

Instructional Strategies – Developing and Using Models

A model is an abstract representation of phenomena that is a tool used to predict or explain the world. Models can be represented as diagrams, 3-D objects, mathematical representations, analogies or computer simulations.

Potential Instructional Strategies for Developing and Using Models

1. Have students work in groups to create models of non-observable phenomenon (e.g., lunar cycles, erosion). Be explicit that models offer explanatory accounts – they show how or why a phenomenon occurs.
2. Show students an example of a scientific model and a non-example, such as a labeled diagram. Have students compare and contrast the two. Highlight for students that the scientific model shows how a phenomenon occurs, while the labeled diagram does not.
3. Provide opportunities for students to make decisions about the type of model they will create, such as a picture, a physical creation, or a computer animation. Emphasize that there is no one “right” way to create a model, but that models should show how or why the phenomenon under study occurs.
4. Provide graphic organizers to support students in planning their models. Sections of the graphic organizer might include “key ideas” and room to sketch the model. At the end of the graphic organizer provide a checklist so that students can be sure their proposed model shows how or why the phenomenon occurs and is not only descriptive.
5. Provide a range of materials and computer access so students can choose the type of model to create. Before students select their medium, facilitate a discussion about the benefits and drawbacks to each type of material.
6. Have students do a “gallery walk” of the different models they create. Provide students with a chart to use to make notes about how the various models do and do not explain the phenomenon being modeled. Give students sticky notes to post suggestions and comments for their peers.
7. Ask students to critique models from various sources, such as texts, the internet, and physical representations in the classroom. Facilitate a discussion of the benefits and drawbacks of the different models. Emphasize for students that all models have benefits and drawbacks.
8. Ask students to apply a model to a different example and then revise the model to reflect the new information (e.g. apply a model for sinking and floating of objects to the floating of a boat).

For a classroom example of instruction using this science practice, visit our website at www.sciencepracticesleadership.com and click on the Grade 7 Exemplar under Case Studies.