LESSON: Composting with Worms GRADE: K

OBJECTIVES:

Science

From Molecules to Organisms

- **K-LS1-1** Use observations to describe patterns of what plants and animals (including humans) need to survive.

Science & Engineering Practices

Analyzing and Interpreting Data

- Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
- Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)
- Organisms have basic needs. For example, animals need air, water, and food; plants require air, water, nutrients, and light.
- Humans depend on their natural and constructed environments.
- Humans change environments in ways that can be either beneficial or detrimental to themselves or other organisms.

Physical Education

- **P.E. Standard 4** - Exhibits responsible personal and social behavior that respects self and others.

MATERIALS & RESOURCES:

- Book: *Compost, By Gosh!* Portman, M.
- Another good resource book: *Worms Eat My Garbage: How to Set Up and Maintain a Worm Composting System*, Appelhof, M.
- Container with air holes to hold worms- 2 plastic totes or bins works very well.
- Supply of biodegradable bedding
- Supply of food waste
- Worms- *Eisenia fetida* is the scientific name for Red Wigglers, the worms to use in indoor compost bin.

PRESENTATION:

Read the book *Compost, By Gosh!* to the class. Explain that the class is going to set up and maintain a worm bin. Discuss the responsibilities, expectations and questions the students raise about the activity. Discuss the facts about keeping worms for the purpose of composting.

DIRECTIONS:

1. Decide where to obtain worms. Refer to the book listed above for ideas, as well as websites that sell red wiggler worms. One pound should be plenty to start a bin.
2. Some preparation of the worm bin can be done before beginning the activity with students. Poking holes in a plastic bin is easily done with a drill and small bit, or with just a bit more work, a hammer and nail.
3. 2 plastic bins nested inside one another allows the run off (and inevitable escapee) from inner bin to end up in the outer bin.
4. Create about 5-6 holes in the bottom of the bin to allow drainage. Place one hole in the middle and a few on each side of the bottom. Then create air holes in the lid. Creating holes can be done with students if preferred.
5. Next shred the source of carbon or brown material. Newspaper is a good source. Newspaper will tear into thin strips if you tear it the long direction. This will work even with several pages and with it folded in half- the way newspaper is usually folded. Just pick up a section and begin tearing a strip in vertical direction. Other sources of carbon-based material are dried leaves, cardboard, paper based egg cartons, etc. The books referenced in this lesson will offer ideas also. High carbon material will help absorb odor. If the bin stinks, add newspaper, or leaves or other high carbon material.
6. Add moisture to the newspaper. Get the paper wet and then squeeze water out until is like a damp sponge- damp, but not dripping. After squeezing, pull it apart some so it's fluffier than a condensed ball of wet paper.
7. Once you have placed about six inches of a carbon source is placed in the bottom of the bin, a bit of sand or clean, crushed eggshell can be added. Worms need this gritty material in order to digest their food.
8. Add the worms! Then, add just a small amount of food nearby the worms.
9. Allow the worms to become accustomed to new surroundings. Often, in the first few days, some of the worms will escape the bin through holes in the bottom. This is because they are not used to the new bin. They should settle down within a few days.

10. The worms should be fed when they run out of food. They can live for quite a while in between feedings, but it is healthier and kinder to feed them regularly. And like humans, it is unhealthy to over feed the worms. You will find more specific information about bedding, food, and worm care in the books recommended in the materials and resources section of this lesson.

TIME: **90-120 min.** to set up bin

PROCESSING THROUGH THE SIX PILLARS:

WHAT?

- How do we affect the worms in the worm composting experiment?
- What do you think we need to do as a classroom to make the worm composting experiment successful?

SO WHAT?

- How do you feel about caring for our worms?
- How do you want to organize our classroom to care for our worms?
- How do you want to organize our classroom to care for our worms?
- What could happen to the worms if we don't follow through?
- How will we know that each person is caring for the worms in a responsible way?
- How do you feel about caring for our worms?

NOW WHAT?

- What will we do if we have a problem(s) in our experiment?
- What are some other situations where we have responsibility for other creatures?