

The Coordinate System Using StudyWorks!

GRADE LEVEL: 5th and 6th

TIME NEEDED: 100 MIN or two class periods

OBJECTIVE:

- 1) Students will learn to graph points in all four quadrants on a coordinate plane.
- 2) Students will do their work using the StudyWorks! Program.

MATERIALS:

A class set of computer with StudyWorks! Program.

A class set of maps or atlases

KEY TERMS:

Coordinate system	x-coordinate
Origin	y-coordinate
x-axis	Quadrants
y-axis	Ordered pair

CONCEPTS LEARNED AND MASTERED:

- 1) Students will learn to locate points using a coordinate system.
- 2) Students will understand that a coordinate system is formed by the intersection of two number lines that meet at their zero points called an origin.
- 3) Students will learn how to graph any point on a coordinate system by using an ordered pair.

TEACHING DIRECTIONS:

- 1) Day one teach the background information. Students should learn and understand the Key terms. Student should also know how to identify the parts of a coordinate system.
- 2) Students should learn what an ordered pair is and that the ordered pair is the coordinates of the point. The students should understand that the coordinates are the directions to find the point. Work some examples with the students so that they can understand how to graph an ordered pair on the coordinate system.
 - a. Example: Graph the ordered pair (5,3)
 - i. Begin at the origin. (0,0)
 - ii. The x-coordinate is 5 this tells you to go 5 units *right* of the origin.
 - iii. The y-coordinate is 3 this tells you to go *up* 3 units.
 - iv. Draw a dot.

b. Now demo on StudyWorks!

The screenshot shows the StudyWorks application window titled "StudyWorks - [Untitled:1]". The menu bar includes File, Edit, View, Insert, Format, Math, Algebra, Window, and Help. The toolbar contains various icons for file operations and editing. The text area contains the following text: "Example:", "ordered pair (5,3)", "x := 5", and "y := 3". Below the text is a coordinate plane with a grid. The x-axis is labeled from -10 to 10 in increments of 2, and the y-axis is labeled from -5 to 5 in increments of 1. A point is plotted at the coordinates (5, 3). To the right of the grid is a plus sign "+". To the left of the grid, the letter "y" is positioned above three small circles. On the right side of the window, there are two floating windows: "Calculator" and "Boolean". The Calculator window contains various mathematical functions and symbols, and the Boolean window contains comparison and logical operators.

- 3) Illustrate direction number 2 by having students locate points on a map by giving them the latitude and longitude only.
- 4) Day two review the previous day's lesson with the students.
- 5) The students are now ready to plot ordered pairs in StudyWorks!
 - a. Students are to open the StudyWorks program.
 - b. Select the **Insert** menu and choose **graph** and then x-y plot
 - c. The program will insert a graph on to the worksheet.
 - d. Place x and y in the placeholders on the axes.
 - e. Double click on the graph and to format the graph.
 - f. Turn off the auto grid and choose your grid number.
 - g. Set your axis limits by clicking the graph and changing the maximum and minimum values.

- 6) To plot sets of data have the students put the data into vectors.
- Define the vectors as x and y.
 - Select the insert menu. Choose matrix input the number of rows and input 1 for the number of columns, then click ok.
 - Now insert the graph and format it for your data.

The screenshot shows the StudyWorks Math software interface. At the top, the menu bar includes File, Edit, View, Insert, Format, Math, Algebra, Window, and Help. Below the menu bar is a toolbar with various icons. The main workspace contains the following text and graphics:

Ordered pairs: (6,2) (4,4) (2,6)

Put the data into vectors

$x := \begin{pmatrix} 6 \\ 4 \\ 2 \end{pmatrix}$ $y := \begin{pmatrix} 2 \\ 4 \\ 6 \end{pmatrix}$ +

A coordinate plane is shown with x and y axes ranging from -10 to 10. Three points are plotted and connected by line segments: (6,2), (4,4), and (2,6). The points are connected in the order (6,2) to (4,4) to (2,6). The axes are labeled 'x' and 'y'.

At the bottom of the window, there is a status bar with the text "Press F1 for help." and buttons for "AUTO", "NUM", and "Page".

EVALUATION AND POST ACTIVITY

- Assign a post activity to tie the lesson together.
- Give students ordered pairs to graph as well as sets of data to practice using the program.
- A vertex of a polygon is a point where two sides of the polygon intersect.
 - Create a polygon on a coordinate system.
 - Subtract 4 from y-coordinate. Graph the new ordered pairs. What figure is formed if all the points are connected?