education OUTSIDE

RESOURCES

FIRST GRADE CURRICULUM TABLE OF CONTENTS:

First Grade Unit 1: Plant Structure and Function

OVERVIEW:

This unit introduces students to plant structure and function. Lesson 1 (Plant Needs) addresses the four resources plants need to survive. Lessons 2 through 7 (Roots: Nature's Straws, Leaves, Stems, Flowers, Fruits, and Seeds) detail the form and function of the six typical plant parts. Students interact with each of these plant parts and explore the form and function through student-centered activities. The unit culminates with Lesson 8 (Plant Part Recipe) where students cook using all six plant parts.

FOCUS QUESTIONS:

1. What makes a good home for a plant?
2. What makes roots special?
3. What makes leaves special?
4. What makes a stem special?
5. What makes fruit special?
6. What makes the flower special?
7. What makes seeds special?
8. What makes plant parts special?
9. How do these structures help plants get what they need to survive and reproduce (what is the function of each part)?

NGSS:

[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)
[LS1.B] Growth and Development of Organisms: Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)
[LS1.D] Information Processing: Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

[LS2.A] Interdependent Relationships in Ecosystems: Plants depend on water and light to grow. (2-LS2-1) Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)
[LS4.D] Biodiversity and Humans: There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

Unit 1: Plant Structure and Function

Lesson #	Title	In this lesson, students will...
1.	**Plant Needs/Garden Maintenance**	Learn what plants need to grow and survive. Students will plant seeds in the garden and do garden maintenance.
2.	**Roots: Nature's Straws**	Be introduced to plant roots. Students will observe the roots of different plants, learn the function of roots, and make root art.
3.	**Leaves**	Play a leaf matching game and learn that leaves make food for plants. Students will make leaf rubbings and/or drawings and make mint tea or pesto.
4.	**Stems**	Investigate the purpose of stems through a stem simulator activity and an experiment with celery. They will further explore stems through a stem scavenger hunt.
5.	**Flowers**	Observe flowers in the garden and read *The Reason for a Flower* to learn that flowers develop into fruits to hold seeds. Students will then make "garden bling" with flowers.
6.	**Fruits**	Investigate different fruits to find their seeds and explore the garden looking for fruits that are growing. Students will end class with a fruit snack.
7.	**Seeds**	Observe the seeds they planted in the first week of the unit and will investigate a soaked seed to see what is inside. They will then do seed art and seed sorting. Students break into two groups to do seed art and seed sorting.
8.	**Plant Part Recipe**	Use the six plant parts (roots, stems, leaves, flowers, fruits and seeds) to make a recipe. Students will harvest available produce from the garden.

TITLE | PLANT NEEDS

GRADE | First Grade

UNIT | 1

LESSON | 1

OVERVIEW | This lesson consists of two 45 min parts. In the first part students will learn what plants need to grow and survive. Students will explore different growing media and will vote on which they think is best for planting a kale seedling. They will learn a "Sun, Soil, Water, Air" chant and will plant their seedling in the garden and water all of the plants. In the second part of the lesson, students will review the plant needs chant and will plant their own pea seed in a small cup. They will draw the seed in their science notebook or on a worksheet.

Time: Two 45 minute lessons

Key Terms: SUN, SOIL, WATER, AIR, SEED

Focus Question: What makes a good home for a plant?

Objectives: Students will be able to…
1. understand that plants need sun, soil, water, and air to survive.
2. effectively plant a seed.
3. determine the best environment in which to plant a seed

Materials/Prep Work:

Part 1:
- ☐ **Kale seedling**
- ☐ **4 plastic pots (3 gal),** placed in different locations in the garden, filled with:
  - ☐ Sand and rock
  - ☐ Garden soil or seed starter
  - ☐ Soil in a plastic bag
  - ☐ Just water, or soil under a shed
- ☐ *Optional: What Do Plants Need? poster (available in Curriculum Visuals, linked in the Table of Contents)*
- ☐ **"Sun, Soil, Water and Air" chant**[1]
- ☐ Make sure you have a **garden bed** prepared to plant into for the last section of the lesson.

Part 2:
- ☐ **Cup** for each student
- ☐ **Pea seed (pre-soaked)** for each student
- ☐ **Trowels**
- ☐ **Seed starter** in a tub
- ☐ **Sun Soil Water Air Worksheet** or paper or science notebooks
- ☐ **Clipboards, pencils**
- ☐ **Colored pencils/crayons**
- ☐ **Labels** for student plants

Part 1 Steps

Introduction: Plants in the Garden *(10 minutes)*

- **Present** students with a kale start. Tell them, "We need to plant this plant, and we want to make sure that it has everything it needs to grow! Where can we plant it? … in my pocket? … in my ear? … (etc.)" Make it silly!
- **Ask** students: What makes a good home for a plant? **Make** a list on the board to reference later in the lesson.

Activity 1: Exploring different planting areas *(15 minutes)*

- **Tell** students that scattered throughout the garden, there are four pots with different materials inside. **Ask** students to stand by/point to which bucket they think would be the best home for a plant.
- **Students explore** the garden and stand next to the media in which they think the kale should be planted.
  Stations:
  - Water
  - Sand and rock
  - Soil in a plastic bag
  - Garden soil, nicely moist
- **Bring** all of the buckets back to the seating circle, and call students to circle up. **Ask** students to share why they chose for the media they voted for.

Activity 2: Sun, Soil, Water, Air chant *(15 minutes)*

- **Teach** the "Sun, Soil, Water, and Air" chant.
  - "This is a repeat after me song. Sun, soil, water and air / Everything you eat and everything you wear / Everything comes from sun, soil, water and air." Repeat.
- **Explain** that the soil bucket has all four things a plant needs, and that's why it was the best place for planting!

Closing *(5 minutes)*

- **Get students excited** about planting their pea seedling in the garden during the next lesson. Bring them to a bed with garden soil that has already been prepared. Have the classroom teacher or a student demonstrate how to plant a seed, reminding them that they will all plant their own seed in the next lesson. Be sure to highlight the good behaviors the teacher or model student exhibits!
- **Review** with your motions the needs that the plant has, and sing/chant "Sun, Soil, Water and Air."

Part 2 Steps

Introduction: Review Sun/Soil/Water/Air chant *(10 minutes)*

- **Ask Students**: What makes a good home for a plant?
- **Sing** the "Sun, Soil, Water, and Air" chant.

Activity 1: Planting pea seeds (15 minutes)

- **Explain** that now that student scientists know the four things plants need to grow, it will be up to them to provide those four things to their own plant: a pea!
- **Describe** the planting process: use a trowel to fill a cup with seed starter, put a name label on the cup (with help from the classroom teacher), water the seed, and put the seed in a predetermined place where it will get plenty of sun and air.
- Have students **plant** their pea seeds.

Activity 2: Science Diagram *(15 minutes)*

- **Students draw** their seed in the cup, adding pictures of the four things that it needs to grow (sun, soil, water and air). If there's time, also ask students to draw what they predict the plant will look like next week.

Closing *(5 minutes)*

- **Bring the group back together** to discuss what might happen to the pea seeds over the next couple of weeks, now that they have everything they need to grow.

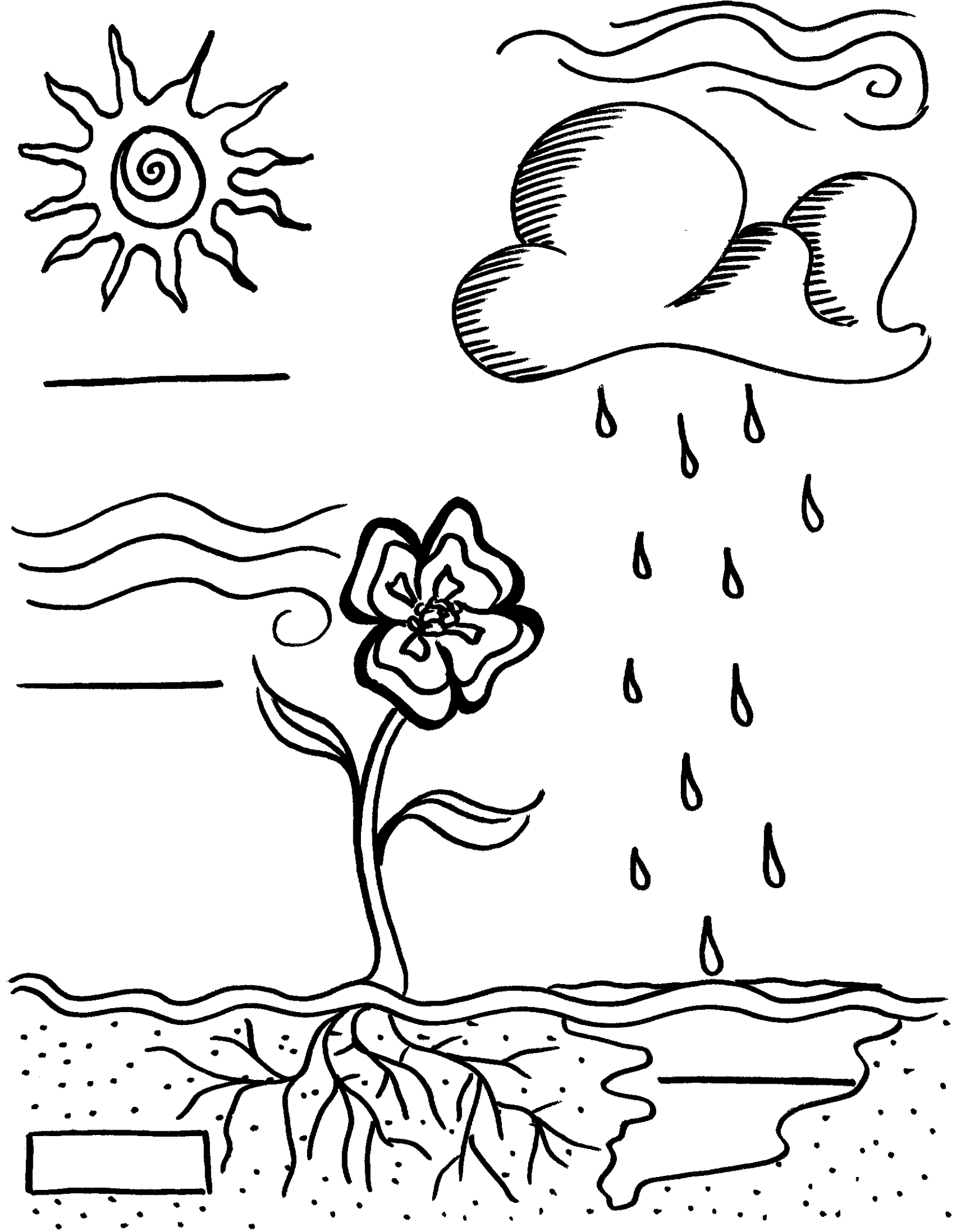
Additional Information

NGSS:
[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)

Classroom extensions:
- If planted in cups, teachers can have students make observations of their seeds in the classroom.

