

Mapping Models to Real World Systems

Using models is an important part of science. Models help you understand science concepts that you might not be able to experience on your own. Sometimes events that happen in science are too big or too small to be seen. In these cases, scientists will represent the system at another scale using 3-D materials, 2-D diagrams, or computer simulations to model the parts and interactions of the system and the effects of these interactions. This is like the analogies you may have learned about in English class. An analogy is a comparison between two things, usually to help explain an idea. Similarly, when you map a model you describe (1) each part or feature of the model and (2) the part of the science concept that it represents. Then you describe how those two parts are alike and sometimes how they are different. This helps you more fully understand the model you are using, and the system you are mapping it to.

The models you map to real life may not always be physical models that you can touch and feel. They might be a model you think about. For example, you might use a running river to represent electric current. Even though you may not be touching the river, you can compare your mental image of the river to an electric current.

An example can help you better understand how to map a model. Imagine that you were studying forest fires. You have a model that looks like the photo here. Your plan is to light a match on one side of the model and see if all the matches burn. In order to understand more about forest fires, you would need to know what each part of this model represents. A map can help. See the completed map for this model for an example. Sometimes you will be given some of the information in the analogy map. Other times you will have a blank one to complete on your own.



Mapping the Model to a Forest Fire			
<i>Feature of the representation ...</i>	<i>is like this feature of the real world ...</i>	<i>because ...</i>	<i>and is not like it because ...</i>
A block of wood covered in clay	the ground in the forest	they both hold up the trees and matches	in a real forest, the ground might be covered in brush, which can spread fire. Also in a forest, there might be rain or snow that would wet the ground and the trees and change the way the fire spreads. A forest is also a much larger surface area, and fire can spread from embers in the wind.
Matches standing up in the clay	the trees in the forest	they are standing up, close to one another at different heights	trees have leaves and matches don't, and this might affect the way the fire spreads. Trees also have sap, which can burn and can sometimes cause explosions.
A hand with a lit match	a bolt of lightning that could start a forest fire.	they can both cause a fire to start in a small area	most of the time when lightning strikes a tree it does not cause a fire. But the match will almost always light another match on fire.