What is a Model?

Overview:
Examine different types of models and discuss why they are useful.

Materials:
- Sample model items (see Explorations list below)
- Chart paper
- List of professions that use models (see Analyze results below)
- Optional: Commercially available model kit

Objective/Questions:
Learn that a model is a representation or copy of an object that is larger or smaller than the actual size of the model, which seeks to maintain the relative proportions (scale factor) of the physical size of the original object. A model can be either a three-dimensional object or a two-dimensional picture or blueprint.

Generate a list of examples of types of models that are familiar, and explain why professional model makers go to the trouble and expense of creating scale models.

Questions:
- What is a scale model?
- Why do many professionals find it necessary or helpful to use them instead of just creating an actual object?

Explorations:
Provide a box containing some of the items listed below, giving each group of four students several of the items:
- Doll
- Dollhouse
- Blueprint
- Map of city or community
- Diagram of a school or mall
- Picture of a model railway
- Picture of a house
- Model train
- Model rocket
- Model robot
- Model living creatures
- Model ship
- Model airplane

**Communication:**

Provide materials to each group. Ask students to identify each object. Discuss why professional model makers often create models for their professions.

**Solve:**

Have students share at least one of the objects they were given by identifying the object for the group and then relaying to the whole class why they think someone would go to the expense or difficulty of producing a model of that object rather than just constructing a full-size object.

**Test and Record Results:**

Keep track of students’ ideas on a sheet of chart paper.

**Analyze Results:**

Be prepared with a list similar to the following, and share it with the class at the conclusion of the group sharing activity. Compare your list to that produced by the students.

- Engineers require scale models to test the likely performance of a particular design at an early stage of development without incurring the full expense of a full-size prototype.
- Architects require architectural models to evaluate and sell the look of a new construction project before it is built.
- Filmmakers use sets that are actually scale models of real buildings or locations because it is too expensive or impractical to use the real location or because they cannot physically go to a location in the time allotted for filming.
- Salesmen require models to promote products such as heavy equipment, automobiles, airplanes, or other vehicles.
- Hobbyists or amateur model makers make model railroads, remote-control vehicles, and model ships for war gaming, fantasy collections, or their own entertainment.
- Scale models can also be objects of art, either created by artists or constructed for the entertainment of others.

**Final Product:**

Hang the chart paper showing the responses of each group of students. As mentioned above, the contributions of each group should be identified and compared to your list.

**Post Activity Reflections:**

Refer to the above list to highlight some possible examples of how models are used in professional establishments.

If possible, provide the student teams with a commercially available model kit and allow them the opportunity to construct a scale model of a plane, car, or automobile.