References:

1. [Banana Slug String Band]. (2002, January 1). Sun, Soil, Water, Air [Video file]. Retrieved from https://www.youtube.com/watch?v=vEYhs8m_qo4



TITLE | ROOTS: NATURE'S STRAWS

GRADE | First Grade

UNIT | 1

LESSON | 2

OVERVIEW | In this lesson, students will be introduced to plant roots. Students will observe the roots of different plants, learn the function of roots, and make root art.

Time: 45-50 minutes

Key Terms: ROOTS, WATER

Focus Question: What makes roots special?

Objectives: Students will be able to…
1. state the function of roots.
2. identify the roots of a plant.

Materials/Prep Work:

- ☐ *Optional:* ***"What Do Plants Need?"*** **poster** *(Available in Curriculum Visuals, linked in the Table of Contents)*
- ☐ ***Parts of a Plant*** **poster (Available in Curriculum Visuals linked in the Table of Contents)**
- ☐ **Weeds** for students to pull or examples of plant roots
- ☐ *Optional:* ***Spray bottle***
- ☐ **Greeting card templates** (folded pieces of paper)
- ☐ **Roots stamps** (pre-cut into shapes)
  - ☐ Beets
  - ☐ Carrots
  - ☐ Potatoes
- ☐ **Roots for tasting**
  - ☐ Carrots
  - ☐ Radishes
  - ☐ Beets
  - ☐ Jicama
- ☐ **Paint and trays/plates** for paint, if necessary
- ☐ **Clipboards, pencils**
- ☐ **Colored pencils**
- ☐ **Worksheet or science notebooks**

Lesson Steps

Introduction *(5 -10 minutes)*

- **Review** the 4 things plants need to survive with the "Sun, Soil, Water and Air" chant.
- **Distribute**: If the garden has enough plants, have students pick one weed with its roots attached. Otherwise, pass out examples of roots or hold a big one up for the class to see.

- **Ask**: What makes roots special? Record student answers on the board.
- **Think-pair-share:** How do the plants in our garden get water? How do plants in nature get water? Can plants get up and walk around if they need to find water?
- **Introduce** vocab word: ROOTS.
- **Explain** that the function of the roots is to soak up water from the soil and hold the plants in the ground. Brainstorm ways plants can access water since they cannot move around to find water.

Activity 1: Real Life Root Activity: *(10 minutes)*

- **Have** one student come to the center to be a "plant." For the demo, put a few pieces of blue paper strips around the student (one within arms reach, some too far) to represent water. Have the student acting as the plant act really thirsty and try to get as many "drops of water" as possible, without moving their legs.
- **Have** students from the class act as roots by linking arms with the "plant" to reach more water. Continue placing water further and further away from the "plant," requiring additional student "roots" to reach the water. Ask the "root" students to pass the water from student to student, back to the "plant."
- After this exercise **ask** students "When the plant was alone, did it get a lot of water? How did the roots help the plant? - etc."

Activity 2: Root Stamped Greeting Cards (with garden educator) *(10 minutes)*

- **Show** the students root stamps.
  - **Think-pair-share** what roots garden educator used to make the stamps (can use carrots, beets, potato).
- **Demonstrate** how to use the root stamps.
  - If using beets, no ink is needed. Students can stamp the beets. If they dry out, students can re-wet them on a paper towel.
  - If using carrots or potatoes, have trays of paint (or ink pads) available for students to use to stamp their greeting cards.
- **Distribute** greeting card templates.
- *Optional: Beet tattoos. Cut cooked beets into shapes for students to stamp onto skin.*

Optional: Activity 3: Root Tasting *(10 minutes)*

- **Ask**: What makes a root a root? Ex. it has to grow underground, has to soak up water for a plant.
- **Ask**: Do we eat roots? Write down student responses.

Today, we are going to **try** some roots (carrots, radishes, beets, jicama). Students show their reaction to the roots taste on their "thumb-o-meter" or using descriptive words.

Activity 4: Weeding and Drawing (with classroom teacher) *(10 minutes)*

- **Weed** the garden.
  - **Option 1**: Students weed the garden.
  - **Option 2**: Students weed and then scientifically illustrate the roots of their weed.
    - **Send** students into garden to find one weed.
    - **Distribute** clipboards and worksheets or science notebooks and have students draw their plant and label the roots.

Closing: *(5 minutes)*

- **Review** the function of plant roots.
  - **Key Questions**:
    - What makes a root special?
    - What does a root do for a plant?
    - How can a plant get water from a source that is far away?
    - What might happen to a tree if its roots were as deep as the weed from our garden?
- Have students make slurping sound to signify water moving up the roots to the rest of the plant.

Additional Information

NGSS:

[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)

TITLE | LEAVES

GRADE | First Grade

UNIT | 1

LESSON | 3

OVERVIEW | In this lesson, students will play a leaf matching game and learn that leaves make food for plants. Students will make leaf rubbings and/or drawings and make mint tea or pesto.

Time: 45-50 minutes

Key Terms: LEAVES

Focus Question: What makes leaves special?

Objectives: Students will be able to…
1. describe a leaf's characteristics.
2. understand that leaves make food for the plant.

Materials/Prep Work:

- ☐ Collect **pairs of various leaves** for each student from the garden.
- ☐ **Leaves** for leaf rubbing
- ☐ **Paper**
- ☐ **Crayons/colored pencils**
- ☐ **Herbs** for tea
- ☐ **Hot water** for tea
- ☐ **Cups**
- ☐ *Optional:* ***See pesto recipe below.***

Lesson Steps

Introduction: Leaf Bouquet *(15 minutes)*

- **Distribute** one leaf to each student. Students must find the student that has a leaf that matches their leaf. Once students find their match, they sit down together until all students have found their match. While students are seated, they can think of descriptive words for their leaves. For example, my leaf feels rough, soft, hard, etc.
- **Think-pair-share:**
  - What makes leaves special?
  - How are leaves different?
  - How are leaves similar?
  - What is the special job that leaves do?
- **Explain** that all leaves have the same function of making food for the plant.
- **Chant**: *"Take and Make"* or *"Making Food"* with hand motions.
- **Divide** class into two groups for activities 1 and 2.

Activity 1: Take, Make, Breathe *(10 minutes)*

- This activity shows students how leaves breathe. About 1 hour before class, put leaves in shallow buckets of water and left in the sun.
- **Give** students a straw and a cup of water.
- **Instruct** students to blow bubbles into the water and talk about what is in the bubble and what is happening when we breathe into the straws.
- **Have** students observe the oxygen bubbles that have started to form on the leaves in the water.
- **Ask** students what is inside of the bubbles on the leaves
  - Is it the same as the bubbles that we blew with our straws?
  - What happens to this oxygen once leaves make it?

Activity 2: Make Tea (with garden educator) *(10 minutes)*

Instruct students to harvest herbs from the garden to make tea. Rip leaves up and place into boiling water.

Optional Activity: Make pesto rather than tea.

Materials:

- ☐ Mortar and pestle
- ☐ Cutting boards
- ☐ Measuring spoons

Ingredients

- ½ cup olive oil
- 1-3 leafy greens per student: chard, parsley, basil, arugula, fava leaves, sorrel
- A pinch salt and pepper
- Optional: ½ cup sunflower seeds, walnuts, ext.
- Optional: 1 small clove of garlic (watch out! students may have a low tolerance for spice)
- Optional: ½ cup parmesan cheese
- 2 packages pita bread

Instructions

1. Harvest leaves from garden and rip into small pieces.
2. Add all ingredients to mortar.
3. Combine ingredients using mortar and pestle. Allow each student to have a turn using the mortar and pestle.

Activity 3: Leaf Rubbing (with classroom teacher) *(10 minutes)*

- **Instruct** students to pick which leaf they will rub.
- **Demonstrate** how to color over their leaf to make a rubbing. (Place the leaf under paper and use the side of a crayon to color on top of the leaf)
- **Ask** students: What structures in the leaf are showing in their leaf rubbing? Why do you think these structures are important?

Closing: *(10 minutes)*

- **Distribute** tea to each student
- **Explain** that the stem and veins of the leaf help to transport water and minerals throughout the leaf.
- **Cheers** to the sun!
- **Think-pair-share:**
  - What would happen if we ripped all of the leaves of the plants?
  - When harvesting why do we leave some leaves on the plants?

Additional Information

NGSS:
[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)

TITLE | STEMS

GRADE | First Grade

UNIT | 1

LESSON | 4

OVERVIEW | In this lesson, students will investigate the purpose of stems through a stem simulator activity and an experiment with celery. They will further explore stems through a stem scavenger hunt.

Time: 45-50 minutes

Key Terms: STEM, OBSERVATION, DISSECTION

Focus Question: What makes a stem special?

Objectives: Students will be able to…
1. explain the role of the stem in a plant.
2. set-up an experiment to demonstrate how a stem moves water.

Materials/Prep Work:

- ☐ **Celery stalk**
- ☐ **Cups**, one per every two students, either filled with water or with **bowls of water**
- ☐ **Food coloring** (red or blue works best)
- ☐ **Paper towel** for each student
- ☐ **Stem scavenger hunt worksheet** (attached)
- ☐ **Clipboards, pencils**
- ☐ **Colored pencils/crayons**
- ☐ **PRE WORK:** Three days before class cut about an inch off of the bottom of a piece of celery and stick it in colored water. You will reference this while teaching.

Student Prior Knowledge: Students should know the function of roots and leaves from **L2: Roots** and **L3: Leaves**.

Lesson Steps

Introduction: What is a stem for? *(5 minutes)*

- **Review** the function of roots and leaves, especially that leaves need water to make food.
- **Ask**- "What makes stems special?"
- **Distribute** a plant (like a weed) and have students investigate it. *(Alternatively, **pretend** to be a plant, with feet as roots and hands as leaves)*
- **Think-pair-share**: What part of the plant *(or of you)* is the stem? What does the stem do for the plant? How does the water get from the roots to the leaves?

