



*Drexel-SDP GK-12 ACTIVITY*

## Activity: Cartography and Your Schoolyard

**Subject Area(s)** Measurement

**Associated Unit** Landforms, module 1

**Lesson Title** Cartography and Your Schoolyard

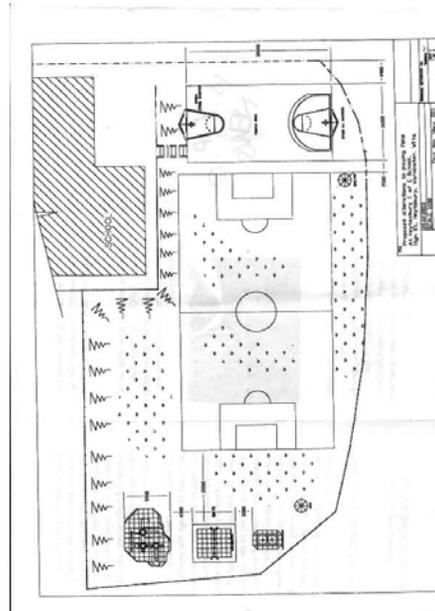
**Grade Level** 6 (4-6)

**Lesson Dependency** None.

**Time Required:** 1 Hour

**Group Size** Teams of 2-3

**Expendable Cost per Group** \$0



**Image 1**

**ADA Description:** Picture shows a playground plan

**Caption:** A playground plan.

**Image file name:** playground.jpg

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### 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 schoolyard.

### Keywords

Cartography, measurement, estimation, scale drawings.

### Educational Standards (PA)

- 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:

- **Make a scale drawing**
- **Locate North, South, East and West on their drawing**
- **Represent objects and landmarks in a legend**

### Materials List

Each group needs:

- A yardstick, ruler or tape measure
- String
- Graph paper

### Introduction / Motivation

Engineers commonly make use of scale drawings to comprehend the details of an engineerin design. For example, a jet engine for an airplane will be drawn so that it fits on a single piece of paper. These drawings include labels and legends that describe what each symbol means. In this activity, your team is going to construct a floor plan of an assigned part of your school yard. 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 schoolyard is oriented on the compass rose, showing the directions North, South, East and West.

### Vocabulary / Definitions

Word	Definition
Scale drawing	The process of drawing a figure either enlarged or reduced in size from its original size.

Legend	The key to the meaning of symbols and pictures on a map.
Compass rose	A figure displaying the orientation of the cardinal directions, north, south, east and west on a map.
Perimeter	The sum of the length of the sides of a polygon.
Area	Amount of surface, measured in square units.

## Procedure

### Background:

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

Step 6: Ask the students to explain to you the objects and orientation of their map.

## Safety Issues

- None

## Troubleshooting Tips

Make sure the students understand how to use a piece of string to measure the length of a long piece of the school yard (e.g. measure with string, fold in halves multiple times until the piece can be measured with a ruler, multiply the measurement by the number of pieces of string).

## Investigating Questions

How did you represent irregularly shaped objects? Did you have any trouble figuring out which way is North and how did you resolve it?

## Assessment

### Pre-Activity Assessment

Perform a quick oral quiz of the vocabulary.

### Activity Embedded Assessment

None

### Post-Activity 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?

Use the following rubric to evaluate the students' maps.

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

_____	_____	_____	_____	_____
Scale	Measurement	Compass	Writing	Presentation

**Contributors**

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