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SIXTH GRADE

EXPLORE

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Garden as a System	<i>Explore the garden to identify its main parts and evaluate how all the components work together to make a balanced system.</i>
* Planting: Soil Science Part 1 of 2	<i>Perform a series of tests on garden soil to determine its health in preparation to plant a crop.</i>
* Planting: Design & Engineering Part 2 of 2	<i>Combine math, science, and engineering skills to design a garden.</i>

* ICON INDICATES TWO-PART LESSON



Garden To-Do List

SIXTH GRADE

The first time students enter the garden is the best time to set expectations and also take some time to explore. Students will be involved in the rule-making process, then survey the garden to evaluate its condition and identify the tasks that need to be done to make sure it's in tip-top shape. Students will gain a sense of community as they pitch in to care for the school garden.

SUBJECT

EXPLORE

TIME

30 - 45 MIN

MATERIALS

Garden To-Do List, 1 per pair of students

Trowels

Watering cans

Rakes

Seed envelopes (if applicable)

Black nursery trays

Buckets

Wheelbarrow (if available)

DIRECTIONS

- If your school garden does not have an outdoor classroom with a whiteboard, begin the lesson inside the classroom to make the garden rules.
- By sixth grade, many students are already familiar with the school garden and garden rules. Ask students to draw on their past experiences to remind everyone of the garden rules and record them on the whiteboard. Basic garden rules may include: be respectful to others and your surroundings, only pick flowers, plants, or vegetables with permission from an adult, handle plants and animals gently, only touch animals when an adult says it's okay (never touch spiders or bees), use tools safely, and walk at all times.
- Explain to students that they are going to be doing a very important job. They will inspect the garden to identify tasks that need to be done to bring it to tip-top shape, and then they will complete some of those tasks. This is important because maintaining a school garden is a huge effort, and when everyone pitches in, they contribute to making the space enjoyable for each other. It takes a village!
- As you enter the garden, have students make general observations of the condition of the garden. Are there weeds in the garden beds? Weeds in the pathways? Weeds anywhere else? Is there clutter strewn about that needs to be put away and organized? Is there litter and trash that needs to be picked up?
- Gather in the outdoor classroom and have students share their initial observations. Ask students what their ideas are of a well-maintained garden. How would they rate the current state of their school garden? Hand out the checklist and go over it as a class.
- Give students 5 minutes to survey the garden to identify and tasks that need to be done. Return to the outdoor classroom and share their findings.
- Have students choose the tasks they want to work on and send them out for 10-15 minutes to complete the tasks.

SOURCE

- BCK Programs



Garden To Do List

- 1. WEED.** Check for weeds inside and around the outside of garden beds, in the pathways, and around the perimeter of the garden. Use a trowel to pull weeds out from the roots. Collect weeds in one pile, and make sure it's out of the pathway. This will be the debris pile for the garden and will be collected by the grounds crew within a couple weeks.
- 2. WATER.** Fill up a watering can and check for thirsty plants. If there are rain tanks in your garden, use that water for any ornamental plants but not in the garden beds. Signs to look for are plants that are droopy, have yellow or brown leaves, or have leaves that are falling off. Water the soil around each plant for about 5-10 seconds, just enough to saturate the ground around them. If your garden has any potted plants, they will surely need a drink. Water potted plants for 5-10 seconds each, let the water seep in, and water for another 5-10 seconds.
- 3. RAKE UP LEAVES.** Check for areas in the garden where trees have dropped their leaves. Rake the leaves and place them in a pile next to the compost bins. The leaves will be combined with food scraps to make compost. You will be doing the composters a favor by collecting the leaves as they are essential for composting.
- 4. COLLECT SEEDS FROM SPENT PLANTS.** Check the garden beds and perimeter of the garden for plants with spent flowers. Spent flowers are flowers that have finished flowering and are dying off. The dead part of the flower usually contains seeds. If the plants produced obvious seeds, like sunflowers, sweet peas, or pea pods, collect the seeds and save them in a seed envelope. Ask your teacher for seed envelopes that are provided with the garden activities supplies. Label the seed packet with the name of the plant (if known) and any other information you can find. Place the remainder of the dead plants in the pile with the weeds, or make a new pile out of the pathway.
- 5. SIFT COMPOST.** Check the active stack compost pile (this is different from the worm bin, and should have a sign next to it). If the pile looks dark brown, does not have any visible food pieces in it, and no or very few noticeable leaves and twigs, it is ready to sift. Grab a black nursery tray and place a scoop of compost in the tray. Grab a bucket or wheelbarrow and sift the compost over it. Discard any trash pieces in the trash and return the larger objects and any insects (like worms) to the compost pile. Feed the plants with your sifted compost by spreading a handful around each plant in a garden bed. **NOTE:** Please do not sift all the compost to share this activity with other classes.
- 6. HARVEST WORM COMPOST.** Worm castings are the digested dark matter in the worm bin that does not have visible signs of food- the "Black Gold"). To separate castings, grab 3 small paper trays for each small group of students (these should be located inside the worm bin). Place a small scoop (1-2 cups) of the digested compost in one tray (this will be from the side of the pile that has no visible signs of food and is a dark brown/black). Bring the trays to the tables and pick out the worms placing them in tray 2 and pick out any trash and placing it in tray 3. Place the worms back in the worm bin, throw away the trash and sprinkle the castings around the base of the plants in the garden beds. Use a watering can to water over the applied castings.
- 7. CLEAR AND ORGANIZE CLUTTER.** Sometimes things get left in the garden and need to be organized from time to time. Collect all buckets and stack them in one spot, do the same with nursery pots, organize the potting supplies and put away tools and gloves.
- 8. PICK UP LITTER AND EMPTY TRASH.** Grab a bucket and take a walk around the garden and pick up any litter you find. Be sure to check the perimeter next to fences, where litter tends to collect. Collect all the litter into one bucket and discard it in the nearest trash can. Return the bucket to the garden.
- 9. EXTRA TASKS:** Make a list of extra tasks that need to be done in the garden, like trimming trees, more weeding, etc. and give the list to your teacher so they can give it to the garden coordinator.



