Unit 4: Expressions, Coordinate Planes, and Geometry

Content Area: **Math**
Course(s):
Time Period: **MP4**
Length: **45**
Status: **Published**

NJSLS Math

5.OA.A.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
5.OA.A.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
5.OA.B.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.
5.G.A.1	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, with the convention that the names of the two axes and the coordinates correspond (e.g., □-axis and □-coordinate, □-axis and □-coordinate).
5.G.A.2	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.
5.G.B.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.
5.G.B.4	Classify two-dimensional figures in a hierarchy based on properties.

Unit Focus

- Write and interpret numerical expressions
- Graph points on the coordinate plane to solve real-world and mathematical problems
- Analyze patterns and relationships
- Classify two-dimensional figures into categories based on their properties

Standards for Math 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
7	Look for and make use of structure
8	Look for and express regularity in repeated reasoning

Critical Knowledge & Skills

NJSLS Math	Suggested Math Practices	Critical Knowledge and Skills
5.OA.A.1 (A) Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	MP.1 Make sense of problems and persevere in solving them. MP.5 Use appropriate tools strategically. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): • Standard convention for performing operations (Order of operations, including grouping symbols). Students will be able to: • Evaluate numerical expressions with parentheses, brackets, and braces, including expressions containing fractions and decimals) • Use parentheses, brackets, or braces to group parts of a numerical expression. Learning Goal 1: Evaluate numerical expressions that contain parentheses, brackets and braces.
5.OA.A.2 (A) 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 x (8+70. Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921 without having to calculate the indicated sum or product.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.	Concept(s): • Order of operations, including grouping symbols. Students will be able to: • Write simple numerical expressions from a description that record calculations with numbers. • Interpret numerical expressions to compare

	MP.8 Look for and express regularity in repeated reasoning.	their values without evaluating them. Learning Goal 2: Write numerical expressions when given a verbal description or word problem; interpret numerical expressions without evaluating them.
5.OA.B.3 (A) 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.	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.	Concept(s): • No new concept(s) introduced Students will be able to: • Generate two numerical patterns using two given rules and identify relationships between corresponding terms in the patterns. • Form ordered pairs consisting of corresponding terms from the two patterns and graph the ordered pairs on a coordinate plane. Learning Goal 3: Generate two numerical patterns from two given rules, identify the relationship between corresponding terms, create ordered pairs and graph the ordered pairs.
5.G.A.1 (A) 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, with the	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools	Concept(s): • A coordinate system is defined by a pair of perpendicular lines called axes with the intersection of the lines, the origin, occurring at 0 on each line. • A given point in the coordinate plane is located using an ordered pair of numbers called coordinates. • The first number in an

convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	ordered pair 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. • The names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). Students will be able to: • Graph points defined by whole number coordinates in the first quadrant of the coordinate plane in order to represent real world and mathematical problems. • Interpret coordinates in context. Learning Goal 4: Represent real world and mathematical problems by graphing points defined by whole number coordinates in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
5.G.A.2 (A) 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.  Climate Change Example: Students may represent real world problems about the reduced yields of staple crops by graphing points in the first quadrant of the coordinate plane; Students may interpret coordinate values of points in the agricultural context.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): • No new concepts introduced. Students will be able to: • Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane. • Interpret coordinate values of points in the context of the real world and

	MP.6 Attend to precision. MP.7 Look for and make use of structure.	mathematical problems. Learning Goal 5: Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane and accurately interpret the meaning of the coordinate values in the context of the situation.
5.G.B.3 (A) Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): • Attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. Students will be able to: • Identify attributes of a two-dimensional shape based on attributes of the categories to which it belongs. Learning Goal 6: Understand that attributes of a category of two-dimensional figures apply to all subcategories within that category, and use this knowledge to classify shapes and justify their reasoning with specific geometric properties.
5.G.B.4 (A) Classify two-dimensional figures in a hierarchy based on properties.	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically.	Concept(s): • No new concepts introduced. Students will be able to: • Classify two-dimensional figures (triangles, quadrilaterals) based on shared attributes (e.g. parallel sides, number of sides, angle size, side length, etc.). • Arrange the

	MP.6 Attend to precision. MP.7 Look for and make use of structure.	categories/subcategories of figures (e.g. squares, rectangles, trapezoids, etc) in a hierarchy based on attributes. Learning Goal 7: Classify two-dimensional figures in a hierarchy based on properties.

School/District Formative Assessment Plan

- Topic 13-1 through 13-4 Quick Check (found in Savvas Realize)
- Topic 14-1 through 14-4 Quick Check (found in Savvas Realize)
- Topic 15-1 through 15-4 Quick Check (found in Savvas Realize)
- Topic 16-1 through 16-4 Quick Check (found in Savvas Realize)

School/District Summative Assessment Plan

- Topic 13 Assessment
- Topic 14 Assessment
- Topic 15 Assessment
- Topic 16 Assessment

Benchmark & Alternative Assessments

- STAR Renaissance
- LinkIt Benchmarks
- Performance Task (found in Savvas Realize)

Focus Mathematical Concepts

Pre-requisite skills:

- Apply properties of operations (associative property) as strategies to multiply (3.OA.B.5).
- Generate a number or shape pattern that follows a given rule (4.OA.C.5).
- Identify the features of a pattern that are not explicit in the rule (4.OA.C.5).
- Shapes (quadrilaterals) in different categories may share attributes, and that the shared attributes can define a larger category (3.G.A.1).
- Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories (3.G.A.1).

Common Misconceptions:

- Students may believe the order in which a problem with mixed operations is written is the order to solve the problem.
- Students reverse the points when plotting them on a coordinate plane. They count up first on the y-axis and then count over on the x-axis.
- Students may think the order in plotting a coordinate point is not important.
- Students think that when describing geometric shapes and placing them in subcategories, the last category is the only classification that can be used.

Number Fluency:

- 5.NBT.B.5 Multiply multi-digit whole numbers using the standard algorithm.

District/School Tasks

- Pick A Project (found in Savvas Realize)
- Performance Tasks (found in Savvas Realize)

District/School Primary, Supplemental and Intervention Resources

- Envisions by Savvas (P)
- STAR Renaissance (S)
- Freckle Math (S)

- Connecting Math Concepts (I)
- Corrective Math (I)

Instructional Best Practices/Open Educational Resources

Illustrative Mathematics

Desmos

Numeracy Tasks

Building Thinking Classrooms Tasks

Open Middle Math Tasks

Resources from Dr. Eric Milou

Career Readiness, Life Literacies & Key Skills

9.1.5.CR.1	Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
9.4.5.CT.1	Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
9.4.5.IML.2	Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).
9.4.5.IML.3	Represent the same data in multiple visual formats in order to tell a story about the data.
9.4.5.TL.2	Sort and filter data in a spreadsheet to analyze findings.

Computer Science & Design Thinking

8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.

8.1.5.DA.2	Compare the amount of storage space required for different types of data.
8.1.5.DA.3	Organize and present collected data visually to communicate insights gained from different views of the data.
8.1.5.DA.4	Organize and present climate change data visually to highlight relationships or support a claim.
8.1.5.DA.5	Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Interdisciplinary Connections

RI.MF.5.6	Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on web pages) and explain how the information contributes to an understanding of the text in which it appears.
SL.UM.5.5	Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
5-ESS1-2	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
5-ESS2-1	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.