Operations and Algebraic Thinking: Grade 5

Stage 1 Desired Results

ESTABLISHED GOALS:

Competencies:

- ***Students will demonstrate the ability to solve arithmetic and algebraic problems by utilizing effective strategies and applying properties of operations to rational numbers.***
- ***Demonstrate the ability to reason with the coordinate plane in order toplot and interpret points.***

Content Standards:

- 5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
- 5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.
- 5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.
- MP1 Make sense of problems and persevere in solving them.
- MP2 Reason abstractly and quantitatively
- MP7 Look for and make use of structure.

Transfer

Students will be able to independently use their learning to ***solve arithmetic and algebraic problems, with fluency.***

Meaning

ENDURING UNDERSTANDINGS

Students will understand that…

- mathematical operations are used in solving problems in which a new value is produced from one or more values.
- algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions.
- recognizing a structure or pattern can be the key to solving a problem or making sense of a mathematical idea.

ESSENTIAL QUESTIONS

- ***Do rules and relationships make any sense?***

Acquisition

Students will know…

- expressions may be analyzed without solving them.
- patterns are useful in making predictions.
- that there is a relationship between two numerical patterns when comparing how each pattern grows when comparing the relationship between each of the corresponding terms from each pattern.

vocabulary:

numerical patterns, numerical expression, evaluate, corresponding terms, ordered pair, coordinate plane, sequence

Students will be skilled at…

- using parentheses, brackets, or braces to group an expression within a multi-step numerical expression.
- evaluating a numerical expression with parentheses, brackets, or braces.
- representing a calculation expressed verbally with a numerical expression.
- forming ordered pairs out of corresponding terms from patterns and graphing them on a coordinate plane.
- generating two numerical patterns with the same starting number for two given rules.
- identifying patters between correcsponding terms to discover the rule
- creating sequences by following a rule
- comparing sequences in order to compare the rules that make them.

Content Area Literacy Standards	*21st Century Skills*
not applicable	• *reason effectively* • *make judgments and decisions* • *think creatively*

Stage 2 - Evidence

Evaluative Criteria	*Assessment Evidence*
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan

Summary of Key Learning Events and Instruction

Language Arts Integration	*Mathematics Integration*
• 1.OA.1 Use	• 1.OA.1 Use

Technology Integration	*District Materials*
• 1.OA.1 Use	