

## Activities #1 and #5

### Activity #1 – Tale of Two Craters

#### *Tactile Models:*

- 3D model of Meteor Crater in Arizona
- 3D model of a Perfect Crater on the moon

#### *Starting Your List of Wonders:*

Take your time studying the shapes and textures of the two craters. You want to notice small features as well as large ones. Try to determine the ways that the structures of the craters are similar and different. What do these characteristics make you wonder about the craters, or the asteroids that formed them? Start building your List of Wonders. Keep in mind that you can add wonders to your list at any time. Wonders can happen at any time during the science process, not just at the beginning.

#### *Gathering Your Data:*

One question that might already be on your List of Wonders is, “How big are these craters in real life?” We’re going to gather data from the model craters to answer this question and gain an appreciation for the real sizes of these craters. We’ll do this by taking measurements of the models and then scaling up to the actual sizes of the real craters. We will record our data in a journal that we can share with our mentors. Journals can be anything you like, including written files or spoken voice threads.

### *Presenting Your Work:*

Communicating with others about our work is an essential part of science. This month we're going to start with a short presentation of just 30 to 60 seconds. We will work our way up to longer and more complex presentations over the next few months. For this first presentation a good plan might be to focus on what we learned from the models about the sizes of the craters, and how we learned this. An important tip to keep in mind as you are building your presentation is, "Never try to tell them everything you know." You won't have time to tell people everything you've done, so pick one or two things you think are most interesting and build your presentation around these.

Using only your voice practice giving a brief 30- to 60-second presentation about Meteor Crater to a friend or family member. Even though this is a very short presentation, don't let that fool you. It still takes a lot of practice. And remember to include an introduction and conclusion. When you are comfortable with your presentation, record yourself and ask your friends, family members, and your university mentor for comments and feedback. Sometimes people who watch or hear your presentation will ask you questions you hadn't thought of before. Did this happen to you? Do you need to add anything to your List of Wonders?

### **Activity #5 – Two Faced Moon**

#### *Tactile Models:*

- 3D models of moon's Near Side and Far Side hemispheres
- 2D tactile diagram of moon's rotation and orbit around Earth

### *Continuing Your List of Wonders:*

Compare your models of the two sides of the moon. Think about the similarities and differences between these two faces of the moon. What features are distinctive for each side? Hold the two hemispheres together with the Near Side facing you. Think about how the moon moves. If the moon rotates and also orbits around Earth, how is it possible that it keeps one side always facing us?

Now it is time to add to your List of Wonders. But, don't forget that wonders may occur to you at any time during the scientific process. Share what you add to your list with your university mentor and ask them what new things are on their list.

### *Gathering Your Data:*

In the previous segment last month, we researched how lunar maria form. Asteroid impacts crack through the lunar crust and the cracks let lava flow up to the surface. The lava fills in the crater basins, erasing old craters and hardening into a smooth flat fresh surface. But this didn't happen in most of the crater basins on the Far Side. Why not? To help us understand, let's compare the thickness of the crust in the Far Side and Near Side models. This is not as easy as you may think. We want the thickness in the center of each hemisphere, not around the edge where the models connect. Try to think of three different techniques that you can use to measure the thickness of the crust in the center of the Near Side and Far Side models. The only rule is that you can't drill a hole into the model! Use each of your techniques and then take the average of the thickness you get for each model.

### *Presenting Your Work:*

For our presentation this month we're going to combine two things we worked on in previous months, an activity and a demonstration. First, design an activity that your audience can do with you during your presentation to help them understand how the moon rotates and how it orbits around Earth. The main idea is to help people understand that the moon rotates one time for every one orbit it makes around Earth. Second, design a demonstration to help explain one of the techniques you used to find the thickness of the crust for the Near Side and Far Side models. This presentation has a lot of moving parts, so be sure to practice several times.