

OCM BOCES Science Center

# Animal Responses

Information, Tips and Hints



## Brine Shrimp

### Habitat Care

The key to hatching brine shrimp is TEMPERATURE (and salinity). You will have greater success hatching brine shrimp if you are able to place the shrimpery in a sunny window OR provide a lamp (clamp lamp or gooseneck style lamp) with a 40 W bulb. (82 degrees F is optimal temperature, do not exceed 86 degrees)) Brine shrimp do best in water that has a pH of 8.0 - the hatchery mix adds some Epsom salt to help obtain this level.

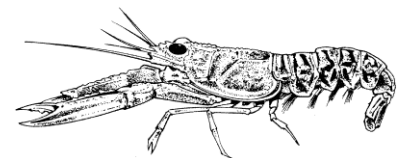
Once the brine shrimp hatch you should move them to another container to continue their development to adults. The teacher guide suggests a bucket - I would suggest a 2-L or 3-L clear soda bottle (well rinsed). Cut the top off of the bottle for easy access. Save the top and use it as a cover by inverting it and placing it on top of the cut end. Make a salt solution for the shrimp by adding non-iodized salt (provided in the kit) to water at a ratio of 2 tablespoons of salt per liter of water; use aged\* tap water or spring water. As a precaution against low pH add 1/4 tsp. of baking soda for each liter of salt water. You can occasionally aerate the water by placing an air stone in the container but I have found that it is not necessary depending on the amount of time that you would like to maintain the population.

**\*aged water** - water that has sat out in a container that is open to the air for at least 48 hours to allow the added chlorine to dissipate out of the water into the air. Well washed/rinsed gallon jugs are great for this use.

### Feeding

Feed the brine shrimp a small amount of yeast every other day - a small amount is a dropper drop or two (too much will foul the water). To activate the yeast place a small amount ( 50 or so grains) in a small jar or glass and mix in a small amount of warm water. Let the mixture sit for 10 minutes before feeding to the shrimp.

Additional Information: <http://www.brineshrimpdirect.com/res-hatching-c169.html>  
<http://www.brineshrimpdirect.com/teachers-classroomshrimp-c176.html>



## Crayfish

Crayfish are crustaceans which resemble small lobsters. Crayfish, also known as crawfish or crawdads, live in fresh water and breathe with gills. Crayfish hide in the mud during the day, then come out at night in search of fish, insects, and organic debris for food. It is possible that your crayfish may have offspring, especially if you do this kit in the spring. In the spring, females may have eggs adhering to their swimmerettes under the tail for up to two months. The young hatch and remain attached under the mother's tail for their first few molts. Crayfish have gills for breathing underwater, but can also breathe air. The crayfish will molt, shed its exoskeleton. During the few hours after the molt, the crayfish has a soft exoskeleton and is vulnerable to predators. Hiding places are important at this time.

**Crayfish Arrival:** Your Crayfish should arrive shipped in moss, remove the box and mist with room temperature aged (de-chlorinated) water. If the box and contents are at room temperature, you can proceed to add them to the prepared habitat. Otherwise, close the lid and wait 15 – 20 minutes or until everything is at room temperature, then transfer the crayfish to the habitat.

## Habitat Care

We provide a large gray tub as a crayfish habitat.

- The tub should be kept in a dim area, away from direct sunlight. Crayfish do best at 60-75 degrees Fahrenheit.
- There are plastic rocks and plastic pots provided to give the crayfish hiding places. Your class can experiment with other possible shelters or add to the habitat by bringing in rocks or even plants.
- Possible water sources for the habitat can be pond water or aged tap water. The water level should be 3-4" deep. (This would be about 8-gal. of water.) A water change should be done once or twice a week. Remove about ¼ of the water by either siphoning\* or scooping. Wipe the sides of the tub with a paper towel to remove any leftover food or waste materials then refill with aged water.

\*siphon – A 3 foot long plastic tube has been provided for a siphon hose. You can use a siphon if the grey tub is up off of the floor as the catch bucket must be below the water level.

1. Place the 1-gal. catch bucket provided in the kit on a chair or on the floor below the gray tub (remember that the hose is only 3 feet long).
2. Fill the siphon hose full of water. This can be done at a sink. Place your thumb or finger over one end of the hose. This should keep the water in the hose.
3. Place the open end of the hose in the catch bucket and lower the covered end into the water in the gray tub. Keeping the hose end under water release your thumb (finger). The water should start to flow into the catch bucket. You will find that the flow of water will create a vacuum effect and you will be able to suck debris into the catch bucket. If you solicit the help of a student or colleague to carry the catch bucket you can move around the tub vacuuming up waste material.

**IMPORTANT:** Crayfish will escape from open containers especially if the container has low sides and the crayfish are crowded. Crayfish have been observed climbing out of their container via the air line. Clip the cover down in this area and make sure that the air line is routed over one of the crayfish "houses" (pots). Crowding the crayfish allows students to observe the interactions that occur between organisms in an environment: competition for food, competition for shelter, dominance or "pecking order" interactions. In order to minimize crayfish escapes we have provided a mesh cover that can be secured with clothespins. Since crayfish are most active at night – the time when no one is in your classroom - this will be the time of escapes. Therefore, be careful when entering your classroom first thing in the morning keeping a watch for wayward crayfish.

