

Discovering Plants

Fourth Grade Science Unit

(A Unit on Plant Parts, Life Cycle, and Functions)

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Schedule:

Day 1:

Science Topic: Plant Anatomy & Functions

Daily Question: What are plants and how do they work?

Projected Learning Outcomes: Students will identify basic plant parts such as the roots, stem, leaves, and flowers, and explain the function of each to the plant's overall health.

Activities: Have students witness a live plant that has been uprooted from the ground and encourage them to look and touch its various parts, making predictions about the function of each part. The hands-on activity for this activity will focus specifically on the function of the roots and stem, (as there are two separate lessons devoted to the function of leaves and flowers.) Students will take a sponge and dip it into water with food coloring. Students will then stick a straw into the sponge, puncturing it. One student will slowly suck on the straw, and students will watch the results. Students will compare this activity to the function of the roots and stems. Students will also take a celery stick and dip it into water with food-coloring, watching what happens to the stem in ensuing hours. Students will close by filling in a plant anatomy diagram, labeling the various parts of a plant. The extension will reinforce student knowledge about the function of each plant part by having students compare the function of plant parts to corresponding human parts. (For example, the esophagus is like the stem transporting water and nutrients, while the mouth is like the roots because they absorb nutrients and water.

Learning Outcome: Students will understand the function of each plant part and how they work together under one plant anatomy. The science activity will focus particularly on the function of the roots and stem. Students will understand that the motion of sucking through the straw from the sponge represents the relationship between the root and the stem in helping a plant intake water and nutrients.

Assessment: Pre-assessment will occur when students are asked at the beginning of class to name and describe each plant function. Students will be formatively assessed to see if they can make the connection between the relationship between the sponge and straw as comparable to the roots and stem. The graded assessment will be the plant anatomy diagram that students will fill out, labeling the name and function of each plant part.

Day 2:

Science Topic: Photosynthesis

Daily Question: How do plants eat?

Projected Learning Outcomes: Students will learn how plants make their own food, with special attention to the parts of the plants involved and their function (ex. Roots, stem, and specifically leaves,) as well as the necessary elements for plants to produce food. Students identify and recognize the terms: Photosynthesis, chlorophyll, oxygen, glucose, and carbon dioxide.

Activities: Students will be given green leaves at the beginning of class, and will be asked to flip their leaves over and scratch the back of the leaf. They will record their observations and predict why there was green moisture inside the leaf. Students will learn that the green moisture that they got under their fingernails when they scratched the leaf is called "chlorophyll," which is essential to the production of food in the leaves.

Students will learn that the combination of carbon dioxide, water, and sunlight produces food by chlorophyll, while oxygen, water, and glucose are released. Students will also see three plants brought in by the teacher—one that was exposed to no light for two weeks, one that had full access to light, and one that only received light on half of its side. Students will conjecture the reasons why this specific plant was twisted to one side looking deformed. Explain that the plant was desperate for light in order to make food, so it adapted. Explain that plant adaptation will be the primary focus of the next lesson.

Assessment Plan: Formative Assessment will be student engagement and ability to formulate hypotheses about the leaves based on the hands-on experience at the beginning of class. Summative evaluation will come in the form of a word sort, which will have students match vocabulary words about Photosynthesis learned in the lesson with corresponding definitions. Graded evaluation will come in the form of the word bank and fill in the blank sheets to assess students understanding of the vocabulary definitions and content from the lesson.

Day 3:

Science Topic: Plant Adaptations

Daily Questions: How do plants protect themselves and adapt to their environment in order to stay alive?

Projected Learning Outcomes: Students will identify plant adaptations and recognize how they allow plants to stay healthy and respond to their environment in an effective way. Students will learn about different plant adaptations from a variety of ecosystems, which will help them to understand why plants are different from one another.

Activities: Students will begin with an extension from the previous lesson on Photosynthesis. They will take a ten-minute “field trip” outside (during the fall seasons) to collect green, multicolored, and brown leaves. Just as they received green leaves and were instructed to scratch the back of them and record their observations, students will be given leaves that have changed color in autumn and asked to do the same thing. The teacher will draw a diagram on the board with three sections labeled “green,” “multicolored,” and “brown,” and students will record their observations about how these leaves compared when students scratched the back. After this exploration phase, the teacher will define and describe the process of dormancy and how it is one of many plant adaptations. Students will understand why the brown leaves did not have as much moisture as the green leaves—that they stop producing chlorophyll in the fall and winter. Students will learn about other plant adaptations. They will be directed to the Biology of Plants website which shows a variety of examples of plant adaptations in a number of habitats. They will be given a worksheet and asked to hypothesize why cactus roots are very shallow based on the environment it lives in, as well as why rose have thorns. Students will receive a handout with three categories: structural adaptations, physical attributes, and behavioral adaptations. Their homework will be to go outside and find at least one plant with each one of the following behavioral adaptations.

