

What is in Our Garden Bed?

TK-1 Lesson

Vetted by Riverside County Office of Education-STEM

Master Gardeners

The University of California Cooperative Extension (UCCE) Master Gardener Program (MGP) is an educational program designed to teach and effectively extend information to address home gardening and non-commercial horticulture needs in California.

UCCE is the outreach arm of UC's division of Agriculture and Natural Resources (ANR). Master Gardener volunteers (MG volunteers) promote the application of basic environmentally appropriate horticultural practices through UCCE-organized educational programs that transfer research-based knowledge and information.



University of California

Agriculture and Natural Resources

UCCE Master Gardener Program



For Teachers

PPT Tips: The slide sequence is designed to tell a story in a rhythmic manner, repeating certain phrases.

- Pause on the opening slide to each section and ask students to use the image to predict the answer to the question.
- Pause on the follow-up slide to each section and have students share what they think the answer might be.

Instructional Background: Children often interchange the words “soil” and “dirt” and use them as synonyms.

Getting your hands *dirty* in garden *soil* can increase your serotonin levels.

- Contact with soil and a specific soil bacteria, *Mycobacterium vaccae*, triggers the release of serotonin in our brain. Serotonin is a natural anti-depressant and strengthens the immune system. So, getting your hands dirty with soil can make you happy.

Learning Goals

Student gardeners will learn that:

- Soil is a natural resource,
- and that there is a direct relationship between soil and organisms.

Anchor Phenomena: [My Garden Bed](#)

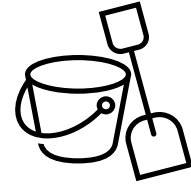
Teachers: Preview the entire video prior to sharing with students.

- For student viewing, **start** the video at the **2:00** minute mark and **end** at the **5:00** minute mark.



The living soil (1982)

What is in your garden bed?



Draw a picture showing what is on top of the ground and what is underground.



*What is in our
garden bed?*

Soil is in our garden bed!

