

Small Patch, Big Diversity!

Even a small patch of ground can be a great way to make observations of natural elements. This investigation can take place in urban, suburban and rural spaces. You only need a small area of ground and some common household materials to discover its hidden biodiversity.

Materials:

- A frame of paper ~6" x 8". Cut out your own or cut out the frame attached.
- Stones to keep to the frame from blowing away. Golf tees also work nicely.
- Other useful materials:
 - Magnifying glass
 - Tweezers
 - Child-safe scissors
 - Small trowel, to dig with
 - Paper plates or small flat containers
 - A ruler, 6-12 inches
- ***A note to parents/caregivers:*** Part of this activity includes digging in the soil. If, when doing so, you and your child come across bees or a great deal of ants, stop digging and move away from the area. Some insects may sting if their home has been unexpectedly disturbed and we also want them to be able to peacefully continue their lives.

Procedure:

1. Place the frame on the ground. It can be a patch of grass, garden, sand, even a cracked sidewalk or walkway. Anchor the frame with stones or golf tees.
2. Sit or lie on the ground and look closely. What do you see? Use your tweezers and scissors to take samples and put them on your plate.
3. Dig under the surface just about an inch or so. What do you see?
 - Soil: Look at the soil and identify characteristics. Consider these questions:
 - Is it wet or dry?
 - Does it go through your fingers like sand?
 - Does it stick together like clay?
 - What color is it?
 - Plants: Examples may be grass, dandelions, flowers, leaves, seeds, or roots.
 - Are the plants colorful and alive or dry and dormant or dead?
 - Roots: Look at the roots in the soil, if there are some. Consider these questions:
 - How far do the roots of plants go down?
 - Animal Life: Can you identify any of it? Look at the samples and categorize them by placing them on different paper plates. Examples may be ants, worms, grubs, or pill bugs.
 - Do these animals move? Do they have legs?
 - Inorganic Material: Is this a rocky area? If so:
 - What colors and shapes do you observe?
 - Are the surfaces smooth, rough or cracked?

- A Closer Look: Take out your magnifying glass and look at your samples more closely. How different do your samples look now? What do you notice at his close range?

Recording Observations

Record observations in a nature journal or on a piece of paper. Learners can illustrate and label their findings.

Extensions

Select two (or more) different locations and compare and contrast the observations you have made from these locations.

1. Describe why animals can be found on or under some surface areas and not on or under others? What makes one habitable and others not?
2. Small samples of surfaces can be glued onto cardboard and critically observed. Can you notice similarities and differences?
3. Using graph paper, or just a ruler and string, you can construct a grid. Students can draw or list what they find in each “square” of the grid. You can label the one side with letters and the other with numbers. For example, 5B might be a dandelion; 3A may be grass.
4. The book, One Small Square: Backyard by W.H. Freeman and Co. is a partner to this activity. If you selected an area that had been “landscaped” vs one that was “wild”, would there be differences? Why/Why not? What if you selected a median strip in an urban environment. What would you expect to find? Are all urban plots less diverse than suburban or rural plots? How would you develop a study to test that assumption?

Additional Resources:

Deep Down Underground by Oliver Dunrea is a book about the underground and it is structured in a counting setting. As the pages continue, the “mouldiwort” (a Scottish word for moles) introduces ten neighbors.

Up and Down in the Garden and Down in the Dirt by Kate Messner is a favorite book to reveal the underground world. The illustrations by Christopher Silas Neal provide a look of the many things that are not easily observed “down in the dirt” while also showing a top-side view. [To hear the book read aloud.](#)

The Amazing Dirt Book by Paulette Bourgeois is an oldie but goodie. It includes everything you would like to know about dirt (and soil) including historical facts. Lots of vocabulary words are introduced.

Learning Standards

Next Generation Science Standards

- K-LS-1 - Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording and sharing observations. Use observations to describe patterns in the natural world to answer scientific questions.

- 3.LS4-3 - Construct and argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

NJ Mathematics

- K.CC B - Count to tell the number of objects. Count to answer “how many”.
- K.G.A - Identify and describe shapes. Describe objects in the environment using names of shapes and describe relative positions of these objects such as above, below, beside, in front of, behind, and next to.
- 1MD C - Represent and Interpret Data. How many in each category and how many more or less in one category.

For more information on how to integrate this lesson into your classroom or use modification for family fun, contact Kate Reilly, Manager of Education at kreilly@dukefarms.org.

Thank you to VEA, Ellen Parker, for her collaborative efforts.



Small Patch, Big Diversity! Frame

Cut out the grey area. Place the hollow, white frame on the ground to accompany the lesson.