Seasonal Planting

SIXTH GRADE

Everybody loves to plant in the garden! Due to the seasonal nature of growing a garden and the logistics of sharing garden space, just a little bit of advance planning will ensure a successful class crop. In this activity, students will plant seeds in a garden bed, make a nature journal entry, and pitch in to do some garden care tasks. Have fun!

SUBJECT

EXPLORE

TIME

30 - 45 MIN

MATERIALS

Empty garden bed (filled with soil but not plants) or empty spaces in the garden beds

Seeds or seedlings to plant

Comprehensive Planting Chart for Zones 9 and 10

Trowels

Watering cans

Finished compost to sift (if applicable)

Black nursery trays

Buckets

Wheelbarrow (if available)

12 - 15 leaves of the same type, either found on the ground or picked from a tree

Blank paper, 1 per student

Pencils, 8-10

Clipboards, 8-10

DIRECTIONS

- A few main tasks will be important to work out as you plan this activity. You will need to:
 - Identify a garden bed to plant in. The assignment of garden beds varies from school to school, so it's best to get in touch with your school's garden coordinator for guidance. If your school doesn't have one, reach out to the district's garden liaison, Barbara Larson of BCK Programs (barbara@bckprograms.com).
 - Identify what you are going to plant. If you are in touch with Barbara, she may be able to get seedlings for your class to plant. If you want to go with seeds, refer to the laminated planting guide titled "Comprehensive Planting Chart for Zones 9 and 10" from the San Diego Seed Company. Locate the month and then look for the O symbol to identify the "Crop Family" varieties that can be planted from seed in that month. Then check to see which of those varieties you have in the Seed Library.
 - From the seeds you selected, read the back of the seed packet and note the planting information so you can plan out the garden bed and direct students on how to plant their seeds (generally, students can use their finger to poke a hole for their seed). You can place trowels or popsicle sticks in the places where students should plant - look for spaces near the emitters in the irrigation tubes so they are planted close to water. Use the Crop Planting Worksheet to record the information from the seed packet, if desired. Plan for students to water the bed after they plant their seeds.
 - Refer to the Garden To-Do List and survey the garden to predetermine the tasks you will assign to students.
 - Schedule one or two volunteers for the day of the activity to help supervise the rotations.
 - Plan to divide students into three groups to rotate through the following stations: Planting, Garden Care, and Nature Journaling.
- On planting day, gather students in the outdoor classroom and introduce each of the three stations.
 - Station 1 Planting: Share with students the types of crops they will be planting and any information about why these were selected. Explain that they will be given specific instructions on how to plant their seeds when it's their turn to plant in the garden bed.
 - Station 2 Garden Care: Identify the tasks that students will complete and any tools they will be using. Talk about how to use

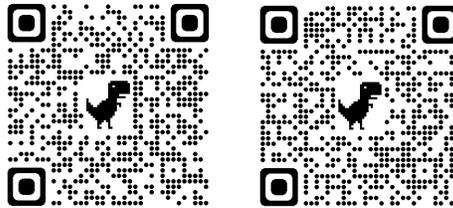


tools safely and other garden rules (walk at all times, keep tools below the waste, etc.).

- Station 3 Nature Journaling: Students will do an activity called “Zoom In, Zoom Out,” where they will select an object and draw it at three scales: from a distance, actual size, and zoomed in. Give students about a minute to select their objects, then give the following instructions to students to guide their drawings. You may want to give students a brief overview of the activity and then leave the detailed explanation for when they are in their rotations.
- (Life-size) Draw a view of your object that is exactly life-size. If it is larger than the page, only draw a portion of it.
- (Zoomed in) Select a part of the object that you find interesting and ‘zoom in’ to observe it in detail. To show this view, draw a circle around that part of your drawing. At the side of the paper, draw a larger circle and draw a magnified view of that same area showing details that are too small to be shown in the life-size picture.
- (Zoom out) Next, imagine your object as if you’re looking at it from afar. Did you select a leaf from a tree? In the zoomed out view, you would draw a picture of the entire tree. Draw the zoomed out view in a blank spot on your paper.
- Assign students to their groups and spend 10 minutes at each rotation. Spend the final 5 minutes enlisting students’ help to put away tools and tidy up the garden.

SOURCE

- BCK Programs | Seasonal Planting
- San Diego Seed Company | [Planting Chart](#)
- John Muir Laws | [Zoom In, Zoom Out](#)



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- 2. WATER.** Fill up a watering can and check for thirsty plants. If there are rain tanks in your garden, use that water for any ornamental plants but not in the garden beds. Signs to look for are plants that are droopy, have yellow or brown leaves, or have leaves that are falling off. Water the soil around each plant for about 5-10 seconds, just enough to saturate the ground around them. If your garden has any potted plants, they will surely need a drink. Water potted plants for 5-10 seconds each, let the water seep in, and water for another 5-10 seconds.
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- 9. EXTRA TASKS:** Make a list of extra tasks that need to be done in the garden, like trimming trees, more weeding, etc. and give the list to your teacher so they can give it to the garden coordinator.



