Name: Where am I?

Subject: Geography

Grade: 9

Goal:

This lesson will assist students in better understanding basic geographic tools in a Geographic Information System.

Materials:

http://pol.pictometry.com/

Expected Duration: One 45 to 50 minute period

Objectives

Academic Standards:

Pennsylvania:
7.1.9
Explain and illustrate how geographic tools are used to organize and interpret information about people, places, and environments.

Assessment

Student understanding will be assessed by reviewing calculations, as well as in class discussion.

Student Objectives: (*related to assessment)*

As a result of this lesson, the students will be able to:

1) Identify key components of latitude and longitude measurements
2) Describe the differences between vertical air photos and oblique air photos
3) Describe the differences in details when maps have a small scale and a large scale

Lesson Development

Anticipatory Set

Ask students to describe where they are. Students will typically answer, in a classroom, in a school, perhaps name the town. Ask students to be more specific. Tell students that there is a universal way to say where you are, by giving your latitude and longitude

coordinates. Share with students the coordinates for your particular location.

Teaching Procedure/ Instructional Process:

1) Introduce students to the important aspects of latitude and longitude
A) What is latitude? Longitude? How do they differ?
B) Where is longitude negative? Positive?
C) Where is latitude negative? Positive?
D) Latitude and Longitude are measured two ways- decimal degrees and degrees minutes seconds. 1 degree= 60 minutes; 1 minute= 60 seconds

2) Have students log onto the Pictometry Online Software. Find PNC Park by using the search bar.

3) Find the latitude and longitude of home plate by using the location button. Convert both latitude and longitude into Degrees, Minutes and Seconds by using the following steps:
1.The whole units of degrees will remain the same
2. Multiply the decimal by 60. The whole number becomes the minutes.
3. Take the remaining decimal and multiply by 60. The resulting number becomes the seconds (6"). Seconds can remain as a decimal.
4. Take your three sets of numbers and put them together, using the symbols for degrees (°), minutes (‘), and seconds (").

4) Explain to students that air photos can be takes one of two ways… from directly above (vertical) or at an oblique angle. In Pictometry Online, we can move between Vertical and Oblique photos by clicking on the camera icon at the bottom of the screen. Have students try it with their present location (PNC Park).

5) Using the distance tool (the D icon on the toolbar) measure the distance from Home Plate to the Pitcher’s Mound in the vertical DOQ photo. What is this distance? What is the regulation distance, as required by MLB? (Note- 60 feet). What is the distance between the other bases? Are they all equal?

6) You’ve just won Steelers Tickets, but your seats are in the very last row at the top of the upper deck. How high up are your seats? Find this distance by using the elevation tool (the E icon on the toolbar). Can you complete this task by using a vertical DOQ photo or do you need to use an oblique photo to get this measurement? (Note- students will need to switch to an oblique view to complete this measurement). Can you measure the distance between goal posts in the Oblique view? Why do you think this is?

7) Explain to students the difference between large and small scale maps. (Note- A map which depicts a small territory is referred to as a large scale map. This is because the

area of land being represented by the map has been scaled down less, or in other words, the scale is larger. A large scale map only shows a small area, but it shows it in great detail. A map depicting a large area, such as an entire country is considered a small scale map. In order to show the entire country the map must be scaled down until it is much smaller. A small scale map shows more territory, but it is less detailed.)
Have students zoom in and out in Pictometry Online. Which offers more details? Which represents a large scale? A small scale?

Content Notes

Latitude and Longitude Coordinates:
They can be represented as Decimal Degrees (As Pictometry does) or Degrees, Minutes and Seconds.

Example:
42.5935 is in Decimal Degrees. You need to turn it into Degrees, Minutes and Seconds.
DEGREES

- 1°=60 minutes
- 1'=60 seconds
- °=degree
- '=minute
- "=seconds

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Converting Coordinate Formats
Lat/Long – you have learned about this
These come in 2 formats

1. Decimal Degrees
    a. 42.5935
2. Degree Minutes Seconds
    a. 43° 4’ 31”

- DD to DMS:
    - 42.5935°:

      42.5935 - 42° = .5935
      .5935 x 60 = 35.61
      .61 x 60 = 36.6
      Result: 42° 35’ 37”
- DMS to DD:
    - 42° 35’ 37”:

      Divide seconds by 60: 37/60 = .6167
      Add product to whole number of minutes: 35 + .6167 = 35.6167
      Divide result by 60: 35.6167/60 = .5936

Add degrees: 42 + .5936 = 42.5936 (It could be a little different due to rounding of degrees.)