Lesson: Cartography and Your Schoolyard

Subject Area(s) Cartography, Mathematics
Associated Unit Landforms, module 1
Lesson Title Cartography and Your Schoolyard
Grade Level 6 (4-6)
Lesson # 3 of 5
Lesson Dependency None.
Time Required: One Hour

Summary

In this activity, your team is going to construct a map of an assigned part of your schoolyard. Your map will include an outline of the area, drawn to scale, and your map will also show the significant objects in the area, also drawn to scale. Lastly, you will show how your room is oriented on the compass rose, showing the directions North, South, East and West.

Engineering Connection
Measurement and scale drawings are crucially important to mechanical engineers. Every car on the road today was once a scale drawing. Similarly, the civil engineers who helped to build our schools also made use of blueprints, the scale drawings representing the scale of the building and all of its doors and windows. In this exercise, students will practice cartography, or mapmaking, to make a scale drawing of their bedroom.
Keywords
Cartography, measurement, estimation, scale drawings.

Educational Standards
• Math: Measurement and Estimation 2.3

Pre-Requisite Knowledge
Some practice in using a ruler or tape measure.

Learning Objectives
After this lesson, students should be able to:
• Know how to make a scale drawing
• Be able to locate North, South, East and West
• Be able to represent objects and landmarks in a legend

Introduction / Motivation
In this activity, your team is going to construct a floor plan of an assigned part of your school. Your map will include an outline of the area, drawn to scale, and your map will also show the significant objects in the area, also drawn to scale. Lastly, you will show how your room is oriented on the compass rose, showing the directions North, South, East and West.

Lesson Background & Concepts for Teachers

Equipment:
Graph Paper, Pencil, String, Tape Measure

Group Roles:
Surveyors, Recorder, Mathematician,
Drafter, Analyst (each student is an Analyst)

Procedure:

Step 1: Determine the scale of your map in metric units. To measure the perimeter of your area, stretch string along a length, then fold the string in halves until it can be measured on the ruler. Use multiplication to determine the full length.

Step 2: STOP! Wait for the other groups to finish Step 1. Now, all groups have to pick the same scale to use, because we will interface all the maps together at the end.

Step 3: Draw the perimeter of the area on the graph paper, using the scale that you've determined in Step 2. Include the location of any entrance points.
Step 4: Identify the significant objects in the area and draw their location on the map. Represent the objects' perimeters as closely as possible. You can use rectangles or circles to represent irregularly shaped objects.

Step 5: Use symbols to label each object. Objects of the same type share the same symbol. Add a legend to your map identifying the meaning of each symbol used.

Step 6: Add a compass rose, and orient its direction to show where North is.

Step 7: STOP! Wait until all groups have completed step 6, then we will all agree on a common orientation and a common legend for everyone's maps.

Step 8: Make a final draft of your map using the orientation and legend from Step 7, then paste your group's map together with the other groups to make a composite map of the entire school yard

**Vocabulary / Definitions**

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Scale drawing</td>
<td>The process of drawing a figure either enlarged or reduced in size from its original size.</td>
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<tr>
<td>Legend</td>
<td>The key to the meaning of symbols and pictures on a map.</td>
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<tr>
<td>Compass rose</td>
<td>A figure displaying the orientation of the cardinal directions, north, south, east and west on a map.</td>
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<tr>
<td>Perimeter</td>
<td>The sum of the length of the sides of a polygon.</td>
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<tr>
<td>Area</td>
<td>Amount of surface, measured in square units.</td>
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**Assessment**

**Lesson Summary Assessment**

Question 1: What is the scale of your map?  
1 Square = ___________ centimeters  
1 Square = ___________ meters  
(this number might be a fraction or decimal)

Question 2: What is the area of the space you have mapped? How did you calculate this?

Question 3: What proportion of area does the object in Step 2 occupy in relation to the total area of the space? How did you calculate this?
Question 4: What problems did you encounter in composing the map? What could you do differently next time?

You will be evaluated on a scale from 0 to 4 on:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Measurement</th>
<th>Compass</th>
<th>Writing</th>
<th>Presentation</th>
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