All About Worms

Reference:
Part II of this lesson is adapted from "Organic Gardening with Worms: They Can Dig It!", Polk Avenue Elementary, Lake Whales, FL.
http://www.polk-fl.net/staff/grants/pefgrants/documents/KellyBachmanHughes.pdf

Overview:
Part I: Children hunt for worms in dug-up garden soil and collect them.
Part II: Children hypothesize about what habitats worms prefer and then test their hypotheses with their collected worms.
Part III: Children use what they learned in Part II and construct a worm race-track, then race each other's worms.

Subject area: Backyard Science

Grade level: 3rd-5th (you can also do the first two parts with younger grades, K-2nd)

Oregon Benchmarks/Common Core Standards:

- *4-LS1 From Molecules to Organism: Structures and Processes*
  4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction
  4-LS1-2: Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
- *5-LS2 Ecosystems: Interaction, Energy, and Dynamics*
  5-LS2-1: develop a model to describe the movement of matter among plants, animals, decomposers, and the environment
  LS2.A: Interdependent Relationship in Ecosystems
  LS2-B: Cycles of Matter and Energy Transfer in Ecosystems

Objectives:
Children will be able to identify three different habitat preferences of worms.
Children will be able to create a hypothesis.

Prep time: 30 minutes

Lesson time:
Part I – 25 to 45 minutes (depending on how quickly they find worms, and how "into" it they are);
Part II – 20 minutes;
Part III – 30 minutes

Materials needed:

Part I

- Large tarp (big enough for all children to sit around the perimeter, with space to dump shovels full of worms for kids to sort through)
- Gardening gloves for all children
- 2-4 shovels for volunteers to dig up a garden bed
- Bucket with some droplets of water on the bottom to collect the worms
- Lid for bucket with air holes

Part II

- Blackboard, whiteboard, or poster board
- Marker
- 3 trays (Rubbermaid tote lids work well)
- Cardboard to fit half of one tray
- Moist paper towel to fit half of one tray
- Dry paper towel to fit half of one tray
- Gravel or pebbles (enough to cover half of one tray)
- Garden soil (enough to cover half of one tray)

Part III

- Enough of the following for children to choose from and build a 3-foot long "worm race-track": cardboard, moist and dry paper towel, gravel or pebbles, garden soil
- Garden gloves (optional)

Space needed: Garden; gathering space

Staff needed:

Part I: 2-4 people to shovel garden bed soil onto tarp

Part II: 1 person to lead activity

Part III: ideally 1 person per group of children to help set up race-track

Preparation steps:

Part I: Lay out tarp near an un-used garden bed (or any area in the garden where you can dig up soil). If soil is really dry, water for about 10 minutes prior to this activity. Have shovels ready at garden bed. Have garden gloves ready for children.

Part II: Write the following on the board…

Worm Habitat Preferences		
Habitat elements	*Your Hypothesis*	*What Really Happened*
Moist or Dry environment?		
Light or Dark Environment?		
Smooth or Rough Environment?		

Have trays or lids set-up with the following:

Tray 1: Cover with paper towel; half should be moist/wet, half should be dry
Tray 2: Cover half with cardboard
Tray 3: Spread pebbles or gravel on half of the tray; spread garden soil on the other half

Part III: Have all materials ready for each group. Have garden gloves ready, if they choose to use them.

Pre-test of knowledge:
Ask children what they already know about worms in the garden…e.g.:
"Are worms good or bad for our gardens?"
"What do they do to the soil?"
"What do they do for plants?"

Presentation steps:
Part I

- Explain that we are going to hunt for worms in the soil that we dig from our garden; have children put on garden gloves and sit around the perimeter of the tarp.
- Explain that when you find a worm, carefully place it in the collection container; we will use these worms for a later activity. (You can talk about the humane treatment of all living things in our garden. Quick fact: if you cut a worm in half, it is *possible* that one half will continue to survive, *if* all of its organs are in that half. However, splitting a worm in half will never create two worms.)
- Have volunteers or staff dig garden soil and place in front of each child on the tarp. Children can gently dig through the soil to look for worms.
- Collect enough worms for each child to test several on their race-track. Make sure the collection container has water droplets on the bottom so they don't dry out. If using the worms in a few hours, cover the container with a lid and place it in a cool, dark place. Don't leave worms in collection container overnight!

Part II

- Ask children what a *hypothesis* is. Explain it's like an educated guess or prediction.
- Using knowledge of earthworm habitat, have children make hypotheses about earthworm preferences and record these on the chart.
- Place several worms at the junction of each different material on the lids and observe for about 5 minutes (e.g. place the worms where the wet and dry paper towels touch each other.)
- Record observations in the last column of the chart.

Part III

- Explain that we will use what we learned in Part II to create a "race track" for the earthworms. Have children set up about 3-4 feet of track, using a variety of the

different environments used in Part II. This can be done in small groups; tracks should be near each other so everyone can watch the worms together.

- Give each team several worms as their "worm racing team" and have them place them at the start of their tracks at the same time. Watch for about 10-15 minutes to see if any of them get to the finish line!

Notes:

The racing in Part III does not work perfectly, though the children still enjoy seeing what their worms will do.