

## Lesson 4: Introduction to Modeling

How do we take complicated relationships that exist in the natural world and represent them in ways that allow us to discuss them, learn about them, and teach about them? Scientists, by necessity, create models to show and study these relationships. The kinds of models that scientists and science educators use vary widely, and can include physical models (think about a 3-D map of a landform), statistical models, diagrams, and other graphic representations. Models help scientists show their thinking and provide important tools for teaching and analysis. Models are not about finding the one right answer, though. Similar phenomena can be modeled in very different ways for different purposes. No model is ever complete however! If a model showed or contained everything that happened in the real world, then it wouldn't be a model, it would be the real thing!

**Turn and Talk:** Why do you think modeling can be helpful for scientists?

Representation of data is one form of basic modeling that can lead into and support more complete models. Your task will be to represent relationships in the natural world between severe weather events and the quality of water in the Maumee River watershed and western basin of Lake Erie. You will do this by first analyzing data about precipitation and water quality, looking for relationships and patterns in the data, and then figuring out the best way to represent these data-based relationships.

To represent relationships in the data, you might develop different types of graphs, tables, diagrams, or infographics. You have lots of choices in terms of what data you will focus on, how you will analyze the data, and how you will create models of the relationships or patterns you find. The way you choose to represent the data should help explain the type of relationship you found.

**Turn and Talk:** What experience do you have representing data? When and how have you done it?