

Dynamic Design: The Cleanroom

How Clear is the Water?

STUDENT ACTIVITY

BACKGROUND

In this activity you will build a Secchi disk to measure the clarity of a sample of liquid. You will also learn how to build such a device that can be used to measure clarity of a lake.

PROCEDURE

Part 1: Observations and Ideas

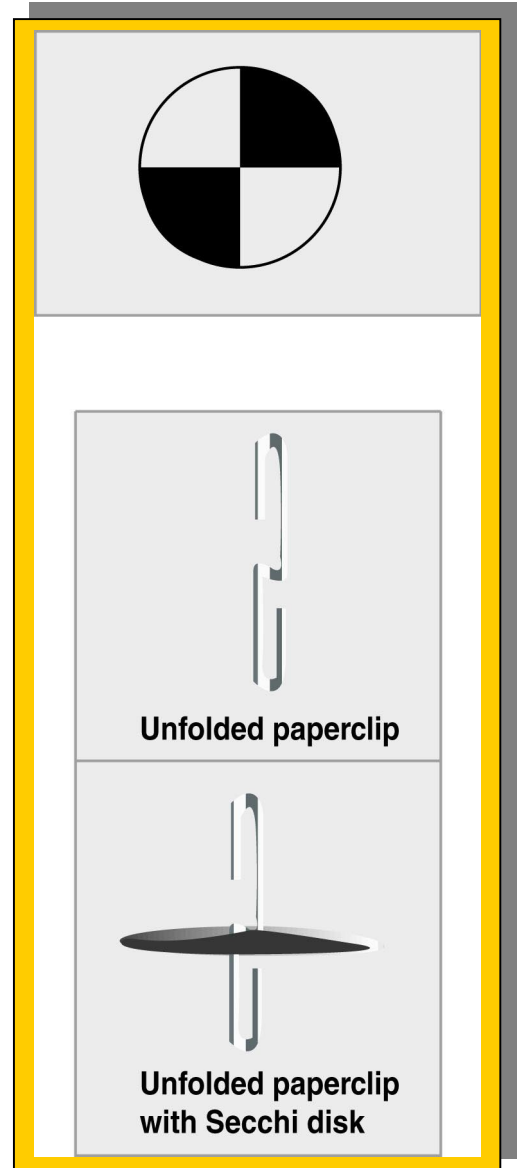
1. Make observations of the four liquids presented to you by your teacher. Record your observations on the Student Data/Recording sheet. Make sure there are both qualitative and quantitative observations.
2. List some ideas about methods to determine the water clarity. What constraints (time, cost of materials) would be most important for your group to consider?

Part 2: Making a Small Secchi Disk

3. Gather the materials you will need for this procedure.
4. Use a compass or another method to draw a circle with a diameter of six centimeters on your index card. Cut the circle out with your scissors. Fold the circle along the diameter of the circle then draw a line on the fold. Fold the circle again this time with the fold perpendicular to the first line. Using your black marker, color two alternating pieces of pie on your circle.
5. Using the end of your compass, poke a small hole at the intersection of the two lines you drew. Unfold the paperclip so that it makes two hooks. Put the paper clip through the hole in your circle so that the circle is in the middle of the clip.
6. Attach a string to the top end of the paperclip and some washers or other weights to the bottom end. Your Secchi disk is now ready to test the waters.

Part 3: Testing the Waters

7. Fill the graduated cylinder with one of the liquids. Hold onto the string and lower your Secchi disk into the graduated cylinder. Make a mark on the string at the surface when the disk disappears. Sink the disk a little lower, then raise it until it reappears. Mark the string again when it reappears.
8. Bring the Secchi disk out of the graduated cylinder. Use your ruler to measure the distance from the marks on the string to the Secchi disk. Average the two readings. This distance known as the Secchi number can be used to compare the clarity of this sample with the other liquids. Create a data table and record this data or record your results in the Student Data/Recording Sheet, "[Testing the Waters.](#)"
9. Repeat this process with the other two liquids using a different color to mark the string each time.



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10. Complete two more trials of each of these liquids using a different string for each trial.
11. Complete one trial with liquid "A," which contains no salt. Compare this result with the other three liquids.

Part 4: Comparison

12. Write a procedure for testing for clarity of the liquid based on a method other than the Secchi disk. Test the liquids using your method and record your results in a data table.
13. Compare the results from the Secchi disk to the results from the different method noting benefits and limitations of each method.
14. Read the Student Text, "[From Macroscopic to Microscopic.](#)"