Harvesting Kindness

ALL GRADES

Gardening programs offer many opportunities to show kindness to each other, to the community, and to our planet. This lesson is designed specifically for when there is an abundance of produce to harvest, more than just one class could use, to inspire students to think of others. Students will harvest their crops, conduct a taste test, and then decide how to donate the excess of their harvest.

SUBJECT

EXPLORE/KINDNESS

TIME

OPEN-ENDED

MATERIALS

Read aloud book from the Garden Library (optional)

Buckets (or containers to collect harvest)

Scissors

Trowels

Colanders

Sink or hose

Paper towels

Food-grade bowls (if available)

Taste Test Evaluation, 1 sheet per student

Pencils, 1 per student

Clipboards, 1 per student

DIRECTIONS

- The garden is a great place for teaching empathy for others and modeling kindness. Often the school garden operates in “boom or bust” cycles, meaning there are times when plants are germinating and very little appears to be happening to the naked eye, or conversely an entire garden bed of lettuce must be harvested before it goes to seed. This lesson is designed to get students thinking about what to do when we have abundant resources and to model compassionate behaviors.
- If your class notices that some garden beds are bursting with crops ready to be harvested, but you didn't plant the crops, check with your school's garden coordinator before harvesting to ensure the crops are not already spoken for.
- Gather students in the garden around a garden bed with a successful crop that you plan to harvest. For younger students read *If You Plant a Seed* by Kadir Nelson or *Katie's Cabbage* by Katie Stagliano and ask questions about sharing and how it makes them feel when their friends share with them in class or when their siblings share with them at home.
- As a group, discuss how you might conduct an act of kindness with the food growing in the garden bed. Below are some examples of successful sharing outcomes from EUSD schools.
- **K-2 Salad Party:** Students harvest an entire garden bed of lettuce and celebrate with a huge salad for their class **AND** a salad for all of the teachers. Students write thank you notes for teachers and school staff and place the salad in the Teachers' Lounge.
- **3rd-4th Taste Test Sharing:** Students harvest a crop, like snap peas, peaches, cherry tomatoes, figs, passion fruit, grapes... and hold a taste test first for the class **AND** set up a “taste-test” table during their lunch to share the harvest with fellow classmates.
- **4th-6th: Food Pantry:** Students harvest a crop and prepare it to be delivered to a local food pantry. Often food pantries do not receive fresh fruit and vegetables. There are several food pantries nearby EUSD schools. Contact the district's garden liaison, Barbara Larson of BCK Programs (barbara@bckprograms.com) to arrange for the crop to be delivered.
- Harvesting vegetables that students grew can be a thrilling experience, but can also get chaotic with an entire class gathered around one garden bed. Some tips to help manage the large group are to:
 - Set up several different stations so students can eventually spread out. Older students can manage the stations, while



younger students will need assistance (additional help from another adult is ideal).

- Set out colanders at the sink or hose and assign students to the **Washing Station** where they will rinse all the soil off the vegetables and then take them to the Drying Station.
 - Set up a clean table with paper towels and bowls (if you have them) and assign students to a **Drying Station** where they will dry the vegetables using paper towels.
 - After all the plants have been harvested, assign students to the **Clearing Station** where they will pull out the remaining plants and place them in a pile. Have students wash their hands after this task.
 - After the vegetables are washed and dried, gather in the outdoor classroom and conduct a taste test. How do students rate their crops? Distribute the Taste Test Evaluation to students.
 - Pack up the remaining crops to share with others.
- **NOTE:** Whichever manner your students choose to use to share the crops, make sure the produce is thoroughly washed.

SOURCE

- BCK Programs



Taste Test Evaluation

Food Tasted: _____

	Rate one to five stars (draw) ★★★★★	Description
Look		
Smell		
Texture		
Taste		
Overall Rating		



Worms at Work

SIXTH GRADE

By 6th grade, EUSD students have had an opportunity to explore their school's garden and compost areas. They know their school collects food scraps during lunch for composting. They may not know too many details about the stars of the composting team: the worms. Students participating in this activity will have an opportunity to explore worms up close and learn a bit about their anatomy.

SUBJECT

EXPLORE/SCIENCE

TIME

30 - 45 MIN

MATERIALS

Worms from the worm bin

Bucket or bin for worms

Worm Information Sheet, 1 per student or group

Magnifying lenses, 1 per student

Newspaper, several to share

Qtips, 1 per student

DIRECTIONS

- Ask students if they know why we keep a large worm bin in our garden? (to help us reduce food waste from the landfill) Ask if worms have teeth to chew the food scraps we put inside the bin? (they don't have teeth, but they do have mouths) Ask if they know how the worms process the food scraps that we put in the worm bin? (most people don't)
- Hand out the worm information sheet and ask students to read through it. While students are reading, go to the worm bin and put a large scoop of worms into a bucket.
- Next, hand each student some newspaper, a magnifying lens, a Qtip, and a worm from the worm bin. Invite students to try and identify some of the main parts of the worm listed on the information sheet.
- Remind students to be gentle with the worms, and try to keep worms out of the sun.
- When the observation activity has ended:
 - Return the worms to the worm bin.
 - Wash hands.

SOURCE

- BCK Programs

RESOURCE

- Edible Learning Lab | [Anatomy of the Red Wiggler Worm](#)



Worm Information Sheet

Segments

Adult redworms can have 200 to 400 ringed segments. This set of stacked circular muscles gives the worm its ring segments and works in concert with a set of longitudinal muscles, contracting and expanding to provide the worm with movement.

Each ring segment has a set of little hair-like appendages, known as *setae*, which help it move through soil and allow the worm to grip the surrounding soil when grasped by a predator. The *setae* are very strong and are formed from the same material that makes up our fingernails and the exoskeletons of insects.

