**A New Function Family: Quadratics in the Kitchen**

The cross sections of many kitchen bowls and some cups are in the shape of a parabola. (Actually a paraboloid) Your teacher may have a right circular cone and be able to show you how you can cut it with a plane to generate a “perfect” parabola.

In this experiment you will keep adding water to your bowl and will measure the depth of the water using a toothpick (or another thin object like a wooden skewer) and the diameter of the surface of the water using a thick but not stretchy string. Measure everything in millimeters (mm).

Use the table below to record your measurements.

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| --- | --- | --- |
| **Diameter**  **(mm)** | **Radius**  **(mm)** | **Height of Water (mm)** |
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**Instructions**

* If the bottom of the bowl is flat, measure the diameter of the bottom before you put in any water. Record the diameter and radius in the table and set the corresponding height of water to 0.
* Put a little water into the bowl or cup. You might want to add some food coloring. Measure the diameter of the surface in millimeters using your string. Measure the depth at that moment. Record above.
* Add a little more water and repeat your measurements. Record your measures above.
* Keep repeating this step until the bowl is almost full or you have completed all rows of the table. (If only the lower portion of the bowl is approximately parabolic do not fill to near the top.)

**Analyze the Data**

1. On the graph paper your teacher gives you, graph the height of the water on the vertical axis (*y*-axis) against the radius (not diameter) on the horizontal axis (*x*-axis).
2. Which measure is the independent variable?
3. Which measure is the dependent variable? ­­­
4. Compare your graph with the graph from another group. Do the data appear to be linear?