

Baked Potato Invertebrates **Teacher Resource**

Grade Level **K-12**

Objectives

1. The student will capture and examine invertebrates in the soil using proper field work with a stereoscope to identify the invertebrates.
2. The student will identify organisms found in the soil by recording still images and movies with a digital microscope.

National Standards

[NS.K-4.1](#); [NS.5-8.1](#); [NS.9-12.1](#)

Science as Inquiry

[NS.K-4.3](#); [NS.5-8.3](#); [NS.9-12.3](#)

Life Science

[NS.K-4.5](#); [NS.5-8.5](#); [NS.9-12.5](#)

Science & Technology

[NT.K-12.1](#)

Basic Operations and Concepts

[NT.K-12.3](#)

Technology Productivity Tools

[NT.K-12.6](#)

Technology Problem-Solving & Decision-Making Tools

MATERIALS

Digital Microscope

Stereoscope

Baked potatoes

Soil Conditioner (Scotts)

Small plastic bags

Dissection Probes

TEACHER BACKGROUND INFORMATION

Invertebrates make up over 98% of the worlds animal species. Invertebrates are known not to possess an internal skeleton made of compact bone and no backbone. Some invertebrates may possess an internal skeleton such as a jellyfish. Others contain a hard outer skeleton such as a lobster or grasshopper.

There are many kinds of invertebrate types, but the most common that will be examined in this lab will be arachnids, annelids, insects, and protozoa. Arachnids are a type of arthropod made up of spiders, scorpions, ticks, and mites. Most commonly seen in the soil will be spiders that have a hard exoskeleton, 8 legs, and no antennae. Insects are the largest group of Arthropods that exist on Earth today. There are over 8,000 different species of insects and they exist almost everywhere on Earth. Insects have a hard exoskeleton and their bodies are broken into 3 segments: the head, thorax, and abdomen. One common characteristic of insects is the simple and compound eyes that they possess. Annelids have existed on Earth for more than 120 million years, worms and leeches making up this group. The most common being seen in the soil will be the worm for students. They have bodies divided into segments and the most common characteristic is that they have no limbs. The last group, Protozoa, is the single-celled, microscopic invertebrates that exist on Earth. There are several types that might be seen in the soil. First, the amoebas are clear, shapeless cells. Second, the flagellates have a body shape looking like a hair. These invertebrates can help us in digesting harmful bacteria and can harm us by living as a parasite.

To prepare moist soil:

- *Add peat moss to soil or use Miracle Gro Moisture Control.*

To prepare well-drained soil:

- *For every 10 square feet, mix a 2 cubic foot bag of organic soil conditioner with soil to a depth of 8 inches.*

To prepare dry soil:

- *Do not add anything to the area of soil denoted "dry".*

PROCEDURE

1. Prepare baked potatoes the night before the experiment.
2. Cut potatoes in halves for each group to use.
3. Prepare a section of moist soil, well-drained soil, and dry soil outside marked off in order to place the potatoes there undisturbed.
4. Have each group place their baked potato half cut side down on a section of the moist soil.

5. Repeat step 4 for well-drained and dry soil.
6. Allow the potatoes to sit for 24-48 hours undisturbed.
7. Remove each potato after the given time period has expired and examine.
8. Have students use dissecting probe to examine the interior potato where invertebrates may have penetrated.
9. Use a stereoscope to observe.
10. Have each group classify according to type of invertebrate.
 - Insect, Worm, Snail...
11. Once back in the classroom, have each group examine each invertebrate under the a digital microscope.
12. Have students record their observations under 2x, 4x, and 10x.
13. Have students group all data and build their conclusions based on the three different soil types.

QUESTIONS

1. What are the difference and similarities between the invertebrate populations of the moist soil, well-drained soil, and the dry soil?
 - Why do these differences occur?
 - Did the type of soil make a difference in the number of organisms? Type of organisms?
2. Name at least three other “bait” options, besides the potato, you could use to catch invertebrates.
3. Are the invertebrates you caught helpful or harmful to humans?

PRESENTATION

Prepare a lab report including the data, images, and video to give a presentation on the interactive white board or projector for the class.

EXTENSION

- Collect leaf litter from an area and compare organisms.