QUILLS
Queen's University Indigenous Land-Based Learning STEM
Queen's University Biological Station

Name: _____

Diatom Data-mania

Learning Goals

1. I can analyze data to find patterns.
2. I understand how lakes can teach us about climate change.

Vocabulary

Sediment Cores	Data	Freshwater

Scientists working at Queen's University, here in Kingston, have sent us some of the data they collected for one of their recent projects. Let's see if we can spot the same patterns they did!

Step 1: Skim the Data

Take a look at the data sheet. There's probably a lot of information you don't understand here! The first step is to understand exactly what type of data this is.

1. Ask yourself: What do you need to know to understand this data? (words, concepts, etc.)
2. Read through the following information.
3. What questions does this answer? What do you still need to know?
4. If there's anything you still need to know, see if you can find the answers on the internet or with the help of your teacher.

Step 2: Graph the Data

Now that we understand what type of data we have, we're going to graph it. This will help us look for patterns.

1. Choose a lake. Look at the data. Discuss, with your group, how you might graph this:
    a. What will your x-axis and y-axis be?
    b. What will your graph be titled?
    c. How big will your graph be?
2. Graph the data.
3. Observe: what do you notice?

Step 3: Compare Patterns

Now we're going to look for larger patterns! Post your graph up at the front of the classroom.

1. What differences do you see?
2. What similarities do you see?
3. What might explain the differences?

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Check your understanding!

What is a sentiment core?

Where would you look on a sentiment core to find the oldest material? The newest?

What are diatoms?

Why are diatoms useful for figuring out what the past was like?

What does an increase in Cyclotella diatoms mean?

Want to learn more? Check out:
https://diatoms.org/what-are-diatoms
https://www.youtube.com/watch?v=IgouMVdqLDI
https://www.sciencejournalforkids.org/wp-content/uploads/2019/09/superior_article.pdf
https://www.amnh.org/exhibitions/climate-change/changing-ocean/evidence-sediment-cores

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Diatoms

Diatoms are tiny organisms that live in water. They get energy by photosynthesizing, a lot like plants. Most are diatoms are single-celled and have a cell wall made of glass! Diatoms live in salt-water and fresh water, and some can even be found in the soil. Living diatoms make about 20 to 50 percent of the oxygen produced on the planet each year.

Diatoms are useful because different diatoms will grow in different environmental conditions. By examining which diatoms grow in a lake, scientists can often see how polluted that lake is, how many nutrients there are, or how warm it is.

There are many different species of diatoms, just like there are many different species of plants. One group of species is called the Cyclotella. They are small circular diatoms that mostly live in calm water. They can tell us something interesting — in general, scientist have concluded that when lakes get warmer, the small Cyclotella diatoms do better than other species.

Sediment Cores

Sediment is the material — dead animals, plant material, drifting sand — that sinks down to the bottom of a lake or ocean. The sediment in a lake changes depending on the environment. Different animals and plants grow in different types of lakes, for example. One of the most common things scientists look for in sediments is dead ***diatoms***, which can tell them a lot about the conditions of the lake.

New sediment usually ends up on top of old sediment, in the same way that new snow covers up older snow. By looking at the different layers of sediment, scientists can see how the environment in a lake changes over time.

Scientists do this by taking a ***Sediment Core***. They do this by driving a tube deep into the bottom of a lake, and then pulling it up, so that all the dirt and mud stays inside the tube. They can then compare the sediment of different layers.

Adapted from:

Rühland, K., Paterson, A. M., & Smol, J. P. (2008). Hemispheric-scale patterns of climate-related shifts in planktonic diatoms from North American and European lakes. *Global Change Biology*, *14*(11), 2740-2754.