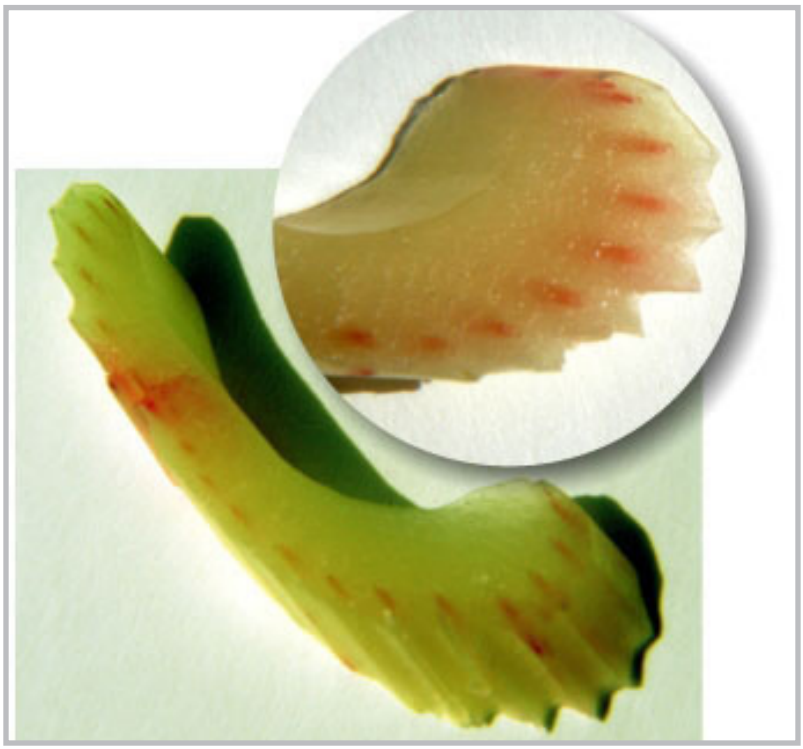
Activity 1: Stem Simulator *(15 minutes)*

- **Explain** to students that we are about to create our own model of stems.
- **Give** each student a cup with dyed water and a paper towel.
- **Have** students twist and scrunch the paper towel to look like a stem.
- **Ask** students what they think will happen when they put the paper towel in the dyed water.
- **Have** students place the paper towel into the dyed water and make observations.

Activity 2: Celery Experiment Debrief *(10 minutes)*

- **Show** students a piece of celery. Tell them that you will be placing the celery in a cup of colored water. Ask them to make predictions about what the celery will look like after three days of sitting in the water.
- **Show** the second cup that you have prepared and ask students what they think happened?
- **Tell** students that you dissected the celery. Explain the term DISSECTION and discuss how scientists use it to investigate things more closely.
- **Demonstrate** how to perform a dissection.
- **Challenge** students to identify where the water moved through the stem

*Dissection should appear similar to the image below[1]:



Those are the **xylem**, or little tubes that carry the water.

- **Explain** that stems deliver water from the roots to the rest of the plant, but they also deliver sugar from the leaves to other parts of the plant.
- **Chant** "water goes up, sugar goes down" with motions. **Review** other motions/chants for leaves and roots.

Activity 3: Stem Scavenger Hunt *(10 minutes)*

- When students finish with their experiment, **instruct** them to complete the stem scavenger hunt (worksheet attached).

Closing: *(5 minutes)*

- **Think-pair-share** predictions for the experiment.

Additional Information

NGSS:
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References:

1. Celery Lab (Phloem & Xylem) [Digital image]. (n.d.). Retrieved June 4, 2019, from http://biocircuits.ucsd.edu/outreach/?p=568
2. S. Flynn (2015, March 27). "My stem has all these little lines inside…" [Web log post]. Retrieved June 4, 2019, from https://miralomagarden.wordpress.com/2015/03/27/my-stem-has-all-these-little-lines-inside/

Stem Scavenger Hunt! Find…

- ☐ A tall stem
- ☐ A short stem
- ☐ A thin stem
- ☐ A thick stem
- ☐ A soft, bendy stem
- ☐ A hard, stiff stem
- ☐ A round stem
- ☐ A square stem

Draw a stem you see below!

Stem Scavenger Hunt! Find…

- ☐ A tall stem
- ☐ A short stem
- ☐ A thin stem
- ☐ A thick stem
- ☐ A soft, bendy stem
- ☐ A hard, stiff stem
- ☐ A round stem
- ☐ A square stem

Draw a stem you see below!

TITLE | FLOWERS

GRADE | First Grade

UNIT | 1

LESSON | 5

OVERVIEW | In this lesson, students will be introduced to the concept that plants make flowers that turn into fruit, which hold seeds. They will search the garden for flowers, buds and fruits, read a story about flowers, and make "garden bling."

Time: 45 minutes

Key Terms: FLOWER, FRUIT, SEED

Focus Question: What makes flowers special?

Objectives: Students will be able to…
1. observe flowers in the garden.
2. explain that flowers turn into fruit.

Materials/Prep Work:

- ☐ ***The Reason for a Flower*** by Ruth Heller
- ☐ **Masking tape**
- ☐ **Small paint brushes**
- ☐ **Paper**
- ☐ **Plenty of flowers with colorful petals (enough for students to use for petal art)**
- ☐ **A large flower with visible pollen**
- ☐ **"Parts of a Flower" poster** (available in *Curriculum Visuals* linked in the Table of contents)

Lesson Steps

Introduction: What is a Flower? *(5 minutes)*
- **Review** the role of roots, stems, and leaves, using chants and hand motions.
- **Two-minute challenge:** How many different kinds of flowers are in our garden? Count!
- **Ask** students:
  - What makes flowers special?
  - Why do you think there are so many flowers in the garden?
  - Why do plants make flowers?

Activity 1: Flowers in the Garden *(10 minutes)*

- **Brainstorm** why plants might make flowers.
- **Exploration**: Students pick one flower from the garden. Be sure to review picking rules.
- **I notice, I wonder, It reminds me of…** with the flowers. **Encourage** students to think of questions and relate experiences they've had with flowers to the function of the flowers (i.e. seeing strawberry flowers or seeing bees at flowers, etc.)
- *Educator Tip: If garden does not have flowers, provide students with images of flowers to ask questions/share experiences about, or purchase flowers at the store for students to examine*
- **Ask** students: Do you have any new ideas about why plants make flowers?

Activity 2: The Reason for a Flower *(10 minutes)*

- **Read** *The Reason for a Flower* and **discuss** with the class. Be sure to show the image of the flower turning into a fruit.

Activity 3: Garden Bling *(10 minutes)*[1]

- **Demonstrate** how to make garden bling using masking tape. Take a piece of masking tape and tape it with the sticky part facing out on your wrist.
- **Review** picking rules.
- **Have** students go around the garden collecting small petals and flowers and placing on the tape.
- **Distribute** tape and make some bling-bling.

Activity 4: Petal Art *(10 minutes)*

- **Collect** flowers with various colored petals.
- Introduce and **show** students how can you rub petals on paper to extract their color and make art.
- **Have** students rub petals on paper to create art.

Activity 5: Pollinator Party *(5 minutes)*

- **Show** a large flower with visible pollen. Show students that your finger collects pollen when you touch it.
- Use the **"Parts of a Flower"** poster to explain how pollen helps make fruit
- **Ask**: What are some fruits that you like to eat?
- **Say**: That each of these fruits must be pollinated.
- **Explain** to students that today we are going to play the role of pollinators and help to pollinate our plants in the garden.
- **Give** each student a small paintbrush and model how to mix pollen from different plants.

Closing: *(5 minutes)*

- **Ask** "Why are flowers special?" "How did we help our garden today?"
- Have students **perform** a fashion show with their garden bling

Additional Information

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References:

1. Life Lab. (2015, January 4). Flower Tape Bracelets. [Video file]. Retrieved May 30, 2019 from https://www.youtube.com/watch?v=jhxtpFUNthE&list=PL3299B838956E2A94&index=4
2. S. Flynn (2015, April 28). "This is the best yet." [Web log post]. Retrieved June 4, 2019, from https://miralomagarden.wordpress.com/2015/04/28/this-is-the-best-yet/

TITLE | FRUIT

GRADE | First Grade

UNIT | 1

LESSON | 6

OVERVIEW | In this lesson, students will Investigate different fruits to find their seeds and explore the garden looking for fruits that are growing. Students will end class with a fruit snack.

Time: 55 minutes

Key Terms: FRUIT

Focus Question: What makes fruit special?

Objectives: Students will be able to…
1. identify seeds inside different fruits.
2. understand that fruits hold seeds

Materials/Prep Work:

- ☐ **Various fruit and vegetables cut into cross sections** to show seeds (if it's a fruit) or no seeds (if it's a vegetable)
- ☐ **The same fruits and vegetable used for cross sections**, but cut into pieces for students to taste
- ☐ A **book on the function and structure of fruits** such as *A Fruit is a Suitcase for Seeds* by Jean Richards
- ☐ **Clipboards, pencils**
- ☐ **Worksheets** or **science notebooks**

Note: This lesson involves eating. Before the lesson, check in with the classroom teacher about students with food allergies!

Lesson Steps

Introduction: *(10 minutes)*

- **Review** plant parts learned in previous lessons, focusing on last class when they learned that flowers turn into fruits.
- **Ask**: What makes fruit special?

Activity 1: Read Aloud *(10 minutes)*

- **Read** a book on the structure and function of seeds such as *A Fruit is a Suitcase for Seeds*

Activity 2: Is it a Fruit or a Vegetable? *(10 minutes)*

- **Say**: Today we are going to play a game called -- Is it a fruit or vegetable?
- **Say**: If it is a fruit you will hold up the number 1 and if it is a vegetable you will hold up the number 2.
- **Hold** up cross-cutting of various fruits and vegetables and have students vote.
- **Ask** students to explain why they think the item was a fruit or a vegetable. Explain that some things that they might call vegetables are actually fruits, because they have seeds insid
- **After** each guess have students taste the fruits or vegetables.

Activity 3: Fruit observations *(10 minutes)*

- What do they notice now about the fruits?
- Can they find the seeds of each fruit?
- **Ask** students to draw one seed from each fruit.

