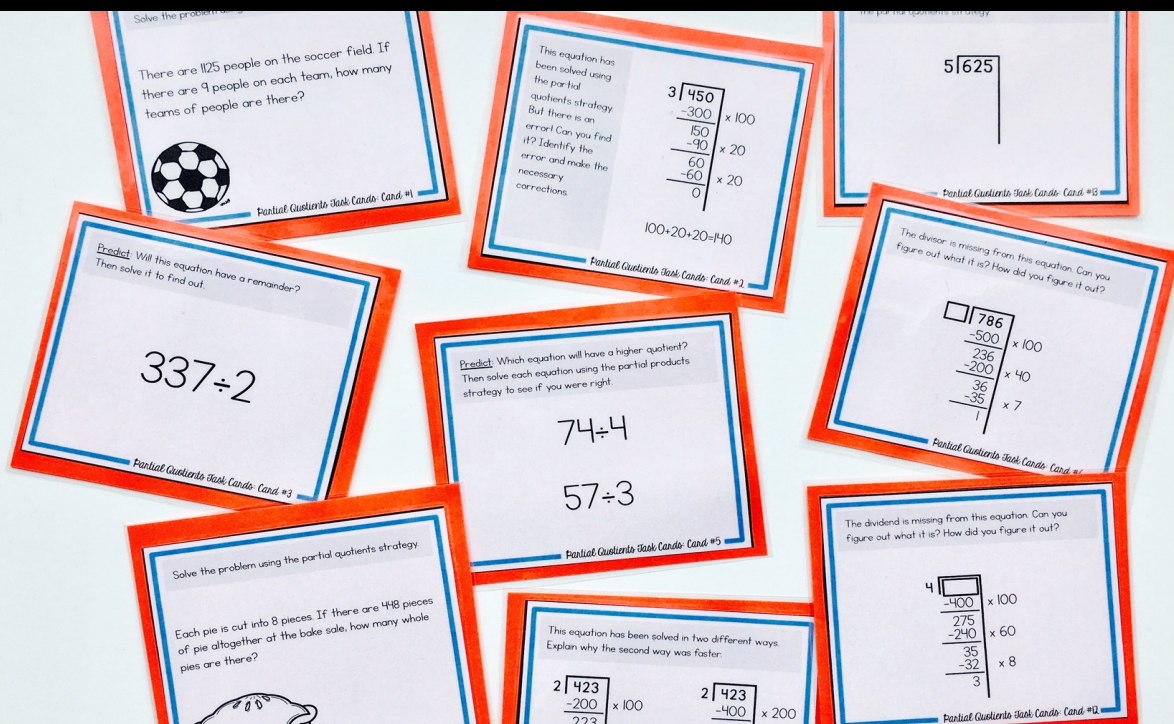


Partial Quotients TASK CARDS

an alternative for long division

**2 and 3 digit dividends; 1-digit divisors
some remainders**



Created by Shelley Gray

The Partial Quotients Strategy: an alternative to long division

Partial Quotients is an effective alternative for traditional long division. It is a mental math based approach in which a division equation is solved in manageable parts in order to find the final quotient.

The partial quotients strategy involves subtracting parts until you get to 0, or as close to 0 as possible.

Let's take a look at how we perform the partial quotients strategy. I have also included a video link on the next page.

$$\begin{array}{r} 3 \overline{) 84} \\ \underline{-60} \\ 24 \\ \underline{-24} \\ 0 \end{array}$$

x 20 ←

First we can take away 20 groups of 3, which makes 60. This leaves us with 24.

x 8 ←

We can still make more groups of 3 out of this 24. Let's take away 8 groups of 3, which makes 24. This leaves us with 0.

To find the quotient, we add these partial quotients: 20+8.
So $84 \div 3 = 28$.

Here's another example. Notice that we try to work with "easy" numbers, such as multiples of 10 and 100:

$$\begin{array}{r} 4 \overline{) 764} \\ -400 \\ \hline 364 \\ -360 \\ \hline 4 \\ -4 \\ \hline 0 \end{array}$$

x 100 ←

First we can take away 100 groups of 4, which makes 400. This leaves us with 364.

x 90 ←

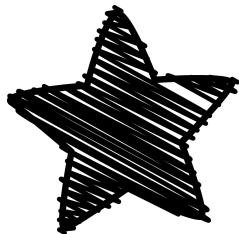
We can still make more groups of 4 out of this 364. Let's take away 90 groups of 4, which makes 360. This leaves us with 4.

x 1 ←

We can still make more 1 more group of 4. This will leave us with 0.

