Name: _____ Class: _____ Date: _____

Telltale Creatures – Identifying Aquatic Invertebrates

Learner Outcomes:

- Describe and illustrate the use of biological monitoring as one method for determining environmental quality (e.g., assess water quality, by observing the relative abundance of various vertebrate and invertebrate species)

Key Terms:

Monitoring	Microbiologial indicators	Aquatic invertebrates Vertebrates

Background Information: Biological monitoring, the study of biological organisms and their responses, is used to determine environmental conditions. One type of biological monitoring involves identifying and counting the number of organisms to determine the health of an ecosystem. Many small invertebrates are good indicators of the physical, chemical and biological conditions of an ecosystem because they are easy to identify, they are sensitive to long and short term changes, and they cannot escape their aquatic environments.

Research Question: What kinds of invertebrates are found in pond water and can we use these invertebrates to assess water quality?

Materials:

Microscope	Medicine dropper	Methyl cellulose solution
Microscope slides	10 mL graduated cylinder	
Hand lens	Pond water	
Petri dish		

Procedure:

1. Use the eyedropper to acquire a sample of pond water that includes some invertebrate organisms and place the drop on a microscope slide or petri dish. If the organisms are moving very fast, you may need to add a drop of methyl cellulose solution to slow them down.
2. Using a microscope or a hand lens, observe the organisms features such as legs/ no legs, gills/no gills, wings / no wings and use the invertebrate classification guide to help you identify the invertebrates in your sample. Record your observations and the name of the organism.
3. Randomly select 10 mL of pond water and place it in a petri dish. Use the hand lens to count the number and type of organisms in the dish to determine the relative abundance of each organism (in organisms / mL).
4. Repeat step 3 two more times and determine the average abundance.
5. Research what the normal or expected numbers of each organism should be, and what conditions each organism needs for survival.

Observations:

Organism Drawing	Organism name	Number in 10 mL	Average abundance

Analysis:

1. How many different types of organisms were you able to identify?

2. Which organisms were most sensitive to the environmental conditions?

3. Which organisms would make the best indicator species?

4. What kinds of environmental changes would reduce the abundance of the organisms you identified?

Conclusion:

Extension:

1. Use print and internet resources to identify at least 4 other types of organisms that are used as 'indicator species' in Alberta and describe what their numbers indicate about the health of the environment.