Activity 4: Exploring Fruit *(10 minutes)*

- **Exploration**: Have students hunt for different fruits in the garden: peas, lemons, strawberries, etc. When students come back to seating circle have them share out what fruits they found in the garden.

Closing: *(5 minutes)*

- **Ask** students: What makes fruit special?

Additional Information

NGSS:

[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)

Fruit
What makes fruit special?

Education Outside Curriculum

Overview

Time: 45 minutes

Description: In this lesson, students will read a book on the function and structure of fruits. Students will investigate different fruits to and find their seeds. Students will explore the garden looking for fruits growing in the garden. Students will eat a fruit snack at the end of class.

Key Terms: FRUIT

Essential Question: What makes fruit special?

Objectives: Students will be able to…

1. Identify seeds inside different fruits.
2. Understand that some things we call vegetables are actually fruits.

Materials/Prep Work:

- ❑ **Various fruit and vegetables cut into cross sections**: Cucumber, banana, kiwi, strawberry, apple, pepper, etc.
- ❑ A **book on the function and structure of fruits** such as *A Fruit is a Suitcase for Seeds by Jean Richards*
- ❑ **Fruit & Vegetable for tasting**: melon, kiwi, carrot, strawberry, tomato, radish, banana etc.
- ❑ **Clipboards, pencils**
- ❑ **Worksheets** or **science notebooks**

Note: This lesson involves eating. Before the lesson, check-in with the classroom teacher about students with food allergies!

Lesson Steps

Introduction: *(10 minutes)*

- **Review** plant parts learned in previous lessons, focusing on last class when they learned that flowers turn into these fruits.
- **Ask:** What makes fruit special?

Activity 1: Read Aloud *(10 minutes)*

- **Read** a book on the structure and function of seeds such as *A Fruit is a Suitcase for Seeds*

Activity 2: Is it a fruit or a vegetable?

- **Say:** Today we are going to play a game called -- Is it a fruit or vegetable?
- **Say:** If it is a fruit you will hold up the number 1 and if it is a vegetable you will hold up the number 2.
- **Hold** up cross-cutting of various fruits and vegetables and have students vote.
- **Ask** students why what you held up was a fruit or vegetable.
- **After** each guess have students taste the fruits or vegetables.

Activity 3: Fruit observations *(10 minutes)*

  - What do they notice now about the fruits?
  - Can they find the seeds of each fruit?
- **Ask** students to draw one seed from each fruit.

Activity 4: Exploring Fruit *(10 minutes)*

- **Exploration:** Have students hunt for different fruits in the garden: peas, lemons, strawberries, etc. When students come back to seating circle have them share out what fruits they found in the garden.

Closing: *(5 minutes)*

- **Ask** students: What makes fruit special?

Additional Information

NGSS: [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)

Name_____
Fruits

Name of fruit: _____

Can you see the seeds? (circle one)
Yes / No

Name of fruit: _____

Can you see the seeds? (circle one)
Yes / No

Name of fruit: _____

Can you see the seeds? (circle one)
Yes / No

Name of fruit: _____

Can you see the seeds? (circle one)
Yes / No

Name of fruit: _____

Can you see the seeds? (circle one)
Yes / No

Draw your favorite fruit:

Do you know what the seeds look like? Draw them.

TITLE | SEEDS

GRADE | First Grade

UNIT | 1

LESSON | 7

OVERVIEW | In this lesson, students will observe the seeds they planted the first week during the Plant Needs lesson. Students will investigate a soaked seed to see what is inside. Students break into two groups to do seed art and seed sorting.

Time: 45 minutes

Key Terms: SEEDS

Focus Question: What makes seeds special?

Objectives: Students will be able to…
1. understand that a seed becomes a new plant.

Materials/Prep Work:

- ☐ **Soaked bean seeds** - fava beans or lima beans work best soaked overnight
- ☐ A **book on seeds** such as *Seeds are Sleepy* by Dianna Aston
- ☐ **Various old seeds** for seed art
- ☐ **Glue**
- ☐ **Paper with shapes or students' names** written on it for seed art
- ☐ **Various old seeds** for seed sorting
- ☐ **Egg carton cut in half** - 1 per student
- ☐ **Extra seeds** such as scarlet runner beans

Lesson Steps

Introduction: Seed Investigation *(5 minutes)*

- **Distribute** seedlings from Plant Lesson 1: Plant Needs, or if seeds were planted in the ground pull one up and show students how the seed transformed into a small plant.
- **Show** an example of the original seed they planted.
- **Ask** students: What happened to this seed?

Activity 1: Seed Investigation *(10-15 minutes)*

- **Review** what makes a good home for a plant.
- **Distribute** a soaked bean seed to each student. Ask students to pull apart their seed and describe what they notice. See if students can identify the seed coat, the baby plant and root, and the food for the baby plant.
- **Have** students do an observational drawing of what they see inside their seed, including parts of the seed.
- **Read:** a book on seeds such as *Seeds are Sleepy* by Dianna Aston.

Activity 2: Seed Art and Seed Sort *(12 minutes)*

- **Seed sort**: Students are each given an egg carton cut in half and a cup of seeds. Students sort the seeds by seed type into the egg carton.
- **Ask** students to report back on the seeds they sorted. Ex: how many of X color did they sort? How many small seeds did they find? How many big seeds? Were there any seeds that were interesting to them? Why?
- **Ask** students what would happen to the seeds they sorted if they planted them in the ground. What would these seeds need to grow?
- **Ask**: Even though seeds look different do they all need the same things to grow?

Closing: *(5 minutes)*

- **Give** each student a cool seed to keep such as a scarlet runner bean.
- **Ask** If you wanted to grow your seed at home what would you need to do it? What do seeds need to grow?

Additional Information

NGSS:

[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)
[LS1.B] Growth and Development of Organisms: Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)
[LS1.D] Information Processing: Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

TITLE | PLANT PART RECIPE

GRADE | First Grade

UNIT | 1

LESSON | 8

OVERVIEW | In this lesson, students will use the six plant parts (roots, stems, leaves, flowers, fruits and seeds) to make a recipe. Student will harvest available produce from the garden.

Time: 45 minutes

Key Terms: ROOTS, STEMS, LEAVES, FLOWERS, FRUITS, SEEDS

Focus Question: What makes plant parts special?

Objectives: Students will be able to…
1. identify the six plant parts.
2. use basic cooking skills to create a meal.

Materials/Prep Work:

- ☐ **Vegetables/ fruits** from the garden or store bought representing the six plant parts
- ☐ **Signs:** Roots, Stems, Leaves, Flowers, Fruits, Seeds *(Only if you are making plant part tacos or spring rolls)*
- ☐ **Roots, Stems, and Leaves** song[1], lyrics (below) printed if desired. *(Optional: Play guitar!)*

Note: This lesson involves eating. Before the lesson, check-in with the classroom teacher about students with food allergies!

Lesson Steps

Introduction: *(5 minutes)*
- **Sing Roots Stems Leaves song**
- **Review** the plant parts with students and the plant parts various jobs.
- **Have** students reflect on: What plant part is most important for me and for plants?
- **Read Recipe** (see below) as a class. Inform the students that they will be eating the six plant parts. Go through each ingredient to see if they can name what plant part it is.

Activity 1: Cooking *(20 minutes)*

- Possible recipes (recipes below):
  - **Plant part tacos**
  - **Plant part spring rolls**
  - **Plant part stir-fry**

Optional: Break the class into smaller groups to cook. While one group is cooking, the others will be writing the recipe including drawings of the ingredients and labels of the plant parts.

Activity 2: Eating *(20 minutes)*

- **Challenge**: If you are making plant part tacos or spring rolls, ask one student to place the plant part signs next to each ingredient before students assemble their meal.
- **Ask**: What plant part is most important for the plant and for me?
- **Ask** student to thank the garden for the delicious food before eating.

Closing: *(5 minutes)*

- **Give** each student a cool seed to keep such as a scarlet runner bean.
- **Ask** If you wanted to grow your seed at home what would you need to do it? What do seeds need to grow?

Lyrics: ROOTS, STEMS, LEAVES, FLOWERS, FRUITS, AND SEEDS (Steve Van Zandt)

Chorus:
Roots, stems, leaves, flowers, fruits, and seeds.
C G C
Roots, stems, leaves, flowers, fruits, and seeds.
C
Roots, stems, leaves, flowers, fruits, and seeds.
C G C
Roots, stems, leaves, flowers, fruits, and seeds.
C
Well, that's six parts! (How many? Six parts!)
C G C
Six plant parts that plants and people need.

Verses:
C
The roots hold the plant in the ground,
C G C
They gather up the water that falls around.
C
And there's a root inside of me because... Spoken: What's an example of a root that you can
eat? (Take student suggestions. Carrot, radish, beet, etc.) Those are all roots that I eat!
can eat? (Take student suggestions. Sunflower seed, sesame seed, rice, etc.) Those are the stems that I eat!
The leaves are the kitchens where the sugar is made
With carbon dioxide and sun rays.
And there's a leaf inside of me because...
Spoken: What's an example of a leaf that you can eat? (Take student suggestions. Lettuce, spinach, kale, etc.) Those are all leaves that I eat!
The flowers are dressed so colorfully
They hold the pollen and attract the bees.
And there's a flower inside of me because...
Spoken: What's an example of a flower that you can eat? (Take student suggestions. Cauliflower, broccoli, artichoke, etc.) Those are all
flowers that I eat!
The fruit gets ripe, then it falls on down
It holds the seeds and feeds the ground.
And there's a fruit inside of me because...
Spoken: What's an example of a fruit that you can eat? (Take student suggestions. Apple, pear, peach, etc.) Those are all fruits that I eat!
The seeds get buried in the earth
And the cycle starts again with a new plant's birth
And there are seeds inside of me because...
Spoken: What's an example of a seed that you can eat? (Take student suggestions. Sunflower seed, sesame seed, rice, etc.) Those are the stems that I eat!