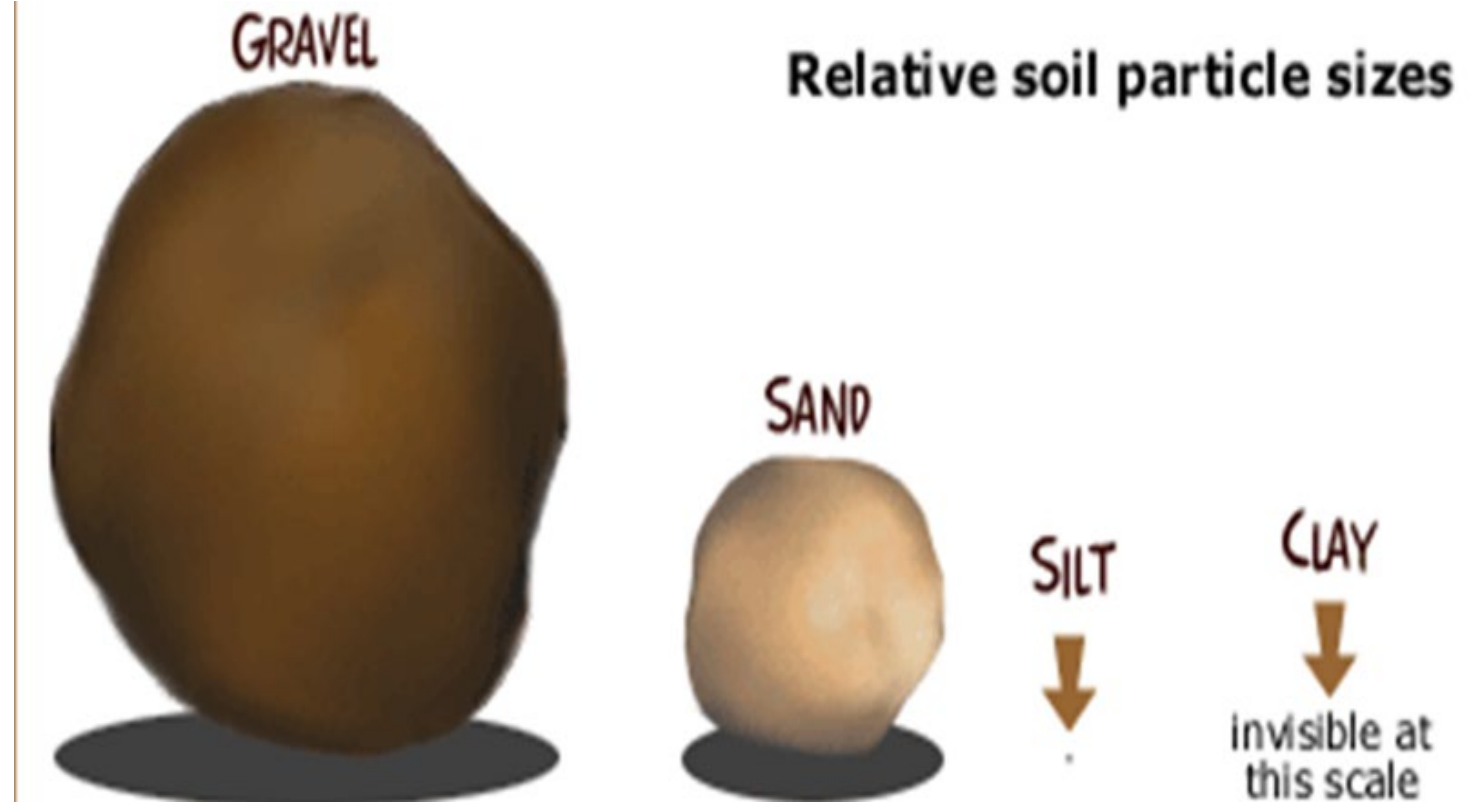


What is soil?

Soil

Soil is the upper layer of earth. It is a mix of tiny grains of sand, silt and clay.

- These grains are smaller than gravel.
- They are so small that you need a microscope to see them.



Why is soil important?

Soil is a home for plants.



- Soil holds plant roots in place.
- Soil holds air, water and **organic matter** that help plants grow.

Soil is a home for animals and other living creatures.



- Soil provides places for creatures to dig tunnels and burrow.



*What is in our
garden bed?*

Plants are in our garden bed!



What are plants?

Plants

Plants are living organisms.

- Plants have three main parts that help them grow:
 - Roots
 - Stems
 - Leaves

Can you identify the parts of this plant?



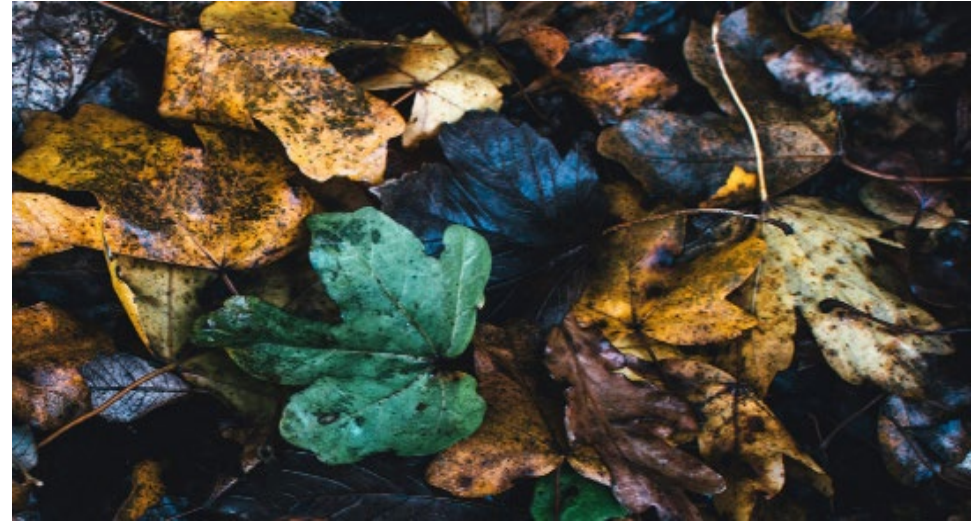
Why are plants important?