Brain and Nervous System

The worm has a simple nerve bundle called the *cerebral ganglion*, which serves as its brain. The worm uses the *cerebral ganglion* to collect sensory input from the world around them, such as light, temperature, moisture, and vibrations.

Digestive System

Without teeth, worms cannot really chew food. Instead, a muscle near the mouth called the pharynx pulls food through their body and into the gizzard. The gizzard is where food mixes with sand and soil and pulverizes food particles so they can be digested. Food can then move into the *intestine*, which takes up nearly two-thirds of the worm's body and is where final digestion and nutrient absorption occurs before waste is expelled through the *anus*. This waste is called worm castings and is what we put directly into our garden beds as compost.

Circulatory System

The worm's circulatory system is powered by five hearts that regulate blood flow and push blood through a set of blood vessels. The *ventral and dorsal vessels* carry oxygen-rich blood throughout the body.

Respiratory System

Worms have no specialized respiratory organs, but they do breathe. Oxygen and carbon dioxide are diffused through the skin. Lack of moisture in the worm's environment restricts the breathing process. Prolonged dryness will cause death by suffocation. Exposure to direct sunlight can lead to death in less than three minutes.

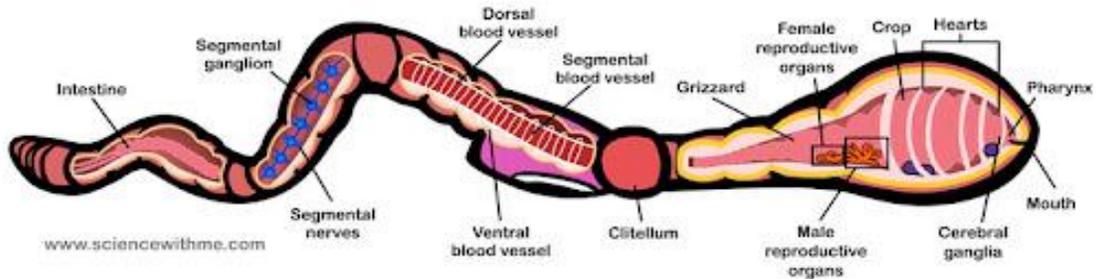
Reproductive System

When a redworm is immature, its body segments are uniform throughout its entire length. As it matures, it develops a bulbous gland about one-third of the way down its body called the *clitellum*. The clitellum produces mucus needed for cocoon production to hold the eggs. Worms have both male and female organs, so they can lay eggs and fertilize them, too. When they mate, they join together at the clitellum and create cocoons to deposit, fertilize, and store eggs. Each cocoon can have as many as five worms. It only takes a few weeks for the baby worms to hatch.

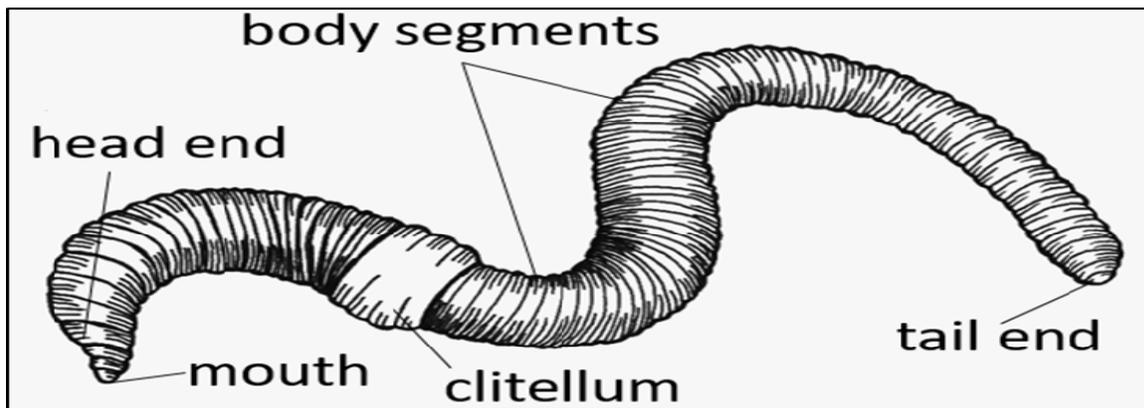
Source: Edible Learning Lab



Worm Diagrams



Source: sciencewithme.com



Source: https://www.kindpng.com/imgv/iRTbmJb_collection-of-free-worm-drawing-download-on-ui/



Anytime Garden Care

ALL GRADES

A gardener's work is never done! To keep your school garden healthy and inviting there are a few basic chores that always need attention. Follow this garden care activity anytime you want to spend time outdoors and keep students tuned in to the garden.

SUBJECT

EXPLORE/
COMMUNITY BUILDING

TIME

OPEN ENDED

MATERIALS

Trowels

Watering cans

Rakes

Seed envelopes (if
applicable)

Finished compost to
sift (if applicable)

Black nursery trays

Buckets

Wheelbarrow (if
available)

Garden To Do List

DIRECTIONS

- Prior to the activity, refer to the Garden To Do List and survey the garden to predetermine the tasks that you will assign to students, then plan to split the class into groups. When a whole class works in the garden, it is a good practice to split up into smaller groups and rotate through tasks to avoid overcrowding.
- Gather students in the garden and ask them to share their favorite parts of the garden. Then ask if they know who takes care of the garden to make sure they can do all of their favorite things? Explain that caring for a school garden is a huge task and today they will be showing kindness to their fellow students and to the garden's caregivers by spending time keeping the school garden in good shape. Caring for the garden will also give students a sense of ownership and community.
- Divide students into groups and explain the tasks to be accomplished, referring to the instructions in the Garden To Do List. Assign each group to one task (i.e., Group 1 - weed, Group 2 - water, Group 3 - sift compost, etc.). Some of the tasks may need to be modeled for younger students.
- Give students 5-10 minutes at the first task and then rotate so students can participate in all tasks.
- After all tasks are complete (or you run out of time) gather students and ask how they feel after pitching in to maintain the garden? Are there any tasks that they need extra help with (such as trimming fruit trees, too many weeds to clear, etc.). Make a list of extra tasks and provide it to your school's garden coordinator.

