GARDEN BED CONSTRUCTION

Allow students to accurately and creatively identify a garden bed construction plan that may be used in your school's outdoor space.

Introduce students to a specific set of constraints - the amount of area that can be taken up by garden beds, funding issues, and material resources. Encourage students to think about the restrictions in a constructive way - how can you make the most of a potentially limited situation?

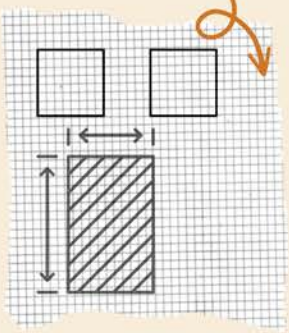
Divide students into table groups of 4-5. Their materials should include graphing paper, calculators, rulers, writing utensils, etc.

Allot each group the same budget (this will depend on what is actually available to your specific school).

Price items like lumber, power tools, and manual labor to ensure that the budget encourages creative thinking.

Delve into environmental areas of concern- how will the plants excel in larger plots within each garden bed? Should the beds be flat or raised? Does the material each bed is made of (aluminum/wood) affect the plant in any way?

Example of a student mock-up



Following the paper design, students should also be challenged to construct a 3D model using the plans they created as a team. These models should be made using simple materials such as cardboard or popsicle sticks.

Reflection

Questions to consider following the lesson

- What team designed the most productive, least financially exhaustive garden bed?
    - Will this team's bed be suitable for the class to use long-term in the garden?
- How will creating garden beds be beneficial to the class as a whole?
    - What can we grow within the handmade beds in order to better enrich our school experience? Microgreens? Holistic plants?

Lesson Plan Source: Green Education Foundation

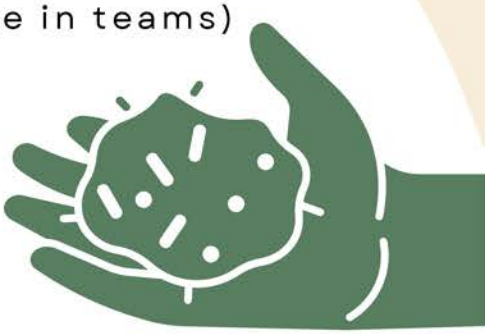
Duration: 1-2 hours
Subject Areas: Horticulture, Critical Thinking, Environmental Science, Mathematics

SOIL EXAMINATIONS
TEST THE SOIL AROUND YOUR SCHOOL

Students should have had a basic lesson detailing how different soil compositions may make for more satisfactory or more destructive plant conditions.

Lab Materials

- Standard Mason jars (enough for students to use in teams)
- Handheld shovels or trowels
- Gloves (optional)
- Kitchen strainer or sieve
- Rulers
- Granular dishwasher detergent (1 tablespoon per jar)
- Online/paper lab worksheet



Tailor this lab to any previous lessons dealing with how the silt, clay, and sand levels of soil affect the growth of plants)

Instructions

This lesson may be completed totally outside, giving students outdoor time and experience

- Begin by splitting students into groups of 3-4, giving each group a jar, shovel, sample of detergent, and strainer
- Direct each group to a different area outside, with some amount of distance between so the soil tests may be over a vast area
- Have students dig into the soil deeper than surface level in order to get an accurate reading of the soil
- Sift the soil before inserting it into the mason jar
- Add water and detergent. Shake vigorously
- Let sit for 5 minutes, marking where the sand and silt settle

Using what is found, how can we make the most of the soil in our area?

Following this lesson, two lab sessions are recommended to test the soil samples taken from the school garden.

Lesson Plan Source: Growit Buildit

Duration: 1-2 50 minute class periods
Subject Areas: Environmental science, Critical thinking

POLLINATOR SCIENTIFIC WRITING

BACKGROUND

Technical writing is an explicit form of writing used to provide instructional information to its readers. Researchers use technical writing to communicate information and relay research findings.

1. PROCEDURE

Have students visit the pollinator garden and allow them to observe different pollinator insects for a few minutes

2.

Have students select a pollinator insect and tell them they have 10 minutes to write a technical writing piece. This piece should fully describe the insect using only facts that are observed by the student.

ENGAGEMENT

Pair students in groups of two or three and have them read their partner's technical writing piece to identify the insect. Then, have them return to their pollinator insect and list ten adjectives describing the pollinator and its relationship to the garden. Once the students have made their list, have them write a paragraph using the ten words.

Lesson Plan Source: Green Education Foundation

Duration: 30-40 mins
Subject Areas: Art, Mindfulness, Environmental Science

POLLINATOR SCIENTIFIC WRITING

4.

Have students share their paragraphs with the class. Once this is done, have students compare the two writing styles. Which style do they like best? Why? When would you use the technical writing style? When would you use the creative writing style?

Writing Objectives

Develop an understanding of technical writing.

Supplies

Paper, Writing utensil, Clip board

Use observational skills to identify pollinator species.

Lesson Plan Source: Green Education Foundation

Duration: 30-40 mins
Subject Areas: Writing mechanics, Mindfulness, Environmental Science

Sprouting Seeds

DESCRIPTION

Students will plant seeds that are quick starters in a variety of containers – plastic cups, 2 liter bottle on its side, peat cup, etc. Then, they will study the growth of their seed through the plant development process.

MATERIALS

- Various planting containers (plastic cups, 2 liter bottle with a slit cut out of its side, peat cups, clear CD gem case, fingertips of a clear food handling glove, etc.)
- Soil
- Quick start seeds (lettuces, beans, alfalfa, etc.)
- Inside a Seed Sheet
- Sprouting Seeds Daily Growth Chart

BACKGROUND

Learning about the growing process is a basis for science inquiry and data collection. Not only will students learn about the seed-to-plant process, they will learn about the unexpected, as seeds don't always sprout the way that they're supposed to. This encourages students to become critical thinkers, employing out-of-the-box thinking to solve problems through plants.

