

TRACKING PLANTS AND KEEPING TRACK

Stage 1: Desired Results	
<p>Established Goals:</p> <p>BIO.8: The student investigate and understand dynamic equilibria within populations, communities, and ecosystems. Key concepts include</p> <p><i>e) analysis of the flora, fauna, and microorganisms of the Virginia ecosystems.</i></p>	
Meaning	
<p>Essential Understandings: <i>Students will understand that</i></p> <ul style="list-style-type: none"> use local ecosystems to apply ecological principles in the classroom and in the field where appropriate, using field guides and dichotomous keys for identifying and describing flora and fauna that characterize the local ecosystem. <p>Possible Misconceptions</p> <ul style="list-style-type: none"> That plants are equally distributed in an area. That wetlands are areas mostly filled with water and are not important to the world That plants cannot live in areas completely saturated in water. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> What is a wetland? Why are wetlands important enough to have a month dedicated to them? If a wetland is always plants survive there? What is the difference between a bog, fen, marsh, and a swamp? <p>Prerequisite Skills:</p> <p>Virginia Standards of Learning BIO.1. Students can collect preliminary observations, both qualitative and quantitative.</p>
Acquisition	
<p><i>Students will</i></p> <ul style="list-style-type: none"> Use a dichotomous key to classify plants Name and identify wetland plants Practice sampling procedures by taking plant inventory Describe a plant community based on species collected 	<p><i>Students will be skilled at</i></p> <ul style="list-style-type: none"> Classifying plants and estimating the amount of each species throughout an area. Illustrating the amount of particular species found in the various communities studied.

Stage 2: Assessment Evidence

Formative Assessments

- Students will participate in a discussion on the importance of wetlands. Teacher will check for understanding by summarizing on the board that the wetlands have many different important features.
- Students will complete an activity to classify plants and practice using a dichotomous key. Feedback will be provided when the classroom discusses the keys as a group. All students will hand in a key that has been completed as well as corrected by themselves. Teachers will hand back with the quarterly laboratory notebook check.
- Students will be responsible for understanding the various roles of working cooperatively in an outside setting. Teacher will check for understanding in a review of each of the groups the beginning of Day Two.

Summative Assessments

- A laboratory notebook will be collected quarterly.
- Students will work together to create an infographic (i.e., a poster with images, statistics and information tidbits) on what their group discovered in their three quadrants.

Stage 3: Summary of Learning Plan

This lesson is designed for two 90-minute class period.

DAY ONE:

1. Bell Work: As bell work, students are asked to spend time thinking about how they classify their lockers, book shelves, music collections, or another special assemblage of their belonging.
Anticipatory Set 5 minutes

2. Multimedia (<https://www.youtube.com/watch?v=jeyOA0mwBhc>): Students will be pre-assessed and write a 1-3 sentences on why they think wetlands are important and why they should be preserved.

Student will then watch the eight minute video

During the film, students will be asked to determine at least three reasons that wetlands are important. Answers will vary and may include wetlands help diminish potential shoreline erosion, absorb the impact of storm surge and high waves, are nursery areas for many vertebrate and invertebrate species, prevent water from flooding coastal towns, provide habitat and crucial nesting area for threatened and endangered species, buffer the full force of the ocean and protect property, and even ecotourism. *Anticipatory Set 15 minutes*

3. Transition: Follow-up discussion will lead into the importance of plants being the prominent feature of a wetland. The teacher will then ask how we classify plants bringing the Bell Work activity into the discussion.

4. Classroom Discussion/Lecture: The teacher explains that there are numerous ways in which to classify items. In particular, in the sciences classifications systems are used to organize information. Teachers will explain that the dichotomous key is a tool to develop skills for making decisions and in and classifying organisms.

Teacher will review major adaptations of wetland plants involved in the dichotomous key which may be witnessed during the next class which is to be a field excursion. Students will be taught that a plant does not always look the same (i.e., changes with the seasons), many plants grow flowers, leaves and twigs are arranged in different pattern on different plants, and the shape and edge of leaves are important for identifying features. Some key words and features to focus on are opposite, alternate, and whorled leaves; simple, compound; palmate leaves; round, oval, or lanced-shaped leaves; toothed, hairy, or lobed edged leaves.

