Unit 6, Lesson 17

An Algorithm with Partial Quotients

Let's make sense of and use an algorithm that uses partial quotients.

Warm-up

Number Talk: Divide by 3

Find the value of each expression mentally.

- $90 \div 3$
- $96 \div 3$
- $960 \div 3$
- $954 \div 3$

Activity 1

Decompose Dividends

1. Find the value of $465 \div 5$. Explain or show your reasoning. You may use base-blocks if you find them helpful.

2. Here is how Priya finds the value of $465 \div 5$.

$$\begin{aligned} 400 \div 5 &= 80 \\ 60 \div 5 &= 12 \\ 5 \div 5 &= 1 \\ \hline 465 \div 5 &= 93 \end{aligned}$$

   a. Describe the steps in Priya's method.

   b. How is Priya's method similar to your method?

   c. Use Priya's method to find the value of $428 \div 4$.

Activity 2

Tyler's Method

Tyler uses a different method to find the value of $465 \div 5$. Let's compare Priya's and Tyler's work.

Priya's method

$$\begin{aligned} 400 \div 5 &= 80 \\ 60 \div 5 &= 12 \\ 5 \div 5 &= 1 \\ \hline 465 \div 5 &= 93 \end{aligned}$$

Tyler's method

$$\begin{array}{rl} \boxed{93} & \\ 1 & \\ 12 & \\ 80 & \\ 5\overline{)465} & \\ -\ 400 & 5 \times 80 \\ \hline 65 & \\ -\ 60 & 5 \times 12 \\ \hline 5 & \\ -\ 5 & 5 \times 1 \\ \hline 0 & \end{array}$$

1. How are these methods alike? How are they different? List as many similarities and differences as you can find.

2. Why do you think Tyler uses subtraction in his method?

3. Show how Tyler might record the process of finding the value of $428 \div 4$.