Assessment: The teacher will use formative assessment by testing to see if students understood the concept of photosynthesis from last lesson versus dormancy from the current lesson by understanding the green leaves have green pigment and moisture because they still have chlorophyll and produce food, while multicolored leaves have stopped producing chlorophyll, and brown leaves are dead. Graded assessment will be the

homework assignment where students will record a plant with a structural adaptation, a physical attribute, and behavioral adaptation.

Day 4:

Science Topic: Introduction to Flowers & their reproduction processes

Daily Question: Why do some plants have flowers? What is their role?

Projected Learning Outcomes: Students will learn the different parts of a flower including the terminology stamen, stigma, pistil, sepal, embryo, spore, and seed.

Activities: Students will dissect flowers step by step, and glue each flower part into a sequence chart in their journals. They will use a scalpel to make a vertical incision to open their flower. They will draw a brief sketch of the flower during various phases, such as when it is pinned open, labeling sepals, the anther, stamen, filament, stigma, style, ovary, and pistil. Students will look inside ovary and attempt to find ovules. They will be reminded that these will become seeds, (leading into the following lesson.) Students will also look at each part under a microscope. They will pay special attention to the anther, looking to see if there is a powder, meaning that it is producing pollen.

Assessment: Formative assessment will be given when the teacher tests student's recognition of the proper scientific name for each flower part when asking students to remove it during the dissection. Students will be graded on proper placement of the plant parts with the coordinating definitions, which they will do on their own. Students will also be graded on their answers to a list of follow-up questions after the dissection, such as: Name the female and male parts of the flower, how do they know if their flower was mature or not? Was your flower releasing pollen?

Day 5:

Science Topic: Seeds and Spores

Daily Question: Why are seeds and spores important to plant reproduction?

Projected Learning Outcomes: Students will learn how seeds and spores play crucial roles in the reproductive processes of the plants. Students will learn that fertilized ovules that they saw during the plant dissection become seeds. Students will learn about how seeds travel, and also learn about spores—which ferns and moss reproduce. Students will learn the difference between seeds and spores, and students will recognize the process of pollination and how it fertilizes seeds, as well as how spores facilitate plant reproduction.

Activities: Have students create bees out of pipe cleaners and wax paper, and bring a beanie baby model of a flower. Have students pour a slight amount of corn meal on the flower and see what happens to the bee when it lands on the flower. Ask students what will happen when the bee lands on another flower. This activity will represent the pollination process. Then have students place a cotton ball onto a Velcro strap. Blow a fan on the cotton ball and see what happens. Compare this motion to how spores travel, reproduce and germinate.

Assessment Plan: Students will be graded on their ability to describe in their science journals how the two activities demonstrated in class relate to the plant reproduction processes for seeds and spores. Students will also be graded on their ability to differentiate seeds from spores, with proper vocabulary and explanation of the differing functions of each.

Overview:

Theme/Question: The topic for this unit is investigation of plant anatomy and its basic life processes. Students will not only to learn the structural make-up of a plant, but also to understand what elements, conditions, and scenarios it needs to thrive in its environment. This unit reminds students that plants are self-sufficient living organisms that are essential parts of any habitat or ecosystem. The main question is: What is the structural makeup of plants, and how do plants function, reproduce, and adapt most effectively in their natural environments? Sub-questions include: What are the functions of each plant part? What is the function and importance of a flower in the plant life cycle? How do seeds and spores help plants reproduce? How do plants produce food and what elements do they need to do so? Finally, how do plants adapt to their surrounding environments? Each daily question will help guide students' knowledge development of the unit, and students should be able to refer back to the overarching daily question and be able to answer it at the end of every lesson.

Virginia Standards of Learning:

- 4.4 The student will investigate and understand basic plant anatomy and life processes. Key concepts include
- a) the structures of typical plants and the function of each structure;
 - b) processes and structures involved with plant reproduction;
 - c) photosynthesis; and
 - d) adaptations allow plants to satisfy life needs and respond to the environment.

National Science Education Standards, K-4:

- A. Science as Inquiry: Students answering questions using scientific resources combined with observations.
- C. Characteristics of Organisms:
 - a. All organisms have different needs.
 - b. The environment must supply the needs of organisms.
 - c. Each organism has different functions.