To find the quotient, we add these partial quotients: $100+90+1$.

So $764 \div 4 = 191$.




Here is a link to a video that I've made about the Partial Quotients Method for division. Please watch this to familiarize yourself with this method.

<https://www.youtube.com/watch?v=IHKIPJ7y9ow>

**THE
LONG DIVISION
STATION**

A
SELF-PACED, STRATEGIC,
STUDENT-CENTERED
program for
long division



BY SHELLEY GRAY

Are you looking for even more support with teaching long division in your classroom? You might be interested in this self-paced, student-centered Long Division Station that will allow your students to move through all of these strategies and approaches at their own pace. That station can be found here:

<https://www.teacherspayteachers.com/Product/The-Long-Division-Station-self-paced-student-centered-3552960>

This resource includes...

Detailed explanations of the partial quotients strategy, as well as a link to a helpful video

A partial quotients strategy poster to display in your classroom:

The Partial Quotients Strategy: An Alternative to Traditional Long Division

Partial Quotients is an effective alternative for fractional long division. It is a mental math based approach in which a division equation is solved in manageable parts in order to find the final quotient.

The partial quotients strategy involves subtracting parts of the dividend from the divisor.

Let's take a look at how we perform this partial quotients strategy on the next page.

3 | 84

First we can take away 30 (The leaves us with 54)

We can still make more groups of 3 out of the 54. Let's take away 3 more leaves us with 51

To find the quotient we add these groups to 8+3=28

2 | 545

First we can take away 50 groups of 2, which makes 100. This leaves us with 45

We can still make more groups of 2 out of the 45. Let's take away 20 groups of 2, which makes 40. This leaves us with 5.

We can still make more groups of 2 out of the 5. Let's take away 2 groups of 2, which makes 4. This leaves us with 1. We can't take away any more groups of 2 from 1, so it becomes our remainder.

To find the quotient we add these partial quotients: 100+20+2=122

Here's another example. Notice that we try to work in multiples of 10 and 100

4 | 764

First we can take away 400 (This leaves us with 364)

We can still make more groups of 4 out of the 364. Let's take away 90 groups of 4, this leaves us with 4

We can still make more groups of 4 out of the 4. This leaves us with 0

To find the quotient we add these groups to 10+90=100

Here is a link to a video that I've made about the Partial Quotients Method for division. Please watch this to familiarize yourself with this method.

<https://www.youtube.com/watch?v=JHFPJ7V3Aw>

THE LONG DIVISION STATION

Are you looking for even more support with teaching long division in your classroom? You might be interested in this self-paced, student-centered Long Division Station that will allow your students to move through all of these strategies and approaches at their own pace. That station can be found here: <https://www.teacherspayteachers.com/Product/The-Long-Division-Station-w/answer-Student-centered-552286>







PARTIAL QUOTIENTS

621 ÷ 3

$$\begin{array}{r}
 3 \overline{) 621} \\
 \underline{-300} \\
 321 \\
 \underline{-300} \\
 21 \\
 \underline{-21} \\
 0
 \end{array}
 \begin{array}{l}
 \times 100 \\
 \times 100 \\
 \times 7
 \end{array}$$

100+100+7=207

Twenty-four task cards that practice the partial quotients method in a variety of different ways