Standards/Objectives/Teaching (Input, Modeling, Checking for Understanding) 15 minutes

5. Warm Up to Activity: Show students pictures of ten different types of wetland plants. Ask them to describe some of the plant

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color are the leaves? Does it have flowers? Where might it grow? Have students describe each of the eight plants in as much detail as possible. *Teaching* (Input, Modeling, Checking for Understanding) **10 minutes**

6. Activity: Students will be given the groups. The teacher will walk around the classroom and check for understanding. Students will also have access to field guides to review other plants and animals in the Chesapeake Bay watershed. *Guided practice/Monitoring* **20 minutes**

7. Review expectations for field work: *Closure* **15 minutes**

Students are reminded that this field excursion will be the majority of the next class and they will be assessed in how they work will together to complete the assessment which is to create an inventory of the plants in three assigned quadrants. A summative grade will be given to each group for a collage they will create on the plants and the percentages of each type of plant. Each group can decide how they want to display this information in a graphic manner (i.e., infographic on wetland plants). The teacher explains that each group should have a data collector (what plants are in each area of the quadrat?), an organizer (what areas have been surveyed?), and a recorder (writes down the information on a data sheet). Also, as with all lab exercises in the class the students will be responsible for providing a laboratory write-up that will be independently written in their lab notebooks which are collected quarterly. Each group will inventory three quadrants so each student should have each job.

Students are reminded that they will not participate if they do not have a permission slip signed and are not wearing proper clothing (long pants, long sleeves, proper footwear). They are also reminded of the equipment that will be used (i.e., quadrants) and how to use it. Students are also showed poisonous plants to avoid (although the teacher has predetermined areas for students to survey that do not contain poison ivy and has not been recently sprayed for herbicides or pesticides, etc.). Students are reminded to bring water and wear sunscreen. The total time outside will be approximately 50 minutes. As with any activity in the class all students are welcome to participate in this field excursion and methods for involvement will be determined upon case.

Students are reminded that even though they will leave the classroom all of the same rules apply. Also, the reminder that the students should make certain to leave only footprints and take only memories when the laboratory is complete. Students are not to collect plants.

8. Exit Ticket: Students are put into their field study groups (three students) and asked to provide on a piece of paper their understanding of each of the roles during the field work. The teacher reminds them that they each will rotate the roles. Students are also asked to begin brainstorming how they will present their infographic. *Independent Practice* **10 minutes**

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DAY TWO:

1. Bell Work: Students meet at the classroom and the students that have permission slips signed and are wearing adequate clothing will exit the school. The students that are not wearing proper shoes or clothing or are without a permission slip begin an alternate assignment in the classroom with a classroom monitor. **5 minutes**
2. Lecture: As the class travels to the field site, the teacher speaks of the natural history of the area and answers questions on the flora/fauna of the area (or even questions on the assignment). The class should have at least one parent volunteer or even a Master Naturalist to help passing with the field excursion. **15 minutes**
3. Pre-Activity: Students are reminded of the proper use of the equipment, that they are being assessed not only the final project (i.e., infographic), but also in how their independent lab write-up and in how they work together cooperatively. The teacher reminds the class to take organized and careful notes of what they discover. Each group is given a field guide as well as pencil and a clipboard.

Students are reminded that even though they have left the classroom all of the same rules apply. Also, the reminder that the students should make certain to leave only footprints and take only memories when the laboratory is complete. Students are not to collect plants. **5 minutes**
4. Activity: Students are given ten minutes to inventory three 8 species. They are allowed to take pictures of items or draw items. A final part of the assessment for the infographic is the focus on what types of plants make up this community and what are some other living and non-living factors. (**35 minutes**; ten minutes for each quadrants and then a few minutes for transitioning roles and summarizing each one).
5. Lecture: Student are requested to collect their information and take their belongings back into the classroom. The teacher takes the time to ask students through an informal assessment of what students might be able to infer about plant adaptations for living in the environment that is usually covered in water. **10 minutes**
6. Back in the Classroom Wrap-Up: Students are given time to work in their groups to compile information, being brainstorming how the information will be presented, and ask any questions. Students are also given time to transition their field notes into their laboratory notebooks. Students are also asked to check themselves for ticks or other organisms they may not want on themselves for the day. Students are given time also to changes shoes, etc. *The teacher lets the students know that they only have to provide data back for two of the three quadrants to account for any errors in practice of the first round, etc.* **15 minutes**

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7. Final Wrap-Up: The teacher reminds the students of the expectations for finishing the laboratory write-ups for their notebooks (rubric below) which are collected quarterly and that in a week they will be expected to present their graphic on their wetland plant communities. The teacher also plants the seed on the followings days briefly discussed during the walk back to the classroom. **5 minutes**

References

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- The Environmental Concern Inc. and The WaterCourse. (2005) *WOW! The Wonders of Wetlands*. Bozeman, MT: The WaterCourse.