SOURCE

- BCK Programs



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- 2. WATER.** Fill up a watering can and check for thirsty plants. If there are rain tanks in your garden, use that water for any ornamental plants but not in the garden beds. Signs to look for are plants that are droopy, have yellow or brown leaves, or have leaves that are falling off. Water the soil around each plant for about 5-10 seconds, just enough to saturate the ground around them. If your garden has any potted plants, they will surely need a drink. Water potted plants for 5-10 seconds each, let the water seep in, and water for another 5-10 seconds.
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Garden Poetry

SIXTH GRADE

Students will use their experience in the school garden to inspire them as they compose a haiku poem.

SUBJECT

ENGLISH LANGUAGE
ARTS

TIME

30 - 45 MIN

MATERIALS

Haiku Organizer, 1
sheet per student

Pencils, 1 per student

Clipboards, 1 per
student

DIRECTIONS

- Gather in the outdoor classroom and ask students for their ideas about poetry. Have they ever written a poem? What are poems about? Are there rules to writing poetry? What is the purpose of poetry? Has anyone written a Haiku poem?
- Haiku is a Japanese form of poetry, and it is typically written about nature. There are very specific rules when writing a Haiku. First, a Haiku has just three lines in the entire poem. The first line has five syllables, the second line has seven syllables, and the third line has five syllables.
- Send students to explore the garden in search of inspiration for their Haiku poem. Hand out the Haiku Organizer to help students form their poems.
- Return to the outdoor classroom and have students share garden Haikus with the class.

SOURCE

Adapted from:

- International Reading Association | [Haiku Starter](#)



Haiku Organizer

Topic:

Brainstorm several words about your topic:

Think of a title for your poem:

Use some of the words you brainstormed to create your poem:

Line 1 (5 syllables):

Line 2 (7 syllables):

Line 3 (5 syllables):



Sun Print Art

SIXTH GRADE

Making nature art using sun print paper is a great way to teach kids about the sun and shadows. It also encourages them to observe shapes, patterns, and the various sizes of leaves, plants, and other objects in nature. Sun print paper has special qualities that react with exposure to sunlight, creating gorgeous art displays. This project is best to do on a sunny day.

SUBJECT

ART

TIME

30 MIN - 45 MIN

Move between inside and outside

MATERIALS

Light-sensitive paper, 1 sheet per student

Cardboard (slightly larger than the paper), 1 per student

Pushpins, at least 2 per student

Interesting objects found around the garden: leaves, flowers, flower petals, clover, seed pods

Cardstock, 1 per student

Tub of water to rinse the paper

Paper towels for the prints to lay and dry on

DIRECTIONS

- Take students on a walk through the garden to collect objects for their sun prints. Show students an example of a sun print, so they have an idea of the finished project.
- Due to direct sunlight quickly exposing the paper, the next steps should be done indoors with the lights **OFF**.
 - Pin a sheet of light-sensitive paper to a sheet of cardboard.
 - Arrange a collection of garden objects on the paper, avoiding overlapping. Place a piece of cardboard or cardstock on top to keep in place when transporting outside.
- Go outside and set each paper in the sun for 2-5 minutes. The areas of the paper exposed to the sun will fade from blue to white. When most of the color disappears from the paper, the print has been fully exposed. If no direct sunlight is available, expose the print for a few more minutes.
- Once the exposed paper has turned almost white, remove the objects and rinse the paper in water to stop the chemical reaction. As the paper is submerged, the white will turn to blue, and the blue will turn to white. Leave each paper in the water for 1-5 minutes.
- Lay the sun prints out on a paper towel and allow them to dry. You can use a paper towel or a piece of cardboard.

SOURCE

Adapted from:

- Run Wild My Child | [Sun Print Paper Nature Art](#)



A Mindful Moment

SIXTH GRADE

Students are very busy, and school is filled with expectations, successes, and challenges. In this activity, students will take a moment to appreciate the quiet and reflect on happy and peaceful thoughts as they clear their minds and create a mindfulness garden.

SUBJECT

SOCIAL-EMOTIONAL

TIME

30 - 45 MIN

MATERIALS

Reusable plates, 1 per student

Birch forks, 1 per student

Sand, enough for 1-2 cups per student

Collected items from the garden such as small pebbles, twigs, dried seeds or leaves

Photo examples of mindful gardens

Small paper bags to take home items so students can recreate the garden any time

DIRECTIONS

- Hand students each a small paper bag. Ask them to look around the garden and collect very small items, like pebbles, twigs, dried leaves, etc. They should find about ten small items.
- Next, have students sit in a circle in the shade. Tell students for this part of the activity they need to be very quiet, and talking is not allowed. Ask students to close their eyes and listen to the sounds of the garden. Maybe it is a bit breezy, and they can hear leaves rustling? After one minute of listening, ask students to clear their minds of everything and only focus on what makes them feel happy and calm.
- While they are quiet and thinking, hand out the plate and birch fork, place a few scoops of sand on each paper plate. Tell students they will be creating a mindfulness garden with the sand and the items they collected. Pass around a few photo examples and explain that the goal is to keep their minds calm while creating the mini garden. As part of a calming behavior, students can use the birch fork to groom the sand.
- Students may disassemble the mini garden and place sand, pebbles, and twigs back in the bag to bring home. Then, whenever they feel apprehensive or stressed, they can repeat the exercise on a plate or pie tin of their own.
- Extension: Ask students to write one paragraph about what they focused on to make them feel calm and why.