References:

1. [Banana Slug String Band]. (1987, January 1). Roots, Stems, Leaves [Video file]. Retrieved from https://www.youtube.com/watch?v=T-pZmjls2eI

Plant Part Tacos

Materials:

- ☐ **Grater**
- ☐ **6 little bowls**
- ☐ **6 serving spoons**
- ☐ **Scissors**

Recipe:

Ingredients - use whatever you have in the garden or can purchase cheaply, super flexible

- Roots: carrots, sugar beets
- Stems: celery
- Leaves: lettuce, sorrel
- Flowers: nasturtium, borage, any *salvia* plant
- Fruit: berries, apples, snap peas
- Seeds: beans, peas, sunflower seeds
- Dressing: ranch; oil, salt, and honey

Instructions

1. Harvest ingredients from garden
2. Grate roots
3. Cut other ingredients with scissors if necessary
4. Put each ingredient in its own bowl
5. Serve using leaves as the tortilla and other ingredients stacked on top.

Spring Rolls

Materials:

- ☐ **Large bowl (or two)** for soaking rice wrappers
- ☐ **Cutting boards,** one for each student
- ☐ **Baking sheet/large tray** to store spring rolls
- ☐ **Small bowls** to place prepped ingredients
- ☐ **Tongs** for serving pasta
- ☐ **Stove and fuel or thermos** with hot water
- ☐ **Pot**
- ☐ **Dixie cups/paper trays/plates** for serving
- ☐ **Grater**

Recipe:

Note: This recipe allows for flexibility. It can be as simple as rice noodles, carrots, and a garden herb or as complex as a multi-ingredient fiesta.

Ingredients

- **Rice wrappers**, one for each student plus extra for teacher and garden educator, and to account for any that are broken in the package
- **½ - 1 package rice vermicelli**, quick cooking rice noodles that can be soaked in hot water or cooked on the stove, before class
- **Vegetable filling ingredients**
  - **Carrots**, grated
  - **Cabbage**, thinly sliced
  - **Herbs**: mint, cilantro, basil, thai basil
  - **Edible flowers**: pineapple sage, borage, calendula, fava bean flowers
  - **Fava leaves, kale, arugula, lettuce, chard, any other green**
  - Sliced **apple**

Optional prep: Recommended for younger grades or if the garden educator wants students to focus on making their own spring roll rather than prepare ingredients for the entire class.

- Cook rice noodles.
- If using, grate carrots and thinly slice cabbage.
- Lay out cutting boards and bowls with ingredients.

Instructions

1. Prepare filling ingredients (either by grating, cutting, or harvesting ingredients from garden).
2. Soak rice wrapper in water (it can be cold or hot).
3. Roll the spring rolls: place filling below the equator of each rice wrapper. Fold up from the bottom, then in from the right and the left, then roll from the bottom to the top.
4. Enjoy spring rolls with dipping sauce (recipes below).

Spring Roll Best Practices

- After students make spring rolls, place them in paper trays (similar to those that come with school lunch). Serve sauce into trays. The trays provide a catch-basin for all the ingredients that fall out of the spring roll/the students' mouths.
- Divide the class into two groups so only half are assembling their spring rolls at once. After students prepare their spring roll, have them place it on a large tray next to their name label. After both groups have prepared their spring rolls, ask students to sit for serving. Distribute spring rolls and dixie cups for serving the sauce.
- ALWAYS have extra rice wrappers.

Spring Roll Dipping Sauces
Option 1: Savory

A simple three ingredient sauce that students might ask to drink. It can be paired with spring rolls, potstickers, or used as a salad dressing.

Ingredients

- 1/4 cup rice vinegar
- 1/4 cup soy sauce
- 1 tablespoon sesame oil

Combine the ingredients in a bowl. Whisk until blended. Serve!

Option 2: Sweet and Savory

Ingredients

- 1 cup soy sauce
- 3 tablespoons honey

Combine Ingredients in a bowl. Whisk to combine. Serve!

Stir-Fry

Materials:

- ☐ **Stove and fuel**
- ☐ **Pan** to cook stir-fry
- ☐ **Spatula/spoon** to stir and serve
- ☐ **Knives or scissors** to chop green ingredients
- ☐ **Plates, utensils** for each student
- ☐ **Cutting Boards**

Recipe:

Note: This recipe allows for flexibility. It can be as simple as rice noodles, carrots, and a garden herb or as complex as a multi-ingredient fiesta.

Ingredients

- 2 tbsp oil
- *At least* 1 medium leaf per student: kale, chard, collards, etc
- Other vegetables: garlic, onions, leeks, peas, root vegetables, ginger, peppers, etc. (may prepare beforehand or instruct students to do so)
- 1 tbsp soy sauce
- 1 tbsp rice vinegar
- ½ tsp toasted sesame oil
- *Optional: 2 tbsp sesame seeds*
- *Optional: a pre-cooked grain like rice, noodles, etc. If using, add more soy sauce, vinegar, and oil.*

Instructions

1. Wash the vegetables harvested from the garden.
2. Using your preferred teaching method, prepare the vegetables:
   - Dice the vegetables using scissors or knives.
   - Tear the green leaves into bite-sized pieces. Discard the stems, unless students want to dice them.
3. Heat the oil in a large skillet over medium-high heat.
4. Add the green onions, leeks, and sugar snap peas. Cook for two minutes, until leeks and onions are soft.
5. Add the kale and soy sauce, stirring occasionally, until the kale is tender, 4 to 7 minutes.
6. Pour the rice vinegar, sesame oil, and sesame seeds into the stir-fry.
7. Stir until combined.
8. Serve to very excited and eager students.

First Grade Unit 2: Animals in their Environment

OVERVIEW:

In this unit students will be introduced to the concept of habitats through several case studies. In Lesson 1, students search the garden for different creatures that live in our garden habitat. Lessons 2-6 each focus on one of these creatures. In Lesson 2, students learn about what birds need to survive and in Lesson 3 students apply their knowledge by making the garden a welcoming place for birds. In Lessons 4-6 students will observe snails, bees, and worms and learn how their habitats are similar or different. In Lesson 7 students will create a creature that would live in the garden using nature art or food.

FOCUS QUESTIONS:

1. What makes a good home?
2. Why don't all bird nests look the same?
3. Could all birds live in our garden habitat?
4. Why is our garden a good home for snails?
5. Why are bees and flowers friends?
6. Can worms eat our garbage?
7. What creature could survive best in our garden?

NGSS:

[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)
[LS1.B] Growth and Development of Organisms: Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)
[LS1.D] Information Processing: Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)
[LS2.A] Interdependent Relationships in Ecosystems: Plants depend on water and light to grow. (2-LS2-1) Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)
[LS4.D] Biodiversity and Humans: There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

Unit 2: Animals in their Environment

Lesson #	Title	In this lesson, students will...
1.	**Habitats**	Learn about the concept of a habitat and search in the garden for different places where animals live.
2.	**Birds and Their Habitats**	Review what a habitat is through a case study of birds. We will read a story about birds and review how birds acquire all that they need to make a home in a habitat. Students will then participate in an imaginative play activity and will make "binoculars" to observe birds in the garden.

Lesson #	Title	In this lesson, students will...
3.	**Feeding Our Local Birds**	Focus on making the garden a good habitat for local birds. They will learn to identify types of birds that would and would not be found in the garden. They will then make seed bird feeders for these birds, and will search for other foods in the garden that these birds might eat.
4.	**Snails**	Observe snails and create a snail habitat.
5.	**Bees**	Observe bees in the garden, play a pollination game, and taste nectar.
6.	**Worms**	Learn how worms turn organic matter into a key ingredient in soil (worm castings). They will simulate what happens in a worm's gizzard by rubbing a pretzel on sandpaper. Then, students will have time to closely observe and scientifically draw and label a worm.
7.	**Invent a Creature**	Use their knowledge of habitats and animal needs to invent a creature that lives in the garden.

TITLE | HABITATS

GRADE | First Grade

UNIT | 2

LESSON | 1

OVERVIEW | In this lesson, students will learn about the concept of a habitat and search in the garden for different places where animals live.

Time: 45 minutes

Key Terms: SUN, SOIL, WATER, AIR, SEED

Focus Question: What makes a good home?

Objectives: Students will be able to…
1. explain what animals need to survive.
2. explore the garden and find different creatures' homes.

Materials/Prep Work:

- ☐ **"What Makes a Habitat" poster** (available in *Curriculum Visuals* linked in the Table of Contents)
- ☐ **Collect** different photos of animals (Elephant, whale, ladybug and rabbit).

Lesson Steps

Introduction: What Do We Need? *(5 minutes)*

- **Think-pair-share**: What makes a good home? Record students' answer on the board.
- **Show** students photos of the animals, one at a time, and ask them to show a thumbs up if they think the creature could live in the garden and a thumbs down if they think the creature could not live in the garden.
- After each photo **ask** students to explain their reasoning.
- Make sure students mention FOOD, WATER, SHELTER, SPACE, and COMMUNITY and discuss why each of these things are necessary for survival. Show the "What Makes a Habitat" poster to emphasize the parts of a habitat.
- **Discuss** how all animals need these things, not just humans.

Activity 1: Ideal Habitat Creation *(10 -15 minutes)*

- **Explain** to students that now we will go out into the garden and create habitats for different creatures in our garden. You can have them choose a garden creature or give them some options (i.e. worm, ladybug, pill bug).
- **Have** students use items from the garden to create a habitat for one of these creatures, keeping in mind that each habitat must have food, water, shelter, and space.
- **Emphasize** that students can use natural materials to create these habitats. Encourage students not to use bricks, shovels, etc.

Activity 2: 1,2,3 What Do We Need? *(15 minutes)*

- **Brainstorm** hand motions for food, water, shelter, space and community.
- **Explain** how animals cannot live in a certain place if they are not able to get what they need.
- **Set up game**: Have students stand in a line, shoulder to shoulder, facing you. Explain that you are going to turn around and make a certain hand motion for one of the needs. When you shout "1,2,3, what do you need?" you will turn around to face them. If they are making the same motion as you, that means they can't find that resource in their habitat and would have to move to a different place to survive. Have these students come to join you and become part of the habitat, working as a group to pick one motion to act out. After the next round, send the group that was with you back to be reborn in the old habitat. Make sure to point out years when most students survive vs. years where few animals survive.

Note: You can also make the game into a story and describe why that resource was scarce that year--i.e. "We are making the motion for shelter because this year there was a big fire in the forest and it was difficult for the animals to find a home after most of the plants died."

Closing: *(5 minutes)*

- **Think-pair-share:** What creatures did you find, and where did you find them?
- **Review** hand motions for the 4 things all animals need to survive.
- **Ask:** "What was the most difficult part of the habitat to incorporate into your habitat?" "Do creatures need humans to create habitats for them?"

