Lesson 14: Situations Involving Factors and Multiples

Standards Alignments

Building On   4.NBT.B.5, 4.OA.B.4

Addressing   4.NBT.B.6, 4.OA.A.3

Teacher-facing Learning Goals

- Reason about division of two- and three-digit numbers in situations involving factors and multiples.

Student-facing Learning Goals

- Let's interpret and solve division problems beyond 100.

Lesson Purpose

The purpose of this lesson is for students to solve division problems that involve finding unknown factors. They do so by reasoning with partial quotients and by decomposing a dividend into familiar multiples of the divisor. In the problems, the dividends are greater than 100 and the divisions result in whole numbers with and without a remainder.

In this lesson, students relate problems about factors and multiples to division. To solve the problems, they rely on the relationship between multiplication and division, and their understanding of division as a way to find an unknown factor.

Students continue to interpret division in terms of finding the number of groups ("If we write multiples of 5, how many numbers will we need to write to get to 105?") and the size of a group ("What number are we finding multiples of if we get to 112 after writing 7 numbers?"). They may solve the problems by multiplying in parts (finding partial products) or by dividing in parts (finding partial quotients). Through repeated reasoning, they notice that it helps to decompose a dividend into familiar multiples (MP2, MP8).

In these materials, division that results in a whole number with a remainder—for example $145 \div 7$—is not expressed with an expression such as "20 R 5." Instead, students will relate this result to a multiplication equation, in that $145 = 7 \times 20 + 5$.

In future lessons, students will more formally investigate partial quotients as a strategy dividing numbers.

Access for:

♿ Students with Disabilities

- Engagement (Activity 1)

🌐 English Learners

- MLR8 (Activity 1)

Instructional Routines

Number Talk (Warm-up)

Lesson Timeline

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

Teacher Reflection Question

Which questions that you asked today would you rephrase to improve students' ability to make connections or to help them better consolidate what they did? How would you rephrase them?

Cool-down (to be completed at the end of the lesson)   🕐 5 min

Reaching 161 with Multiples

Standards Alignments

Addressing   4.NBT.B.6, 4.OA.A.3

Student-facing Task Statement

Mai is writing multiples of a number. When she reaches 161, she has written 7 numbers.

1. What number is Mai writing multiples of? Explain or show your reasoning.
2. What division equation can represent the question you just answered?

Student Responses

1. 23. Sample reasoning: I know that $7 \times 20 = 140$ and $7 \times 3 = 21$. Because $140 + 21 = 161$, the number must be $20 + 3$ or 23.
2. $161 \div 7 = ?$ or $161 \div ? = 7$