SOURCE

- BCK Programs



Examples of Mindful Gardens



Photo Credit: [Balcony Garden Web](http://BalconyGardenWeb.com)



Garden as a System

SIXTH GRADE

Systems are all around us. A system is a group of two or more things that work together to form a whole. The school garden is a perfect example of a system that depends on many different inputs to be in balance. In this activity, students will explore the garden to identify many parts that make up the school garden system.

SUBJECT

SCIENCE

TIME

30 - 45 MIN

MATERIALS

Garden System Worksheet, 1 per student

Pencils, 1 per student

Clipboards, 1 per student

DIRECTIONS

- Find a shady spot in the garden to lead a class discussion. Elicit student ideas about what they think is the definition of a system. Give an example of the human body. The human body is a system made up of many parts. Would the human body function properly if one of its organs were removed, like the heart? No, it wouldn't. The heart is an essential part of the human body's system. What is another essential part?
- Ask if they think the school garden is a system and ask them to name all of its parts—record ideas on the board. Write the word "Garden" in the center and the parts listed around it.
- The main parts of a garden system are sunlight, soil, water, air, plants, animals, and people. Accept other ideas if they make sense and have students record all the parts on their worksheet.
- Explain that in today's activity, they will explore all the parts of the school garden's system to become more familiar with them and then answer the following questions: What is the function of each part? How does each part interconnect with other parts? What would happen to the garden system if we removed one of the parts?
- Send students out into the garden to explore all the parts. After students have answered the questions, lead a group discussion so students can share their ideas. Also, ask if they observed any failing parts in the garden (i.e., droopy or dead plants could mean not enough water, excessive weeds could mean not enough maintenance, etc.). What needs to be done to fix that part of the system?
- Ask students if any of the solutions to the identified problems could be done immediately. Then, spend the rest of the time weeding, watering, cleaning up, etc.
- These observations will be helpful to the school garden's caretaker - feel free to share with Barbara Larson barbara@bckprograms.com.

SOURCE

- BCK Programs



Garden System Worksheet

GARDEN PART (Ex. Soil)	FUNCTION and INTERCONNECTIONS	WHAT WOULD HAPPEN IF REMOVED?



Example: Garden System Worksheet

GARDEN PART (Ex. Soil)	FUNCTION and INTERCONNECTIONS	WHAT WOULD HAPPEN IF REMOVED?
Sunlight	Provides light and heat. Plants need light for photosynthesis; light keeps people and animals warm.	Plants would die, and without plants as a food source, animals would not survive.
Air	Provides oxygen. Plants and animals/people need oxygen to breathe, plants for photosynthesis.	Plants and animals/people would not survive.
Water	Provides hydration. Plants and animals/people need water to survive.	Plants and animals would not survive.
Soil	Provides nutrients and foundation. Plants get their nutrients from the soil. It also provides a foundation for roots and a habitat for decomposers.	Plants would need to get nutrients and stability from another source; decomposers would not survive.
Plants	Provide food and shade, absorb CO ₂ , release oxygen back into the air. Plants provide food, shelter, and shade to people and animals, and they help clean the air for people to breathe.	People and animals would have to get food elsewhere.
Animals	Decomposers break down plants to provide nutrients, pollinators help plants reproduce to make food, predator insects protect plants from bad insects.	Plant and animal waste would not break down into nutrients in the soil; many plants would not produce edible parts (i.e., fruits), many plants could be destroyed without predator insects to protect them.
People	Make sure plants have what they need to grow by watering, weeding, making sure the soil is healthy, plant, harvest, and eat garden crops. People breathe air, drink water, tend to the soil, take care of and eat plants, leave garden animals alone to do their jobs.	Likely, a school garden would not exist without people to taking care of it.



Planting: Soil Science

Part 1 of 2

SIXTH GRADE

Knowing how the soil in a garden or farm is composed ensures it is in top condition to grow nutritious food. In this activity, students take on the task of many organic farmers. They conduct a series of observations and tests to determine the health of the soil in the garden and discuss what they can do to improve the quality. Students will amend the soil (if necessary), and in Part 2 they will plant a garden bed.

SUBJECT

SCIENCE

TIME

45 MIN - 1 HR
+
30 - 45 MIN follow up to plant

MATERIALS

Empty Garden Bed (filled with soil but not plants)

Soil Test Information Cards

Ruler for Test 2

Shovels, several to share for Tests 2 and 3

Blank sheet of paper, pencil, and clipboard, 1 per group

pH test kit for Test 4

Watering can or hose

DIRECTIONS

- Identify an empty garden bed ready for planting prior to the activity. Gather students in the outdoor classroom and prompt a discussion about soil health. Has anyone planted in a garden before? How would you describe the soil? (color/texture) Was the soil healthy? How could you tell? What happens when you plant a garden in soil that isn't healthy? Why? (plants don't thrive because they don't get the correct balance of nutrients, they become more susceptible to harmful insects, and poor soil can impact their ability to take in water)
- Briefly explain to the class that you will be planting a crop in the bed, and you'll need to determine if the soil is healthy and what nutrients the class might need to add to make the crop thrive.
- Divide teams into four groups and give each group a Soil Test Information Card, blank sheet of paper, clipboard, and pencil.
- Distribute the ruler and a few shovels for Test 2, a few shovels for Test 3, and the soil meter (or pH strips) for Test 4. Then, without too much intervention, allow students to run the test as listed on the card and record data on their paper.
- Come back together as a class and ask each group to share how they conducted the test and the test results. As a group, decide if anything should be added to the soil prior to planting.
- Contact Barbara Larson at barbara@bckprograms.com if any soil amendments need to be purchased prior to planting.

