



Lake Mapping A 3D Science Lesson

By Tom McConnell



Grade Level: Grades 2-6

Timeline: 1 period, plus long-term observations

Materials:

- Printable map image of a lake
- Tracing Paper
- Large poster paper or art paper
- Colored pencils, other drawing media

Objectives:

- I can develop a model using an example to represent the shapes and features of a lake.
- I can develop a model to show how living and nonliving features interact and affect life in the lake.

NGSS Alignment

DCIs:

- ESS2.A: Earth Materials & Systems
- ESS2.C: The Roles of water in Earth's Surface Processes
- ESS3.A: Nature Resources

SEPs:

- Developing & using models.
- Analyzing & interpreting data
- Using mathematical & computational thinking
- Obtaining, evaluating & communicating information

CCs:

- Patterns
- Scale, Proportion, & Quantity
- Systems & System Models

Background Information

Scientists sometimes study lakes and the living things that are found in them. As you read Conservation Tales: Invasive Carp, you learned that scientists take many kinds of observations, and record them on maps to help understand where fish and other living things are found, and to figure out what kinds of nonliving things they need to survive.

Maps are Scientific Models

The maps that scientists use are a type of scientific model. You may think of models of planets or atoms, but any map is a model. It shows some of the features of a location, and it can help scientists understand many things about a lake. So to help you become a scientist, you can learn to create a map and use it in your own scientific investigations.

If you visit a lake, you can practice doing the same kinds of science! One way to start is to make your own map of the lake. The map can be very simple at first, and then you can add more details and features as you spend more time observing.

In this activity, you will practice making a map. Your map can be as large as the paper you use, and can have as much or as little detail as you want. As you make the map, keep in mind that you can add new information to it any time you want!

So let's get started with your map!

Procedures

Pick a Lake!

The first step is to pick a lake you'd like to map! It may help to pick a lake that you can observe many times, like one close to home. It does not have to be large!

Then go visit the lake, and look at it, paying attention to its shape. Take some pictures if you like, or draw what you see. Then it will help if you find a map that shows the lake. Websites like Mapquest will let you find the map, and zoom in to see the lake, either on a street map or an aerial photo. Zoom in close enough to see the lake clearly. Then either print it or save it on the computer.

Trace the Lake!

Now you can create an outline of the map on paper. If you print the map you found, put it on a table, and lay some tracing paper over it. Tape it down and draw the outline of the map.

You can also use a projector to make the map larger, then put a large piece of paper or poster paper on the wall. Aim the project at it, then trace the lake. This can make a bigger map so you have room to draw more details.

Add More Details!

Your map is ready to add more details! Look at the lake, or the pictures you took, and draw some of the things you see along the edge of the lake. Those might be things IN the water, or on the shore.

You can use symbols to represent these things. The drawing at the right shows samples of symbols used by Hoosier RiverWatch (2022), a project that collects scientific observations about rivers. You can make up your own symbols.

It might help if you make a "legend" for your map – a box that shows the symbols you use.

Contours and Observations

As you add more details, you may want to add contour lines. These are lines that show the depth of the water in the lake. Figure 2 is an example of a map of a lake that shows contour lines. Some contour maps put numbers to show how deep the water is.

One way to find out about depth is to find a contour map of the lake you are mapping. States and counties sometimes print maps or put them online. Another way is to use a "depth finder," a device some fishermen use to find out how deep the water is. If you know an adult who has a boat and depth finder, you might be able to do this.

You can continue adding more details on your map for as long as you like! You can also put colored dots on locations where you find fish, show where you see plants growing in the lake, or other interesting observations you make. You can even name parts of the lake if you like.

So have fun with your map and keep adding more information!

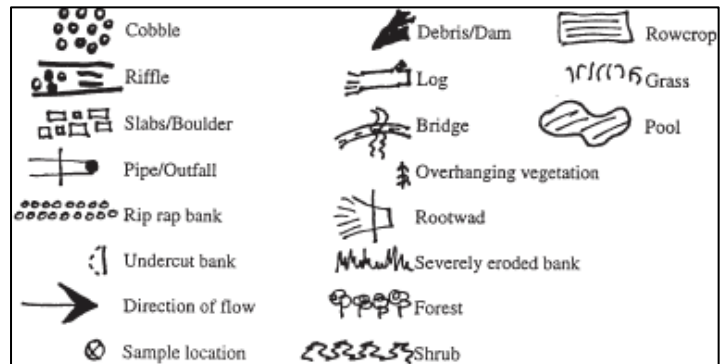


Figure 1. Map symbols from Hoosier Riverwatch (2022)

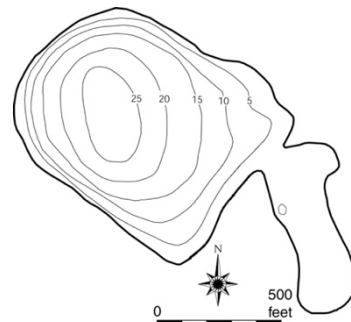


Figure 2. Sample of a contour map