

Using Graphs to Solve Problems / Happy Hamster Chow

Rationale

- ✚ Fifth grade students will build upon previous work with polygons to understand that the attributes belonging to a category of figures also belong to all figures in subcategories of that category. In addition, students will utilize a hierarchy chart to classify two dimensional figures. Students will also plot ordered pairs on a coordinate plane and will be able to generate the coordinates of a point graphed onto a coordinate plane. Additionally, students will be able to represent real-world problems by graphing points on a coordinate plane.

Goals

- ✚ To be proficient in both plotting points given coordinates, and writing coordinates given a plotted point
- ✚ To identify the specific attributes of various quadrilaterals such as parallelograms, rhombi, and squares as well as other polygons such as hexagons and triangles

Standards

- ✚ **5.G.A.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
- ✚ **5.G.A.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
- ✚ **5.G.A.3** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.
- ✚ **5.G.A.4** Classify two-dimensional figures in a hierarchy based on properties.

Objectives

- ✚ Write poetry about various polygons, focusing on the attributes of each polygon
- ✚ Create a quadrilateral hierarchy chart
- ✚ Plot ordered pairs on a coordinate plane
- ✚ Identify points which will complete a closed figure on a coordinate plane

Materials

- ✚ *Using Graphs to Solve Problems* handout
- ✚ *Happy Hamster Chow*

- ✚ Straight Edge
- ✚ Graphing Practice

Procedures

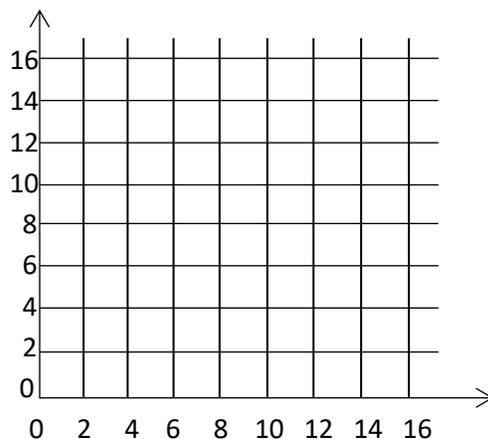
- ✚ Before distributing the practice question, ask the students to share the parts of a graph. The students should mention the x and y-axes, the ordered pairs, and the fact that graphs must be labeled.
- ✚ Distribute the *Using Graphs to Solve Problems* handout and a straight edge to each student. Go through the Graphing Practice handout as a whole class.
- ✚ After thoroughly discussing the practice problem, distribute the *Happy Hamster Chow* handout. Have students work independently to create a graph that they can use to help them respond to the posed questions.

Happy Hamster Chow



Phoebe has 15 scoops of Happy Hamster Chow. Two days from now, she will feed her hamster 3 scoops of the Happy Hamster Chow. She will then continue to feed him 3 scoops of Chow every 2 days. Phoebe would like to plan when she next needs to go to the store to get more food for Ping.

Create a graph that shows the relationship between the number of scoops of Happy Hamster Chow that remain and the number of days that have passed. Be sure to include all appropriate labels. Once the graph is complete, answer the questions below.



- A. In how many days will Phoebe run out of Happy Hamster Chow?
- B. After how many days, will there be 12 scoops of Happy Hamster Chow left?
- C. How many scoops of food will there be on day 4?