Description of Students:

This unit was created for a fourth grade co-education classroom at Matoaka Elementary School to be taught in the Spring of 2013. The class is composed of 24 students; three students have ADD and/or ADHD, and one has dysgraphia. Four students have an IEP and are taken out of certain days of class to work with a specialist. Normally, the students with ADD and ADHD have greater behavior issues than other students and tend to get off task most easily. However, I noticed that hands-on activities will have helped retain interest and have led to better behavior. I have created many worksheets in this module that will go along with science activities and are supposed to help students stay on task with guided questions. The student with dysgraphia will be allowed to record answers on a laptop.

Students' main form of instruction for Science has been lecture, PowerPoint presentations, and 'science cards' given to them for every unit with a word and definition that they past to the back of an index card. My cooperating teacher uses hands-on activities sparsely, and usually only gives Science a thirty-five minute time block. I noticed students appearing bored, and memorizing words on cards whose concepts they do not understand at all. For this reason, I think that these hands-on, inquiry-based science activities will be beneficial to students. I am especially excited to steer children away from blind memorization of concepts that they do not comprehend, to students completing activities where they generate their own genuine questions based on their interest in the topic at hand.

Connectivity:

The framing of the lesson plans in this module was very carefully laid out and sequenced so that lessons would flow and connect in a natural progression. The module begins with a lesson on the basic structure of a plant. I found it important to begin with plant anatomy because it introduces that concept of a plant as a living organism or entire 'entity,' and I find it valuable for students to have a basic mental picture of a plant. Learning basic plant anatomy creates a solid foundation for more in depth analyses of structural parts of plants in later lessons. The first lesson discusses all parts of a plant's structure, but emphasizes the function of the roots and stem, which makes sense, because they are the basic structural support system of the plant. Once the functions of the roots and stem are established through the hands-on activity in the first lesson, the next logical step is to discuss how these two anatomical structures interact with the leaves. Consequently, Lesson 2 deals with Photosynthesis, where the most emphasized plant structures involved are the leaves, stem, and roots. After students complete the hands on activity with the sponge and straw from Lesson 1, they will be able to better understand how water and nutrients travel through the roots and stem to the leaves in Lesson 2. Lesson 2 focuses specifically on the "food factories" in the leaves. Through the description of the Photosynthesis process, students learn what plants need to stay alive—carbon dioxide, water, sunlight, nutrients in order to thrive. After learning about Photosynthesis by examining the green leaves, a natural transition to the next lesson would be to promote the question, "If leaves are green to make food, why do leaves change color in the fall?" This question can be answered in Lesson 3, which focuses on plant adaptations. Students learn the process of dormancy right after the lesson about photosynthesis. After the description of how plants eat and protect themselves, the next logical question is: How do plants sustain their existence? This leads in smoothly to Lesson 4 on Flowers and plant reproduction. The flower was the part not discussed in Lesson 1 because of its complexity, so students will devote an entire day to dissecting a flower and understanding how it is the reproductive center of the plant. In this lesson students briefly learn about pollination, and they see the ovules that could become fertilized and turn into seeds. This leads smoothly into the final Lesson 5, which discusses seeds—the facilitators of the continuation of the plant life cycle. Lesson 5 focuses on how seeds and spores travel and reproduce to ensure the survival of plants. I think that the seed is a satisfactory final lesson, because it shows the continuation of the plant life cycle.

This unit is especially relevant to the learners at this particular time of year because students are genuinely curious about what happens to leaves in the Fall. Students always become excited when they see elements of nature that they have studied in their own home and school environment. All lessons are extremely relevant to the students. They are surrounded by plant life, so it is beneficial for them to know the anatomy, function, and reproductive cycles of plants. It is important for students to recognize plants as living organisms and recognize their importance to our ecosystem. Students learn about ecosystems shortly after plants, so understanding about plants is essential to understanding concepts such as the food web, respiration, and adaptation. It is important for students to see the relationship between human and animal adaptations to plant adaptations.

Nature of Science and Inquiry-based activities:

100% of my lessons involve inquiry. In the first lesson, students view a plant and predict the function of each plant part. In the second lesson, students are given leaves and predict why the leaves are moist and have green pigment inside them. In the third lesson, students are given multicolored leaves in addition to green leaves and ask why the multicolored and brown leaves are dry and do not have the green pigment. In lesson four, students ask why a flower is the reproductive center of the plant and dissect it to analyze the specific parts. Finally, in lesson five, students see a hands-on 'demonstration' of a bee pollinating a flower, and they ask what is happening and how this affects the plant. 100% of the activities are hands-on, and 80% of the lessons use authentic/natural materials from the outdoors.