Additional Information

NGSS:
[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)

Blog Posts:

1. K. Owyang (2015, April 17). "It's an acro-snail!" [Web log post]. Retrieved June 5, 2019, from https://educationoutsideafy.wordpress.com/2015/04/17/its-an-acro-snail/

Name: _____ Date: _____

Where do animals make HOMES in our garden HABITAT?

TITLE | BIRDS AND THEIR HABITATS

GRADE | First Grade

UNIT | 2

LESSON | 2

OVERVIEW | In this lesson, students will review what a habitat is through a case study of birds. We will read a story about birds and review how birds acquire all that they need to make a home in a habitat. Students will then participate in an imaginative play activity and will make "binoculars" to observe birds in the garden.

Time: 45 - 50 minutes

Key Terms: HABITAT, FOOD, WATER, SHELTER, SPACE, COMMUNITY

Focus Question: Why don't all bird nests look the same?

Objectives: Students will be able to…
1. describe what animals need to make a home in a habitat.
2. demonstrate their knowledge of bird habitats through an imaginative play activity.
3. safely observe birds in the garden.

Materials/Prep Work:

- ☐ **A book about birds**, such as *A Nest Full of Eggs* by Priscilla Belz Jenkins
- ☐ **"What Makes a Habitat" poster**, available in *Curriculum Visuals* linked in the Table of Contents.
- ☐ **Space to play "baby bird"** with plenty of natural materials for students to gather
- ☐ **Toilet paper rolls or rolled & taped construction paper** - enough for each student to have two. *(Note: Try asking your school for toilet paper rolls or asking students to bring them in the week before!)*
- ☐ **Scotch tape**
- ☐ **Markers, crayons, and other materials** for decorating binoculars
- ☐ Optional: **Binoculars**
- ☐ Optional: **2 photos of different types of bird nests (or actual bird nests if available)**

Note: If you feel your garden does not have an adequate space to play baby bird, consider trying to coordinate a mini field-trip to a local park.

Student Prior Knowledge: An understanding of the word HABITAT from **L1: Habitats**.

Lesson Steps

Introduction: *(5 minutes)*

- **Tell** students a series of clues, asking them to put their finger on their nose when they "knows" the answer (i.e. these animals have wings, their bodies are covered in feathers, they eat with beaks…)
- **Say:** "today we are going to be learning all about birds and their habitats. Raise your hand if you have seen a bird nest."
- Optional: **Show** a picture of a bird nest or a real bird nest. **Ask** students what they notice. **Ask** students what questions they have about bird nests. Show another picture of a different type of bird nest. **Ask** students what they notice about the second nest. What is similar or different about these birds nests?
- **Say**: Our question today is "Why don't all bird nests look the same?"

Activity 1: What Does A Bird Habitat Look Like? *(10 minutes)*

- **Review** the word HABITAT (a place where an animal makes a home) and the four things animals need to make a home in a habitat (FOOD, WATER, SHELTER, SPACE, COMMUNITY) using the hand motions and **poster** from L1: Habitats.
- **Ask** students to try to figure out how birds get what they need from their habitats by listening to a story.
- **Read** a book about birds, such as *A Nest Full of Eggs* by Priscilla Belz Jenkins.
- **Review** what students learned in the book, emphasizing things that birds need in their HABITAT.
  - **Key Questions**
    - What do birds eat? Where do they find food?
    - Where do birds find water?
    - What do birds use to build shelter? What does their shelter look like? Where could they find these materials?
    - Can 50 birds live in one nest?
  - *Note: It is important to address that there are many different kinds of birds, all with different diets, nesting patterns, etc. Highlight a few of these differences with examples to explain how habitats are different for different creatures!*
- **Divide** the class into two groups for activities 2 and 3.

Activity 2: Garden Educator Turns Into Baby Bird! *(12 minutes)*

- **Pretend** to use your "garden magic" to turn into a baby bird, and to turn the students into adult birds. *(Note: You may want to identify a specific species that could nest and eat in your garden. Some examples are listed in L3: Feeding Our Local Birds.*
- **Show** students a picture of the local bird (adult and baby pictures) you have transformed into. Have them turn to a partner and share what is unique about that bird (beak/body/ feet).
- **Sit** on the ground and flap your baby bird wings.
  - **Tell** students that you need a shelter. Students should gather materials to make a nest around you.
  - **Hold** out your hands and tell students you're hungry and need food. Students should gather baby bird grub to bring to you.
    - **Review** with students what is/is not okay to pick. In this case, you can limit students to things on the ground, or specify berries, grass, seeds, etc.
  - **Pretend** there is a big rain storm. Ask students where birds might seek shelter in this situation, then have them hide in these spots. (Can mimic the rainstorm with a hose mister if the other teacher is okay with it).
  - **Repeat** using different local bird pictures, each time having students think about why this bird's nest would be different than others.
  - *Optional*: **Tell** *students that in 20 seconds you will transform into a hawk/fox/bird predator, and that they will need to find shelter to hide from you. You can also challenge them to keep bringing food to the nest while avoiding the predator. This activity is best done in a large garden or park.*

Activity 3: Making Binoculars (With Classroom Teacher) *(12 minutes)*

- **Show** students a pair of binoculars (if available) and demonstrate how they are used to observe things from afar.
- **Demonstrate** how to make and decorate "binoculars" using toilet paper rolls.
- **Help** students tape the rolls together (the taping can also be done ahead of time if needed).
- **Review** how to be respectful to living creatures, and observe birds without scaring them.
- **Provide** time for students to observe birds in the garden using their binoculars.

Closing: *(6 minutes)*

- **Ask** students to indicate how many birds they observed with their binoculars by holding up fingers.
- **Whisper to a partner**: Share where you observed your favorite bird and what it looked like.
- **Ask** students to share other locations where they can use their binoculars to observe birds.
- **Ask** students "Why all bird nests don't look the same?"

Additional Information

NGSS:

[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)
[LS1.B] Growth and Development of Organisms: Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)

Blog Posts:

1. K. Owyang (2015, April 17). "It's an acro-snail!" [Web log post]. Retrieved June 5, 2019, from https://educationoutsideafy.wordpress.com/2015/04/17/its-an-acro-snail/

TITLE | FEEDING OUR LOCAL BIRDS

GRADE | First Grade

UNIT | 2

LESSON | 3

OVERVIEW | In this lesson, students will focus on making the garden a good habitat for local birds. They will learn to identify types of birds that would and would not be found in the garden. They will then plant sunflowers for birds to eat and will search for other foods in the garden that these birds might eat.

Time: 45 - 55 minutes

Key Terms: HABITAT

Focus Question: Could all birds live in our garden habitat?

Objectives: Students will be able to…
1. identify the types of birds that might be found in the garden.
2. plant flowers that birds might enjoy eating.
3. safely interact with creatures in the garden.

Materials/Prep Work:

- ☐ **Check with your local parks representatives for their recommendations on specific bird feeder ingredients**
- ☐ **Pictures of birds that would/would not visit our garden** (Examples of those that might be found in Bay Area school gardens: Crows, Pigeons, Sparrows, Blackbirds, Robins, Steller's Jay, Ravens, Mourning Doves... Examples of those that would not be found in Bay Area gardens: American Avoset, Snowy Plover, Willet, Marbled Godwit...) The beak should be visible in the photos.
- ☐ **"What Makes a Habitat" poster**, available in *Curriculum Visuals* linked in the Table of Contents.
- ☐ **Sunflower** seeds or other plants that birds like to eat
- ☐ **Pine cones**
- ☐ **Vegetable shortening**
- ☐ **Local bird seed**
- ☐ **Butter knives or spoons** (for spreading vegetable shortening on pinecones)

Note: Try emailing your school for toilet paper rolls or asking students to bring them in the week before!

Student Prior Knowledge: An understanding of the word HABITAT from **L1: Habitats**.

Lesson Steps

Introduction: *(5 minutes)*

- Two-minute challenge: Search for evidence of birds visiting the garden (nests, feathers, poop, holes in leaves, etc).

Activity 1: What Birds Live Around Here? *(10 minutes)*

- **Ask** students to raise their hands if they used their binoculars to observe birds at home. Ask them to share what the birds looked like.
- **Review** the word HABITAT (a place where an animal makes its home), using the "What Makes a Habitat" poster.
- **Class vote**: Can all birds live in our garden HABITAT?
- **Play** a sorting game with students, where they guess which birds would or would not be found in the garden.
- **Have** students vote with a thumbs up or down, or point left/right to indicate where the picture should be placed on the board.
    - **Compare** the beaks of birds that would/would not be found in the garden.
    - **Tell** students that the birds that visit the garden have beaks that are good for eating seeds and bugs, while the birds that don't visit the garden have beaks that are good for eating other things, such as fish.
- **Class brainstorm**: What could we do to make sure local birds can make a home in our garden HABITAT? (In the discussion, be sure to mention making sure that food is available).
- **Explain** the activity directions.
    - The whole class will start with making bird feeders, then once finished will go with the classroom teacher to do a bug hunt.

Activity 2: Make Bird Feeders (with garden educator) *(12 minutes)*

- **Ask**: "What are some ways we can create a good habitat for birds in our garden?"
- **Discuss**: We are providing food for the birds in our community by making bird feeders. In the spring/summer, birds will eat the seeds from our feeders.
- **Tie** a string around a pinecone.
- **Have** students spread vegetable shortening on pine cones and dip into trays of bird seed.
- Students can hang bird feeders in the garden or at home.

Activity 3: Bug Hunt (with classroom teacher) *(12 minutes)*

- **Review** the other foods that birds eat besides seeds (insects and other bugs!).
- **Review** how to safely interact with creatures in the garden and collect them in bug hunt boxes.
- **Distribute** bug hunt boxes.

Closing *(6 minutes)*

- **Reflect** on the bird foods from the activities.
- **Key Questions**:
    - Were all of the seeds for the bird feeders the same? Why do you think it's important for birds to be able to eat different types of seeds?
    - Where did the seeds come from originally? (Ask students to recall L7: Seeds)
    - Where could birds find seeds for food if we didn't make bird feeders? (Celebrate that we are providing a good habitat for the birds all year long, because there are plants in the garden always producing seeds in our local climate).
- **Ask**: Could all birds live in our garden habitat? Are there things we can change about our garden to bring more birds to our garden habitat?

