

LessonTitle: Water Flask FUNctions		Geo 1.5
Utah State Core Standard and Indicators Geometry Standards 1-4 Process Standards 1-5		
Summary		
In this lesson, students are asked to pour a specific amount of water into a container, measure the height of the water, and graph the results. Because different groups will use containers of various sizes and shapes, the graphs can be compared and analyzed. When all groups have completed their graphs, students try to determine which graph matches each container for all of the groups.		
Enduring Understanding	Essential Questions	
We can use visualization, spatial reasoning, and geometric modeling to solve problems , specifically coordinate geometry in representing and examining the properties of geometric shapes.	How can we use coordinate geometry to compare capacity change as you pour water into different shaped bottles?	
Skill Focus	Vocabulary Focus	
<ul style="list-style-type: none"> • Measuring volume in curved containers • Understanding functions and analyzing change • Modeling and interpreting physical and mathematical patterns 		
Assessment		
Materials: a variety of vases and bottles enough for one or two per group, rulers, measuring cups, colored water, paper towels, markers, newsprint.		
Launch		
Explore		
Summarize		
Apply		

Directions:

Assemble an assortment of vases, bottles, glass bowls. Place the bottles in the front of the room in random order. Demonstrate how you will add a specified amount of water at a time—different containers will require a different specified amount depending on the size of the container. For instance, if you have a large container, you may choose to add one cup each time. If you have a small container, you may choose to add a tablespoon each time.

Explain the goal of predicting the graph of water height vs. water added. Have students predict graphs for a few of the bottles, vases, and glass bowls.

Instruct students to create larger type graphs on the newsprint for hanging around the classroom. Assign letters to the student graphs. After the graphs are created and hung, students will attempt to match the lettered graphs to the numbered containers.

Water Flask FUNctions

1) Observe the containers at the front of the room. Each group will add water to a container in specified amounts and then create a graph which communicates the growth in water height over time.

- Begin with an empty bottle. Add a specified amount of water to the bottle. Depending on the size of your bottle, the water amount you add each time will be different. Use a centimeter ruler to measure the height of the water in the bottle. Record the measurement in the table below.
- Add a second “specified amount of water. Measure and record. Repeat until the container is full.

# of cups	0	1	2	3	4	5	6	7	8	9
Height of water										

- Create a graph of your data on a sheet of graph paper or newsprint. This graph will be hung on the wall. Be sure to label the axes, but do not designate which bottle was used. Label your graph with the letter given to you by your teacher.

2) Sketch your graph below. Explain what your graph can tell someone about the shape of your bottle.

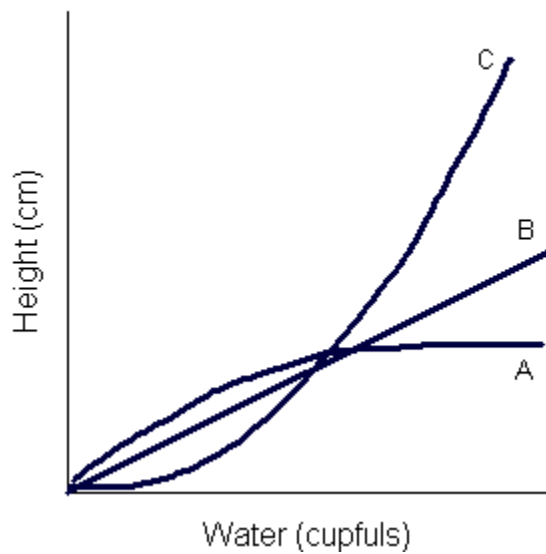
3) After all groups have hung their graphs, match the containers to the graphs. Record below.

Container #															
Graph Letter															

4) What are your observations about this activity?

Water Flask Assessment

1) Examine the graph of data from three different containers.



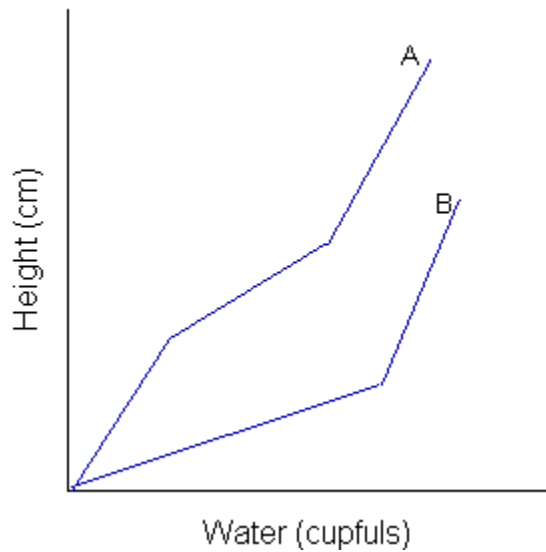
Which bottle is tallest? Why?

Which bottle is widest? Why?

Which bottle hold the most water? Why?

2) Design bottles which could produce the graphs A and B below.

Bottle A



Bottle B