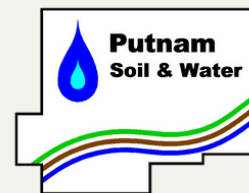




# Education Programs



## Ohio Standards

K.L.S.1: Living things have specific characteristics and traits. \*Observe nature in a variety of ecosystems. Design and plant a pollinator garden.

K.L.S.2: Living things have physical traits and behaviors, which influence their survival.

### Worms and their Ecosystem

First we will find out what the students know so far about worms. Then children will be introduced to red worms and their environment. We will discuss how to properly care for the animals so none get hurt. Students will then use magnifiers and craft sticks to discover and meet the organisms that make up the worm bin ecosystem. Kids will find their creatures on a picture sheet as they search. Students will share what they have found with one another as we sort through the worm bin contents. We will try two experiments with the worms. After discovery time, we will have a short debriefing where we will talk about how many things we discovered and mull over why the organisms are shaped the way they are and behave the way they do. Teacher receives a coloring book on worms.

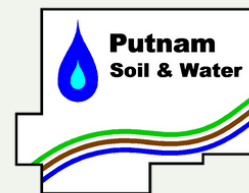
### What Bird Goes Where (Project Wild Adaptation)

We will have a short intro on organism differences and why all animals are not the same. Why do giraffes have long necks and elephants have big feet? The class will be divided into small groups and given a set of photos of bird bodies, feet, and food. Each group will match the birds, feet and habitat that they think go together. Then we will guess which habitats the birds would live in. Then we will all talk together about what matches with what and debrief why differences are important. We will go out for a short walk to identify birds. We can try to call some in to us. If time allows we will end with a little guessing game.

Each program is designed to be about 40 minutes long and can be geared toward any education level. All programming is FREE. Contact Bonnie Brooks at [bonnie.brooks@putnamcountyohio.gov](mailto:bonnie.brooks@putnamcountyohio.gov) or 419-523-5159 to schedule.



# Education Programs



## **Plant Differences**

We will open with showing some interesting plants and how they are different from one another. Students will then plant 3 different seeds in a recycled container and watch them grow. They will make hypothesis and observations of the differences of roots, stems and leaves over time. They will compare how the roots are different than the leaves and take note of the needs of the plant. They will measure the plants every 3 days and put those lengths on paper to compare growth from one week to the next. How long before their life is over? How to dispose of plants like nature? Take to a compost pile or put in the woods or feed to worms in a worm bin.

## **Habitat Walk**

We will first practice how to do a habitat walk. Each child will choose a picture of a native Ohio organism they think we will see in the habitat we will be visiting. We will then take a walk outside to find out if they can see signs of what they chose. We will discuss what we found and why. Then we will look at another habitat and choose new cards. Walk is determined by how many habitats we can find. Discussion about how to make more habitat will be included.

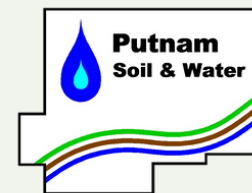
## **Animal Tracks**

Students observe animal paws and note the similarities and differences between them. Why do some paws have webs and others fur? Why do some have big claws and others have long feet? Students then use plaster-of-Paris to make their own animal track to take home.

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# Education Programs



## Ohio Standards

1.LS.1 Living things have basic needs, which are met by obtaining materials from the physical environment.

1.LS.2 Living things survive only in environments that meet their needs.

### Soil Buddies

We will do a short review about what living things are and what they need to grow and survive including the differences of some animals over others. We will have a little quiz and compare a few different animals with one another considering living and non-living parts of the ecosystem. We will identify the needs of the seeds we will be using and then make soil buddies. We will be using panty hose, seeds, soil, and puffy paints.

### Bird Feeder Frenzy

We will learn a little about common birds seen at feeders. We will focus on environmental needs of each focusing on specific species like Woodpeckers, Cardinals, Hummingbirds, Goldfinches and Orioles. Students will play a game together matching birds/feeders/food. We will also touch base on 2 invasive birds and how to identify and keep them away from our feeders. Students will then pair up to design a feeder using recycled materials. After the design period, we will look at some feeder designs on the market to help meet the needs of specific birds and those that deter pests.

### Web of Life (Sharing Nature with Children by Joseph Cornell)

Students will become a part of the ecosystem and find out how important each part is to the survival of the whole. We will first talk about what energy is and where each living thing in the environment gets it. After the activity we will talk about what happened and why.

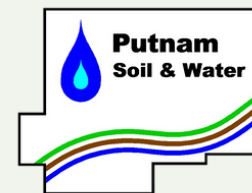
### Oh Deer! (Project Wild)

Students play a game and become either a part of the environment or a herd of deer (also called a bunch, mob, parcel, or ragale). Through a series of events, students easily see how the resources in the environment effect the deer population and vice versa. This is a very active game and will need an outdoor space or 15 minutes or so in the gym. The teacher will keep track of the deer population from one round to the next. After the game we will debrief together what happened and why. If time allows we will put a graph on the board.

