Unit 5: Domain: Coordinates and Geometry

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Marking Period 4**
Length: **4-5 Weeks**
Status: **Published**

Unit Overview

Students begin Unit 5 with building on their knowledge to identify relationships within patterns and to graph the resulting ordered pairs on coordinate grids. Students will solve real-world and sample mathematical problems by graphing points on a coordinate plane and interpreting coordinate values of points in the context of the situation. When two-dimensional figures are presented on coordinate planes, students will classify them as a hierarchy. The teacher will use various types of station activities in these areas, and final assess daily in ticket to leaves.

Standards

MA.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.
MA.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., x-axis and x-coordinate, y-axis and y-coordinate).
MA.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.
MA.5.G.B.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.
MA.5.G.B.4	Classify two-dimensional figures in a hierarchy based on properties.

Essential Questions

- How can we best represent and verify algebraic/geometric relationships?
- How can we show the relationship between sequences on a graph?
- How is data utilized in our everyday life?

Application of Knowledge and Skills...

Students will know that...

- in an ordered pair, the first number indicates how far to travel from the origin in the direction of one axis (x), and the second number indicates how far to travel in the direction of the second axis (y)
- a given point in the plane is located by using an ordered pair of numbers, called its coordinates.
- 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.
- the intersection of the lines of a coordinate plane is called the origin, and it is arranged to coincide with the 0 on each line
- the standard algorithm for multiplying is a useful tool for making computations in all aspects of mathematics

Students will be skilled at...

- classifying two-dimensional figures in a hierarchy based on properties
- forming ordered pairs consisting of corresponding terms from two patterns, and graph the ordered pairs on a coordinate plane.
- generating two numerical patterns using two given rules.
- identifying apparent relationships between corresponding terms.
- relating the strategy used to solve a problem to a written method and explain the reasoning used.
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- using a pair of perpendicular number lines, called axes, to define a coordinate system.

Assessments

- Benchmark Tests
- Other visual assessments During the guided practice part of the lesson, students record responses to problems on individual whiteboards. Teacher will monitor for errors, and assist where needed
- Placement Test: used to test prior knowledge
- Task Cards: used as a reinforcement of a topic
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- Topic Math Projects
- Topic Quick Checks: can be given after each section in the topic to check for understanding
- Topic Tests: given after each topic

Activities

Problem of the Day-Present a daily problem that serves as a review from the previous day's lesson.

Station activities- Each section has center activities to reinforce skill (leveled)

- Toss and Talk - Toss a die and complete the problem to that number. Explain and discuss with your partner.
- Display the Digit- Choose a table. Explain how each number in the bottom row is related to the one about it. Find the missing numbers. Display each 0-9 tiles exactly once. Take turns with partner.
- Teamwork - As a team (2-4 students) pick a tile (1-4) and chose from the list of jobs (A-F) to complete. Check each others work.
- Think Together - Put a tile (1-4) and choose (A-D) box. Complete the problem together, discuss process and if the answer is correct.

STEM - Certain sections have Going Digital integrating technology and the use of calculators

- Mixed Problem Solving: Science page 369

Projects - There is a math project for each topic (Topic 15-16) - (See Cross-Disciplinary Instruction for projects and page numbers)

Practice work - Communicator practice can be done using Independent work and problem- solving practice problems in each section.

T**essellation activity** - Students make a pattern and trace the pattern to make a picture just like M. C. Escher

Coordinate Graphing Activity: (see link)

Use graph paper and the coordinate pairs given to create a mystery picture.

Coordinate Graphing Activity

Activities to Differentiate Instruction

General strategies for modification of this curriculum for students with special needs, ELL, and gifted learners:

- **General strategies:**
  - preferential seating

    - manipulatives
    - modified workbook pages
    - practice or enrich homework pages
- **Center activities** - There are leveled center activities for each section. There is a separate activity for "Intervention", and then "On-Level" and "Advanced" are in spiral book.
- **Leveled practice pages** - There are three leveled (Reteaching, Practice, and Enrichment) sheets that can be used for practice or homework.
- **Math Concept Readers:** These readers allow the student to read the story at different levels- above level, on level, and below level. (also available on line with audio) Complete the Think and Respond and Write Math questions at the conclusion of each book.
- **Assessment**- Using Quick Check Review can determine differentiated instruction levels using sample answers and using the rubric at the Close/ Assess and Differentiate section in the teacher edition.