Technology and Safety:

The teacher should remind students to use safety precautions whenever possible. In Lesson 1, it is important that each student who sucks on the straw uses a new straw so as not to spread germs/illnesses. For Lesson 3, it is important to make sure that students wear gloves in the woods to avoid poison ivy and ticks. It is also important to remind students that on 'field trips,' no matter how informal or short, it is important to stay with your teacher and not stray from the group. For Lesson 3, make sure that students do not touch plants with harmful adaptations such as thorns. For Lesson 4, make sure that students using the scalpel are always monitored by an adult. Finally, for Lesson 5, ensure that no one has a food allergy to graham crackers.

Technology is actually used sparsely in this module. For Lesson 5 on plant adaptations, students will need access to a computer in order to access the Plant Adaptations website. Other than the need for computer use, students will not need technology.

Lesson Plan Day I

Topic: Plant Anatomy and Function:

NSES Content Standard C

SOL 4.4 a. The student will investigate the structures of typical plants and the function of each structure.

Daily Question: What are plants and how do they work? What is the basic plant anatomy and what are the functions of each of its parts?

Procedures for Learning Experience	Guiding Questions	Materials Needed	Evaluation	Time Needed
<p>Engagement: Have students watch a short video on George Washington Carver, a famous botanist, who discovered numerous helpful uses for plants. Students will become engaged with plants and see them as useful living organisms. Place a different kind of plant on each group of student desks. Allow students to observe and touch the different parts of the plant. Asks questions gauging student knowledge of plant anatomy as well as the function of different plant parts. Ask students to migrate to other groups of desks with different kinds of plants. Ask students to keep in mind the similarities in structure and anatomy that they see, even though the types of plants are different.</p>	<p>“Why are plants useful?”</p> <p>“What do you know about plants?”</p> <p>“What do you notice about the anatomy or structure of the plant?”</p> <p>“What do you think is the function of each part of the plant?”</p>	<p>6 different plants with roots, stem, and leaves intact, Paper towels to keep desks clean</p>	<p>Evaluate student’s prior knowledge of plants and students ability to hypothesize</p>	<p>5 minutes</p>
<p>Exploration: 1) The students are each given a sponge, water with food coloring, and a straw. Students are given</p>	<p>“Why does this experiment relate to plants?”</p> <p>“Which part</p>	<p>Sponge, Water, Food coloring, Straw, Goggles, Celery,</p>	<p>Evaluate students ability to follow directions and draw connections</p>	<p>15 minutes</p>

<p>instructions to place the straw into the sponge suck the water through the straw.</p> <p>2) The students are given a celery stalk, which they dip in a glass of water with food-coloring.</p>	<p>of the plant could we be imitating with our ‘manmade plant’?”</p>	<p>glass</p>		
<p>Explanation: The class will share their experiment. Students will describe what happened when they attempted to suck the water through the straw from the sponge. The teacher will share with students the scientific terms for each of the basic parts of plant anatomy, with the exception of the flower, which will appear in a later lesson. The teacher will draw connections between the experiment that students did with the straw and sponge and the function of the roots and stem and how they work together to hydrate and brings nutrients to plants.</p>	<p>“What are the names for the basic parts of plants and what are their function?”</p> <p>“How was this experiment similar to how the roots and stem function in a plant?”</p>	<p>handout with a picture of a plant with spaces where student can fill in parts</p>	<p>Evaluate students’ recognition of the different parts of the plant as well as the function of each.</p>	<p>20 minutes</p>
<p>Extension: The students will compare plant parts to human body parts in order to solidify the function of each plant part. For example, the roots are similar to the human mouth because it collects water and nutrients. The stem would be our esophagus because it carries the nutrients to</p>	<p>“How can you make comparisons between the function of plant parts versus human parts?”</p>	<p>paper and pencil</p>	<p>Evaluate student understanding of the function of each of the plant parts.</p>	<p>10 minutes</p>

other parts of our body. Finally, the leaves will be our stomach, because our stomach processes food.				
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Notes: This lesson would fulfill SOL 4.4a and is a good introduction to the study of plants. It can be made more complex by bringing in the structures and function of the flower, but the flower appears in a later lesson.

Safety Note: Be aware of germs, and do not share the same straws with other students. Wear goggles to avoid poking eyes or getting food coloring in eyes.

The science activity using the celery stalks was adapted from the North Lake Nature center website at: <http://www.northlakenature.org/Activities/StemsorStraws.pdf>.

