Thinking Like a Scientist

How does a Scientist approach a problem?

Scientists ask questions.

Scientific inquiry begins when a scientist asks a question about something that he or she has observed. These questions often include How?, What?, When?, Who?, Which?, Why? or Where? Scientists then do background research to see how much is known about what they are interested in.

Scientists formulate a hypothesis.

The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing creative process. Construct a hypothesis means to make an educated guess about how something works. “If [I do this], then [this] will happen.”

Scientists test their hypothesis.

When Scientists test their hypothesis, sometimes they need to invent new ways to do so. Other times they are able to make measurements to compare characteristics of the objects being observed. Scientists carefully construct these experiments so as to change only one variable at a time. A variable is a measured quantity or quality that can be either increased, decreased, or left the same.

Once a Scientist has completed their experiments and tested their hypothesis, they communicate their findings to other Scientists by publishing their results in scientific papers and journals.

Let’s do it...

One possible activity to get students thinking like Scientists is to use the Skateboarder CSDT program and have students modify the parameters one at a time. The available parameters are the initial X and Y position of the skateboarder character, the X and Y position of the board that the character will ride down, the friction of the board, and the elasticity of the board. Students can be arranged in groups. Each group collaboratively decides which skateboarder parameter they would like to change. In keeping with the scientific method, only one variable should be changed at a time. The instructor works their way around the room, with each student group contributing the change they would like to make to the program. As changes are made, the program will provide feedback for further adjustments by pressing the ‘Begin’ button at the top left of the application.