

Grade 7 Technology Unit: Geography & Inquiry

Enduring Understandings	Essential Questions	Eligible Content (Pennsylvania Standards)
<p>How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.</p> <p>National Geography Standard 1</p>	<p>How do I use cardinal directions to describe location and movement community?</p> <p>How is location and movement using latitude/longitude related to location and movement using cardinal directions?</p>	<p>7.1.3.A Identify geographic tools and their uses.</p> <ul style="list-style-type: none"> • Characteristics and purposes of different geographic representations <ul style="list-style-type: none"> ○ Maps and basic map elements • Geographic representations to display spatial information <ul style="list-style-type: none"> ○ Sketch maps ○ Thematic maps • Mental maps to describe the human and physical features of the local area
<p>How to use mental maps to organize information about places and environments in a spatial context.</p> <p>National Geography Standard 2</p>	<p>How does my mental map match the standard map and the actual environment?</p>	<p>7.1.6.A Describe geographic tools and their uses.</p> <ul style="list-style-type: none"> • Basis on which maps, graphs and diagrams are created <ul style="list-style-type: none"> ○ Field observations • Geographic representations to display <ul style="list-style-type: none"> ○ spatial information ○ Absolute location ○ Relative location ○ Topography • Mental maps to organize an understanding of the human and physical features of Pennsylvania and the home
<p>How to analyze the spatial organization of places, and environments on earth's surface.</p> <p>National Geography Standard 3</p>	<p>How do technology-enabled tools permit users to view and understand patterns in their environment?</p>	<p>7.1.6.A Describe geographic tools and their uses.</p> <ul style="list-style-type: none"> • Basis on which maps, graphs and diagrams are created <ul style="list-style-type: none"> ○ Field observations • Geographic representations to display <ul style="list-style-type: none"> ○ spatial information ○ Absolute location ○ Relative location ○ Topography • Mental maps to organize an understanding of the human and physical features of Pennsylvania and the home

<p>How to apply geography to interpret the present and plan for the future.</p> <ul style="list-style-type: none"> - Spatial understanding is developed through the use of spatial thinking skills, using data as evidence to formulate explanations, reasoning and critical thinking. <p>National Geography Standard 18</p>	<p>How can I use geographic data to understand my environment better?</p> <p>How can I analyze and interpret geographic data to plan for the future?</p>	<p>county</p> <ul style="list-style-type: none"> • Basic spatial elements for depicting the patterns of physical and human features: <ul style="list-style-type: none"> ○ Point, line, area, location, distance, scale ○ Map grids ○ Alpha-numeric system ○ Cardinal and intermediate directions <p>7.1.9.A Explain geographic tools and their uses.</p> <ul style="list-style-type: none"> • Development and use of geographic tools <ul style="list-style-type: none"> ○ Geographic information systems [GIS] ○ Satellite-produced images ○ Access to computer-based geographic data (e.g., Internet, CD-ROMs) • Construction of maps <ul style="list-style-type: none"> ○ Scale ○ Symbol systems ○ Level of generalization ○ Types and sources of data • Geographic representations to track spatial patterns: Weather, Migration, Environmental change (e.g., tropical forest reduction, sea-level changes) <p>7.1.12.A Analyze data and issues from a spatial perspective using the appropriate geographic tools.</p> <ul style="list-style-type: none"> • Human and physical features of the world through mental maps
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		<p>7.2.9.A Explain the physical characteristics of places and regions including spatial patterns of Earth's physical systems.</p> <ul style="list-style-type: none"> • Landform regions (?)
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Topical questions:

Where does the rainwater go in Bethlehem after it rains?

As you move North, what changes? Latitude or longitude? Does the latitude increase or decrease as you move North?

As you move South, what changes? Latitude or longitude? Does the latitude increase or decrease as you move South?

As you move East, what changes? Latitude or longitude? Does the longitude increase or decrease as you move East?

As you move West, what changes? Latitude or longitude? Does the longitude increase or decrease as you move West?

On a GIS map, examine the Broughal Middle School intersection. How many sewers are located near this intersection? Which street is located in the East/West direction? Which street is located in the North/ South direction?

If it rains all day, will there be enough sewers near the 48 Video store, the Cup, and Broughal Middle School to prevent people from getting their shoes and socks wet as they walk into these buildings?

What key knowledge and skills will students acquire as a result of this unit? (Students will know....; Students will be able to....)

Students will be able to use a GPS to identify their geographic position.

Students will understand how satellites triangulate a GPS location.

Students will understand current and historical purposes for using maps.

Students will understand systems for directions including absolute and relative directions (N,S,E,W. Latitude/ Longitude).

Students will learn basic map reading skills including interpreting location and direction (North, South, East, West).

Students will understand why accuracy and validity are important in research, specifically data collection.

Students will use a GPS to locate the latitude and longitude of storm sewer locations within a 4-block radius of BMS.

Students will validate and check the data recording of storm sewer locations.

Students will use GIS to discover patterns of Bethlehem storm sewer locations around Broughal.

Students will analyze data (evidence) to formulate explanations.

ACCEPTABLE EVIDENCE

What evidence will show that students understand? (e.g. tests, quizzes, prompts, work samples, observations)

Pretest and posttest assessment of content and spatial thinking skills aligned to objectives described above.

Pretest and posttest sketch maps of a 2 block area around the school.

Completion of AEJEE (Arc Explorer Java Edition for Education) handouts:

- Exploring the School Area with GIS
- The Attribute Table
- Changing GIS Map Displays
- Querying Data
- Earthquake Analysis

Performance Tasks: Through what authentic performance task will students demonstrate understanding?

Storm Sewer Planning Task: Students will be provided a street map with the placement of eight new businesses. They will create a plan to place brand new storm sewers in an unsurveyed section of south Bethlehem.

Draw a map task (sketch map). Students will draw a map of a 2 block area around the school. They will be asked to label streets with names, and label particular areas or objects on the map.

Students will use a GPS to accurately identify storm sewer locations and storm sewer types within a 4-block radius of BMS.

Students will use tools in AEJEE (Arc Explorer Java Edition for Education) to explore the school area and examine data information.

Students will change GIS displays to identify location patterns of double-grated and single-grated sewers, investigate patterns of sewer

placements on East/West and North/South streets and examine the number of sewers at the intersections near the 48 Hours Video store, the Cup, and Broughal Middle School to determine if enough sewers exist at those locations to prevent customers from getting their shoes and socks wet as they walk into the stores or school.

By what criteria will student products and performances be evaluated?

Storm sewer planning task rubric.

Sketch map inclusion criteria: view, boundary, labeling, orientation, span, features, completeness, and thoroughness.