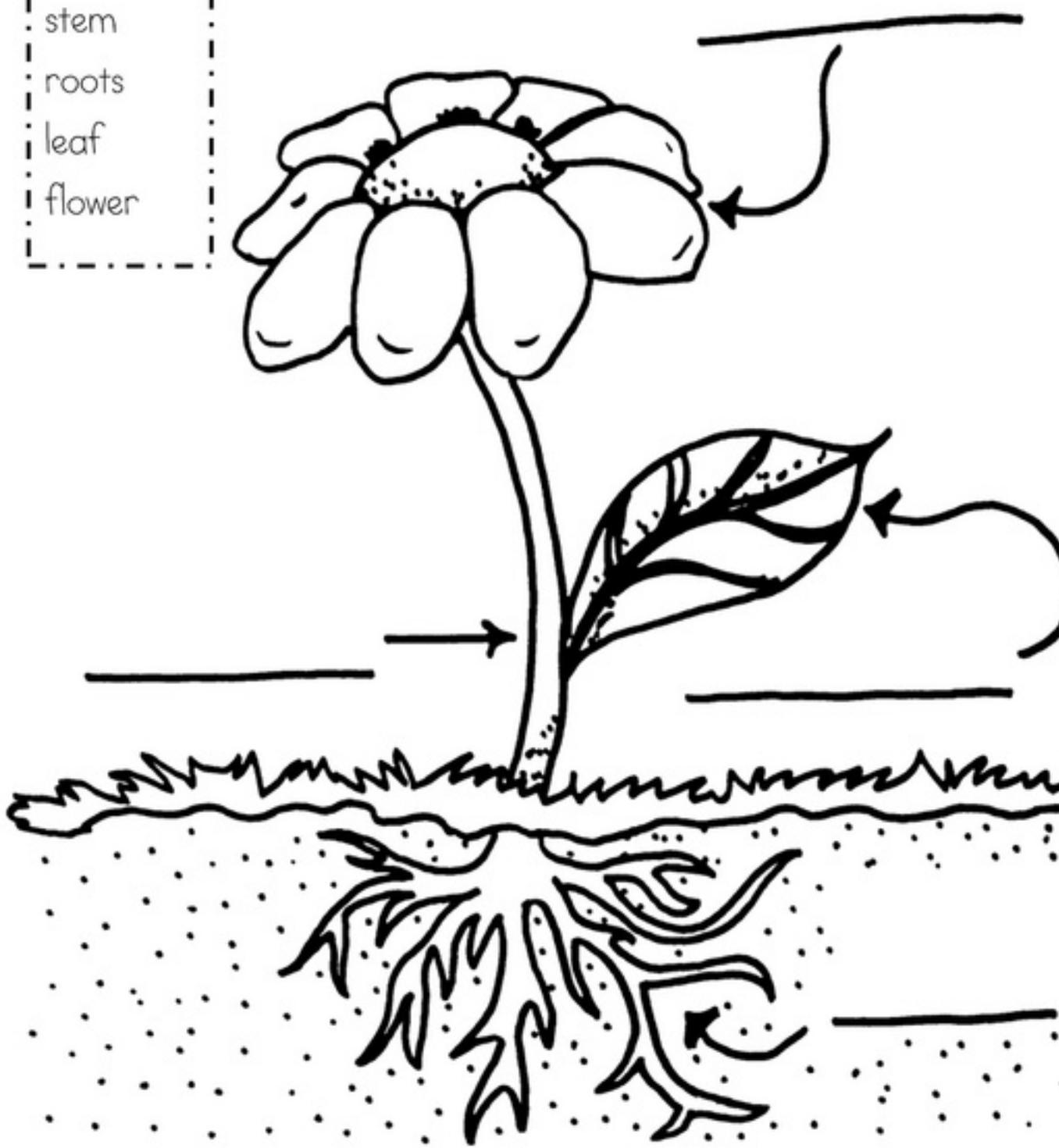
Video on George Washington Carver retrieved from:

<http://www.biography.com/people/groups/scientists/botanists/>

Name: _____

Label the Flower

Word Bank:
stem
roots
leaf
flower



Lesson Plan Day 2
 Topic: Photosynthesis
 SOL 4.4c.

Fourth Grade
 Science

Daily Question: How do plants eat?

