

# ***From the Mountains to the Estuary: From the Schoolyard to the Bay***

**Meaningful Watershed Experiences  
for Grade 6 Students**

**Created by:**



**With grant support from  
The NOAA Bay Watershed Education Training (B-WET) Program**



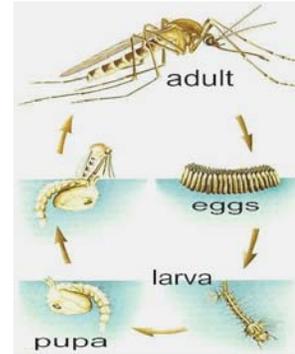
**In partnership with:**



**Occoquan Bay National Wildlife Refuge  
Manassas Battlefield National Park**



## Mosquito Larvae Demo



### Overview:

Observing human impact on an aquatic ecosystem.

### Teacher Background:

Mosquito image:  
<http://www.mosquito-misting.com/life%20cycle.htm>

### Mosquito Life Cycle

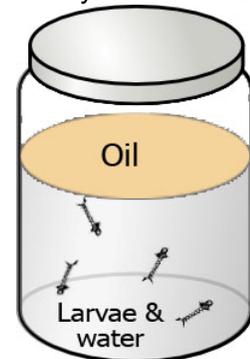
There are over 50 different mosquito species in Virginia. Mosquito larvae, commonly called "wigglers" or "wrigglers," live in water 7-14 days depending on water temperature feeding on algae and small aquatic organisms. Larvae must come to the surface at frequent intervals to obtain oxygen through a breathing tube called a siphon located at the tip of their abdomen.

As the larva grows, it molts (sheds its skin) four times. The stages between molts are called instars. At the 4th instar, the larva is almost a 1/2 inch long and is easily visible to humans.

When the 4th instar larva molts it becomes a pupa. The winged adult will emerge from the pupa, leave the water and search for a mate. Males and females feed on plant nectar. Females take in protein from a blood meal prior to laying their eggs. They detect humans primarily from their CO<sub>2</sub>.

### Materials:

- 1 small jar with lid, baby food jars works well
- Vegetable oil
- 4 -10 Mosquito larvae in water. These can be obtained from most any untreated standing water source during warm weather



### Setting the Stage:

Fluids leaked from vehicles onto roads and parking areas (i.e. transmission fluid, gasoline, antifreeze, motor oil) are washed into nearby streams when it rains. How might this affect the aquatic ecosystem?

### Acquisition of Learning:

Place mosquito larvae and water in jar. Pass them around for students to examine. Observe how often the wigglers come to the surface for air. To determine their 'breathing rate,' count the number of times particular wigglers touch the surface and descend. Slowly pour the vegetable oil into the jar until a layer about 1 cm thick is floating on the surface. Observe the behavior of the wigglers. Are they coming up to the surface more often? Does their breathing rate increase or decrease? Leave the jar out for observation for the remainder of the day. Encourage students to question.

## Closure:

1. How might aquatic invertebrates that breathe through siphons (like water scorpions and other types of fly larvae) be affected by this type of run off?
2. What effect might this have on fish and other predators that feed on these invertebrates?
3. How might insects like water striders which walk on the surface and breathe through tiny holes in the sides of their body, be affected by this type of run off?
4. What could you do to make drivers more aware of their vehicle's impact on the ecosystem?
5. If a lot of soil/sediment washes into a stream during a storm, how might this affect invertebrate's ability to obtain dissolved oxygen from water using gills?