Plant roots help absorb some of the water in the soil.



- This makes it harder for water to wash the soil away in your garden.

Plants can be food for many organisms that live in and on the soil.



- As they eat the decaying plants, they produce material that helps keep soil particles together.



*What is in our
garden bed?*

All kinds of animals are in our garden bed!



Who are these animals?

Animals

Animals are living organisms. Big and small animals live in the soil. Some animals you can see in the soil are:

- ✓ Mammals- gophers, moles, squirrels.
- ✓ Insects – ants, beetles, crickets
- ✓ Worms-earthworms
- ✓ Arachnids (Spiders)
- ✓ Isopods (Pill Bugs)



Why are animals important?

They help make better soil for plants to grow in.

- Mammals that dig tunnels and build burrows add places for water and air in the soil.
- Insects and spiders bring organic matter into the soil.
- Pill bugs and earthworms add waste and organic matter to the soil. Earthworms also tunnel through and turn the soil.



A photograph showing several hands of different skin tones holding small green seedlings in soil. The hands are arranged in a circle, with the seedlings pointing towards the center. The background is dark, making the green plants and the hands stand out. The overall mood is one of care and community.

What is in our garden bed?

Children are in our garden bed!



Why are children important in the garden?

Children in the Garden

Children can take important actions to keep their garden soil and plants healthy.

- Don't walk too much on your garden bed's soil. This will help keep those tunnels open for air and water.
- Respect the helpful animals in the soil by disturbing them as little as possible.

Can you think of another way you can help keep your garden soil and plants healthy?



Video: [Soil is Living](#)



July: Soils Are Living!

Check For Understanding

- Name a very small grain that makes soil.
- Share one example of how soil is important.
- What is a plant?
- Share one example of how plants are important to the soil.
- Name an animal that lives in the soil.
- Share one example of how animals help make better soil.



Phenomena in the Garden:

Bucket of Soil Observation

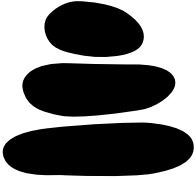
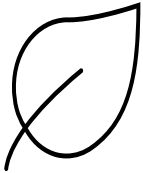
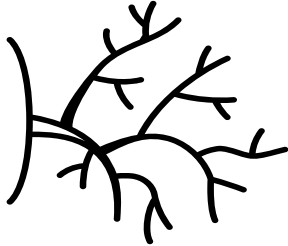
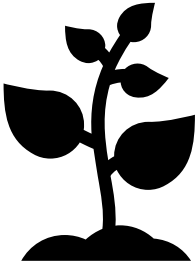
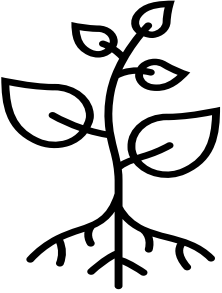

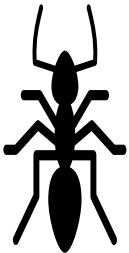
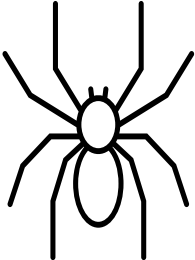
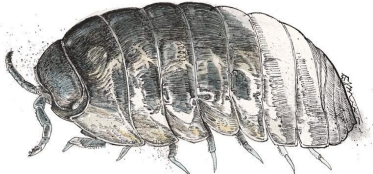
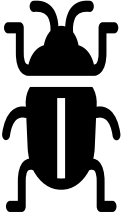


Soil | More Than Just Dirt

Optional: Watch the video demonstrating the process.

1. Collect one or more buckets of soil from your school garden.
2. Use a magnifying glass to observe handfuls of soil from the bucket or pour each bucket sample on white butcher paper to observe.
3. On your recording chart circle any examples you find in the soil.
4. Share the results with your teacher.