Procedures for Learning Experience	Guiding Questions	Materials Needed	Evaluation	Time Needed
<p>Engagement: Teacher will remind students of the basic parts of plant anatomy that they learned the previous day. Students will quickly review the different functions of each plant structure, and the teacher will emphasize that students will be focusing specifically on leaves today.</p>	<p>“What are the different parts of a plant, and which one should be focused on when focusing on what plants eat?”</p> <p>“How do plants eat?”</p>	<p>Marker, white board</p>	<p>Assess student recollection of vocabulary and content from the previous day</p>	<p>5 minutes</p>
<p>Explore: Students will examine different green leaves and write down their observations about the leaf. After students have had time to explore on their own, the teacher will instruct them to slip their leaf over and scratch the back, recording what happens. Have students share their observations and predictions for why the leaves produced a moist green liquid.</p>	<p>“What did you observe when you scratched the back of the leaf?”</p> <p>“What are your predictions for why the leaf had green pigment and was moist inside when you scratched it?”</p>	<p>greens leaves, loose leaf sheet of paper and pen</p>	<p>Evaluate student ability to hypothesize. Teacher will assess students by listening to their reasoning for what they discovered about the plant.</p>	<p>15 minutes</p>
<p>Explain: Students will learn about the process of Photosynthesis and the key elements involved. Students will receive an acronym “LAWNS” (Light, Air, Water,</p>	<p>“What are the essential components needed to be combined in order for a plant to</p>	<p>three handouts and word sort</p>	<p>Evaluate student understanding of new vocabulary and content through the</p>	<p>25 minutes</p>

<p>Nutrients, Space) to remember the essential elements that plants need to produce food. Students will understand after the explanation that the green pigment was chlorophyll, which is essential to plant production.</p>	<p>produce food?"</p>		<p>fill in the blank worksheets, word sorts</p>	
<p>Extend: Show students three plants that are the same exact type of plant and the same age, giving the same amount of water. One of the plants was never in a lighted area, one was only in a lighted area, and half of the third was in sunlight and the other half in darkness. Compare the sizes of the plants (the littlest was constantly in the dark, and the half-dark one is deformed. Ask students why these plants grew at different rates.</p>	<p>“What caused these plants to grow at such different rates based upon what you learned about photosynthesis today?”</p> <p>“Why is the plant that was in half darkness, half light distorted and leaning to one side?”</p>	<p>pencil and loose leaf sheet of paper</p>	<p>Evaluate student understanding of photosynthesis and the importance of light for healthy plant functioning</p>	<p>5 minutes</p>

Notes: The teacher will distribute the leaves evenly, and remind students not to put leaves near their mouth. The teacher will also encourage students to clean up their stations afterward.

