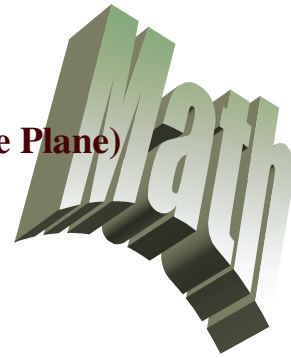# Algebra/Geometry Institute Summer 2005

Can You Help Me Find My Way Home? (Coordinate Plane)

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School: West Bolivar Middle School   Rosedale, MS
Grade Level: Fifth

 1   Teaching objective(s)
The students will locate points on a coordinate plane.

 2   Instructional Activities
The teacher will begin the lesson by asking the students what they want to be when they grow up. The teacher will listen to the student responses. The teacher will ask, "How many students would like to be a pilot or a ship captain?" The teacher will ask the students to mention some of the things that these two people have in common. The teacher will tell the students that one of the most important things for these two people to know is where they are and where they want to go. The teacher will ask the students to explain how they get to school each morning. The teacher will wait for student responses. The teacher will tell the students that it is important for the people who bring them to school everyday to know where they are and where they are going also. The teacher will ask the students, "What would happen if the bus driver that brings you to school did not know where the school was?" The teacher will listen to the student responses. The teacher will tell the students that in order to know how to get somewhere, it is important for them to understand the different directions. The teacher will ask the students to name the four cardinal directions. (Answer: North, South, East and West) The teacher will explain to the students that there are different ways that people use to locate things. The teacher will tell the students that they have to pay close attention to today's lesson because they will be introduced to one of the methods that pilots use in order to get to their destinations. The teacher will present the pull-down coordinate plane. The teacher will ask for volunteers to tell what they think it is and what they think it is used for? The teacher will wait for student responses. The teacher will say to the students, "This is a coordinate plane. A coordinate plane is a grid that is used to locate an ordered pair of numbers." The teacher will ask the students what they think the word **ordered pair** means. The teacher will listen to the student responses. The teacher will explain to the students that the word ordered pair refers to the order that the numbers are presented in. (The teacher will give

an example: 4 across and 2 down.) The teacher will explain that points located by these ordered pairs can be named by letters. The teacher will explain that the coordinate plane is the system used in mathematics when graphing ordered pairs. The teacher will explain to the students that this system is referred to as the Cartesian coordinate system because it was named after the French mathematician Rene' Descartes. The teacher will explain that the coordinate plane is divided into four equal parts by the x-axis and the y-axis called quadrants. (Show Attachment 1) The teacher will tell the students that the x-axis is the horizontal line (——) that divides the coordinate plane and the y-axis is the vertical line (|) that divides the coordinate plane. The teacher will tell the students that the quadrants are labeled in a counterclockwise direction. The teacher will ask a volunteer to show the class how the hands of a clock can be moved in a counterclockwise direction using a small handheld clock. The teacher will use the overhead projector to show how the four quadrants of the coordinate plane are labeled. (Show transparency 1) The teacher will write this ordered pair (6, 1) on the transparency. The teacher will explain that the first number 6 is the x-value and will be located first on the x-axis. The teacher will explain that the first number tells how many units to move on the x-axis. The teacher will tell the students that a positive number means to move right on the x- axis and a negative number means to move left on the x-axis. The teacher will tell the students that the 1 is the y-value and it will be located second on the y-axis. The teacher will explain that the y value, which in this case is 1, will tell how many units to move on the y-axis. The teacher will tell the students that when locating points on the y-axis, a positive number means to move up and a negative number means to move down. The teacher will ask the students to look at the place where the x-axis and the y-axis intersect. The teacher will tell the students that the ordered pair for this intersecting point is (0, 0) and is called the origin. The teacher will explain to the students that when they are locating points on a coordinate plane they must **ALWAYS** start at the origin. The teacher will explain to the students that the x value must **ALWAYS** be located first before the y value. The teacher will give the students a handout of a coordinate plane. The teacher will write the following ordered pairs on a transparency and give the students 3-5 minutes to locate them on their grid paper.

1. A (8, 4)
2. B (3, -5)
3. C (-6, -7)
4. D (0, 10)

5. E (-1, 2)
6. F (-9, 0)
7. G (0,0)

The teacher will use the overhead projector to show the students where the points are located. The teacher will ask the students, "Will point AA be located in the same place if you use these two ordered pairs; (4, 3) and (3, 4)?" The teacher will listen to the student responses. The teacher will select a volunteer to explain why it would not. (Answer: The first ordered pair means to go over 4 and up 3, but the second ordered pair means to go over 3 and up four.). The teacher will ask several volunteers to list the steps that they must follow when plotting points on the coordinate plane. (Answer: Start at the origin. Read and find the x-value. Read and find the y-value. Plot the point.) The teacher will pass out handout 1 to the students. The teacher will explain the directions to the students and inform them that the results will be recorded in the grade book.

