Name: _____ Class: _____ Date: _____

Changing Water Quality

Learner Outcomes:

- Analyze the relationship between water quality and living things, and infer the quality of water based on the diversity of life supported by it.

Key Terms:

Salinity Concentration

Background Information: Brine shrimp are a microscopic animal that lives in salt lakes and brine ponds. These environments are so salty that few other organisms can survive there. Brine is a salt and water solution that contains a high concentration of salt.

Research Question: What effect does changing the concentration of salt in the water have on brine shrimp?

Hypothesis:

Research Design:

Manipulated variable

Responding variable

Controlled variables

Materials:

4 x 600mL beakers Pen 2L of room-temperature distilled water

Masking tape

This investigation / activity has been adapted from:

Mah K, Martha J, McClelland L, et al. *Science in Action 9.* Toronto, ON: Addison Wesley.

25 g sea salt	1mLmeasuring spoon	Paper
Stirrers	Brine shrimp eggs	Magnifying lens

Procedure:

1. Fill each beaker with 500 mL of room temperature bottled water. Label the beakers A, B, C, and D.
2. Beaker A will contain only fresh water. Add 2.5 g of sea salt to beaker B, 7.5 g to beaker C, and 15 g to beaker D. Stir the beakers to dissolve the salt.
3. Add about 0.5 mL of brine shrimp eggs to each beaker and put the beakers in a place where they will not be disturbed. Cover each beaker with a square of paper.
4. Observe the beakers daily for 3 consecutive days. Record your observations.

Observations:

This investigation / activity has been adapted from:
Mah K, Martha J, McClelland L, et al. *Science in Action 9.* Toronto, ON: Addison Wesley.

Analysis:

1. In which of the beakers did the greatest number of brine shrimp eggs hatch?

2. What does this tell you about the amount of salt in the brine shrimp's natural habitat?

3. What would happen in a drought year where much of the water in the brine shrimp habitat evaporated?

4. What would happen in a rainy year where rainwater increased the volume of the brine shrimp habitat?

5. Why would the brine shrimp habitat not be suitable to other organisms?

This investigation / activity has been adapted from:
Mah K, Martha J, McClelland L, et al. *Science in Action 9.* Toronto, ON: Addison Wesley.

Conclusion: Summarize how differences in water quality affect brine shrimp eggs.

Extension:

1. Research other water quality factors that influence which organisms can live in aquatic environments.

2. Design the ideal aquatic environment where the greatest variety of organisms can live.

3. Repeat the above experiment using the optimum amount of salt and design and perform an experiment to test other factors that might influence water quality (i.e. sugar, turbidity, temperature, phosphates, nitrates, etc.)

This investigation / activity has been adapted from:
Mah K, Martha J, McClelland L, et al. *Science in Action 9.* Toronto, ON: Addison Wesley.