Creating a Physical Model

Objective – to create physical model using indirect observation and inferences.

Materials (per 3-4 students)
- Plastic container (approximately 12”x6”x4”)
- Sand
- Grid paper (2 different resolutions)
- Thin rod (such as a bamboo skewer)
- Legos

Directions
1. Prior to the activity prepare the plastic containers by building shapes out of legos, placing the shapes in the plastic containers and covering them with sand (see suggested design above).
2. Without mentioning anything about modeling, pass out the containers and tell the students their goal is to create an accurate depiction of the object in the container.
3. Pass out 2 copies of the low resolution grid paper, one with holes at the intersection points and one without holes to draw the model on.
4. Instruct students to place the grid paper with holes over the top of the container and use the rod as a probe to determine the shape of the object. As an extension students could use the rod and a ruler to accurately measure the height of the object in order to create a 3D model. The height could be represented on the 2D drawing by color or shading.
5. Students should draw the model on the 2nd copy of the grid paper. With the low resolution they will have to make a lot of inferences/guesses as to the exact shape, but that’s the idea.
6. Repeat steps 3, 4, and 5 with the higher resolution graph paper. Students should get a much more accurate picture of the shape of the object.
7. Allow students to remove the object from the container and compare it to their drawings.

Discussion/Post Lab questions
1. How accurate where your representations of the model?
2. Which representation was more accurate? Why?
3. What could you do to make a perfectly accurate representation of the model?
4. What effects does resolution have on creating a model?
5. What are some examples of actual models that you know of?
6. Which of these are created through indirect observations and inferences like the ones you used to make this model?