Content specific modification for students with special needs, ELL, and gifted learners:

- **Topic 15**
    - **Below level students:**
        - Students who have poor application of skills may have difficulty recognizing and/or identifying the various kind of triangles and quadrilaterals.
        - Bring as many picture books and magazines into the classroom as you can. Have students look through them for examples of triangles and quadrilaterals.
    - **Students with special needs:**
        - Students who have difficulty with written symbols and visual impairments may find it difficult to perceive angles.
        - Present a chart describing each type of angle in large letters on the board. Acute = less than 90°, Right = 90°, Obtuse = more than 90°, Straight = 180°.
        - Work with students to make tactile models of each type of angle using tacks and four lengths of string.

    - **ELL**
        - Students who have difficulty reading English may have difficulty understanding the concepts of points, line segments, rays, lines, and planes.
        - **Emerging:** Show students concrete examples of each term, such as a point on the chalkboard ofr a point, a piece of string for a line segment, a piece of string connected to a ball for a ray, or a piece of paper for a plane.
        - **Expanding:** Give students geometric terms and have them identify something in the classroom that resembles the term. Have students explain why the object resembles the term using the definition.
        - **Bridging:** Have students analyze the definition of each term and decide what the object should look like. Then have students find at least five concrete examples of each term in the room.

    - **Advanced/Gifted:**
        - Students with a solid understanding of angles can play a measurement game. Give each pair of students a sheet of paper, a protractor, and a number cube. One students tosses the number cube, multiplies the number by 10, and draws an angle with that measure (i.e. 10°, 20°, 30°, 40°, 50°, or 60°). The other students tosses the number cube and repeats the process; he or she should draw the next angle to that it is attached to the first, thereby creating a "growing circle." Students continue to take turns tossing the number cube and drawing angles. The student who can fill int he final "wedge" of the circle with an angle of the correct measure is the winner.

- **Topic 16**
  - **Below level students:**
    - Relate coordinate grids to map grids. Show students examples of simple map grids and have them describe how to move from one location to another.
    - Give students sets of coordinates which when plotted form a figure such as a star or a house. Have them list the coordinates which when plotted make a sign.
  - **Students with special needs:**
    - Discuss with students the concept of a map. Talk about how coordinates work. On the board, sketch the axes of a coordinate grid and tell students this ia map of the area around their school, with the school at the center and each unit on the map representing one block or one mile. Work with students on concepts such as directions and how they relate to x and y.
  - **ELL**
    - Visually relating math terms may help English language learners understand them better.
    - **Emerging:** Explain ordered pairs using gestures and written numbers to illustrate your spoken words. For example, to illustrate the point (2,3), point at (0,0), visibly count two spaces to the right, make a mark, and write, "(2,)." then count up three spaces and write "(2,3)".
    - **Expanding:** Use each of the following terms and ask a volunteer to define each term: point, vertical, horizontal, location, and axis.
    - **Bridging:** As you explain the concepts of ordered pairs, call on students to explain the concepts back to you in their own words to confirm that they understand
  - **Advanced/Gifted:**
    - Have students look for examples of line graphs in the newspaper. Ask them to describe what each graph represents and what pattern or trends the graph shows.
    - If students seem proficient in making line graphs, give them data and have them make double-line graphs.

Integrated/Cross-Disciplinary Instruction

Reading and Writing: The Math Concept Readers allow the student to read the story at different levels- above level, on level, and below level. Complete the Think and Respond and Write Math questions at the conclusion of each book.

Tessellation activity (Art) - Students make a pattern and trace the pattern to make a picture just like M. C. Escher

Topic 15: Science - Have students research and collect pictures if tessellations in nature, architecture, and art. Have students identify the polygons, and then have them compile pictures on a shared notebook or bulletin

board.- page 343E

Topic 16: Social Studies - Give students a outline of a map that interest them. Then have them mark several cities or points of interests on the outline map. Finally, have students carefully draw a coordinate grid on the map and use an ordered pair to describe the location of each city. - page 263E

Resources

Topic 15 - Classifying Plane Figures

Topic 16 - Coordinate Geometry

On line Resources available at www.pearsonrealize.com

- Teacher Edition (TE) Textbook
- Student Edition (SE) Textbook
- Tests on line
- Concepts videos
- Math Tools

21st Century Skills