

# Transect Mapping with GPS

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<b>Grade Level</b>	7
<b>Duration</b>	2 - 4 class periods

Arizona Social Studies Standards
<b>Strand 4: Geography</b> <b>Concept 1: The World in Spatial Terms</b> <i>PO 3. Interpret maps, charts, and geographic databases using geographic information.</i> <b>Concept 6: Geographic Applications</b> <b>PO 2.</b> Describe how environments (e.g., Sun Belt, urban areas) influence living conditions. <i>PO 3. Use geographic knowledge and skills (e.g., recognizing patterns, mapping, graphing) when discussing current events.</i>

Other Arizona Standards
<b>Science</b> <b>Strand 4: Life Science</b> <b>Concept 3: Populations of Organisms in an Ecosystem</b> <b>PO 3.</b> Analyze the interactions of living organisms with their ecosystems: a. limiting factors b. carrying capacity
<b>Writing</b> <b>Strand 3: Writing Applications</b> <b>Concept 4: Persuasive</b> <b>PO 1.</b> Write persuasive text (e.g., essay, paragraph, written communications) that: a. establishes and develops a <b>controlling idea</b> b. supports arguments with detailed <b>evidence</b> c. includes <b>persuasive techniques</b> d. excludes irrelevant information attributes sources of information when appropriate

## Overview

Transect mapping is a tool used to describe the location and distribution of resources as well as to describe the physical landscape and area uses. The tool involves field observation, discussion, and diagramming. This activity will allow students the opportunity to identify the uses for their campus based on information collected on the transect line. One output is a transect map.

## Purpose

Students will walk along a transect path at their campus using specified way point coordinates. Students will count occurrences of the plants and other organisms found along the way to best determine the potential use of this area on campus.

## Materials

- GPS unit with predetermined waypoints set along the transect lines – 1 per group
- Data Table for Transect Map worksheet – 1 per group
- Butcher paper
- Journals

- Clipboards (optional)
- Transect Map--Additional directions and pie chart example showing transect line

## Objectives

Students will:

- Locate a waypoint on the Earth's surface using a GPS unit
- Record observations
- Make inferences
- Develop a transect map of their campus
- Brainstorm ideas for potential land uses
- Collaborate with other teams

## Lesson Components

**Prerequisite Skills:** Students need to know how to use a GPS unit. They should also have an understanding of transect lines.

### Prior Preparation:

Before lesson begins, select a spot near the center of your campus. Transect lines will radiate from this spot so that small groups of two or three can collect data simultaneously. Set waypoints at every five meters. The transect line should continue to the campus boundary in each radiated direction.

Cut out 1 large circle (100 cm diameter) out of butcher paper and divide into equal sections—one for each group (which is 1 for each transect line). Place the team number on the butcher paper to facilitate putting the completed map together. A suggestion would be to make team #1 the north facing team.

### Session One:

1. Begin the class by having students brainstorm ideas for alternative uses of their campus. (i.e., assemblies, music performances, after school activities, and landscaping suggestions)
2. Distribute the Data Table for Transect Map worksheet. Model for the students how it should be completed.
3. Review how to use the GPS unit.
4. Divide students in groups of two or three and give each group a GPS unit. Go outside.
5. Starting at the first waypoint, students will begin gathering data to be collected for the transect map.
6. Have students follow GPS coordinates and collect information at each point.
7. Return to class. Collect Data Table Worksheet from groups for Session Two.

### Session Two:

1. Have student return to their groups and sit together. Return Data Table Worksheets.

2. Model how to transfer the data from the Data Table for Transect Map worksheet to their section of the pie chart (transect).
3. Allow groups time to transfer data collected from table into their section of the pie chart (transect map).
4. Have groups place their pie piece (transect) in the correct order according to the GPS coordinates. Make sure that north is in the correct position on the circle (top). Make sure the compass directions are followed (north, east, south, west).
5. Place all the pie charts (transects) together to form a circle (transect map). Students should copy completed map in their journals.
6. Use the completed map to interpret the campus. Ask probing questions: Is the campus properly represented? Are there major structures that were missed? Explain contractors and developers rely on transect maps to track changes in the environment. Explain why this could or could not be an accurate tool to use.
7. Have groups brainstorm ideas and use data collected to write a proposal to district office suggesting a change in the campus usage. Evidence should be provided by the transect map developed during the field study.
8. Students will then write a persuasive essay following the brainstorming. They must use the correct voice for contacting the district office. They must include an introduction, supporting details (taken from their recorded observations), and a conclusion.

## Assessment

Data Table for Transect Map can be graded for completeness and accuracy. Individual pie pieces (transects) should include coordinates and be in the correct position on pie graph (Transect Map).

The persuasive essay can be graded for Voice and Ideas and Organization using the 6 Traits Writing Rubric.

## Extensions

Students can research plants and animals found at each waypoint. (science)  
Students can also monitor traffic at given waypoints on the transect map. (geography)  
Students can decide which proposal from their class has the most merit. They could then actually contact the district office and see if their voices are heard. (civics)

## Sources

<http://www.newurbannews.com/transect.html>  
<http://www.planetizen.com/node/89>  
[http://www.iapad.org/transect\\_mapping.htm](http://www.iapad.org/transect_mapping.htm)  
<http://www.sea.edu/academics/k12.asp?plan=wetlandstransects>

Name \_\_\_\_\_

\_\_\_\_\_

Group Number \_\_\_\_\_

Period \_\_\_\_\_

## Data Table for Transect Map

Directions:

1. Use the GPS to find each waypoint along the **transect** line.
2. Write the coordinate in the correct column
3. In each box, describe what is observed for that area. Describe plants, animals, surface of the earth, structures, etc.
4. Identify an opportunity and problem for each waypoint.
5. In the last box, draw what is observed for that area. Draw any plants, animals, surface of the earth, structures, etc.

Way Point GPS Coordinates				
Describe the surface of the earth				
Describe the vegetation				
Describe the animals				
Describe any structures				
Problem				
Proposed change				
Drawing of what is located at this way point				

Example of a Transect Map for 10 Groups

North ↑