Additional Information

NGSS:

[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)
[LS1.D] Information Processing: Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

Blog Posts:

1. K. Owyang (2015, April 17). “It’s an acro-snail!” [Web log post]. Retrieved June 5, 2019, from https://educationoutsideafy.wordpress.com/2015/04/17/its-an-acro-snail/

TITLE | SNAILS

GRADE | First Grade

UNIT | 2

LESSON | 4

OVERVIEW | In this lesson, students will closely observe snails with magnifying glasses, draw snails and create a snail habitat with materials in the garden.

Time: 45 - 50 minutes

Key Terms: HABITAT, SNAIL

Focus Question: Why is our garden a good home for snails?

Objectives: Students will be able to…

1. create a scientific drawing of a snail based on close observations.
2. explain how their snail habitat could provide a snail with everything it needs to survive.

Materials/Prep Work:

- ☐ **Snails** (can be ordered if there are none in your garden).
- ☐ **Trays**
- ☐ **Containers** for snail homes (terrarium boxes and paper lunch trays work well)
- ☐ **Worksheets or science journals**
- ☐ **Crayons/colored pencils**
- ☐ **Clipboards, pencils**
- ☐ **"ABCDE of Scientific Drawing" Poster** (available in *Curriculum Visuals* linked in the Table of Contents)
- ☐ ***Are you a snail?*** by Judy Allen and Tudor Humphries
- ☐ Optional: **Magnifying glasses**

Lesson Steps

Introduction: Mystery Animal Guessing Game *(6 minutes)*

- **Greet** students at the entrance to the garden.
- **Introduce** snails with a riddle. Give students clues describing a snail. Have students put their finger on their nose when they "knows" the answer, remind them not to shout out the answer. This creature…
  - Uses slime to travel in the garden. Even though they travel slowly, this slime helps these creatures can latch on to most surfaces, traveling up walls, upside down under leaves, etc.
  - These creatures love to eat all the leaves and veggies in our garden
  - These creatures have a shell to protect themselves from predators
- **Say** answer all together
- **Think-pair-share** something you wonder about snails.
- **Divide** into two groups for activities 1 and 2.

Activity 1: Snail Habitat Creation (with garden educator) *(12 minutes)*

- **Review** what animals need in their habitats to survive.
- **Create** snail habitats with materials from the garden. Check in with students to make sure that their habitats include food, water, shelter, and space.

Activity 2: Snail Observation (with classroom teacher) *(12 minutes)*

- **Review** the ABCDEs of a scientific drawing.
- **Distribute** snails on trays/ plates.
- **Draw** a detailed, scientific drawing of the snail.
- **Create** a word bank as a group about their observations and have students add 2 written notes to their drawing.
- **Have** students turn and talk with a partner to use "I notice, I wonder, It reminds me of" structure to share what they observed. The teacher then asks what makes the garden a good home for snails.

Activity 3: Snail Stories *(10 minutes)*

- **Read:** *Are you a Snail?* discussing what makes a snail a snail as you read the book.

Closing *(5 minutes)*

- **Have** students release the snails back into the garden by choosing a special spot for the snails.
- **Key questions:**
  - What surprised us about our snails?
  - Why is our garden a good home for snails? What does our garden give snails?
  - What are some questions we still have about snails?

Additional Information

NGSS:
[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)
[LS1.D] Information Processing: Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)
[LS2.A] Interdependent Relationships in Ecosystems: Plants depend on water and light to grow. (2-LS2-1) Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)
[LS4.D] Biodiversity and Humans: There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

Blog Posts:

1. K. Owyang (2015, April 17). "It's an acro-snail!" [Web log post]. Retrieved June 5, 2019, from https://educationoutsideafy.wordpress.com/2015/04/17/its-an-acro-snail/

TITLE | BEES

GRADE | First Grade

UNIT | 2

LESSON | 5

OVERVIEW | In this lesson, students will observe bees in the garden, play a pollination game, and taste nectar.

Time: 45 minutes

Key Terms: BEE, POLLINATION, NECTAR

Focus Question: Why are bees and flowers friends?

Objectives: Students will be able to…
1. explain how and why bees move pollen from flower to flower in the garden.
2. observe bees in the garden.

Materials/Prep Work:

- ☐ **"Parts of a Flower" poster** (available in *Curriculum Visuals* linked in the Table of Contents)
- ☐ **Cotton Balls**
- ☐ **Sidewalk Chalk**
- ☐ **Large egg carton squares**, often accessible in restaurant recycling bins
- ☐ **Flowers** that smell nice, with obvious pollen (nasturtium, lilies, etc.
- ☐ **Draw** several flowers on the sidewalk with chalk, coloring in the "pollen" in the center. Make sure there's plenty of chalk dust here. If a sidewalk is not available, print pictures of flowers with a small container of chalk dust in the center, representing pollen.
- ☐ *(Note: Trader Joe's will often give away cut flowers that are too old for them to use - call ahead!)*
- ☐ *Honey Makers* by Gail Gibbons or *Are You a Bee?* by Judy Allen

Lesson Steps

Introduction: Smelly Flowers
- **Greet** students at the entrance to the garden.
- **Introduce** the essential question: *"Why are bees and flowers friends?"*
- **Distribute** flowers for students to observe. Key questions include:
  - What do we notice about the flowers?
  - What kind of creature is attracted to the bright color and great smell of these flowers?
  - What do you notice about the yellow powder on your flower?
- **Collect** flowers back from students. They will use the flowers again for an activity later in the lesson.
- **Ask** students: Have any of you seen bees around flowers before? Why are bees and flowers friends?
- **See** if anyone got a little bit of pollen on their nose and point it out.

Activity 1: Bee observation *(10 minutes)*

- **Explain** how to react calmly to a bee
- **Challenge** students to wander in the garden being extremely quiet and sneaky, tallying on their fingers every time they see a bee.
- **Think-pair-share**: What did we observe the bees doing in the garden? Describe to your partner what you noticed.

Activity 2: Be a Bee Game *(12 minutes)*

- **Distribute** cotton balls
- **Explain** the bee challenge:
  - Students are going to pretend to be bees. As they visit each flower they are going to pick up a bit of the chalk on their cotton ball, run to another flower, and smear the chalk on a new flower (have one student demonstrate while you are saying the instructions).
  - **Ask**: What do you think the chalk represents?
  - **Explain** that bees also have to go back to the hive to store the pollen and nectar they have collected. **Show** students the pretend hives (egg carton) and **demonstrate** dipping their cotton balls into the hive.
- **Play** the game for a few minutes.
- **Reflect** by observing the chalk flowers.
- **Key questions:**
  - What happened to the flowers throughout the game?
  - What do we notice about the hive?
- **Bring** out the smelly flowers that students were looking at earlier in the lesson.
- **Explain** that the chalk from the activity represents the pollen in the real flowers.
- **Introduce** the term POLLEN, and explain that when pollen from one flower gets on another flower it helps the plant make seeds.

Activity 3: Story Time *(10 minutes)*

- **Read** *Honey Makers* by Gail Gibbons or *Are you a bee?* by Judy Allen
- **Key questions** for discussion
  - What role do bees play in the garden?
  - What surprises you about bees?

Closing *(6 minutes)*

- **Think-pair-share**
  - Why are bees and flowers friends?
  - How can we help make our garden a good habitat for bees?

Additional Information

NGSS:

[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)

TITLE | WORMS

GRADE | First Grade

UNIT | 2

LESSON | 6

OVERVIEW | In this lesson, students will learn how worms turn organic matter into a key ingredient in soil (worm castings). They will simulate what happens in a worm's gizzard by rubbing a pretzel on sandpaper. Then students will have time to closely observe and scientifically draw and label a worm.

Time: 45 minutes

Key Terms: DECOMPOSER, NUTRIENTS, GIZZARD

Focus Question: Can worms eat our garbage?

Objectives: Students will be able to…

1. explain and visualize how a worm uses its gizzard and grit to digest organic matter into soil.
2. use a hand lens to carefully observe and scientifically draw a red wiggler worm.
3. practice respectful observation of a living creature.

Materials/Prep Work:

- ☐ **Images of yes/no worm foods** (attached)
- ☐ ***Wormology*** (*Backyard Buddies*) by Michael Elsohn Ross
- ☐ **Apple** sliced into enough pieces for each student
- ☐ Small pieces of **sandpaper**, one per student
- ☐ **Pretzel sticks**, two per student
- ☐ **Trays** for sandpaper/pretzels (or **bowls** to collect after)
- ☐ **Worm bin**
- ☐ **Moist paper towels** for worm observations
- ☐ **Spray bottle** with water
- ☐ **Science notebooks** or **paper**
- ☐ **Clipboards, pencils**
- ☐ **Crayons/colored pencils**
- ☐ **"ABCDEs of Scientific Drawing" Poster** (available in *Curriculum Visuals* linked in the Table of Contents)

Lesson Steps

Introduction: *(3 minutes)*

- **Ask** students:
  - What do worms eat?
  - Do worms eat anything? Collect student responses.
  - Can worms eat our garbage?
- **Sing** worm song
  - Lyrics: Wiggle wiggle wiggle (Motion body wiggling) - munch munch munch (Hand motion eating something)- poop poop poop (Shake your hips) - soil soil soil (pretend to be putting your hands in soil)
  - Introduce DECOMPOSER. Call and response: Decompose → Breakdown

Activity 1: Worm Food and Digestion *(15 minutes)*

- **Show** images of different foods. Thumbs up / thumbs down vote if students think we should feed this food to our worms.
- **Explain**: Worms work with other creatures to eat organic matter (things that used to be alive) - like leaves, fruit, and vegetables - they could also eat meat and cheese, but these foods would make our worm bin smell and attract unwanted creatures! Worms are part of a group of creatures that we call decomposers. They eat this dying organic matter and break it down to become part of our soil. Call and response with students: Decompose-Breakdown!
- **Distribute** apple slices. **Ask**: What parts of our body are we using to eat the apple? (hands, mouth, teeth)
- **Show** image of worms - worms do not have hands AND they don't have teeth! They use their mouth like a shovel and scoop up their food. Usually, the food they eat is soft so they are able to scoop off small pieces to swallow. DECOMPOSERS is a larger term used to classify all creatures that help to break down food.
- **Explain**: Worms have a different kind of stomach called a GIZZARD. Show image from *Wormology* p. 21. This is a big muscle that squeezes tight and opens up again.
- **Explain**: Inside of the worm's GIZZARD is a material called GRIT. These are rough materials like sand or small pieces of eggshell. When the worm's GIZZARD squeezes tight, the grit rubs up against the food in the worm's stomach and breaks the food into smaller and smaller pieces - the worm is digesting/decomposing (breaking down) the food.
- **Distribute** small pieces of sandpaper to act as a worm's gizzard with grit and various objects to test whether worms can eat them (pretzel stick, apple slice, rock, wooden stick)
- **Give** students three minutes to test out the different objects.
  - **Pair-Share**: What is happening? What objects were easier to break down with the sandpaper?
  - **Collect** materials from students.
- **Explain**: The reason worm castings/poop are so healthy for plants is because they are full of NUTRIENTS. The same foods we eat to stay healthy (vegetables, fruits, etc.) are what worms eat to make soil.

