School:	Miami Southridge	Subject:	Biology	Teacher:	Robbi Jackson	Lesson Plan Date:	Tuesday 11/14/16

PRE-PLANNING

OBJECTIVE What will your students be able to learn?	**BENCHMARK**:
• Compare and contrast the structural and functional differences of the parts of a plant between different plant species. • Identify the roles that each plant structure plays in its physiology.	**SC.912.L.14.7** Relate the structure of each of the major plant organs and tissues to physiological processes.

ASSESSMENT *"Begin with the End in Mind"*
How will you know whether your students have made progress toward the objective? How and when will you assess mastery?

Students will complete a plant lab to help reinforce the structures and functions of the various parts of plants that they have learned about in the past classes.

ESSENTIAL QUESTION
A higher order question that is directly derived from the benchmark, introduced at the beginning of the lesson, discussed throughout the lesson, and answered by students at the end of the lesson to show understanding of the concepts taught.

Why do plants have leafs, roots, stems, and seeds?

HIGHER ORDER QUESTIONS (3-5)
What questions will be answered to provoke higher order thinking and include Moderate to High FCAT Complexity Levels? What would the ideal student response be for each question?

- What do leaves contain that make them perfect sites for photosynthesis? **Leaves contain chloroplasts, which are the organelles in which photosynthesis takes place, and stomata, which are openings through which gas exchange can occur.**
- Why is the root system of a plant so large? **The root system is large in order to obtain large quantities of nutrients from the soil. Additionally, if damage occurs to one part of the root system, the plant might not die because of compensation by the other parts of the root system.**
- What are the important gases that we breathe in, and why do we never run out of these gases? **We breathe in oxygen, which is vital for us to live. We never run out of oxygen because plants continue to produce oxygen during photosynthesis.**

LESSON CYLCE

BELLRINGER Follow the Focus Calendar to provide reinforcement of previously taught skills.	**TIME** Approximate
The teacher will engage the students in a brief discussion to review plant anatomy in order to reinforce the concepts taught during the last class. The teacher will encourage students to ask questions on any topics that they might still be confused about.	*10 min*
INTRODUCTION Brief part of the lesson when students learn the objective/essential question and how mastering the objective leads to achieving the bigger goal of the course. • Provide a hook to motivate students and link to prior knowledge in order to introduce a new concept. • Explain the relevance of lesson and the importance of learning the concept. • Introduce important vocabulary using the word wall as an interactive learning tool.	*70-80 min*
The students will watch "How to Correctly Use a Microscope" by scirules99. https://www.youtube.com/watch?v=jP9HtcAvGDk This video demonstrates to students how to properly use a microscope, how to set up a slide, how to adjust the focus and power, and how to handle a microscope. The resident scientist and teacher will then demonstrate to students how to set up a slide on a microscope at the front of the classroom.	
MODELING *"I DO"* Component of the lesson when teacher explicitly models to students exactly what they are expected to do during guided practice and eventually during independent work. • Conduct a think aloud while modeling the steps to completing an activity or solving a problem. • Model the use of a graphic organizer. • Use questioning techniques such as re-directing, wait-time and prompting.	

