Unit 9: Algebraic Connections

Unit #:	APSDO-00016999	Duration:	15.0 Day(s)	Date(s)	

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Grade(s)
5

Subject(s)
Mathematics

Unit Focus

In this unit, students will explore processes of finding, describing, explaining, and predicting algebraic patterns. Students will graph and name points on a coordinate grid using ordered pairs. Using the scales on these axes, students will identify a unique ordered-pair name to every point on the grid. Conversely, given an ordered pair, it is possible to find a unique location on the grid. Students will also collect, graph, and analyze data on line graphs. Primary instructional materials for this unit include On Core and Everyday Mathematics.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer
Common Core *Mathematics: 5* • Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis,	**T1** (T10) Describe, classify, and compare objects/numbers and sets of objects/numbers. **T2** (T13) Move from one representation to another without changing the quantity. **T3** (T21) Perform operations in a conventional order within the real and complex number system. **T4** (T32) Apply appropriate formulas to determine the unknown. **T5** (T50) Based on an understanding of any problem, initiate a plan, execute it and evaluate the reasonableness of the solution. **T6** (T53) Articulate how mathematical concepts relate to one another in the context of a problem or in the theoretical sense. **T7** (T51) Examine alternate methods to accurately and efficiently solve problems. **T8** (T52) Use appropriate tools strategically to deepen understanding of mathematical concepts.
	Meaning

with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). *CCSS.MATH.CONTENT.5.G.A.1*

- Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. *CCSS.MATH.CONTENT.5.OA.A.1*
- Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. *CCSS.MATH.CONTENT.5.G.A.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 $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product. *CCSS.MATH.CONTENT.5.OA.A.2*
- 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. *CCSS.MATH.CONTENT.5.OA.B.3*

Understanding(s)	Essential Question(s)
U1 (U200) Numbers, objects, or elements may repeat in predictable ways (patterns). **U2** (U200) Numbers, objects, or elements may repeat in predictable ways (patterns). **U3** (U305) Sets of measurements may display patterns. **U4** (U503) Effective problem solvers try multiple strategies when struggling. **U5** (U531) Models can distort or reveal patterns; therefore it is essential to recognize the appropriate representation. **U6** (U540) The choice of a mathematical tool depends upon the information you have and the information you want. **U7** (U550) Attention to detail, such as specifying units of measure and labeling, leads to clarity in expressing mathematical information. **U8** (U561) Recognition of patterns and structures fosters efficiency in solving problems.	**Q1** (Q201) How can I represent this information in symbols/equations/models? **Q2** (Q300) What properties of the object am I trying to measure? How do I measure them? **Q3** (Q302) How do I compare/combine measurements of objects? **Q4** (Q531) What values, numbers, quantities, and/or symbols can be used to solve a problem? **Q5** (Q550) Did I use clear language (symbols, labels, terms, units of measure and significant digits) to explain my reasoning to others? **Q6** (Q551) How precise do my quantities need to be for my calculations to be accurate? **Q7** (Q572) How does understanding the pattern/structure help me solve the problem?

Acquisition of Knowledge and Skill

Knowledge	Skill(s)
	S1 Graph and name points on a coordinate grid using ordered pairs **S2** Collect and graph data on a coordinate grid **S3** Analyze and display dates in a line graph **S4** Use at least two rules to generate a

		numerical pattern and identify the relationship between the corresponding terms in a pattern
		S5
		Graph the relationship between two numerical patterns on a coordinate grid