<p>Solve the problem using the partial quotients strategy.</p> <p>80 people are gathered to watch the piano recital. If they are seated in rows of 6, how many rows are there?</p>  <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>This equation has been solved using the partial quotients strategy. Is there an error? Can you find it? Identify the error and make the necessary corrections.</p> $ \begin{array}{r} 4 \overline{) 47} \\ \underline{-20} \\ 27 \\ \underline{-16} \\ 11 \end{array} \begin{array}{l} \times 5 \\ \times 4 \\ \text{R 1} \end{array} $ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Solve the problem using the partial quotients strategy.</p> <p>There are 105 people on the soccer field. If there are 9 people on each team, how many teams of people are there?</p>  <p>Partial Quotients: 105 ÷ 9 = 11 R 6</p>	<p>This equation has been solved using the partial quotients strategy. Is there an error? Can you find it? Identify the error and make the necessary corrections.</p> $ \begin{array}{r} 3 \overline{) 450} \\ \underline{-300} \\ 150 \\ \underline{-90} \\ 60 \\ \underline{-60} \\ 0 \end{array} \begin{array}{l} \times 100 \\ \times 20 \\ \times 20 \\ 100+20+20=140 \end{array} $ <p>Partial Quotients: 100+20+20=140</p>	<p>Explain in words how you could solve this equation using the partial quotients strategy.</p> $516 \div 25$ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>This equation has been solved in two different ways. Explain why the second way was faster.</p> $ \begin{array}{r} 2 \overline{) 423} \\ \underline{-200} \\ 223 \\ \underline{-200} \\ 23 \\ \underline{-22} \\ 1 \end{array} \begin{array}{l} \times 100 \\ \times 100 \\ \times 1 \end{array} $ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Which equation will have a higher quotient? Then solve it using the partial quotients strategy to find out.</p> $34 \div 2$ $465 \div 3$ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>The equation has been solved using the partial quotients strategy. Is there an error? Can you find it? Identify the error and make the necessary corrections.</p> $ \begin{array}{r} 5 \overline{) 788} \\ \underline{-350} \\ 438 \\ \underline{-350} \\ 88 \\ \underline{-88} \\ 0 \end{array} \begin{array}{l} \times 100 \\ \times 10 \\ \times 10 \\ \times 1 \end{array} $ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>							
<p>Which equation will have a remainder? Then solve it using the partial quotients strategy to find out.</p> $463 \div 5$ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Solve the problem using the partial quotients strategy.</p> <p>The waiter can carry 10 plates of food at one time. If he needs to carry 60 plates of food in all, how many trips will he need to make?</p>  <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Which equation will have a remainder? Then solve it using the partial quotients strategy to find out.</p> $337 \div 2$ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Solve the problem using the partial quotients strategy.</p> <p>Each pie is cut into 8 pieces. If there are 48 pieces of pie altogether, how many pies will be made?</p>  <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Solve the problem using the partial quotients strategy.</p> <p>The pet store owner is putting 7 goldfish in each fish tank. He has 82 goldfish altogether. How many tanks will he need?</p>  <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Which equation will have a higher quotient? Then solve it using the partial quotients strategy to find out.</p> $78 \div 3$ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Which equation will have a higher quotient? Then solve it using the partial quotients strategy to find out.</p> $438 \div 4$  <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Which equation will have a higher quotient? Then solve it using the partial quotients strategy to find out.</p> $214 \div 3$ $189 \div 2$ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>The dividend is missing from this equation. Can you figure out what it is? Then solve it using the partial quotients strategy to find out.</p> $ \begin{array}{r} 4 \overline{) 764} \\ \underline{-400} \\ 364 \\ \underline{-300} \\ 64 \\ \underline{-64} \\ 0 \end{array} \begin{array}{l} \times 100 \\ \times 60 \\ \times 8 \end{array} $ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Which equation will have a higher quotient? Then solve it using the partial quotients strategy to find out.</p> $74 \div 4$ $57 \div 3$ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>The divisor is missing from this equation. Can you figure out what it is? Then solve it using the partial quotients strategy to find out.</p> $ \begin{array}{r} \overline{) 786} \\ \underline{-500} \\ 286 \\ \underline{-200} \\ 86 \\ \underline{-86} \\ 0 \end{array} \begin{array}{l} \times 100 \\ \times 10 \\ \times 7 \end{array} $ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Explain in words how you could solve this equation using the partial quotients strategy.</p> 6198 <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>The dividend is missing from this equation. Can you figure out what it is? Then solve it using the partial quotients strategy to find out.</p> $ \begin{array}{r} 3 \overline{) 300} \\ \underline{-300} \\ 0 \end{array} \begin{array}{l} \times 100 \\ \times 10 \\ \times 6 \end{array} $ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>This equation has been solved in two different ways. Explain why the first way was faster.</p> $ \begin{array}{r} 2 \overline{) 520} \\ \underline{-200} \\ 320 \\ \underline{-300} \\ 20 \\ \underline{-20} \\ 0 \end{array} \begin{array}{l} \times 200 \\ \times 100 \\ \times 50 \\ \times 10 \end{array} $ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>	<p>Which equation will have a quotient between 25 and 50? Solve the equation using the partial quotients strategy to see if you were right.</p> $256 \div 8$ $384 \div 4$ <p>Partial Quotients: 80 ÷ 6 = 13 R 2</p>

