

Fire Findings (Fire Ecology)

Teacher's Guide

Subject: Integrated Science (Life; Earth-Space; Physical), Mathematics

Topic: Prescribed burning, successional growth, resource management, plant adaptations, limiting factors

Summary: Students will conduct active field research by visiting three sites which have seen fire within the last five years. They will mark off a two meter by two meter square and identify and record the number of species within the plot. Students will measure the height of plants within this plot. They will discuss prescribed burning as an effective resource management tool. They will calculate the age of a saw palmetto by measuring the stem. They will calculate the height of a slash pine tree by using the shadow method.

Objectives: After completing the field lab, students will be able to:

1. Make observations of the biodiversity of species found in a gridded plot using population counts.
2. Collect and record growth measurements of identified plant species in their plots to analyze growth rates and rate of secondary succession after a prescribed burn.
3. Discuss prescribed burning as an effective form of resource management.
4. List three ways Florida plants are adapted to a fire dependant ecosystem.

Ecosystem: Pine Flatwoods

Equipment: Meter sticks Meter tapes Data sheets Calculators

2 meter X 2 meter wooden markers

Background:

- ‘The Role of Fire in Florida’ PowerPoint presented at school prior to field visit. Provides background information pertaining to prescribed burning, safety equipment, weather data, and wildfire risk reduction.
- **Vocabulary:** Biodiversity, natural communities, pioneer species, succession, carbon cycle, nitrogen cycle, regeneration, ecosystem overgrowth, adaptation, keystone species, native species, exotic species

Procedure (Engage; Explore; Explain):

1. The students will arrive at the prescribed burn locations via hayride.
2. Separate students into four groups.
3. Make sure each group has all equipment necessary.
4. Plot your two meter by two meter area.
5. Count and record the diversity of species in that area and identify as many species as possible.
6. Engage the students by asking a specific question that gets to the heart of the activity: What are pioneer species? What types of species do you think will grow back after a burn? Which species do you think will grow back first? How do you think this area will look in 4 months? 6 months? 9 months? One year?

7. Using your meter stick, measure the height of a saw palmetto in the plotted area.
8. At Site 1 measure the length of a saw palmetto stem and use the equation to calculate its' age.
9. At Site 2 use the given equation to calculate the height of a slash pine tree by measuring the length of a tree's shadow and the shadow of a student in your group; calculate their height in meters and fill in the equation.
10. After completing the lab, allow students to answer the discussion questions as a group and explain their answers relating them to the concepts, processes and skills associated with the activity. Student will record their information as a group, but each be able to discuss and explain their answers in a formal manner.

Sunshine State Standards:

Science: SC.7.E.6.6; SC.7.L.15.2; SC.7.L.17.3

Southport Panther Experience**Fire Findings Data Sheet****General Information**

Name:	Date:
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Burn Site One

1. Mark off a two meter by two meter area using hinged wooden markers.
2. Observe and discuss what evidence you find that this area was recently burned.
3. Note how sunlight can reach the ground and allow for tender low growing plants to grow. How is this beneficial for gopher tortoises?

4. Looking around, notice all the saw palmetto and slash pine that survived the fire. What adaptations helped them do this?

5. Discuss any permanent changes the fire may have made in this area.

6. Measure the height of a saw palmetto plant in or near this area. _____cm
7. Find a saw palmetto plant where the half buried stem is clearly and totally visible. The frond or leaf growth is at one end of this stem and the root growth is at the other end. It has been determined that a palmetto stem grows 1.2 cm a year. Determine the age of this saw palmetto plant.
LENGTH OF STEM IN CENTIMETERS (1 in = 2.54 cm) _____cm

LENGTH OF STEM DIVIDED BY 1.2 IS THE PALMETTOS AGE _____yrs
8. Retrieve your hinged wooden markers.

Burn Site Two

9. Mark off another two meter by two meter area. How many different species of plants are in this area? _____ Do you see different types of plants than those at site one? (Growing right at the ground, taller bushes, etc)

If so, describe how they are different here:

What, if any, species of plant seems to dominate this area? _____

10. This area was burned by fire about 10 – 18 months ago. Do you think this was a prescribed burn or a wild fire and why ?

11. Calculate the height of a slash pine tree! Find an older slash pine tree, where its shadow is readily visible.

Measure the length of the tree's shadow in meters. _____ meters

Measure the shadow cast by a member of your group in meters. _____ meters

Calculate the height of that person in meters (.32 meters = 1 foot). _____ meters

A person's shadow is to that person height as a slash pine's shadow is to the pines height. Figure the tree's height by using this equation.

Height of person ÷ Shadow of person = _____

This number (x) times the length of the tree's shadow = height of tree.

HEIGHT OF SLASH PINE _____ meters

12. Measure the height of an average saw palmetto plant in this area. _____ cm

Retrieve your dowels and string for use at the next burn site.

Burn Site Three

13. Mark off a two meter by two meter area.

14. Are there more or fewer species in this marked off area than in the other sites?

15. Gopher Tortoises and marsh rabbits need to eat tender plants like grasses and flowers that grow right at the ground. Would this be a good area for these animals to live and why ?

16. Notice that some saw palmetto plants are getting so crowded that their stems are growing up out of the ground rather than half buried. What effect could a wild fire have on these plants?

17. Measure the height of a saw palmetto plant in or near your area. _____cm

Height of Saw Palmetto in Burn Site One	Height of Saw Palmetto in Burn Site Two	Height of Saw Palmetto in Burn Site Three
_____cm	_____cm	_____cm

Fire Findings

Student Assessment

18. If a wild fire occurred in this area what effects would it have on the plants and animals that make their home here?

19. List the pros and cons you have observed to having prescribed burns.

20. Considering your answer to question 19 do you think prescribed burns are a good way to manage the Savannas ecosystems? Why or why not?