3. Materials and Resources

Pull-down coordinate plane
Dry erase markers
Graph paper
Pencils, pens and markers
Clocks
Overhead projector
Transparency sheets
Transparency pens
Mathematics Plus (1994). Harcourt Brace & Company
Focus on Algebra by Alan R. Hoffer

4. Assessment
Teacher observation will be used as the students are using their graph paper to locate the sample ordered pairs from the transparency. The students will complete handout 1 and it will be checked for valid responses. The teacher will also listen to the student responses when they are asked to share what they have learned from the lesson.

Attachment 1

II

I

y axis

x axis

(0,0)

III

IV
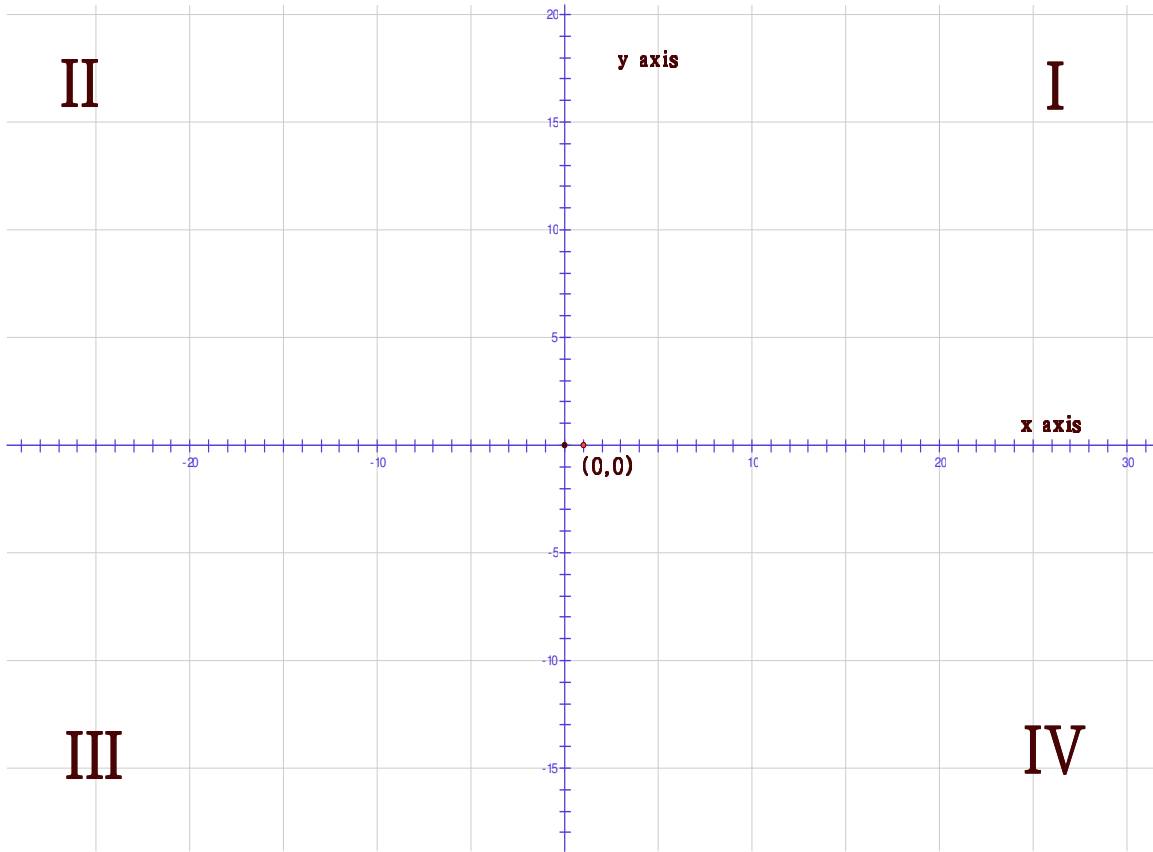
Attachment 2(Handout 1)

Directions: Use the attached sheet of grid paper to draw a coordinate plane, locate and label the following points.

1. Point A (6,9)
2. Point B (12, 15)
3. Point C (10,27)
4. Point D (8,21)
5. Point E (7,5)

Label the following restaurants on your grid.

6. McDonald's (3,3)
7. Wendy's (6,10)
8. Kentucky Fried Chicken (4,7)
9. Popeye's (10,10)
10. Pizza Hut (5,5)