SOURCE

Adapted from:

- The Spruce | [Four Simple Do-It-Yourself Soil Tests](#)



SQUEEZE IT

Take a large handful of soil into your hand and try to make a very tight ball.

1. If it holds its shape and then crumbles when you give it a poke, it is likely you have “loamy” soil. Loamy soil is really good for growing plants because it holds moisture and nutrients while also providing lots of air pockets for roots to grow.
 2. If it holds together tightly, you likely have clay soil, which means less oxygen and ease for roots to spread out. Add compost to clay soil to loosen up the clay so plants can get oxygen and roots can spread out.
 3. If you cannot make a ball because the soil is too crumbly, your soil is sandy. Sandy soil does not stay moist and usually lacks many nutrients. Add compost to sandy soil to improve the water retention of the soil. Compost helps sandy soil hold water.
 4. Write down the type of soil and your recommendations.
-



PERC IT

Dig a hole in the soil about 1 foot deep and fill it with water. Keep track of how long it takes for the water to drain into the soil.

1. If it drains in less than 10 minutes, you have soil that does not hold moisture well, indicating that it probably has a high sand content. Add compost to the soil to improve water retention.
 2. If it doesn't drain after 30 minutes, this shows that you probably have a high clay content. Add compost to the soil to improve water drainage.
 3. If the soil drains between 10 and 30 minutes, you have the ideal drainage rate, and nothing needs to be added to the soil.
 4. Write down the drainage time and your recommendations.
-



DIG IT

Dig a deep hole in the garden bed. Sift through the soil from the hole and look for worms.

When you see soil with worms in it, you can be sure there is lots of other good stuff happening. Worms snack on microbes that also benefit plants. Added bonus: Earthworms create air pockets in the soil and keep it light and fluffy, so roots have space to grow.

1. Did you find any worms? If you found at least 10 worms in the soil from the hole you dug, you have found evidence of nutrient-rich soil.
 2. If you didn't find at least 10 worms, dig a little deeper to see if you can find more. If you still don't find more worms, add compost, which is decomposed organic matter, to attract worms. Also, top the garden bed with a few inches of compost to act as a mulch to keep the soil cool and moist.
 3. Write down your findings and recommendations.
-



STICK IT

Follow the directions on the pH test kit to test the soil's pH level.

Most plants like to grow in soil that has a neutral pH level. This means it does not have too high or too low of an acid "alkaline" level.

1. The pH is measured on a scale of 0-14. A reading between 0-4 means the soil is acidic and probably not too friendly for plants. Add a limestone product to the soil to increase the pH. This type of amendment can be purchased at garden centers.
 2. If you get a reading between 8-14, this means your soil is alkaline, and you may have challenges getting plants to grow. To decrease the pH of the soil, add sulfur or aluminum sulfate, also available at garden centers. You could also lower the pH of the soil over time by regularly adding compost.
 3. If you get a reading between 5-7, the pH is ideal for plants, and no adjustments are needed.
 4. Write down the soil's pH and your recommendations.
-



Planting: Design & Engineering

Part 2 of 2

SIXTH GRADE

In Part 1, Soil Science, students conducted a series of tests and made recommendations on how to improve soil health. In this activity, students will take on different tasks to design a garden bed taking into consideration the season, seed depth, and spacing. Students will also research recipes for the crops they choose to plant.

SUBJECT

SCIENCE

TIME

1 HR

MATERIALS

Empty Garden Bed (filled with soil but not plants)

Soil amendment (based on the recommendation from previous activity)

Tools - rakes, and shovels to work amendment into soil

Comprehensive Planting Chart for Zones 9 and 10

Seeds/Seed Library

Crop Decision Worksheet

Crop Planting Worksheet

iPads for researching recipes, 1 per member of Culinary Team

Recipe Card Worksheet. 1 per group member

Garden Bed Sketch Sheet, 1 per student

Pencils, 1 per student

Colored pencils, several to share

Tools from "Garden To Do List" (if applicable)

DIRECTIONS

- Any time a class plants in the school garden, it is a good practice to split up into smaller groups and rotate through tasks, so the planting space doesn't get too crowded. Additional adult supervision is also helpful. Prior to the activity, refer to the Garden To-Do List, and then visit the garden to identify the maintenance tasks that you will assign to students.
- Several tasks will be accomplished in this activity:
 - **Soil Team:** amend soil based on class recommendations from previous activity
 - **Crop Decision Team:** research for seasonality and preference. Decide what to plant (Team 2)
 - **Crop Planting Team:** research planting requirements for the selected seeds (Team 3)
 - **Culinary Team:** research recipes to make with the harvest
 - All teams will do garden maintenance as part of their rotations
- Rotation 1 (10 min):
 - Soil Team - send to the garden bed and instruct students to work the selected amendment into the top 6-10 inches of the garden bed and then smooth the surface so that it's even
 - Crop Decision Team - read the worksheet and decide what crops to plant based on the season and preference
 - Crop Planting Team - assign a garden maintenance task from the Garden To-Do List
 - Culinary Team - assign a garden maintenance task
- Rotation 2 (10 min):
 - Soil Team - assign a garden maintenance task
 - Crop Decision Team - assign a garden maintenance task
 - Crop Planting Team - research the planting requirements and fill out the worksheet
 - Culinary Team - research recipes to make with the harvest and fill out a recipe sheet
- Rotation 3 (10 - 15 min):
 - All teams - Sketch a bird's eye view of the selected crops
 - Take the Crop Planting Team to the garden bed and plan out where to plant the seeds..
 - Rotate each team individually to plant seeds