Activity 2: Worm Observations and Drawings *(15-20 minutes)*

- **Remind** students about the ABCDEs of a scientific drawing using the poster.
- **Set up** a science notebook page with the date and title.
- **Distribute** a worm on a tray (with wet paper towel piece below it so it doesn't dry out) to every student .
- **Circulate** as students do their scientific drawings.

Closing *(2 minutes)*

- **Review** vocabulary: DECOMPOSER, NUTRIENT
- **Ask**: Can worms eat our garbage? Repeat the worm song as students leave the garden. "Munch, munch, munch. Wiggle, wiggle, wiggle. Poop, poop, poop. Soil, soil, soil."
- **Practice** moving ("wiggling") like a worm to get into line.

Additional Information

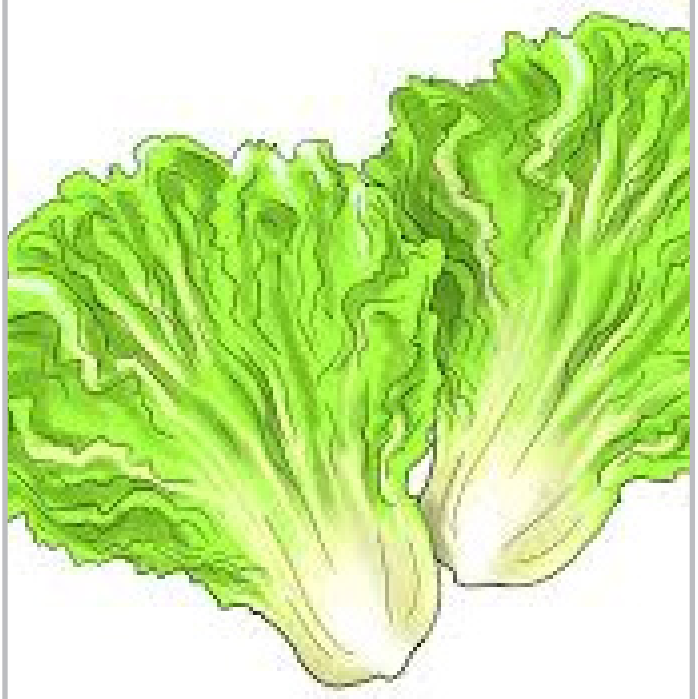
NGSS:

[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)

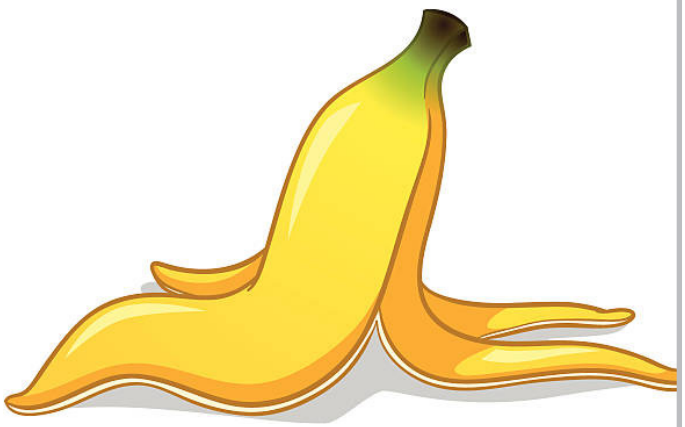
MILK

APPLE

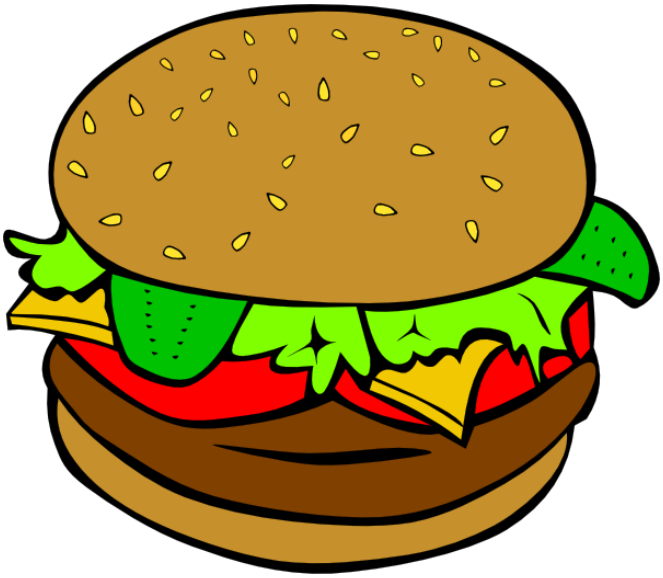
NEWSPAPER



LETTUCE (LEAF)

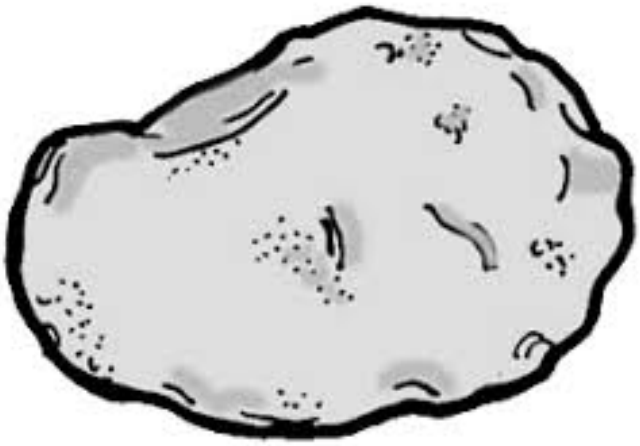


BANANA PEEL



HAMBURGER

EGG SHELLS



ROCK

TITLE | INVENT A CREATURE

GRADE | First Grade

UNIT | 2

LESSON | 7

OVERVIEW | In this lesson, students will use their knowledge of habitats and animal needs to invent a creature that lives in the garden.

Time: 45 minutes

Key Terms: HABITAT, FOOD, WATER, SHELTER, SPACE

Focus Question: What creature could survive best in our garden?

Objectives: Students will be able to…
1. create an animal that lives in the garden.
2. state how their animal obtains what it needs to survive from our garden.

Materials/Prep Work:

Option 1: Nature Art Creature	Option 2: Edible Creature	Option 3: Worksheet
☐ **Nature art materials** (sticks, rocks, leaves, etc). ☐ **Optional: "What Makes a Habitat" poster** (available in *Curriculum Visuals* linked in the Table of Contents).	☐ **Plates** ☐ **Apples**, cut into small slices ☐ **Carrots**, sliced ☐ **Sunflower seeds/sunflower seed butter** ☐ **Celery**, cut into thin sticks ☐ **Raisins** ☐ **Greens** from the garden ☐ **Any other fruit or vegetable**, cut into small pieces ☐ **Optional: honey** to drizzle over insects	☐ **Worksheet** (attached) **or science notebooks** ☐ **Pencils** ☐ **Colored Pencils** ☐ **Clipboards**

Student Prior Knowledge: Students know that animals need food, water, shelter, and space from their habitat and that a habitat is a home.

Lesson Steps

Introduction: Animal Evidence *(5 minutes)*

- **Two-minute challenge:** students search for evidence of animals in the garden.
  - **Brainstorm** what animal evidence might look like (holes in leaves, feathers, footprints, actual animals, etc).
- **Ask** students what animals need to get from their HABITAT (FOOD, WATER, SHELTER, and SPACE) and what our garden animals might eat/drink and where they might live/find space).
- **Revisit** our essential question from Lesson 1: What makes a good home?
- **Explain** We have been studying our garden and the habitats that exist in our garden. Today, you have a chance to use your imagination to invent a new creature that could live in the garden.

Activity 1: Invent a Creature *(20 minutes)*

- Note: Be sure to frame this activity as an "imagination creation" and not necessarily something that would/could exist in nature.

- **Explain** that students will get to invent a creature that lives in the garden.
- **Brainstorm** examples of creatures students could invent.
- **Share** that students will be sharing their creatures with their classmates and they need to include how the garden habitat helps their animal survive.
    - **Option 1**: **Invent a Nature Art Creature**
        - **Demonstrate** how to build one and explain what materials they can use (sticks, rocks, leaves, etc).
        - **Remind** students to be respectful of other students' artwork.
            - Students can work alone, in partners, or in groups.
    - **Option 2: Invent an Edible Creature**
        - **Demonstrate** how to build an edible creature.
        - **Remind** students there is no eating until the end of class.
        - **Divide** students into groups/assign them a spot to make their creatures.
            - Note: if students finish early, they can create another creature or build their creature a habitat in the garden.
    - **Option 3: Invent a Creature on Paper**
        - **Demonstrate** how to draw their creature on the paper.
        - **Remind** them to include labels, descriptions, and color.

Activity 2: Gallery Walk *(15 minutes)*

- **Prompt** students to share how their animal survives in the garden habitat. This can be done in partners or as a full class.
    - **Key Questions:**
        - How does the animal use the garden habitat to survive?
        - What is the name of your creature? (This just included because kids love to name things).

Closing *(5 minutes)*

- **Review** the definition of a habitat.
    - **Key Questions:**
        - What kinds of creatures did you invent today in the garden?
        - Could your imaginary animals or real animals move to a different habitat and still survive?

Additional Information

NGSS:
[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)
[LS1.D] Information Processing: Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

Blog Links

1. F. Lynn (2015, May 14). "You can't want the dough. You knead it." [Web log post]. Retrieved June 6, 2019, from https://miralomagarden.wordpress.com/2015/05/14/you-cant-want-the-dough-you-knead-it/

Name: _____

Invent a Garden Creature

Animal Name: _____

Where in the garden habitat does you animal find it's...

Food: _____

Water: _____

Shelter: _____