	The resident scientist will introduce students to the plant lab. The purpose of this lab is to allow students to build upon previous concepts that they have learned in class related to plant anatomy and function through an interactive set of nine stations that allow for microscopic slide and actual plant observation, higher order thinking, and reading comprehension. Key terms: pollination, photosynthesis, stomata, erosion, capillary action, germination, gymnosperm, angiosperm	
	GUIDED PRACTICE *"WE DO"* Guide students to independent practice by providing an opportunity to work in small groups and practice what was taught during the modeled portion of the lesson. • Incorporate the use of a collaborative strategy in small groups. • Encourage student accountable talk during group discussion. • Perform checks for understanding.	
	The resident scientist and teacher will walk through all nine stations of this lab and explain to the students what they will need to do in each of the stations. Students are encouraged to ask questions and for clarification. The nine stations are as follows: 1. A Short History of Pollen: Students will read a passage related to pollination and answer five corresponding questions related to the passage. 2. Pollen Observation: Students will examine two microscopic slides of pollen, draw what they observe, and answer two corresponding questions. 3. Leaf Observation 1: Students will examine three microscopic slides of different leaves, draw what they observe, and answer two corresponding questions. 4. Leaf Observation 2: Students will use a microscope to examine the top and bottom sides of a fresh leaf, draw what they observe, and answer four corresponding questions. 5. Root Observation: Students will examine a microscopic slide of a root and a fresh root, draw what they observe, and answer three corresponding questions. 6. Gizmo Student Exploration: Plants and Snails: Students will complete an online Gizmo activity that examines the effects of photosynthesis on the production of oxygen. 7. Capillary Action: Students will read a passage related to capillary action, answer two corresponding questions, and examine the effects of capillary action by placing water on three different sized strips of paper towels in graduated cylinders and observing the distance that the water moves. 8. Seed Observation: Students will examine two microscopic slides of seeds, draw what they observe, and answer two corresponding questions. 9. Seed Germination: Students will read a passage related to seed germination, answer a corresponding question, and complete a Venn Diagram comparing and contrasting gymnosperms and angiosperms.	
	COLLABORATIVE PRACTICE *"THEY DO"* Guide students to independent practice by providing an opportunity to work in small groups and practice what was taught during the shared portion of the lesson. • Incorporate the use of a collaborative strategy in small groups. • Circulate throughout the room and provide guidance to each group as needed.	
	Students will be split into groups of three in order to complete this activity. Each group will begin at a different station and will have seven minutes to complete the activity at the station. When the seven minutes pass, all groups will rotate to the next station, at which they will also have seven minutes to complete the activity. This rotation will continue so that all groups have the chance to experience all nine stations. The resident scientist and teacher will be monitoring time and walking around the room to assist any groups who need help.	
	INDEPENDENT PRACTICE *"YOU DO"* Differentiate your instruction to reach the diversity of learners in your classroom. • Assign students independent work that is directly aligned with the "I Do" and "We Do" portions of the lesson. • Conduct Center Rotations • Circulate around the room to provide individual support. • Pull small groups or individuals for more intensive support.	
	Students will have the chance to go back to any stations that they were unable to complete, with the exception of the Gizmo activity, which they will have to finish for homework. They are allowed to move freely between stations. The resident scientist and teacher will be walking around the room to assist any student who needs help.	
	CLOSURE Wrap up the lesson and help students organize the information learned into a meaningful context. • Have students reflect on or answer the Essential Question. Help students connect today's learning to their bigger goal in the course.	*5 min*

	Students will reflect on the essential question and write their responses in their interactive notebooks. If there is time, we will discuss as a class some of the students' responses.	
	HOME-LEARNING How will students practice what they learned? How will opportunities be provided for students to maintain mastery of previously mastered skills/concepts?	
	Students must finish their Gizmo activity portion of the lab if they did not have the chance to do so in class. Students must also begin studying for the unit test.	

Plant Activity

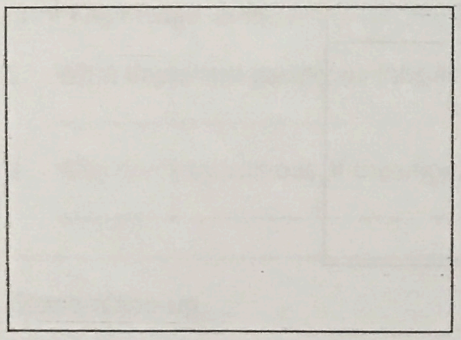
Name: _____ Date: _____ Period: _____

A Short History of Pollen

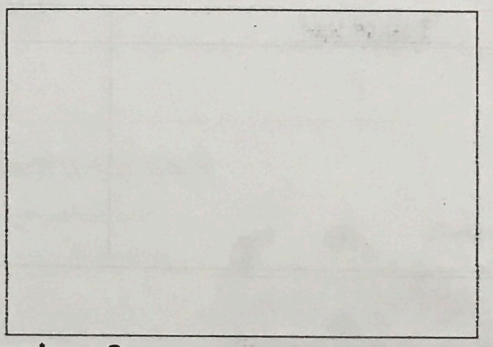
1. _____
   _____
2. _____
   _____
3. _____
   _____
4. _____
   _____
5. _____
   _____

Pollen Observation

Draw what you see in the slide and answer corresponding questions.



