Georgia Department of Education
Deconstructing Georgia Standards of Excellence
Mathematics Standard/Element Using The 5-Step Protocol

Code:	**MGSE4.NBT.1**
Standard and/or Element:	**Recognize that in a multi-digit whole number, a digit in any one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.**

1. Determine and define vocabulary. *Identify and underline key terms within the standard(s) and/or element(s). Define each term as it relates to the standard.*

These definitions are for teacher reference only and are not to be memorized by the students. Students should explore these concepts using models and real life examples. Students should understand the concepts involved and be able to recognize and/or demonstrate them with words, models, pictures or numbers.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language.

- **algorithm:** A set of predefined steps applicable to a class of problems that gives the correct result in every case when the steps are carried out correctly.

- **digits:** A single symbol used to write numerals. (example: the digits 1 and 2 may be used to make the numeral 12)

- **estimate:** To find a value that is close enough to the right answer, usually with some thought or calculation involved.

- **expanded form:** A multi-digit number is expressed in expanded form when it is written as a sum of single-digit multiples of powers of ten. For example, 643 = 600 + 40 + 3.

- **numbers:** A count of a quantity of units (example: **********, the quantity of * counted which can be represented with the numeral, 12).

- **numerals:** A symbol or name used alone or in a group to represent a number (example: 12 is a symbol used to represent a quantity or number of objects. 12 is composed of two digits: 1 and 2)

- **period:** In place value, a period is each group of three digits separated by commas in a multidigit number.

- **place value:** Place- the name of the place a digit is in within a number; Value- the value a digit holds within a number based on its place; Place Value- the relationship

Georgia Department of Education
Deconstructing Georgia Standards of Excellence
Mathematics Standard/Element Using The 5-Step Protocol

between a digit's place and the value it represents in that place.

- **rounding:** A method of approximating a number to its nearest place value.

2. Study the standard(s) and/or element(s). *Identify concepts and skills students will need to know, understand, and be able to do to reach proficiency. Generate key implementation questions related to the standard and/or element(s). Answer each question.*

Students will need to know:

- The value of a number is determined by the place of its digits.
- How multiplying a digit by 10 has an effect on its location in a number.
- How dividing a digit by 10 has an effect on its location in a number.
- How a digit's location has an effect on its value.

Essential Questions:

- How does our base ten number system work?
- How does the value of a digit change if its location is changed in a large number?
- What determines the value of a digit?
- What conclusions can I make about the places within our base ten number system?
- What happens to a digit when it is multiplied and divided by 10?
- What effect does the location of a digit have on the value of the digit?
- What determines the value of a number?

3. Scaffold understanding and communicate the language of the standard and/or element(s). *Paraphrase the standard) and/or element(s). Create a "script" that details how teachers will describe the standard and/or element(s) to students.*

This standard is all about understanding our base-ten number system. You will understand how each place value is related to each other. In other words, you will begin to recognize a pattern of "ten times as many." For example, one ten is ten times as many as a one. A hundred is ten times as many as a ten. A thousand is ten times as many as a hundred. This pattern continues. One one is ten times as many as a tenth.

Georgia Department of Education
Deconstructing Georgia Standards of Excellence
Mathematics Standard/Element Using The 5-Step Protocol

4. Develop "I can" statements. *Describe the standard(s) and/or element(s) as statements of intended learning (e.g., "I can use information from what I read to draw conclusions (make inferences)"; "I can use mathematical vocabulary to describe how I solved a problem," etc.).*

I can use academic language to describe a digit as ten times as many as the same digit to its right.

I can use academic language to describe a digit as ten times fewer as the same digit to its left.

I can apply place value understanding to state the value of a digit in a number.

5. Establish success criteria by identifying strong and weak work. *Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions.*
.

Strong Work	Weak Work
Students are able to recognize and explain the patterns of the base-ten number system. Students use the language "ten times as many" or "ten times greater" to describe the value of a digit in comparison to the same digit to its right.	Common Misconceptions Two important ideas developed for three-digit numbers should be extended to larger numbers. First, the grouping idea should be generalized. That is, ten in any position makes a single thing (group) in the next position, and vice versa. Second, the oral and written patterns for numbers in three digits are duplicated in a clever way for every three digits to the left. These two related ideas are not as easy for students to understand as adults seem to believe. Because models for large numbers are often difficult to demonstrate or visualize, textbooks frequently deal with these ideas in a predominantly symbolic manner. That is not sufficient! (Van de Walle, page 47-48) Student focus is primarily on the digits as opposed to the relative size and magnitude of the number. Students are accurate in saying, "We add a 0 as the number increases;" however, it is our job as teachers to foster the why (what is happening with that 0).

Georgia Department of Education
Deconstructing Georgia Standards of Excellence
Mathematics Standard/Element Using The 5-Step Protocol