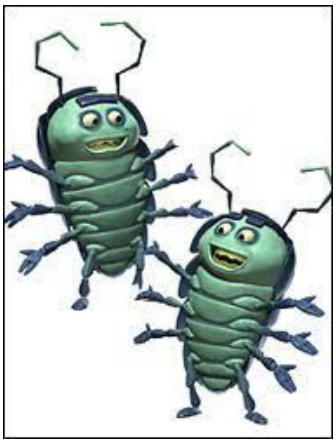

Adventures with a Decomposer

The last few weeks, you have been learning about the benefits of worms in decomposing waste. This week, you will be introduced to another critter that does an amazing job of decomposing vegetation. You have probably seen a Roly-Poly bug before. You may know them by several different names including: roly-poly bugs, pillbugs, woodlice, tiggy-hogs, parson-pigs and their scientific name, Armadillidium vulgare.

Classification

Did you know Roly-Polies (pillbugs) aren't actually a bug? Pillbugs are actually crustaceans, just like shrimp, lobsters, and crabs! They're in the isopod (meaning same pod or foot) family and have seven pairs of legs that are all similar in size and shape. Pillbugs also have three main body parts – head, thorax and abdomen – as well as simple eyes, uropods, a pair of prominent antennae, gills and lunglike adaptations. As terrestrial creatures related to marine animals, they need moisture to survive but cannot live submerged in water.

Life Cycle

Female pillbugs may have one to three broods of young per year. When the eggs are formed, the female places them into a brood pouch where she may carry up to 50 eggs. In approximately two months, the young roly-polies emerge. They look like small roly-poly bugs, and if it is a species that can roll, it can do so at birth. These isopods molt up to a dozen times in their lifetime, and the average lifespan of a roly-poly is between two and five years.

Adaptations

Pillbugs have many unique adaptations. They have an exoskeleton with plates. **They are not able to bite or sting, but many are able to roll up into a ball for protection.** Roly-polies have even shown social behaviors such as fighting over food and communicating by tapping with their antennae. They absorb water with food, through mouth parts or by capillary action through their uropods. These cold-blooded critters react strongly to humidity levels, light and temperature changes. They like dark, moist areas, and if left out in the sun, they perish.

Ecosystem Roles

Pillbugs are decomposers. They digest waste like scat as well as decaying matter from dead plants and animals, and then return the essential nutrients back into the soil. **Because roly-polies are sensitive to changes in the environment, they also serve as biological**

indicators for the health of ecosystems. Additionally, roly-poly bugs are a food source for other animals.

Habitat

As Terrestrial Isopods, pillbugs need moisture to breathe through their gills. You will most often find them hiding under logs, leaf piles, stepping stones, landscape timbers, rocks, trash cans, garden debris, flower pots, mulch, compost, or other dark, damp areas.

Part 1: Find some Roly Poly bugs

Pillbugs are amazing creatures. Can you find some around your home or on a nature hike? Look under logs, mulch, leaf litter, planters, rocks, or in outdoor compost bins. When you find some, gently pick one up and see if it rolls into a ball. Some people confuse pillbugs with Sowbugs. Sowbugs are Isopods but tend to be flatter and have tail like appendages that extend from the rear, and cannot roll into a ball.

Part 2: Build a Habitat

Mr. Chris kept pillbugs in a terrarium for several years in his classroom. Pillbugs do very well as terrarium pets. Can you design a terrarium to keep and observe the pillbugs for a week? Pillbugs are nocturnal and don't like alot of light, so if your parents aren't comfortable having a pillbug terrarium in your house for a week, it is perfectly fine to keep them in the garage, in a shed or on the porch.

Materials

Clear container (Large plastic jar, clear tupperware container, small aquarium, or clear plastic tub)
Soil
Leaf Litter
Small Pieces of Bark or Decaying wood
Plants or some moss (digging up a little grass to plant in the terrarium is fine)
Small rock
Small piece of Damp Cardboard

1. **Find a clear plastic tub, large jar, or glass aquarium.** If using a plastic lid, make sure to poke a few small air holes in the lid. You may choose to use plastic wrap and a rubber band to make the lid, but be sure to add some small holes (Don't make the holes too large as high humidity is very important the soil needs to remain damp.)

2. **Fill the container with plants and dirt.** Once you've secured a container, you can begin creating the proper environment for your pillbugs.

   - Fill the bottom of the container with 1 to 2 of moist soil or sand.
   - As decomposers, Pillbugs need wood bark, leaf litter, and other dead vegetation as part of their habitat.
   - Add a plant, some grass, or moss.
   - Place a small rock in the habitat so the Roly-Polies have a place to hide.
   - A small piece of damp cardboard from a box is great to add to the terrarium. The pillbugs will decompose the cardboard and also use it as a hiding place. If kept damp by gently misting the cardboard with water on a daily basis, often you will find your pillbugs hiding under the cardboard.

3. **Feed pillbugs a healthy diet.** Pillbugs eat mostly decomposing vegetables in the wild and should have a similar diet in captivity to keep them healthy.
   - Feed your pillbugs leftover bits of apples, lettuce, potatoes, and carrots. You can also bring leaf litter in from the wild and feed them to your pillbugs.
   - While you can feed pillbugs food that has been sitting out for a few days, do not offer them moldy food. This can make them sick.

4. **Keep the container humid.** Pillbugs require a humid environment to survive.
   - Mist the container once a day with a spray bottle. Also, make sure to add water to the soil (not too much) to keep it damp. **Remember, pillbugs can't swim!** You can also place a damp piece of cardboard to the terrarium.

5. **Add some pillbugs!** Now that you have created the perfect habitat for your pillbugs, it is time to add them to their new temporary home. Go back to where you found some Roly Poly bugs during the first.

Part 3: Observe your terrarium.

Use the attached Pillbug Observation worksheet to keep a record of the daily changes in your roly poly terrarium. What changes do you see? Where are the pillbugs hiding? Do they move around the terrarium at different times of the day? Are there any questions you have about pillbug behavior? Have you noticed them eating anything? What changes would you make to the terrarium?

* **Note to Parents: Younger students may wish to draw pictures of their daily observations.**

Part 4: Submit a copy of your daily observation log and attach it along with a picture of your terrarium at the end of the week.