

Introduction: Models are used by scientists extensively. A model can be any representation of some aspect of the natural world or a representation of a human-devised object. Some models attempt to explain a dynamic process of how things move or change over time, while others models attempt to recreate or examine one aspect of the real world and may be inaccurate in other ways. A globe is a good example of a physical model of our Earth but may not show the size of mountains accurately. A planetarium is a model that tries to show how the Earth moves with respect to the sun or other stars. In this activity you and your teammates will construct models to show various aspects of Earth.

Activity: You will work in teams assigned by your teacher and complete one of the 5 tasks described below. Each task will require you to develop a *scale* for the construction. There are two ways to develop a scale:

- Select a scale such as 1 cm = 1 km. Apply this to the real object and calculate how large the scale model will be. If this produces too large a scale model, you can change the scale. eg. 1 cm = 100 km. By trial and error you eventually arrive at a scale that suits your needs.
- Start out with a scale model and determine the scale used to create the model. eg. A 30-cm diameter globe represents the Earth. What does 1 cm = \_\_\_\_\_Km. Now you can construct other models to the same scale to maintain a correct size relationship.

### **Tasks to be completed by teams**

1. Construct models of the sun and Earth to scale. Start with a ball for the Earth or the sun and construct the other to the same scale. Note this task will be coupled with task #2. Get actual data from your Earth Science Reference Tables.
2. Construct a model to show the Earth - sun distance to scale. Note this task will be coupled with task #1. Both teams must use the same scale. Use you Reference Tables to get the actual data.
3. Construct a paper model of Earth (a pie section will do) showing Mt. Everest and the Mariana Trench in the Pacific Ocean (deepest ocean depth) to scale with Earth's radius. Use the internet to obtain the actual data.
4. Construct a paper model of Earth (a pie section will do) showing the extent of the atmosphere, lithosphere and hydrosphere to scale with Earth's radius. Use you Reference Tables and textbook or internet to obtain the actual data.
5. Construct a paper model of a cross section (profile) of the Atlantic Ocean from Cape May, New Jersey to Cape Roca, Portugal. Distance and depth data will be supplied to your team. You will use adding machine tape for your paper model.

At the conclusion of the tasks each team will present their model to the class and explain how they arrived at their proper scales.