Lesson Plan Source: Save our Monarchs

Duration: 2 hours
Subject Areas: environmental science and Biology

Sprouting Seeds

ACTIVITY

1. Ask students what they know about seeds. Ask the students if they know how to plant a seed and what a seed needs to grow (soil, water, sunlight, nutrients). Make a K-W-L chart or list this on the board with their responses. A K-W-L chart is divided into three sections

2. Using the *Inside a Seed* Sheet, explain that seeds have different characteristics (shapes, sizes, hard, soft), but all have the same things inside them to turn into a plant.

3. Allow students to observe the different types of seeds and share some of the information on the seed packets

4. Demonstrate how to plant a seed. Seeds shouldn't be buried deeply. The planting depth should be based on the size of the seed.

5. Allow students to select their seed type and container and plant the seeds. After the seeds have been properly planted, have students water their seeds and put them in a sunny spot.

6. Then have students make predictions using their Sorting Seeds Daily Growth Chart. This chart can be placed in their garden journal so that the students can refer back to it as time goes by.

7. Over the next 24 days, have the students write about or draw a picture of their seed/plant each day and continue to fill out the Sorting Seeds Daily Growth Chart. On the last day, have students review their predictions and discuss the outcomes

8. Plants can be sent home or planted in the garden or a pot outdoors.

Lesson Plan Source: save our monarchs

Duration: 2 hours
Subject Areas: environmental science and Biology

VIRGINIA NATIVE POLLINATORS

Botanical Coloring Pages

Source: Gardenia

Garden Phlox

Scientific Name: *phlox paniculata*
Alternative Names: Perennial Phlox, Summer Phlox
Growth: Can grow up to 4 feet tall, and has long blooming season- from summer to early fall
Attracts: Birds (especially hummingbirds) and butterflies
Colors: White, Lavender, Pink, Rose, Red, Bi-Color

Scientific Name: *coreopsis tinctoria*
Alternative Names: Nuttal Weed, Goldenwave, Calliopsis
Growth: Thrives in poor, sandy, or rocky soils, and is drought tolerant
Attracts: Butterflies. Deer resistant and pest free
Colors: Bi-Colored. Yellow with Reddish-Brown center disks

Golden Tickseed

Lesson Plan Source: Green Education Foundation

Duration: 30-40 mins
Subject Areas: Art, Mindfulness, Environmental Science

Butterfly Weed

Scientific Name: *asclepias tuberosa*
Alternative Names: Indian Paintbrush, Swallow Root
Growth: A critical plant to the survival of monarch butterflies, whose population in North America have decreased by 90% in the last 20 years. Drought tolerant.
Attracts: Butterflies, bees, and hummingbirds. Deer resistant and pest free
Colors: Orange

Scientific Name: *solidago canadensis*
Alternative Names: Canadian Goldenrod, Giant Goldenrod
Growth: A rhizomatous, spreading perennial that can grow up to 5 feet tall. Known for its arching branches
Attracts: Butterflies and bees
Colors: Yellow

Golden Rod

Lesson Plan Source: Green Education Foundation

Duration: 30-40 mins
Subject Areas: Art, Mindfulness, Environmental Science

Bee Balm

Scientific Name: *monarda didyama*
Alternative Names: Bergamot, Oswego Tea
Growth: A fast growing plant with a minty fragrance. It is used to make tea and its leaves can be used in salads
Attracts: Butterflies, bees, hummingbirds. Deer and rabbit resistant
Colors: White, Lavender, Purple, Pink, Rose, Red, Scarlet

Scientific Name: *echinacea purpurea*
Alternative Names: Canadian Goldenrod, Giant Goldenrod
Growth: Their central cones blacken in the fall, providing seeds for bird food. Drought, heat, and humidity tolerant
Attracts: Butterflies and hummingbirds. Deer resistant
Colors: Lavender or Purple with Dark Brown central cone

Purple Cone Flower

Lesson Plan Source: Green Education Foundation

Duration: 30-40 mins
Subject Areas: Art, Mindfulness, Environmental Science

Common Milkweed

Scientific Name: *asclepias syriaca*
Alternative Names: Silk Grass, Silky Swallow Wort, Virginian Silk
Growth: A rhizomatous perennial with a sweet scent. They grow in domed clusters of star-like flowers. This plant is also critical to monarch butterflies!
Attracts: Butterflies, bees, and hummingbirds. Deer resistant and pest free
Colors: Pink

Scientific Name: *rudbeckia hirta L.*
Alternative Names: Yellow Ox-eye Daisy, Brown Betty, Golden Jerusalem
Growth: A biennial or short-lived perennial. Drought and heat tolerant. They can be easily propagated by seed
Attracts: Butterflies, bees, and other pollinating insects. Deer resistant and pest free
Colors: Bi-Colored. Yellow with Dark Chocolate center disks

Black-Eyed Susans

Lesson Plan Source: Green Education Foundation

Duration: 30-40 mins
Subject Areas: Art, Mindfulness, Environmental Science

Purple Cloud Asters

Scientific Name: *aster novae-angli*
Alternative Names: New England Aster, Michaelmas Daisy
Growth: This flower grows in masses. On cloudy days or at night, the flowers droop and close, once the sun shines on them again, they reopen. Drought tolerant
Attracts: Butterflies and birds. Deer and rabbit resistant
Colors: Purple, Periwinkle or Blue with Yellow center disks

DRAWING GUIDE: HUMMINGBIRD IN THE PHLOX

By: Kenneth Hang