

**Macroinvertebrates in the Watershed
Lakes Environmental Association
Fall 2020**

With support from the
Casco Bay Estuary Partnership

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Grade Level: 4-8th grade depending on components of lesson (anyone can watch the video!)

Content Areas: Science, Environmental Education, ELA, math

Method: Students review a video and do a bioassessment on various streams based on the inhabitants.

Objectives: Students will (1) Identify several aquatic organisms and pollution tolerance levels and (2) assess the relative environmental quality of the samples in the petri dish pictures based on the biodiversity of organisms present.

Activity Time: 45 minutes for videos, 15 minutes for bioassessment. More time for extensions if interested.

Background:

We can do a number of water quality chemical tests. We can measure the pH, the clarity, conductivity, stream flow, dissolved oxygen, and temperature. But we can also collect and assess the organisms living in the stream to determine a relative water quality. Different macroinvertebrates have different tolerances of pollution. If we collect and identify pollution sensitive organisms, we can conclude that the stream water quality is good. If we collect and identify only pollution tolerant species, we can conclude that the stream quality might not be great and follow up with other tests.

Water with numerous species is usually a healthy environment, whereas water with just a few species may indicate conditions are less healthy. Pollution generally reduces the quality of the environment and affects the diversity of life forms. In some cases the actual biomass (the mass of the living organisms) may increase because of pollution, but the diversity decreases due to the limited organisms that can tolerate the polluted conditions.

Procedure:

For this online activity, we created a video showing a stream, how to collect macroinvertebrates and have identified several as pollution sensitive, mostly sensitive to pollution, and tolerant of pollution. When we visit a stream, we are careful not to disturb the stream banks and beds, nesting sites and vegetation. We bring nets, tubs for water, spoons, petri dishes and a magnifier to identify macroinvertebrates. We ensure that organisms are kept in the water and returned to the stream as soon as possible.

Students will:

1. [Watch the "Macroinvertebrates with LEA" video](#)
2. Open the [Bioassessment worksheet](#) and make your own copy if on the google drive
3. Open the [Stream #1](#) jpeg and fill out the first section of the worksheet
4. Open the [Stream #2](#) jpeg and fill out the second section, answer questions at the end
5. If available, have students share their findings and predictions with each other
6. [Watch the BMI wrap up video](#)
7. Go explore on your own!

Extensions:

1. Ask students to pick a macroinvertebrate from the video to sketch with labels (organism name, head, thorax, abdomen, legs, gills, etc.)
2. Research adaptations of macroinvertebrates and connect them with the appropriate stream habitat. For example, the stonefly lives in rocky streams with fast moving water and is able to flatten its body against the current and holds on to rocks with hooks on the ends of its legs.
3. Have students explore on their own and take pictures or draw sketches of organisms, or create a video of their findings.

