Tips for Helping at Home

- Questions to ask:

  What is it that you don't understand (have the student be specific)?

  What about putting things in order?

  Could you try it with simpler numbers?

  Can you guess and check?

  Does this make sense?

  What can you do to explain your answer to show others what you are thinking?

  Does your answer seem reasonable?

- Offer to solve your child's coordinate mystery after he or she creates it. If you are unsure of how to read grid coordinates, your child can help you.

- Play Sunken Ships with your child when he or she brings it home. Your child can teach you the rules and maybe even some strategies!

- Keep your eyes open for rectangles in the world around you—they're easy to spot. Work with your child to find particularly large or small (smaller than an inch on a side) rectangles, rectangles that are also squares (all sides are equal), and rectangles that are much taller than most fourth graders.

Mathematical Emphasis

Investigation 1—Locating Houses and Ships on a Grid

- Using positive and negative coordinates to name and locate points on a grid

- Calculating distances on a grid based on paths along grid lines

- Exploring numerical patterns that represent geometric situations

- Connecting visual and numerical descriptions of distances on a grid

Investigation 2—Rectangles, Turns, and Coordinates

- Applying knowledge of coordinates to locate points on a computer screen

- Describing geometric figures such as rectangles and squares

- Understanding how *Geo-Logo* commands reflect the properties of geometric figures

- Creating and applying patterns and mental arithmetic strategies to solve turtle geometry problems

- Using symmetry to place rectangles on a grid and design complex patterns of rectangles
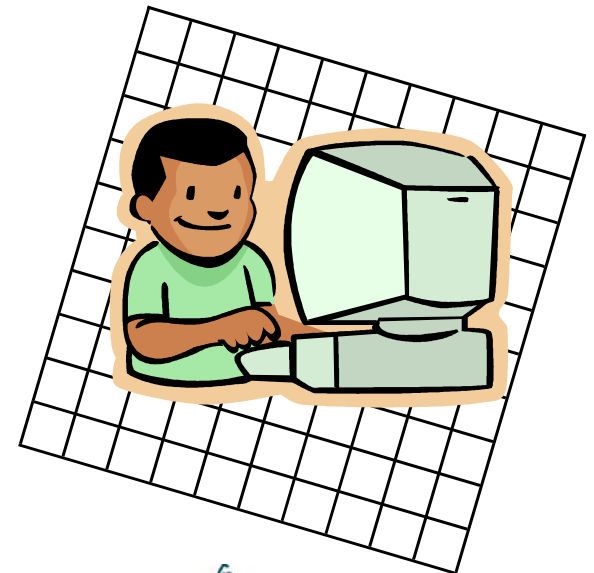
Websites

http://cms.everett.k12.wa.us/math

http://aimsedu.org/aimskids/ipuzzles/hurkle/hurkle.html

http://math.donnayoung.org/m01/coordnt/4squ.pdf

Software download - ask your teacher for the password.

http://investigations.scottforesman.com/sunken.html

Investigations
in Number, Data, and Space

Sunken Ships and Grid Patterns

2-D Geometry

Everett Public Schools

Vocabulary

Ordered pair: A pair of numbers used to locate a point on a coordinate grid. The first number tells how far to move horizontally, and the second number tells how far to move vertically.

Line segment: a straight line from one point to another

Vertex: the place where two or more line segments come together

X-axis: the horizontal axis on a coordinate grid

**Y-axis:** the vertical axis on a coordinate grid

Reflection (flip): creating a mirror image of a shape by flipping it over

Translation (slide): sliding a geometric shape a certain distance in the same direction

Glossary

http://www.amathsdictionaryforkids.com/

Designing Rectangle Patterns

As a final project in Sunken Ships, students create complex patterns, drawing them first on planning paper, then entering them on the computer using *Geo-Logo.* Their work focuses on:

- Analyzing *Geo-Logo* procedures and drawings

- Predicting drawings from commands and commands from drawings

- Designing rectangle patterns using *Geo-Logo*
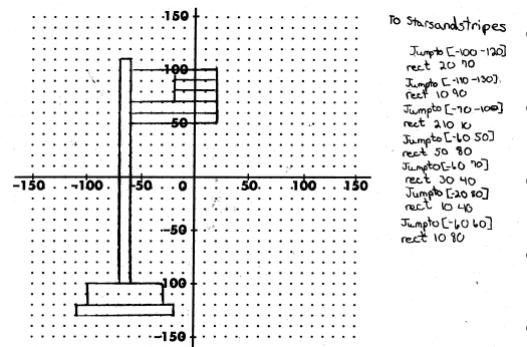
While observing this work, teachers and parents can ask students to explain what they are doing:

- Do they have a plan?

- Are they exploring to see what happens?

- Are they able to predict and explain what happens when the turtle runs a command?

Sunken Ships

Object: two teams try to locate each other's sunken ships

Setting up: Each team secretly draws a sunken ship on the grid labeled "Our Ship" on the Sunken Ships Grids sheet. Ships must cover five grid intersections lying on a vertical or horizontal straight line.

1. The first team starts its search for the other team's ship by naming a grid point, such as (-3, 5)

2. The second team checks to see if that point is on its ship. If it is, it says "Ship." If not, it gives the number of units to the nearest undiscovered point on the ship.

3. The first team records its point on the grid labeled "Their Ship." They write *S* for ship, if it is a point on the ship, or the number indicating how far away from the ship the point is.

4. The second team guesses where to start its search for the first team's ship by naming a point.

5. Teams take turns guessing points until they have both found all five points of the other's ship.