OBJECTIVES:

Young students will understand how different types of towers (in this case a cantilever tower) are built through the steps of the Engineering Design Process.
Extension: Have students learn about and design other famous towers/buildings.

MATERIALS:

- 2 sets of Brackitz
- *The Three Little Pigs-An Architectural Tale* by Steven Guarnaccia
- Large piece of paper to record student responses
- *Amazing Buildings* (DK Readers, Level 2) by Kate Hayden
- Video clip: http://bit.ly/1CCtdq9
- Images of the construction of the Eiffel Tower (found through a Google search)

Step 1: Identify the Problem

Read students the book *The Three Little Pigs-An Architectural Tale* by Steven Guarnaccia.

- Discuss what materials each pig used and why.
- Discuss the job of an architect.
- Which pig was the best architect?
- Which house is going to hold up the best against wind, rain, snow, or an earthquake?
- Allow the students time to experiment with the Brackitz to create their own structures that are sturdy.

Step 2: Build Scientific Knowledge about Towers

Review informational books and videos about tower construction and the different types of towers, plus what makes a good structure. Include images of towers with different purposes, e.g., decorative (like the Eiffel tower), wind turbine, cooling towers, cell towers, etc.

Take a Virtual Field Trip to the Eiffel Tower:

- Watch the video: http://bit.ly/1CCtdq9
- After watching the video, discuss what students learned/observed
- Show the students pictures of the construction of the Eiffel Tower

Step 3: Brainstorm Solutions

Building your own Eiffel Towers

- Allow students time to experiment with creating their own versions of the Eiffel Tower with the Brackitz.
- Discuss what materials they could build with.
- How can you build a structure that won't fall over? How does it stay up?

Ask the students to think about creating the tallest tower they can and ask:

- What does a sturdy structure need?
- If your structure started out wobbly, what did you do to fix it?
- How can buildings and structures stay standing for a long time?

Step 4: Draft Plans

For older students have them draft plans for their towers on paper.

Step 5: Build/Test/Evaluate/Build

During Block Center time provide Brackitz and have the students separately or in small groups test out their designs and create/refine new ones.

- Ask them to identify why they are building it a certain way.
- Once complete, share the structures as a class and compare/contrast the differences between each structure.

Step 6: Share Results

Have the students share and explain the successful and unsuccessful tower designs. Have them describe the towers using the academic math vocabulary they learned about towers.

Notes: