



## Quarrybrook

EXPERIENTIAL EDUCATION CENTER

### **Program Title: Underwater Metamorphosis**

**Theme:** Investigation of an aquatic environment gives us a view of the different lifecycle stages that insects and amphibians undergo during metamorphosis.

**Audience:** 4th grade students

**Next Generation Standard:** 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

**Goals:** In this field class that is best suited for the spring season, students will closely investigate one of Quarrybrook's wetland habitats, either a vernal pool, flowing stream, or beaver pond. Students will collect invertebrate samples, identify species with field guides, and record information. Students will also explore complete and incomplete metamorphosis in insects and the lifecycle stages of amphibians.

#### **Objectives:**

- **What are the objectives?** Students will learn and practice safe and careful live invertebrate specimen collection. Using field guides, students will be able to identify aquatic species. Students will record field data and draw scientific illustrations. Students will know the lifecycle stages that insects and amphibians undergo during metamorphosis.
- **How will they be measured?** Students will work with aquatic invertebrate samples, demonstrating careful live specimen collection, study, and release procedures. Students will successfully identify their invertebrate specimens, and record species information on their datasheets.

#### **Program Outline:**

**Activity 1: AQUATIC INVERTEBRATE COLLECTION (60 min.)** – Students will walk to one of Quarrybrook's wetland habitats, either a vernal pool, flowing stream, or beaver pond. We will discuss how these are very sensitive areas and important nurseries for many different animal species, including invertebrates and amphibians. We will talk about the need to move and work carefully in this delicate habitat, to cause as minimal of an impact as possible. Students will then learn how to properly use the aquatic field equipment and how to carefully collect invertebrates. Students will be split into small research sub-teams and directed to designated stations. During this collecting phase, we will also look for examples of the different lifecycle stages that insects and amphibians undergo during metamorphosis.



Teachers will be asked to split the students into sub-teams. Quarrybrook staff will explain and demonstrate all field methods to the entire group. Each instructor and teacher will work with a different sub-team, to spread their sampling out over the area. The study sites are sensitive habitats and we do not want to impact their shorelines any more than we have to.

Activity 2: DATA RECORDING (60 min.) – Next, student teams will identify their specimens using a macroinvertebrate key and field guides, and record species information on their datasheets. Quarrybrook staff will explain to the group how to carefully release their live specimens back into the habitat.



Adults will continue to assist their sub-teams by monitoring their observations and identifications, and encouraging them to complete their data recording. Please help to make sure all students handle the live specimens with care and respect. Teachers will be essential in helping to cause as minimal of an impact on the habitat as possible, so that we may continue to bring students into these sensitive areas for first-hand explorations.

**Conclusion/Wrap-up:** Sub-teams will have the opportunity to share with the entire group which species of aquatic life they have observed and identified.