Source: lesson, original. photo, <http://pinterest.com/pin/254312710179398835/>

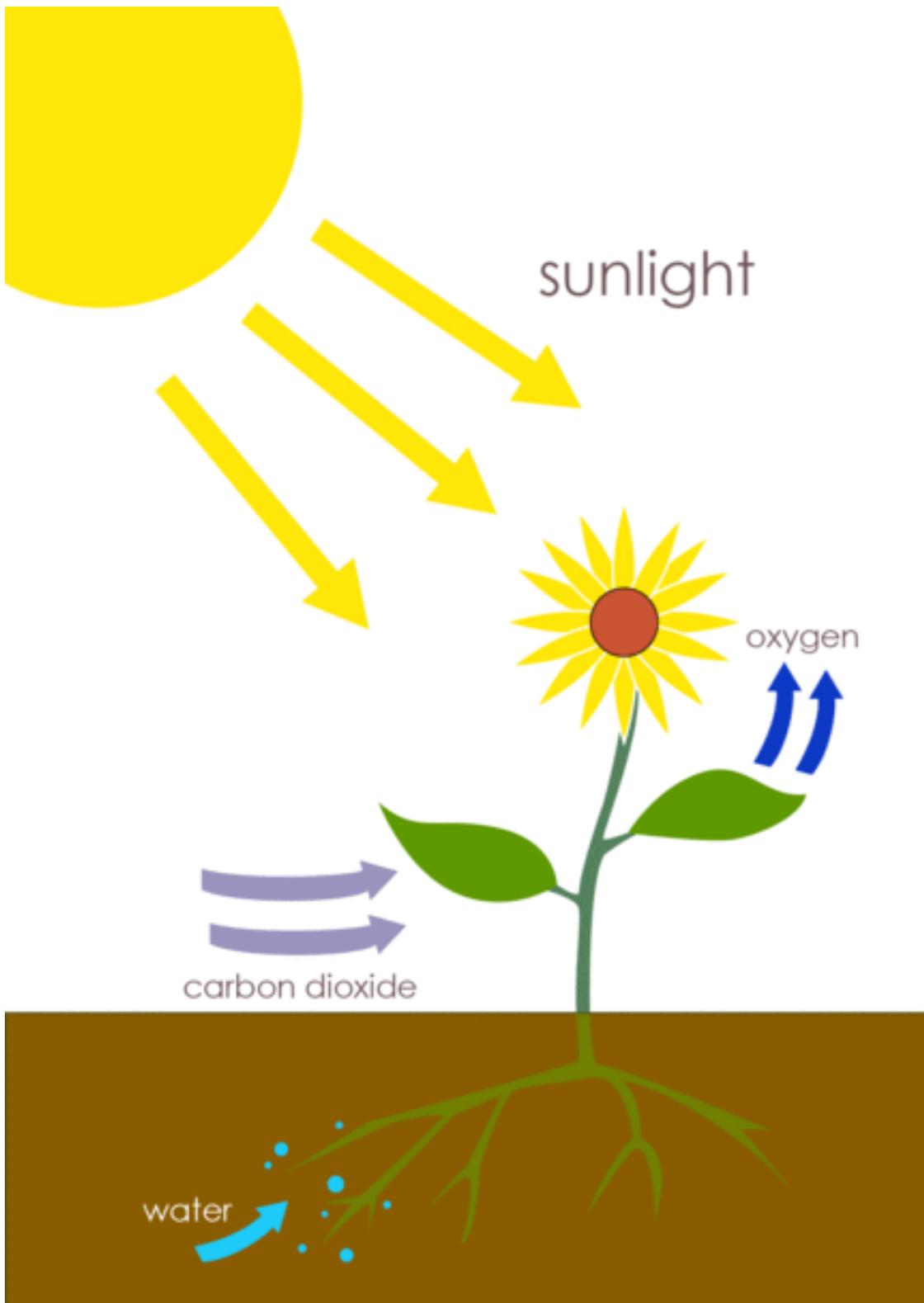
Name: _____

Date: _____

Word Bank:

sun	glucose	carbon dioxide
oxygen	water	chlorophyll
	Photosynthesis	leaves

- 1) A green pigment called _____ traps light energy from the sun and stores it in the plant's leaves.
- 2) Three things needed to make plant sugars are _____, _____, and _____.
- 3) Two waste products of the Photosynthesis process are _____ and _____.
- 4) In what part of the plant is food made? _____.
- 5) As the weather starts to turn colder, plants stop producing food and their leaves change color and fall off. This is called _____.



PHOTOSYNTHESIS

sun	Light energy that is a key ingredient in the process of Photosynthesis
glucose	The food or sugar that is produced by chlorophyll from combining water, carbon dioxide, and sunlight
Carbon dioxide	A gas used by plants in Photosynthesis
Oxygen	A waste product released by plants during photosynthesis

<p>water</p>	<p>A key ingredient absorbed in the roots that is needed for the photosynthesis process to occur</p>
<p>chlorophyll</p>	<p>The green chemical in the plant cell that absorbs sunlight and allows Photosynthesis to take place</p>
<p>Photosynthesis</p>	<p>The food-producing processes in which plants use chlorophyll to produce food (glucose) using carbon dioxide, water, and sunlight</p>
<p>leaves</p>	<p>The primary food producing sites of the plant where photosynthesis takes place</p>
<p>Dormancy</p>	<p>A period where a plant stops making food brought by changes in the environment during the Fall</p>

~WHAT DO PLANTS NEED TO SURVIVE?~

L. A. W. N. S.

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~WHAT TYPE OF AIR DO PLANTS BREATHE?~

CARBON DIOXIDE

~WHAT ARE THE BYPRODUCTS OF
PHOTOSYNTHESIS?~

OXYGEN,
GLUCOSE
WATER

Lesson 3

Daily Question: How do plants protect themselves and adapt to their environment?

Topic: Plant Adaptations: SOL 4.4 d.

Procedures for Learning Experiences	Guiding Questions	Materials Needed	Evaluation	Time Needed
Engage: Remind students of the photosynthesis lesson from the previous day, reminding students of the sticky chlorophyll that they found when they scratched the green leaves. Ask students why leaves change color in the fall.	“Why do leaves change color in the fall?”	pencil, paper	Assess student memory of the previous photosynthesis lesson and gauge level of inquiry.	5 minutes
Explore: Students will go on a 10 minute “field trip” outside and collect multi-colored leaves. When students return inside, have them flip over their leaves and scratch them. Have students record observations and write down whether these leaves reacted differently to scratching than the green leaves.	“Why do multi-colored and brown leaves have a different texture than the green leaves? Why are they more dry and do not have the green pigment?”	plastic bags	Assess student ability to make connections to previous content.	20 minutes
Explain: Explain the process of dormancy. Students will understand that leaves change color in the fall because chlorophyll breaks down and stops producing food. Students will be aware that dormancy is a form of adaptation. Plants have many adaptive behaviors that help them survive in their natural environments.	“Why do trees lose their leaves in the fall? What type of behavior is this called?”	handout: define the word “Adaptation”	Assess understanding of the concept of dormancy Assess understanding of plant adaptations and evaluate whether students can identify other forms of adaptations.	10 minutes
Extend: Have students use the Biology of Plants: Plants adaptation website to locate different kinds of plant	“What are alternative ways that plants adapt to their	Handout, fill-in boxes	Assess students’ ability to recognize plant	25 minutes

<p>adaptations in multiple habitats and expand their knowledge of different kinds of plant adaptations.</p> <p>*Give students a worksheet for homework asking them to identify plant adaptations in their own neighborhood.</p>	<p>environment?”</p> <p>“What kinds of adaptations do plants use based on their habitat?”</p>		<p>adaptations, even if they have never heard of the animals or behaviors before</p>	
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Notes: *Homework assignment addressed above to be completed at home.

