LessonTitle: Maps and Grids	**Pre 5.4**
Utah State Core Pre-Algebra Content Standards 2.3, 3.3 Process Standards 1-4	
Summary In this lesson, students will locate their houses and the school on a local map obtained from the internet. They will translate this map to a coordinate grid sheet and designate the coordinate pairs for their homes and the school. Then they practice placing, naming, and comparing coordinate points.	
Enduring Understanding A mathematician named Descarte invented the coordinate system as a way to communicate about locations. We use this system to help us describe and communicate all kinds of mathematical information.	**Essential Questions** • How does the coordinate system work?
Skill Focus • Orienting on maps and coordinate grids	**Vocabulary Focus**
Assessment	
Materials: Map of your school area from the internet, grid sheets made from overhead plastic (see below), graph paper	
Launch	
Explore	
Summarize	
Apply	

Directions:

Prepare ahead by finding the map of your area on mapquest.com. The teacher may choose to do this or have selected students do this ahead of time. Zoom in on the chosen area (the area around the school or of neighborhoods within the school boundaries. Print the graph.

After the students have located and labeled their homes and the school, they will overlay the grid sheet (copy below) to place their homes and school on the map. Note: Have the students place their coordinate grid points only at the intersections of the grid lines.

When they find the distances between their homes, they will travel only on the lines of the graph. To show the subtraction, they will subtract one x value from the other and then one y value from the other—the total is the distance between their houses (not as the crow flies).

Read and discuss the book **A Fly on the Ceiling, A Math Myth** by Dr Julie Glass. This book is a myth about Rene Descartes inventing the coordinate grid.

Pre 5.4 Maps and Grids

1) On maps, **direction** is shown as East, West, North, and South. Draw below how a map shows East, West, North and South.

2) On the map of your school area, find the school and the approximate location of homes of the members of your group. Place points on the graph for your homes and the school and then label them with first letters of your names.

Grids are used on maps in order to **locate** specific places. For example, if you wanted to tell someone in your class the general location of your home on the map, you might say B3.

Give the grid locations for the school and your homes. (Use the letters and numbers across the top or bottom and side of your map.)

Place	Grid Location
The School	

3) Write 5 sentences in which you relate the different locations of your houses and the school. For example: The school is Northeast of Ben's house. Cam's house is five blocks away from Troy's house.

4) Algebra uses a system for graphs much like your map. It is called a coordinate grid. We will translate the regular map into a coordinate grid.
   - Place your coordinate grid sheet over the map of your area.
   - Label the vertical axis as X and the horizontal axis as Y. (The x and y axes intersect each other at the center of the page.
   - Use an overhead marker to mark the locations of the school and your homes. This is approximate, so place the points for the school and your homes where the lines on the grid cross.

   Explain how this graph shows **direction** (instead of East, West, North, South).

5) The algebra grid is called a coordinate graph because it uses coordinates to show **location**.

- Label your points on the grid using coordinate pairs, that is you write (x, y) or (3, 2). So the 3 is the x location and the 2 is the y location. Place the coordinate pairs next to the points.
- Now give the grid locations using coordinate pairs.

Place	Location (Coordinate Pairs)
The School	

6) Find the distance between each set of locations (not as the crow flies). For purposes of this activity, you can only travel on the lines of the graph.

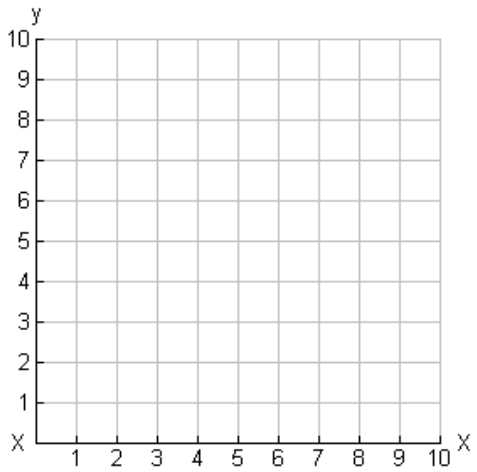
Places to compare	Spaces between	Ordered Pairs	Show the subtraction.
The school and _____'s house			

7) Graph the ordered pairs. Label them with letters and with their coordinate pairs.

A = (0,2) B = (4,3) C = (2,5)

D = (0,6) E = (6,5) F = (4,8)

G = (7,3) H = (8,1)



8) Find the distances between two points by subtracting. Check by counting spaces.

Places to compare	Coordinate points	Show subtraction
D and A	( ) ( )	
E and C	( ) ( )	

Which two points are closer, F and B or G and B? _____ Explain.