Recording sheets to help your students stay organized

Goal #1 Solve the problem. Write an answer sentence.	Goal #2 Identify the error and make corrections. Describe the error. Were you right?
Goal #3 Make your prediction. Solve it. Were you right?	Goal #4 Solve the problem. Write the answer. Were you right?
Goal #5 Make your prediction. Solve the equations. Were you right?	Goal #6 Figure out the missing divisor. How did you figure it out?

Goal #1 Solve the problem. Write the answer.	Goal #2 Identify the error and make corrections. Describe the error. Were you right?
Goal #3 Make your prediction. Solve it. Were you right?	Goal #4 Solve the problem. Write an answer sentence. Were you right?
Goal #5 Make your prediction. Solve the equations.	Goal #6 Figure out the missing dividend. How did you figure it out?

Goal #3 Explanation. Solve the problem.	Goal #4 Identify the error and make corrections. Describe the error. Were you right?
Goal #5 Solve the problem. Write the answer. How did you figure it out?	Goal #6 Write a story problem. Solve it. Were you right?
Goal #7 Figure out the missing dividend. How did you figure it out?	Goal #8 Solve the equations.

Goal #1 Make your prediction. Solve the equations. Were you right?	Goal #2 Identify the error and make corrections. Solve the problem. Were you right?
Goal #3 Make your prediction. Solve the equation. Were you right?	Goal #4 Make your prediction. Solve the equation. Were you right?
Goal #5 Make your prediction. Solve the equations.	Goal #6 Make your prediction. Solve the equations. Were you right?

Answer keys to make self-checking a breeze!

Goal #1 Solve the problem. Write an answer sentence. There are 62 teams of people.	Goal #2 Identify the error and make corrections. Describe the error. There were 30 groups of 3 to make 90, not 20 groups of 3.
Goal #3 Make your prediction. Answers will vary. Solve it.	Goal #4 Solve the problem. Write the answer. There are 36, which pass of the bike side.
Goal #5 Make your prediction. Answers will vary. Solve the equations.	Goal #6 Figure out the missing divisor. How did you figure it out? Answers will vary.

Goal #1 Solve the problem. Write the answer. There are 22 rows of people.	Goal #2 Identify the error and make corrections. Describe the error. 20 groups of 4 were taken away, not 20 groups of 4.
Goal #3 Make your prediction. Answers will vary. Solve it.	Goal #4 Solve the problem. Write an answer sentence. We will need 17 banks.
Goal #5 Make your prediction. Answers will vary. Solve the equations.	Goal #6 Figure out the missing dividend. How did you figure it out? Answers will vary.

Goal #3 Explanation. The second way was faster because larger multiples were subtracted in the first equation, 100 groups of 2.	Goal #4 Identify the error and make corrections. Describe the error. 20 groups of 4 were taken away, not 20 groups of 4.
Goal #5 Solve the problem. Write the answer. He will need 17 banks.	Goal #6 Write a story problem. Answers will vary.
Goal #7 Figure out the missing dividend. How did you figure it out? Answers will vary.	Goal #8 Solve the equations.

Goal #1 Make your prediction. Answers will vary. Solve the equations. Were you right?	Goal #2 Identify the error and make corrections. Solve the problem. Write the answer. 38 months can be credited and 2 floors will be left over.
Goal #3 Make your prediction. Answers will vary. Solve the equation. Were you right?	Goal #4 Make your prediction. Answers will vary. Solve the equation. Were you right?
Goal #5 Make your prediction. Answers will vary. Solve the equations.	Goal #6 Make your prediction. Answers will vary. Solve the equations. Were you right?