Safety: It is important in this lesson to make sure that students wear gloves in the woods to avoid poison ivy and ticks. It is also important to remind students that on ‘field trips,’ no matter how informal or short, it is important to stay with your teacher and not stray from the group. Make sure that students do not touch plants with harmful adaptations such as thorns

Sources: Biology of Plants: Plants Adaptation website:
<http://www.mbgnet.net/bioplants/adapt.html>

Name: _____

Date: _____

Directions: Take a walk in your neighborhood and examine various plants. Record any suspected plant adaptations under each of these three categories:

Structural Adaptations	Physical Attributes	Behavioral Adaptations

Name _____

Date: _____

*What is a PLANT ADAPTATION?

*List as many plant adaptations as you can find from each of the following habitats:

Desert	Grassland
Tropical Rainforest	Temperate Rainforest
Temperate Deciduous Forest	Taiga
Tundra	In Water

Rubric: Formative Assessment of Student Progress

Teacher: _____
 School: _____

Student: _____
 Grade: _____

	1–Below Expectations	2–Meets Expectations	3-Exceeds Expectations
Plant Anatomy Content	The student could not recognize or correctly define parts of a plant	The student properly defined parts of a plant and knew the function of each with prompting	The student properly defined parts of a plant, knew the function of each without prompting
Photosynthesis Content	The student could not identify the elements needed to produce food in plants.	The student could identify the elements needed to produce food in plants.	The student could identify the elements needed to produce food in plants, as well as the byproducts
Plant Adaptation Content	The student could not identify plant adaptations.	The student could identify general plant adaptations.	The student could identify plant adaptations as structural or behavioral.
Handouts and Worksheets	The student failed to turn in multiple worksheets and homework assignments.	The student turned in the majority of worksheets and handouts on time and properly completed.	The student turned in all of the worksheets and handouts on time and properly completed.
Participation	The student failed to participate or make an effort in hands-on activities.	The student participated in hands-on activities and made an effort to be involved.	The student participated in hands-on activities and generated original questions.

Stories of Use:

Today I am finishing up my final lesson plan for my module! I am so proud of these kids who have come such a long way since the beginning of the year. None of them were used to hands on activities, and when I first introduced them to certain hands-on activities during my time as a student teacher, they got a little bit out of hand and I had a hard time retaining control. However, I was excited then and even more excited now about the enthusiasm that emanated from children during the hands-on activities as well as the genuine student-generated questions. I have been so proud of my ADD/ADHD stories especially –the hands-on activities work well with them and helps keep them engaged yet active in a productive way.

The opening lesson could not have gone better. I showed the video of the underrepresented scientist George Washington Carver, who is not only remembered as an inventor, but as a prominent botanist. Too many times I hear students say “Plants are boring,” and “They’re not even alive” when they hear that we will be reaching the plant unit. This is why I decided that I wanted a catalyst showing how useful plants can be. I think the video did just the trick. Students were also fascinated by the color that the celery turned and I think the activity solidified the function of a plant stem to them. The straw/sponge activity was fairly easily to distribute. They only issue I faced was the students spat water on the table so it got slightly messy.

I think that students enjoyed the Photosynthesis lesson. They enjoyed playing with the leaves and then later comparing the green leaves to the multicolored leaves that were changed by Fall. I thought this comparison went especially well because students were very proactive and forthright about generating their own hypotheses without me as a teacher having to prompt them. Students also really enjoyed the extension where they analyzed why the plant only partially exposed to sunlight was distorted. I think this helped them to remember how important light is to the process of Photosynthesis.

The Plant adaptations lesson went well because it changed a lot of students’ views that plants were very fragile and unable to survive in harsh circumstances. Students got examine plant adaptations among a variety of different habitats. This part of a lesson was a good introduction to the habitats and ecosystems SOL that is coming up soon!

Student's favorite lesson was the flower dissection where they got to take apart the flower, look at the parts under a microscope, and see how ovules are fertilized. Students seemed most excited about this activity.

Overall, I thought that the module was a huge success! Next time I am aiming to have all natural resources as props (although I did pretty well this time too!)

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