



Green Classroom

Green Gardening

TEKS Science: 5.1(A, B), 5.2(B,C,D,F), 5.3(A,D), 5.4(A,B), 5.9(A,B,C), 5.10(A)

Social Studies: 9(A, B)

Reading: Students learn academic vocabulary in meaningful context, 5.27(A), 5.28, 5.29

AISD Essential Science Vocabulary

mixture, solution, dissolve, screen, pollution, flow

Concept

Green gardening protects water quality.

Objective - Students will:

- 1) know and practice three rules of green gardening:
 - A. Fertilize with compost (students will learn to make compost);
 - B. Identify the bugs in the garden (beneficials and pests) and;
 - C. Pull weeds instead of using chemicals.

Time

one hour

Materials: Provided at the Green Classroom

- ✿ "Good Bugs" "Bad Bugs" posters
- ✿ Texas Bug Book
- ✿ 4 Microscope viewers
- ✿ Bug collection net container
- ✿ Gardening gloves
- ✿ Gardening tools
- ✿ Seeds
- ✿ 4" compostable pots
- ✿ Wax pencils

Student Take Home Materials at the Green Classroom

- ✿ "Ask Me about a Green Garden" stickers
- ✿ "Clean Creek Challenge"

Preparation: Provided by the Earth Camp Assistant

Set up tools for the 4 stations:

- ✿ composting
- ✿ plant a seed and water garden with rainwater
- ✿ weeding
- ✿ garden bugs

LESSON: Green Gardening

REVIEW GREEN CLASSROOM RULES:

1. Stay on the sidewalks and pathways to avoid stepping on plants.
2. Keep tools below your belt when using them.
3. Use tools and materials for the activities and put them back when finished.
4. There is one bathroom inside. If you need to use the restroom, excuse yourself and go.

ENGAGE

Ask students the meaning of Green Gardening. Explain the answer. (“Green” means environmentally friendly.) Tell students they will practice Green Gardening in this lesson.

EXPLAIN PROCEDURE

1. State Three Rules of Green Gardening

- ☛ COMPOST FOR FERTILIZER - instead of using chemical fertilizers
- ☛ IDENTIFY GARDEN BUGS - instead of using pesticides
- ☛ PULL WEEDS AND MULCH - instead of using weed killer

2. Composting for Fertilizer

(Present this activity at the compost pile located in the back of the Green Classroom.)

- ☛ Explain:

“Garden plants, like vegetables and flowers that do not grow in Austin naturally, need fertilizer to grow well in our dry Austin soil. However, fertilizer in our creeks and river is one of our biggest pollution problems. It causes too much algae in the creek.”

- ☛ Green Gardening Solution:

“We can compost at home to make our own fertilizer. By making your own compost, you are imitating nature by recycling plants back into dirt. **TEKS Connection:** When chemical fertilizer **dissolves** in water as a **solution**, it can run off with the rainwater into the creek. The fertilizer in compost is bound up in the soil, so cannot dissolve in water. The compost is a **mixture**. When it is combined with water it does not dissolve. The compost can settle out because it is heavy. Then the water will not have any of the compost in it.

- ☛ Teach Compost Ingredients and Proportions:

1) 1 part green plant waste (still has some life in it, so it has color and smell, e.g. banana peels, lettuce, carrot tops, fresh cut grass, just pulled weeds, etc.) Show examples and add to the compost pile.

2) 3 parts brown plant waste (has been dead a long time, e.g. leaves, wood, sawdust). Add to the compost pile.

4) Add Enough water to keep damp

5) NO MEAT, DAIRY, GREASY FOOD, SCAT OR BONES

- ☛ Show the finished compost. Use the **screen** to filter out a pile and look at all the bugs. “Compost is full of bugs you can see and bugs you cannot see that decompose the plants in the compost into soil. The bugs are called **decomposers**.”

3. Plant a Seed

Demonstrate Directions: Tell students each one will get a 2 inch planter and a seed. Tell them to fill the cup with finished compost (stage 3). Plant a seed near the top of the soil. Students should take their plant home, place it in a sunny area and water every other day. Once the seed has sprouted and begins to grow into a sturdy plant, transplant to the garden or a large pot. Be sure to add more compost and continue watering until the plant is established.

