world situations. It can be used for day-to-day computation or as a bridge to understanding the standard algorithm.

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Answers**An Introduction to Partial Quotients**

Try it! Solve each problem using partial quotients.

Example

$475 \div 6$

$$\begin{array}{r|l}
 6 & 475 \\
 - & 300 & 50 \\
 \hline
 & 175 \\
 - & 120 & 20 \\
 \hline
 & 55 \\
 - & 54 & + 9 \\
 \hline
 & 1 & 79
 \end{array}$$

$\therefore 475 \div 6 = 79 \text{ r}1$

$352 \div 7$

$$\begin{array}{r|l}
 7 & 352 \\
 - & 350 & 50 \\
 \hline
 & 2
 \end{array}$$

$\therefore 352 \div 7 = 50 \text{ r}2$

$621 \div 5$

$$\begin{array}{r|l}
 5 & 621 \\
 - & 500 & 100 \\
 \hline
 & 121 \\
 - & 100 & 20 \\
 \hline
 & 21 \\
 - & 20 & + 4 \\
 \hline
 & 1 & 124
 \end{array}$$

$\therefore 621 \div 5 = 124 \text{ r}1$

$589 \div 4$

$$\begin{array}{r|l}
 4 & 589 \\
 - & 400 & 100 \\
 \hline
 & 189 \\
 - & 100 & 25 \\
 \hline
 & 89 \\
 - & 80 & 20 \\
 \hline
 & 9 \\
 - & 8 & + 2 \\
 \hline
 & 1 & 147
 \end{array}$$

$\therefore 589 \div 4 = 147 \text{ r}1$

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Answers

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Let's Review! Fill in each blank with the correct vocabulary word.

1. The number that is being divided is called the dividend.
2. The number of groups you are dividing into is called the divisor.
3. The answer to a division problem is the quotient.
4. Part of the answer is called partial quotient.
5. After dividing, if there is a number left that is too small to be divided into a whole number, it is called the remainder.
6. What self talk can you use as you solve a problem with this method? _____
Possible Answer: What number times the divisor will get close to the dividend?

7. What is one reason you would use this strategy? Answers will vary

8. Jamie tried solving a division problem using partial quotients, but she made a mistake!

$$\begin{array}{r|l} 4 & 219 \\ - & 200 \\ \hline & 19 \\ - & 18 \\ \hline & 1 \end{array} \quad \begin{array}{l} 50 \\ + 4 \\ \hline 54 \end{array}$$

$\therefore 219 \div 4 = 54 \text{ r}1$

What would you tell Jamie to help her fix her error?

Four times four is 16, not 18. So the remainder should be 3.