### *Handling Escapees*

If you have an escapee that has been out of the water for any significant period of time, DO NOT put the crayfish directly into deep water (i.e. the tub). The gills need time to slowly re-adjust to water, to prevent the possibility of drowning. Instead, put the crayfish into a bucket that has tall enough sides to be sure it cannot escape, and put just enough water into the bucket to completely cover the crayfish when it's standing on all its legs (NO MORE!). Also put a flat "crayfish-comfortable" rock in the bucket, so it can climb up on the rock, out of the water, if it wants to. Leave the crayfish in the bucket for 24 hours. Then, if the crayfish is still doing well, pick it up and hold it upside down for a few minutes just under the surface of the tank water, to give any trapped air bubbles in the gills a chance to escape. ONLY then, put the crayfish back into the tub.

### **Information and Feeding**

A focus of this unit involves an animal's feeding responses. The crayfish, being scavengers, provide your students will the opportunity to explore feed behaviors related to food choices, feeding time choices, and competition for food. When your crayfish arrive they will need some time to de-stress and to adjust to the new environment.

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Adults do not need a lot of protein, and should be fed primarily vegetables. They will eat canned corn, frozen peas, romaine lettuce (not iceberg), raw potato, carrot, cucumber, etc. Lettuce has to be weighted down with a rock. You can use a rubber band to bind it to a rock. Your class can try sources of protein such as small pieces of bologna, hot dog, ground beef or pieces of worms. You can also go the route of feeder guppies, feeder goldfish or minnows from a bait/pet store (anything cheap). In addition, crayfish can be fed shrimp pellets or crab and lobster bites as a staple, about the equivalent of ONE 3/4" pellet every day, at most. These can be found in a pet store.

It is strongly suggested, in the Teacher Guide, to only feed the crayfish in the small plastic containers and to not place any food in the gray tub. This is due to the concern over fouling the water in the gray tub which would require a complete cleaning and a 100% water change. Crayfish can be fed in the gray tub if you: DO NOT over feed, REMOVE any uneaten food after a short time, PLACE MINIMAL amounts of meat (fat) in the habitat. Crayfish have been known to hoard food so check inside containers, flower pots ... The uneaten food will dirty the water; also over feeding your crayfish will cause them to be unhealthy, developing gelatinous shells.

### **Molting**

When your crayfish molts, leave the old shell in for one week, and then remove whatever (if anything) is left. The crayfish will eat the old shell to harden his new shell. Do not feed your crayfish for a few days after he molts, because he will eat the old shell before any food you put in. So the food you put in will spoil. When crayfish molt, they are very soft, weak, and vulnerable for about a week. So leave them in darkness, undisturbed as much as possible, during that time.

Additional Information:

[http://www.crayfishfacts.net/crayfish\\_care/crayfish\\_care.html](http://www.crayfishfacts.net/crayfish_care/crayfish_care.html)

<http://www.carolina.com/category/teacher%20resources/care-guides/crayfish.do>



### **Mealworms (Darkling Beetle)**

What are known as “mealworms” are not worms at all but the larvae of the Darkling Beetle. Just as a Lady Beetle has egg, larvae, pupa and adult stages, the Darkling Beetle also has these stages of development. The focus of this unit is on the response of the mealworm to its environment and to changes in its environment. (You have the option of including a study of the stages of development of the Darkling Beetle.) If you look closely at the mealworm you will see characteristics that would place the larvae in the insect class. Their bodies are segmented, they have 6 legs that are attached to the first three segments (thorax), they have antennae and they have an exoskeleton. Due to the exoskeleton the larvae must shed their skin (molt) as they grow.

### **Habitat**

The mealworm's preferred environment is very dry, moderately warm, and dark. You can keep them at normal room temperatures in low light. You can store them in a cool place at 45 to 65° F out of direct sunlight. As the temperature increases, so does the rate at which mealworms advance through their life cycle. Under ideal conditions, in a classroom, the complete life cycle can take place in as little as 3 months, but more likely it will take 4 months. Cold slows the process almost to the point of suspended animation. Mealworms can be put into the refrigerator (not the freezer) for periods of time to stop metamorphosis. The mealworms can be moved from the cup that they are

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delivered in to a flat bottomed box so they can spread out. Cover them loosely with a paper towel to provide crawling space.

### **Information and Feeding**

The mealworm culture must be kept dry. Mealworms can go through their complete life cycle without any added water (they are very efficient at extracting water from their food), but it is recommended that moisture continually be provided in the form of small bits of apple, sweet potato, or carrot. If carrot or sweet potato is used as the moisture source, the frass (waste) will be orange, adding evidence that the granules are waste rather than eggs. Replace as necessary or if it becomes moldy. The mealworm is adapted to living in its food source so you may keep them in a container along with their food. In addition to the cereal provided with the mealworms, they will survive on rolled oats, bran, and cornmeal.

<http://www.nyworms.com/mealworms.htm>

[http://mealwormstore.com/mealworm\\_care.php](http://mealwormstore.com/mealworm_care.php)

<http://www.flukerfarms.com/caresheet-mealworm.aspx>

<http://insected.arizona.edu/mealrear.htm>