Mussel Host Activity 5-8th Grade

Mussel Hosts and Substrate	
Time	~30 minutes
Objectives	**1. Understand how mussels use different fish species as hosts for baby mussels (glochidia).** **2. Learn how different substrates affect the survival of mussels.** 3. **Realize the difficulties in sustaining mussel populations because of their reproductive habits.**
Materials	- Students (as glochidia!) - Fish and Substrate cards (about the size of a piece of paper) as below: Fish Cards (Species Name, # of Cards) - Freshwater Drum 1 (also called Sheepshead) - Paddlefish 2 - Carp 1 - Catfish 1 - Largemouth Bass 1 - Crappie 1 - Walleye 2 - Sauger 2 - Rock Bass 2 - Bluegill 1 - Largemouth Bass 1 Substrate Cards (Substrate, # of Cards) - Gravel 2 - Sand and Gravel 2 - Sand 4 - Backwater Muck 4 - Sandbar that dries up in summer 4 - Riprap 4 (Riprap is large rock placed by humans to protect the shoreline from eroding. Mussels cannot survive well on riprap because of the many crevices and large rocks.)
Introduction	Mussels cannot raise their own young (glochidia). Therefore, they must find a fish to host the glochidia until they are able to drop off and survive on their own. The mussel will lure a fish in by resembling food. When the fish bites down, the mussel shoots the glochidia into its mouth. The glochidia will then attach to the fish's gills for a few weeks, until they eventually drop off and live on their own. Some mussels, such as the giant floater, can use a wide variety of fish as a host. However, other mussels, such as the Higgin's eye pearly mussel, can only survive on certain species of fish. When the glochidia drop off from the fish, they could end up on many different types of substrate.Some substrate is the perfect place to grow up and live. However, if they drop off above the wrong substrate, it makes life difficult or impossible for the young mussels. How do you think these factors affect the survival of mussels?
Procedures	≈ Place the fish species cards face down in a line, then the substrate cards face down in a line across from them. Have students line up near the fish species cards. ≈ This activity will be done twice. The first time, students will be glochidia from the giant floater mussel. Explain to them that they will be shot out from their mother mussel into the gills of different fish. ≈ Tell the students that a fish has just grabbed onto their mother, thinking she was food. Now is the time to attach to the gills! They will each stand on one of the face down fish species cards, representing the fish they attached to (more than one student may stand on the same card). The cards are face down because a mussel cannot tell if the fish they attract is the correct species or not when they release the glochidia. ≈ Once all students have chosen a card, have them take turns flipping them over and revealing which species they are using as a host. ≈ Because the glochidia of giant floaters are able to survive on a variety of hosts, all students have survived this round.

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	≈ Tell the students that now weeks have gone by and it's time for them to drop off from their fish species and survive on their own. ≈ Each student will now choose one of the face down substrate cards to stand on (again, more than one student can stand on the same card). These cards are face down because when the glochidia fall off of the fish they cannot choose what they will land on. ≈ Once all students have chosen a card, have them take turns flipping them over and revealing on which substrate they must try to survive. ≈ Students who have landed on "sandbar that dries up in the summer" or "riprap" will not survive. All other students will survive. ≈ Explain that even if a mussel lands on a sandbar underwater, they cannot move around quickly and will not be able to get to a safe place if the water level drops and exposes the sandbar. Now you will repeat the activity, but the students will represent the glochidia of a Higgin's eye pearly mussel. When they choose their fish species cards, only the students who are standing on the walleye, sauger, or largemouth bass will survive. All other fish species are not hosts upon which the glochidia can survive. ≈ The students who survived this round will then choose a substrate card. Students who are standing on "sandbar that dries up in the summer," "riprap," or "backwater muck" will not survive. Although the giant floater mussels are able to survive on the backwater muck, Higgin's eye pearly mussels cannot. They rely on a strong current to survive, and backwater muck is typically in slow flowing water.
Wrap up	≈ How does this activity help us understand the needs of various types of mussels to survive? ≈ How do humans affect the ability of mussels to survive? (Building riprap which they cannot survive on; building dams that change the species of fish living in the area and the flow of the water; destroying riparian zones, which can affect the amount of substrate and water level.) ≈ As a follow up, students may choose another mussel species to research and find out which fish species and substrate they can best survive on.