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.

- $90 \div 3$

- $96 \div 3$

- $960 \div 3$

- $954 \div 3$

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 $465 \div 5$.

$$400 \div 5 = 80$$
$$60 \div 5 = 12$$
$$5 \div 5 = 1$$
$$\overline{465 \div 5 = 93}$$

   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 $428 \div 4$.

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

$$400 \div 5 = 80$$
$$60 \div 5 = 12$$
$$5 \div 5 = 1$$
$$\overline{465 \div 5 = 93}$$

Tyler's method

$$
\begin{array}{r}
\boxed{93} \\
1 \\
12 \\
80 \\
5\,\overline{)465} \\
-\ 400 \quad 5 \times 80 \\
\overline{65} \\
-\ 60 \quad 5 \times 12 \\
\overline{5} \\
-\ 5 \quad 5 \times 1 \\
\overline{0}
\end{array}
$$

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 $428 \div 4$.