Specimen 1



Specimen 2

What is similar about specimen 1 and 2? _____

Which specimen appears larger? _____

Plant Activity

Leaf Observation 1

Draw what you see in the slide and answer corresponding questions

Specimen1	Specimen 2	Specimen 3

How are the leaves different from one another?

_____

_____

Why do you think the leaves are shaped differently for each specimen? Explain.

_____

_____

_____

Leaf Observation 2

Observe the front and back of a leaf under a microscope. Draw your observation and answer corresponding questions.

Top of leaf	Bottom of Leaf

Why do you THINK plants have leaves?

_____

Why does it seem that leaves extend out from the stem?

_____

How does the leaf look and feel? (Compare Top and Bottom of leaf)

_____

_____

What do you think leaves contain that make them perfect for photosynthesis?_____

_____

_____

Plant Activity

Root Observation

Observe plant root under a microscope. Draw observation and answer corresponding questions.

Specimen 1	Specimen 2

What is the purpose of roots? _____

_____

Why is the root system of a plant so large? _____

_____

How do roots help with erosion control? _____

_____

Gizmo Student Exploration: Plants and Snails

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

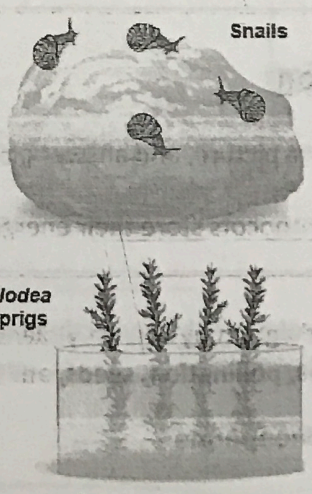
1. What important gas do we take in when we breathe?

   _____

2. Why don't we run out of the important gases that we need to stay alive?

   _____

   _____



Gizmo Warm-up

In the *Plants and Snails* Gizmo™, each of the test tubes contains water an small amount of **bromothymol blue** (BTB). BTB is a chemical **indicator**. An indicator changes color when the chemicals in the water change.

1. With the lights set to **on**, drag a snail into one test tube and a plant in another. Press **Play** (▶). After 24 hours, what is the color of each tu

   _____

   _____

2. Select **Show oxygen and CO_2 values**. Place the **O_2/CO_2 probe** in each tu of two gases, oxygen (O_2) and carbon dioxide (CO_2), in the tubes. We call these amounts the *gas levels*.
   A. When the water turns blue, which gas is most common? _____
   B. When the water turns yellow, which gas is most common? _____
   C. What does it tell you when the water is green? _____

      _____

Plant Activity

Capillary Action

Answer the following questions from the reading provided.

1. What two properties of water contribute to capillary action?

_____

2. How does water move up the thin walls of a tube? Specifically, what is it sticking to?

_____

	Distance the Water Moved (in Centimeters)
1 cm paper towel	
2 cm paper towel	
3 cm paper towel	

Seed Observation

Specimen 1	Specimen 2

What do seeds need to grow into plants? _____

_____

What are different ways that temperature could affect seed germination? _____

_____

Seed Germination

Read passage, observe picture, and answer corresponding questions.

How do dicots and monocots store their energy reserves? _____

_____

Complete the Venn diagram by correctly placing terms in the diagram. Use the terms that follow: cones, fertilization, flowers, pollen grains, pollination, seeds, and seed coats.