SOURCE

- BCK Programs



Garden To-Do List

- 1. WEED.** Check for weeds inside and around the outside of garden beds, in the pathways, and around the perimeter of the garden. Use a trowel to pull weeds out from the roots. Collect weeds in one pile, and make sure it's out of the pathway. This will be the debris pile for the garden and will be collected by the grounds crew within a couple weeks.
- 2. WATER.** Fill up a watering can and check for thirsty plants. If there are rain tanks in your garden, use that water for any ornamental plants but not in the garden beds. Signs to look for are plants that are droopy, have yellow or brown leaves, or have leaves that are falling off. Water the soil around each plant for about 5-10 seconds, just enough to saturate the ground around them. If your garden has any potted plants, they will surely need a drink. Water potted plants for 5-10 seconds each, let the water seep in, and water for another 5-10 seconds.
- 3. RAKE UP LEAVES.** Check for areas in the garden where trees have dropped their leaves. Rake the leaves and place them in a pile next to the compost bins. The leaves will be combined with food scraps to make compost. You will be doing the composters a favor by collecting the leaves as they are essential for composting.
- 4. COLLECT SEEDS FROM SPENT PLANTS.** Check the garden beds and perimeter of the garden for plants with spent flowers. Spent flowers are flowers that have finished flowering and are dying off. The dead part of the flower usually contains seeds. If the plants produced obvious seeds, like sunflowers, sweet peas, or pea pods, collect the seeds and save them in a seed envelope. Ask your teacher for seed envelopes that are provided with the garden activities supplies. Label the seed packet with the name of the plant (if known) and any other information you can find. Place the remainder of the dead plants in the pile with the weeds, or make a new pile out of the pathway.
- 5. SIFT COMPOST.** Check the active stack compost pile (this is different from the worm bin, and should have a sign next to it). If the pile looks dark brown, does not have any visible food pieces in it, and no or very few noticeable leaves and twigs, it is ready to sift. Grab a black nursery tray and place a scoop of compost in the tray. Grab a bucket or wheelbarrow and sift the compost over it. Discard any trash pieces in the trash and return the larger objects and any insects (like worms) to the compost pile. Feed the plants with your sifted compost by spreading a handful around each plant in a garden bed. **NOTE:** Please do not sift all the compost to share this activity with other classes.
- 6. HARVEST WORM COMPOST.** Worm castings are the digested dark matter in the worm bin that does not have visible signs of food- the "Black Gold". To separate castings, grab 3 small paper trays for each small group of students (these should be located inside the worm bin). Place a small scoop (1-2 cups) of the digested compost in one tray (this will be from the side of the pile that has no visible signs of food and is a dark brown/black). Bring the trays to the tables and pick out the worms placing them in tray 2 and pick out any trash and placing it in tray 3. Place the worms back in the worm bin, throw away the trash and sprinkle the castings around the base of the plants in the garden beds. Use a watering can to water over the applied castings.
- 7. CLEAR AND ORGANIZE CLUTTER.** Sometimes things get left in the garden and need to be organized from time to time. Collect all buckets and stack them in one spot, do the same with nursery pots, organize the potting supplies and put away tools and gloves.
- 8. PICK UP LITTER AND EMPTY TRASH.** Grab a bucket and take a walk around the garden and pick up any litter you find. Be sure to check the perimeter next to fences, where litter tends to collect. Collect all the litter into one bucket and discard it in the nearest trash can. Return the bucket to the garden.
- 9. EXTRA TASKS:** Make a list of extra tasks that need to be done in the garden, like trimming trees, more weeding, etc. and give the list to your teacher so they can give it to the garden coordinator.



Crop Decision Worksheet

Refer to the laminated color-coded planting chart titled “Comprehensive Planting Chart for Zones 9 and 10”.

1. Find the current month at the top of the chart.
2. Look for the O symbol in the rows below your month. Follow the row to the left to locate the “Crop Family.” These are varieties that you can plant from seed this month.
3. Working as a group, call out the name of the plant variety and have a partner check the seed library to see if you have that type of seed. If you do, pull the seed packet and set it aside.
4. From the seeds you identified, decide on four varieties that you would like to plant. Consider if you want to grow a themed garden. Some ideas include:

Herb Garden

Pizza Garden

Salad Garden

Salsa Garden

Soup Garden

Stir fry Garden

5. Provide the four seed packets to the Crop Planting Team.



Crop Planting Worksheet

Refer to the planting instructions on the seed packet and record the information in the table below.

Plant Name	
Planting Depth	
Plant Spacing	
Plant Height	
Other Planting Tips	

Plant Name	
Planting Depth	
Plant Spacing	
Plant Height	
Other Planting Tips	

Plant Name	
Planting Depth	
Plant Spacing	
Plant Height	
Other Planting Tips	

Plant Name	
Planting Depth	
Plant Spacing	
Plant Height	
Other Planting Tips	

Based on the Plant Spacing of all the selected crops, visually layout where each seed will be planted and assist your classmates in planting seeds at the correct locations and depths.



Garden Bed Sketch

Make a sketch of what your garden bed will look like when all the plants are growing. Imagine you are looking down on the garden bed from above; this is a birds-eye view. Try your best to sketch the bed "to-scale." This means to draw the size of the bed and all the plants inside proportionally to one another. Use the squares in the graph paper to help you estimate the relative sizes and shapes.