Watering the Garden – Show students the rainbarrel and demonstrate how to fill a watering can using the spout at the bottom of the barrel. Demonstrate how to water the roots of the plants, avoiding getting the leaves wet.

4. Weeding

- ☛ Explain the problem:

“Many people spray weed killer regularly on their lawn to prevent weeds. The problem with this practice is that our scientists are finding trace amounts of weed killer in the creeks and river. It’s even been found at Barton Springs. Weed Killer can harm amphibians.”

✿ Explain the Green Gardening solution:

“Weeds can be pulled by hand instead of using weed killer. Garden gloves to protect the hands and a weeding tool are required because the weed must be pulled out including the root to get rid of it permanently. Mulch areas that have been weeded. Compost the weeds (without seeds) to recycle and make something good for the garden.”

✿ **5. Garden Bug Identification**

✿ Explain the problem:

“Many people spray pesticides regularly on their lawn and garden to prevent bugs from eating their plants. The problem with this practice is that trace amounts of some types of pesticides are showing up in our creeks and river, causing harm to macroinvertebrates. Also, the bugs that are good for the garden are also killed along with any bad bugs. Sometimes this will make the garden worse in the long run because there are no pollinators to make the flowers produce fruit and vegetables, and there are no **predators** to eat bad bugs.”

✿ Explain the Green Gardening solution:

“IDENTIFY GARDEN BUGS. Some examples of good bugs are: ladybugs (eat aphids), bees (pollinate), wasps (kill some kinds of caterpillars), preying mantis. Lizards, birds, and spiders are good too, although not classified as bugs! Some examples of bad bugs you can find in this garden are: snails, pillbugs and grubs.

SOLUTIONS for bad bugs that will not harm the water:

⇒ If it is eating the garden, it is probably good for decomposing the compost pile. The solution is to move the bad bug from the garden to the compost pile.

⇒ Another option is to leave the bad bug in the garden if it is not causing large destruction, and especially if it is a bug that will metamorphosize into a good bug, e.g. caterpillars (butterflies) and grubs (beetles). A healthy garden needs a balance of good and bad bugs.

⇒ The last option is to eliminate the bad bug from the garden by putting it in the net container.

⇒ If it is a good bug, leave it in the garden.

⇒ Explain some natural ways to treat bad bugs: pill bugs are attracted to grapefruit rinds and beer; nematodes can be introduced to kill grubs; insect netting can be used as a physical barrier.”

EXPLORE (Students rotate through the four stations below)

Compost: Possible tasks -

- ✿ Turn one pile into the next bin to aerate.
- ✿ Sift compost that has decomposed enough to use in the garden
- ✿ The plant waste from the activities in the garden should be composted by the students.

Bugs:

- ✿ Give each pair of students a magnifier and allow them to go to different areas of the garden to find bugs.
- ✿ Help students check the bugs they found on the “Good Bugs” “Bad Bugs” posters.
- ✿ Put bad bugs in bug jail (the net bag), and the good bugs in the garden.

Plant a Seed and Water the Garden

Gardening: Possible tasks -

- ✿ Use a sandwich baggie to harvest individual salads from the Earth Camp beds.
- ✿ Taste herbs from the herb bed.
- ✿ Give each student a pair of gardening gloves and a weeding tool. Set out an empty bucket to collect weeds for the compost. Weed the garden in designated areas only.
- ✿ Prepare designated beds with finished (stage 3) compost.
- ✿ Plant a prepared bed with seeds or starts.

EVALUATE

Evaluate the health of the garden by asking the following questions:

“Are there more good bugs than bad bugs?”

“Is there a balanced ecosystem?”

“Are the vegetable plants healthy?”

If the answers to these questions are yes, then no action is required. If the answers are no, help students decide on a plan of action that will protect water quality and the garden.

CLOSING

- ✿ Give students “Clean Creek Challenge” for homework and a sticker.
- ✿ Students will bring home the seed they planted.