Circle what you see in your garden soil

<p>Rocks</p> 	<p>Leaves</p> 	<p>Twigs-Bits of wood</p> 	<p>Plants</p> 	<p>Roots</p> 
<p>Worms</p> 	<p>Ants</p> 	<p>Spiders</p> 	<p>Pill Bug</p> 	<p>Beetles</p> 

What is in your garden bed?

Draw a picture showing what is on top of the ground and what is underground.





Extend Your Thinking: *Can animals be pests in the garden?*

A garden pest is any organism that causes damage to the plants.

For example:

- Snails can be good for the soil, but they also like to eat plant leaves, flowers and plant seedlings.
- They also eat any ripening fruits that are close to the ground, such as strawberries and tomatoes.
- **Yes, snails can be a pest in the garden!**

Which of these animals are garden pests?

Make a prediction for each of the animals pictured. Is it a pest that can damage plants?

Then click on its picture to check your answer.

Yes or No?

Ant

Earthworm

Gopher

Pill Bug

Wolf Spider





Science Vocabulary

Organism

Plant

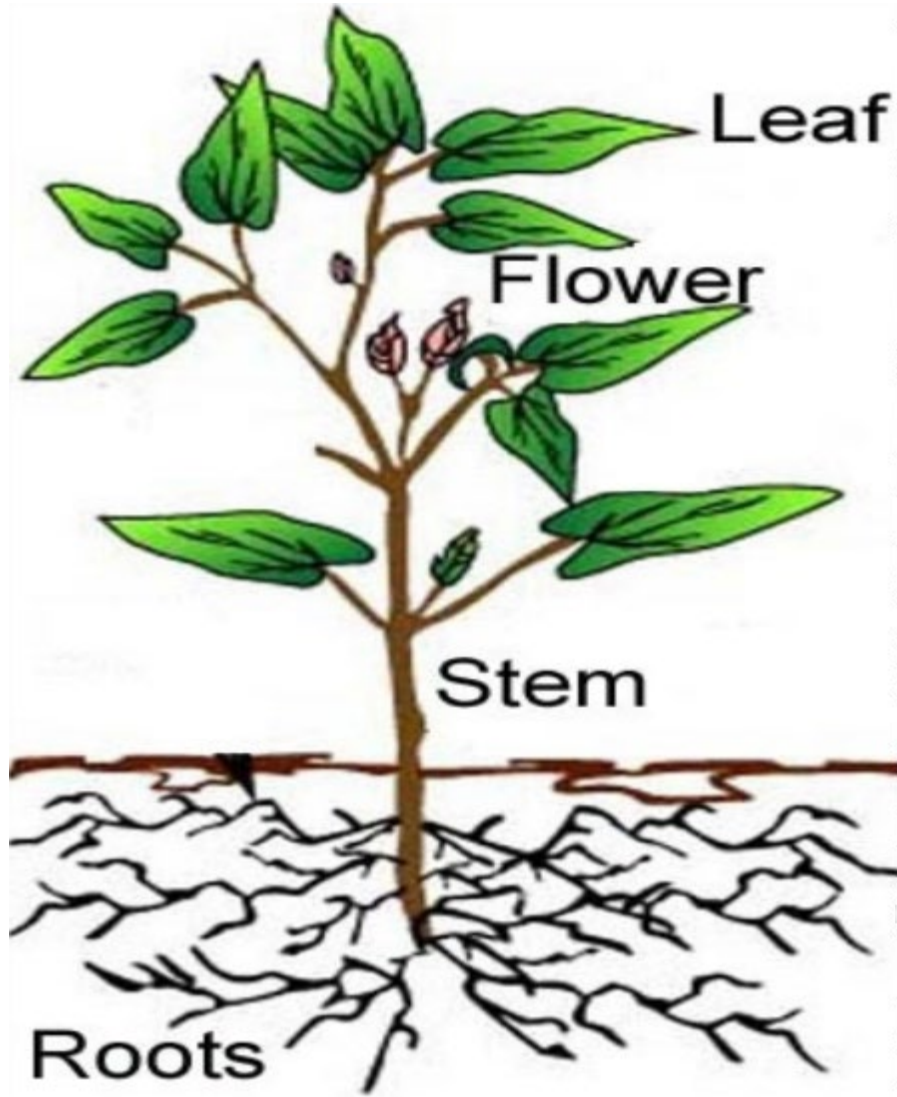
Soil



Organism

- An organism is any living thing
- Plants are living organisms
 - So are:
 - People
 - Cats and dogs
 - Fish and frogs
 - Worms and bugs

Plant



- A plant is a living organism.
- Plants have three main parts that help them grow:
 - Roots
 - Stems
 - Leaves
- Most plants also have flowers.

Soil



Soil is the upper layer of earth in which plants grow.

Ant

- Ants will protect and care for plant-sucking aphids because they produce a honeydew that ants like to eat. This allows aphids to damage plants.
- But ants also help plants by eating other pests including fleas, caterpillars and termites.

No, ants are not a pest if there are no aphids in your garden.



Earthworm

- Earthworms eat decaying plant matter, leaf litter, microbial fungi, and other microscopic organisms

No, an earthworm is not a pest in the garden.



Gopher

- Gophers build mounds of fresh soil in lawns and vegetable beds. They enjoy feeding on vegetables and plant roots.

Yes, gophers are a pest in the garden.



Pill Bug

- Pill bugs feed on decaying plant material and are important decomposers of organic matter.
- However, they occasionally feed on seedlings, new roots, lower leaves, and fruits or vegetables touching the soil.

No, pill bugs are not usually a pest in the garden.



Wolf Spider

- Wolf spiders eat insects that are walking or resting on the ground. They hunt in the open during the day and night,
