

# ScienceNews

## Activity Guide for Students: Lake Scavenger Hunt

### Directions:

In this activity, you will be doing a virtual lake scavenger hunt to explore why lakes vary in color and to learn how climate change might influence lake color in the future.

### Article analysis

Use what you learned about lake color from the *Science News* article "[Climate change could turn some blue lakes to green or brown](#)" to answer the questions below. A version of the article titled "Warming puts blue lakes at risk" appears in the Nov. 5, 2022 print issue.

1. How is temperature related to lake color?
2. How can sediments enter lakes? How does this affect lake color?
3. How can organic matter enter lakes? How does this affect lake color?
4. Sediment, organic matter and algae can affect lake color. What other factors can influence lake color? (Think outside the box!)
5. What is a threshold? What is the threshold air temperature for algal growth?
6. How would lake colors change if the average summer air temperature were to increase by 3 degrees Celsius? Why?

### Lake exploration

Now that you understand lake color, look at the map showing lake colors. Identify any trends in lake color that you see and answer the questions below during your class discussion.

1. What happens to air temperature as you move from the poles toward the equator?
2. How is air temperature related to water temperature? What does this mean for algal growth?
3. Look at the middle of the map. What happens to lake color as you move toward the equator? Why?
4. What happens to lake color as move away from the equator? Why?
5. If latitude heavily influences temperature, then, in theory, lakes at the same latitude should experience similar air temperatures. However, not all lakes at the same latitude are the same color. What might change from location to location?
6. If blue, green and brown lakes can all be healthy, how could we define a healthy lake?
7. What might we look for to identify if a lake is unhealthy?
8. If a lake were to change color, how could we tell if the color change was the result of a natural process or human activities?

### **Lake investigation**

Now that you have identified trends in global lake colors, look for a lake that does not fit the trend for its area and answer the questions below.

1. Looking at the lakes on the map, are there any that are a different color than the surrounding lakes? Why might this lake be a different color?
2. How could you determine what causes this lake's color to differ?

3. How can we fix the environmental problem that causes this lake's color?

### **Design an experiment**

Use what you have learned about lake color and environmental problems to develop a hypothesis and design a research experiment.

1. What do you find most interesting about lake colors?
2. Ask a scientific question that could be realistically answered through observation or experimentation.
3. Rephrase your scientific question into a testable hypothesis.
4. What data will you collect to test your hypothesis? Make sure the data are quantifiable.
5. Imagine that the data you collect do not support your hypothesis. What will you do next?

### **Activity extension: Investigation presentations**

If your teacher offers an extra project for this activity, you could present your testable hypothesis to the class. Make sure to identify what might be difficult about testing your hypothesis. After all students have presented, you and your classmates could discuss the hypotheses and identify one hypothesis that could be realistically tested. The class can then conduct the selected investigation, or teachers can use your presentations to develop a water-quality testing lab.

