CCSS Math Practices Alignment Sample
Activity: "Raise Your Cup" for the TI-84 Plus Family

Note: This alignment sample is intended to highlight opportunities to use TI Technology to help facilitate students' participation in the CCSS Standards for Mathematical Practice. The prompts and examples provided here are from the Teacher and Student activity documents and demonstrate how the activity can be used to engage students in the Practices. It is possible the activity can be used to engage students in the other Math Practices that are not specified here.

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2. Reason abstractly and quantitatively.

Students should:

- Understand and explain the meaning of quantities and relationships in the problem.
- Be able to represent a problem using words, numerical expressions or equations, graphs and diagrams.
- Consider the units involved in the problem and use appropriate conversions, as needed.

TI-84 Plus Technology and Teaching Tips:

- Graph the equation from question 3 and discuss how the graph can be used to explain the relationship of height to volume.
- Have students explain what an appropriate graph for this equation might look like. Students should consider an appropriate domain and range based on the height and volume possible for a cup that holds 12 oz. of liquid.
- Discuss how finding the volume of a rectangular prism is similar to finding the volume of a cylinder. Without using the actual formulas to explain this, ask students to consider why the technique might be different for finding the volume of a cone or sphere.

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4. Model with mathematics.

Students should:

- Explore mathematical models to build a context for problems.
- Use models to generalize a solution from a set of observations.
- Apply mathematics to solve problems in the real world.
- Make assumptions and approximations in order to simplify a complex situation using an appropriate model.
- Use tools to model a mathematical situation.

TI-84 Plus Technology and Teaching Tips:

- Graph the equation for volume in question 3. What is the shape of the graph? How can the graph be used to determine the maximum volume?
- Have students explain why they must assume that the cup has a uniform diameter from the bottom to top.

5. Use appropriate tools strategically.

Students should:

- Consider the benefits and limitations of the available tools to decide which are appropriate for solving a given problem.
- Understand how technology can help visualize and explore results, find patterns and compare relationships.
- Use technology to model problems and to analyze and justify their results.
- Use technology to deepen their understanding of concepts.

TI-84 Plus Technology and Teaching Tips:

- Graph the equation for perimeter in question 9. Discuss how this compares to the graph of volume from question 3.
- What is an appropriate window for these graphs?
- What tools could be used to determine the volume of a cylinder? Have students discuss what considerations must be made when calculating the volume of this cylinder.

6. Attend to precision.

Students should:

- Use clear definitions and precise mathematical language when justifying their conclusions.
- Use correct symbols in expressions, label graphs accurately, specify correct units and appropriately use estimation to solve problems.
- Express numerical answers with the appropriate degree of precision.

TI-84 Plus Technology and Teaching Tips:

- Ask students to calculate the volume for a cylinder using 3.14 for the value of π and then compute the volume using the π key. Discuss how the results are different. When would it be important to use a more accurate approximation of π?
- Discuss how different approximations for height or radius measurements will affect the volume calculation. If there was the same amount of error in measuring the height and the radius, which would have a greater effect on the calculation for the volume?