

TEACHER LED ACTIVITIES

SCIENCE EXPERIMENTS/ INVESTIGATING TEMPERATURE VARIATIONS

OBJECTIVES:

- Investigating Temperature Variations at the Outdoor Learning Center
- Comparisons of Leaf Masses in Trees at the Outdoor Learning Center

PROCEDURE:

1. Discuss with students that they are going to perform an experiment, and the teacher will have the choice between the two experiments listed above. One activity will involve temperature measurement with thermometers and the other activity will involve comparing leaves by using a balance that determines the mass of the leaves.

NOTE: Before visiting the Outdoor Learning Center it would be helpful for students to practice taking measurements with thermometers and balances. Students should also practice calculating averages.

2. Have students work with a partner
3. Show students the materials and discuss how to use the measurement tool before they began.
4. Show students the appropriate student answer sheet and discuss how it should be completed.
5. Students should make a hypothesis for the experiment and record it on the answer sheet before making measurements. (See #4 on answer sheet)
6. Close supervision is necessary to ensure safety so all students should collect and make measurements where the teacher can see all students.
7. When all measurements have been completed and recorded collect all materials and make sure the area is clean.
8. Students should complete the activity by analyzing the collected data and answer the remaining questions on the student answer sheet.

INVESTIGATING TEMPERATURE VARIATIONS AT THE OUTDOOR LEARNING CENTER

TEACHER BACKGROUND:

Webster defines temperature as the degree of hotness or coldness measured on a definite scale.

Temperature has a great effect on the type of habitat in a specific region and the animals that can be found there. Temperature can also have a great effect on micro habitats such as under a tree, in a field, next to the ground, three feet above ground, underground, etc.

Several factors affect temperature such as moisture content, amount of sunshine, contour of the land, amount and type of vegetation, etc.

OBJECTIVE:

Students will perform an experiment by studying the variations in temperature of microhabitats at the Outdoor Learning Center. Students will be asked to make a prediction (hypothesis) as to which site (microhabitat) will be warmer or colder and then after gathering the data determine what factors may have caused the temperature variations.

Comparisons the students might test for: forest vs. field, underground vs. above ground, shade vs. sunlight, shade of a forest vs. shade of a man made structure, different heights about ground, under fallen leaves vs. above the leaves, moist area vs. dry area, windy area vs. calm area and tall grass vs. short grass.

Below are the materials contained in the kit that students may use to complete the experiment.

- Thermometer (Celsius and Fahrenheit)
- Measuring tape
- String
- Scissors

The following page is the activity sheet from the student booklet which will be used by the students.

Student Name: _____

INVESTIGATING TEMPERATURE VARIATIONS:

1. Listen to the teacher's instructions on how to use a thermometer.
2. Listed below are the different sites (microhabitats) to compare. Pick one choice and record your choice in the chart below.

CHOICE	SITE 1	VS.	SITE 2
Choice 1	Tall Grass	VS.	Short Grass
Choice 2	Field Area	VS.	Forest Area
Choice 3	Shady Area	VS.	Sunny Area
Choice 4	Underneath the Leaves	VS.	On top of the Leaves
Choice 5	Windy Area	VS.	Calm Area
Choice 6	Above Ground	VS.	Below Ground
Choice 7	Moist Area	VS.	Dry Area
Choice 8	Up in a Tree	VS.	On the ground by the Tree

3. While waiting patiently for your equipment to be handed out, **make a hypothesis (prediction) as to which site will be warmer or colder.** Record the prediction below using a complete sentence.

4. Record **site 1** and **site 2** temperatures in the chart below. Be sure to take the temperature at each site three times and record both Fahrenheit and Celsius temperatures.

CHART:

CHOICE _____	SITE 1 ()		SITE 2 ()	
1 st Temp. Reading	°C	°F	°C	°F
2 nd Temp. Reading	°C	°F	°C	°F
3 rd Temp. Reading	°C	°F	°C	°F
TOTAL				
AVERAGE				

5. Answer the question and statement below.

- Was your prediction (hypothesis) correct? _____

List one or two reasons why the temperatures were different at each site or why the temperatures might have been the same.

TEACHER LED ACTIVITIES

COMPARING LEAF MASSES

TEACHER BACKGROUND:

Fall provides a perfect time to study leaves. Many trees have begun preparing for winter by removing excess water and nutrients from their leaves and storing that energy in their root systems. In this process the chemicals such as chlorophyll are converted back to simple compounds which can be stored. Many trees leaves therefore, change color and eventually fall off when all the nutrients have been removed. Many leaves become available for study as they fall to the ground.

OBJECTIVE:

Students will perform an experiment after collecting five living leaves from a tree and five dead leaves that have fallen on the ground from the same tree. Students will compare the mass of the leaves and determine what factors might have caused a difference in their mass.

Below are the materials contained in the kit that students may use to complete the experiment.

- Balances
- Rulers
- Scissors

The following page is the activity sheet from the student booklet which will be used by the students.

Student Name: _____

COMPARING LEAF MASSES:

1. Listen to the teacher’s instructions about collecting and studying leaves. You will compare the mass of living leaves with dead leaves.
 2. Listen to the teacher’s instructions on how to use a **balance** to measure the mass of the leaves.
 3. You will gather ten leaves from single tree. Five will be living (green) leaves picked from the tree and five will be dead (brown) leaves picked up from the ground below the tree. It is important to make sure the leaves you gather are from the same tree. Looking at the size, shape, vein pattern, and the type of edges of the leaves should help you determine if they are from the same tree.
 4. While waiting patiently for your equipment to be handed out, **make a prediction (hypothesis) as to which kind of leaves (live or dead) will have a greater mass.**
Record the prediction below using a complete sentence.
HINT: Think about what is in a leaf.
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5. The teacher will point out which trees can be used to collect the leaves.
6. Record the masses of the green leaves and brown leaves in the chart below. Be sure to measure the mass of each group of leaves three times.

CHART:

MASS	GREEN (alive) LEAVES (gms)	BROWN (dead) LEAVES (gms)
1 st Reading (five leaves)		
2 nd Reading (five leaves)		
3 rd Reading (five leaves)		
TOTAL		
AVERAGE		

7. Answer the question and statement below.
 - Was your prediction (hypothesis) correct? _____
 - Explain why the green leaves or brown leaves have more mass.

