



# Use an Algorithm with Partial Quotients

Let's find quotients using an algorithm that uses partial quotients.

## Warm-up

### Number Talk: Partial Quotients

Find the value of each expression mentally.

- $500 \div 5$

- $60 \div 5$

- $5 \div 5$

- $565 \div 5$



## Activity 1

### A Stack of Partial Quotients

Jada uses partial quotients to find out how many groups of 7 are in 392.

1. Analyze Jada's steps in the partial-quotients algorithm.

$$\begin{array}{r} \boxed{56} \\ 9 \\ 7 \\ 40 \\ 7 \overline{)392} \\ - 280 \\ \hline 112 \\ - 49 \\ \hline 63 \\ - 63 \\ \hline 0 \end{array}$$

- a. Look at the 3 numbers above 392. What do they represent?

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- b. Look at the 3 subtractions below 392. What do they represent?

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2. Show another way you can decompose 392 to divide by 7.

3. Use a partial-quotients algorithm to find the value of  $702 \div 3$ .

## Activity 2

### Andre and Elena's Work

Andre and Elena divide 2,315 by 5. Before they begin, Andre says, "I can already tell that the quotient is going to be less than 500."

1. Decide if you agree with Andre without doing any calculations. Explain your reasoning.

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2. Here is Andre and Elena's work. Each student made one or more errors. Identify the errors each student made. Then show a correct computation.

Andre's Work

$$\begin{array}{r} \boxed{103} \\ 3 \\ 60 \\ 40 \\ 5 \overline{) 2,315} \\ \underline{-2,000} \\ 315 \\ \underline{- 300} \\ 15 \\ \underline{- 15} \\ 0 \end{array}$$

Elena's Work

$$\begin{array}{r} \boxed{400} \\ 60 \\ 100 \\ 300 \\ 5 \overline{) 2,315} \\ \underline{-1,500} \\ 815 \\ \underline{- 500} \\ 315 \\ \underline{- 300} \\ 15 \end{array}$$

## Activity 3

### Incomplete Calculations

Here are 4 calculations to find the value of  $3,294 \div 3$ , but each one is unfinished.

Complete at least 2 of the unfinished calculations.

A

$$\begin{array}{r} 90 \\ 1,000 \\ 3 \overline{)3,294} \\ -3,000 \\ \hline 294 \\ -270 \\ \hline \end{array} \quad \begin{array}{l} 3 \times 1,000 \\ 3 \times 90 \end{array}$$

B

$$\begin{array}{r} 80 \\ 200 \\ 400 \\ 400 \\ 3 \overline{)3,294} \\ -1,200 \\ \hline 2,094 \\ -1,200 \\ \hline 894 \\ -600 \\ \hline 294 \\ -240 \\ \hline \end{array} \quad \begin{array}{l} 3 \times 400 \\ 3 \times 400 \\ 3 \times 200 \\ 3 \times 80 \end{array}$$

C

$$\begin{array}{l} 600 \div 3 = \\ 600 \div 3 = \\ 600 \div 3 = \\ 600 \div 3 = \\ 600 \div 3 = \\ 270 \div 3 = \end{array}$$

D

$$\begin{array}{r} 3,300 \div 3 = 1,100 \\ - \quad 6 \div 3 = \quad 2 \\ \hline \end{array}$$