- They are often found on the ground in plant litter and on low vegetation.
- Instead of spinning webs to catch prey, they make a small, thick web where they rest.

No, a wolf spider is not a pest in the garden.



California Preschool Learning Foundations

California Next Generation Science Standards

Preschool Life Science Strand

- At around 48 months: 1.3 Identify the habitats of people and familiar animals and plants in the environment and begin to realize that living things have habitats in different environments.
- At around 60 months: 1.3 Recognize that living things have habitats in different environments suited to their unique needs.

Kindergarten Earth and Human Activity

- ESS3.A: Natural Resources: Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)
- ESS2.E: Biogeology: Plants and animals can change their environment. (K-ESS2-2)

Next Generation Science Standards

First Grade:

LS1.A: Structure and Function All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

California Next Generation Science Standards

Science and Engineering Practices:

- Use a model to represent relationships in the natural world. (K-ESS3-1)
- Obtaining, Evaluating, and Communicating Information: Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)

Cross-Cutting Concepts:

- Systems and System Models: Systems in the natural and designed world have parts that work together. (K-ESS3-1)
- Structure and Function: The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

Resources

- California Master Gardener Handbook, Second Edition, Dennis R. Pittenger Editor, 2015
- [Children's Ideas About Soil](#), Annenberg Learner
- [Plants Important?](#), University of Florida Extension
- [Soil-More than Just Dirt](#), Junior Landcare
- [Soils](#), Nature Journals
- [What Kids Should Know About Soil](#), Soil Science Society of America
- [Get Your Hands Dirty: It's Good for Your Health](#), The FruitGuys Community Fund
- **Images:** Creative Commons; Clipart Library; Kiddle; Stock,, UC Integrated Pest Management; University of Missouri
- **Videos:** CSRI; Junior Landcare; Soil Science Society of America

Gardening Questions?

- Email or Call the UCCE Master Gardeners of Riverside County
- Email Helpline
 - anrmgriverside@ucanr.edu
- [Riverside Master Gardeners Website](#)
- E-mail: mgschoolgardens@gmail.com



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