

SCAFFOLDING TASKS: “WATCH HOW NUMBERS GROW!”

Adapted from North Carolina’s Core Essentials Mathematics Program

STANDARDS FOR MATHEMATICAL CONTENT

MCC.3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80 , 5×60) using strategies based on place value and properties of operations.



STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Students and teachers must understand this unit’s inclusion of multiplying numbers by multiples of 10 is based more on place value than the algorithm of multiplication. This standard expects that students go beyond tricks that hinder understanding such as “just adding zeros” and explain and reason about their products. Students should also understand that products can be calculated using other strategies than the algorithm.

ESSENTIAL QUESTIONS

- How is place value related to multiples of ten?
- What happens to a number when it is multiplied by ten?
- How can I model multiplication by ten?

MATERIALS

- Math Journals (or paper)
- Road Maps
- Manipulatives/cut outs (to help students create models for their problems)
- “Watching How Numbers Grow” task sheet

GROUPING

Students may be grouped individually, in pairs, or in small groups at the teacher’s discretion.

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I

The teacher will begin by asking students to respond to the following questions in their math journals:

- Why is ten such an important number in our number system?
- Make a list of things that come in tens in the world around you. Why are these grouped in tens? Tell what happens to the amount of these objects when there is more than one group of ten.

Part II

After responding in their math journals, the students will complete the “Watching How Numbers Grow” task sheet.

- If you made a line with \$4 worth of dimes, how long would your line be? What if you made your line with pennies? How would your two lines be different?
All of the keys on your calculator except the 1, the 0, and the + are broken. How can you reach the following numbers by pressing the fewest number of keys? Check your work using a real calculator.
 - 60
 - 20
 - 90
 - 80
- If you start with a dime and get double the number of dimes each day for two weeks, how much money would you have on the fourteenth day? If this pattern continues, on what day would you receive \$1000?
- Ryan has 35 dimes in his pocket. Half an hour later, Ryan arrived at the store and realized that he had a hole in his pocket. If three dimes dropped through his pocket every five minutes, how much money did Ryan have left?

FORMATIVE ASSESSMENT QUESTIONS

- What did you notice about the patterns in the numbers?
- What happens when quantities grow by multiples of ten?
- How does this relate to addition/multiplication?

DIFERENTIATION

Extension

- Think of items that come in groups of ten. Draw several groups of your items. Determine your total number of items. Describe your representation with pictures, numbers, and words. Explain your groups to a friend!

Intervention

- Students may use manipulatives such as counters, and a calculator
- Work with students in a guided group and assist with thoughtful questioning



Name _____ Date _____

Watch How Numbers Grow

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