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# Education Programs



## Ohio Standards

### 6.ESS.4:

Soil is unconsolidated material that contains organic matter and weathered rock. Soil sampling and testing should be used to investigate soil.

### 6.LS.4:

Living systems at all levels of organization demonstrate the complementary nature of structure and function. Organisms have diverse body plans, symmetry and internal structures that contribute to their being able to survive in their environments. Properties of soil that are useful in soil identification include texture, color, composition, permeability and porosity. Uses of soils depend upon their properties. Soil sample testing methodology and equipment are included within this content statement.

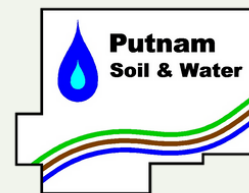
### Pond vs. Worm Bin Organisms

Students utilize 30x magnifiers and microscopes (school would need to provide microscopes) to find, identify and draw organisms for each environment. They will then compare body types, symmetry, and external structures. In cold months when organisms cannot be collected we will observe worm bin organisms and identify body types and structures. 5x's and 100x's magnifiers can be utilized to make it more of a tech learning experience.

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# Education Programs



For the following programs students can bring in their own soil samples or the office can supply them. Information in each can be mixed based on the teacher's request.

## **Soils 1- The Basics**

Students learn how much soil is on the Earth and how long it takes to make it as well as the three types of soil particles. They will take part in a sand/clay demonstration and learn how to identify soil type by using a ribboning technique soil scientists perform in the field.

## **Soils 2 – Shakes, Origins and Horizons**

Students will examine results from the previous day's demonstration on clay and sand. They will examine a soil shake and measure how much sand, silt and clay are in the jar and calculate the percentage of each type. They will utilize a soil triangle to determine soil type based on their calculations. Discussion on how soil is made, soil horizons and how soils form from different types of rock. Different rocks will be passed around to see how rocks effect the soil that is made. Students will look at 3 types of soils with 30X magnifiers and compare particle sizes, color, inorganic and organic matter in each.

## **Soils Tests**

Students will take part in a slake test demonstration with soil they bring into class. They will then utilize test kits that determine the pH and amounts of nitrogen, potassium and phosphorus, in their sample. We will debrief why each nutrient is important and what each does for the plant.

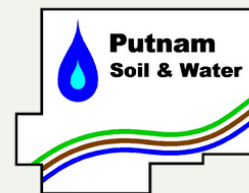
## **Soils – The Web Survey**

A short demo will be done showing how the web soil survey works. Students will then follow directions to get onto the site and find out what type of soil they have at their own home. They will then choose their own perimeters to find out specifics about the particular soils types there and download a copy for their own use.

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# Education Programs



## Ohio Standards

### 7.LS.1

Energy flows and matter is transferred continuously from one organism to another and between organisms and their physical environments. As matter is cycled within the environment, it promotes sustainability. The elements that make up the molecules of living things are continuously recycled. Energy-rich molecules that are passed from organism to organism are eventually recycled by decomposers back into mineral nutrients usable by plants.

### 7.ESS.1:

The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.. The cycling of water in the atmosphere is an important part of weather patterns on Earth. The rate at which water flows through soil and rock is dependent upon the porosity and permeability of the soil or rock.

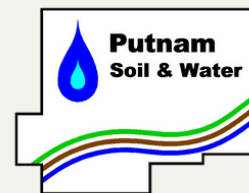
The movement of water in the cycle can have both positive and negative impacts, such as nutrient and contaminant transport. Contamination can occur within any step of the hydrologic cycle. Groundwater is easily contaminated as pollution present in the soil or spilled on the ground surface moves into the groundwater and impacts numerous water sources.

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# Education Programs



## **Enviroscape**

The Enviroscape is a powerful, interactive resource that shows how everyone's activities impact our waterways. Participants learn the difference between source and non-point source pollution, what eutrophication is, what a watershed is, what blue-green algae is, what the Clean Water Act is and why it was created, and what best management practices are.

## **Ground Water Model**

Have you ever got an opportunity to see into the earth and watch what happens to water once it gets there? This model will take your students into that world to observe where rain water goes, see what an aquifer really looks like, understand what a confining layer is and how one type of contaminant can move from one area under the ground to another.

## **Incredible Journey**

This is a get up and move activity that shows the movement of water within the water cycle and identifies the states of water as it moves through the water cycle. Students will make a take-it craft as they go through the activity.

## **Worm Bin**

Students first explore the contents of a worm bin to see how decomposers cycle nutrients in the environment. They then plant seeds using fertilizer from the worm bin vs. a plant with no fertilizer to track over time.

## **Oh Deer!**

Students play a game and become either a part of the environment or a herd of deer (also called a bunch, mob, parcel, or ragale). Through a series of events, students easily see how the resources in the environment effect the deer population and vice versa. This is a very active game and will need an outdoor space or 15 minutes or so in the gym. The teacher will keep track of the deer population from one round to the next. Data tables, graphs and inferences can be added to the program depending on teacher preference. The activity can be morphed into a project based learning opportunity where students develop habitat to enhance species of animals on the school campus.

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