Name: Bearing Down the Street

Subject: Math

Grade: 7-8

Goal:

This lesson will assist students to understand the concepts of bearing and scale.

Materials:

Map of an area
Ruler
Protractor
Paper
http://pol.pictometry.com/

Expected Duration: Two 45 to 50 minute periods

Objectives

Academic Standards:

Pennsylvania:
2.3.7A
Demonstrate an understanding of measurable attributes, and the units, systems and processes of measurement.

Assessment

Student learning will be assessed by giving written directions (using bearings) and following directions given by a fellow student.

Student Objectives: (*related to assessment)*

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

1) *Understand the Compass directions and angles*
2) *Understand the concept of scale*

Lesson Development

Anticipatory Set

Have students listen to verbal directions from the teacher in order to move from their current location to a pre-determined location (do not tell students what the location is). Give students directions such as take five steps to the right or take five steps to the left. Because right or left will be dependent on where the students started from, not all students will end up in the same place. Explain that it is important that directions must reflect where the ending point is in relation to the starting point.

Teaching Procedures/Instructional Process:

1) Put students into groups of 2. Each group will need a protractor and a map of the area.

2) Explain to students that each direction on a compass also correlate with degree measurements.

North = 0 degrees and 360 degrees
East = 90 degrees
South = 180 degrees
West = 270 degrees

3) Show students that these degree measurements are made using a protractor. Have students practice by measuring points on a map, using the protractor. Have students select and mark the points, and then right directions using the bearings (i.e. measure two inches in the direction of 90 degrees).

4) Ask students- If I were to take the directions you just wrote to the location on the map, would I actually need to walk two inches? Why or why not? Direct students to the point that in order to fit a large area on a small map, cartographers (those who make maps) must use a scale. A scale helps to represent a large area in a small space, and also ensures that the people reading the map know how far the distance on the map equals in real life. For example- a map might have a scale of one inch equals one mile. That means that for every inch I would travel on the map, I would travel a mile in real life.

5) Give each student two locations within the City of Pittsburgh. Have students select which point will be their starting point and which would be their ending point. Have students log onto Pictometry Online, and mark both their starting and ending points using the marker feature on the toolbar.

6) Next have students measure the distance and directions (converting N, S, E, and W into bearings) from their Point A to Point B. In order to get from point to point, they may ONLY travel on streets and sidewalks. Have students type their directions using Microsoft Word.

Example:

Going from hotel to the Steelers game

A) You need to travel from a hotel to the Steelers game. Write out directions with the bearings you must travel
B) So I need to follow 270 degree bearings on Street A for 100 feet at which time I will travel a 90 degree bearing for 750 feet, etc.

7) Once all students have finished writing their directions, have students switch directions with their partner. Students should follow the directions they were given exactly as written. Once they believe they have arrived at their stopping point, have students measure from where they ended (by following the directions) and where their partner had marked the ending point. Have students measure the distance between their ending point and the actual ending point, and record this distance in their journals. Why do they think they were able to get that close/were that far away?

Guided Practice/ Monitoring

Assist students in measuring bearings on maps and in navigating the software as necessary.

Closure

Ask students what difficulty they had in developing and following the directions. Was it difficult to stay on sidewalks and roads?

Independent Practice / HW

None.