Lesson 12: An Algorithm Using Partial Quotients

Standards Alignments

Addressing 5.NBT.B.6

Teacher-facing Learning Goals

- Make sense of an algorithm using partial quotients.

Student-facing Learning Goals

- Let's make sense of an algorithm using partial quotients.

Lesson Purpose

The purpose of this lesson is for students to learn an algorithm using partial quotients to divide multi-digit numbers by two-digit numbers.

In previous lessons, students used estimation strategies, properties of operations, and the relationship between multiplication and division to divide multi-digit numbers by two-digit divisors. They analyzed different strategies for recording partial quotients.

In this lesson, students move from strategies to algorithms in which the connections to place value, properties of operations, and the relationship between multiplication and division are clear. Students interpret an algorithm using partial quotients with a two-digit divisor for the first time. They used this algorithm with one-digit divisors in grade 4. They practice using this algorithm with less and less scaffolding. Throughout the lesson, the emphasis is on making sense of each step and the different operations used in each step. Students also see that there are many different ways to correctly find a quotient with this algorithm and they are encouraged to find partial quotients that make sense to them.

Access for:

Students with Disabilities

- Representation (Activity 1)

Instructional Routines

MLR1 Stronger and Clearer Each Time (Activity 1), Notice and Wonder (Warm-up)

Lesson Timeline

Warm-up	10 min

Teacher Reflection Question

Think about a recent time from class when your students were confused. What did you do to

Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

support them in reasoning about their confusion together as a community of learners?

Cool-down (to be completed at the end of the lesson)

5 min

What's Next?

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Student-facing Task Statement

Han started finding the value of a quotient.

$$\begin{array}{r} 300 \\ 15\overline{)5,400} \\ -4,500 \\ \hline 900 \end{array} \quad (300 \times 15)$$

1. Write the division expression that represents the quotient Han is finding.
2. Complete the algorithm that Han started.

Student Responses

1. $5{,}400 \div 15$
2. $$\begin{array}{r} \boxed{360} \\ 60 \\ 300 \\ 15\overline{)5,400} \\ -\ 4,500 \quad (300 \times 15) \\ \hline 900 \\ -\ \ 900 \quad (60 \times 15) \\ \hline 0 \end{array}$$