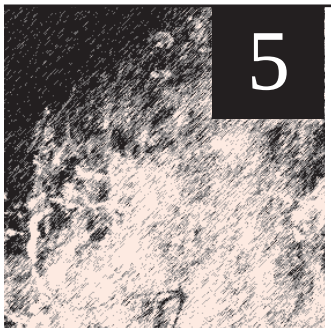


5 Conditions for a Fire

CONCEPT
Certain conditions exist in Southern California that determine "fire season" including humidity level, wind speed, air temperature, and plant fuel moisture. Specific heat plays a role in plant moisture levels.

OBJECTIVE
Students will be able to explain the relationship between specific heat and plant fuel moisture.

METHOD
Have students work in groups to read through their handout and answer the questions on each investigation worksheet. You can conduct the labs as a demonstration or have each group conduct them.

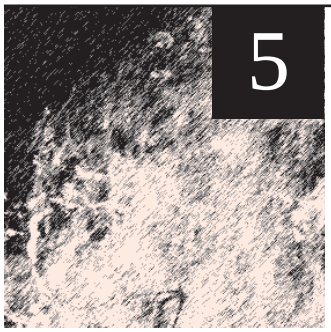
Procedure

1. Ask students to read the *Conditions for a Fire* handout.
2. Discuss specific heat and the role it plays in plant moisture and combustion.

Boiling Water Lab

This lab is designed to demonstrate the specific heat of water.

1. Set up the ring stand/tripod.
2. Go over safety precautions for conducting the lab.
3. Fill 1/3 of the paper cup with water.
4. Place the cup on the tripod so that the bottom of the cup is over the opening in the ring and above the heat source.
5. Light the lamp or Bunsen burner. The flame can touch the bottom of the cup.
6. Heat the cup until the water boils.
7. Have students record the results on *5a–Student Investigation Worksheet.*
8. Use tongs to pour the hot water out of the cup.
9. Place an empty cup in the ring or tripod, and heat until it burns.
10. Have students record the results on *5a–Student Investigation Worksheet* and complete the questions.
11. Have students present their answers.
12. Discuss answers with the student.



5 Conditions for a Fire

MATERIALS
–Student Handout
–Student Investigation Worksheets (5a and 5b)
–Paper "hot" cup (16 oz; not waxed or styrofoam)
–Ring stand/tripod w/ concentric removable flat rings
–Bunsen burner (or other flame source)
–Alcohol lamp
–Matches/butane lighter
–Tongs
–Two 3" long green and two 3" long dry plant cuttings (buds and flowers removed)
–Stopwatch
–Sling psychrometer

DURATION
1 – 2 class sessions

Fuel Combustion Lab

This lab is designed to show the specific heat of water as it relates to the amount of moisture in plants and to determine when a fuel will burn and how much heat is required to burn it.

1. Set up the ring stand/tripod.
2. Go over safety precautions for conducting the lab.
3. Place the alcohol lamp under the stand.
4. Place two green twigs on the ring.
5. Light the lamp and, using the stopwatch, begin recording the time it takes for the green twig to ignite.
6. Have students record the results on *5b–Student Investigation Worksheet.*
7. Repeat the procedure using two dry twigs.
8. Have students record the results and complete the questions on the *5b–Student Investigation Worksheet.*
9. Have students present their answers.
10. Discuss answers with the students.

Video Connections

– Introduction to Fire Behavior – Part 2: Fuels
– Yellowstone Fire

Key Words

Humidity Slope Specific Heat