

Coniferous Forests

Investigation Data Sheet



How Do Forest Fires Impact the Environment?

The largest terrestrial biome is the coniferous forest biome, also known as the taiga or boreal forest. Forest fires in this biome impact the environment by disrupting the natural carbon dioxide cycle.

Objective

Observe how the burning of forest fires releases carbon dioxide gas into the atmosphere by building a forest model and performing a standard test for the presence of carbon dioxide.

Materials

- ten-gallon fish tank with fireproof cover
- some sand or gravel
- two 250 mL beakers
- a few long fireplace matches
- 30 to 40 small wooden matches
- apron, gloves and eye protection
- 500 mL limewater, a clear, saturated water solution of calcium hydroxide (*Teachers: to prepare, dissolve 25 g Ca(OH)₂ in 500 mL of distilled water; close to air; shake twice daily over a 1 week period; filter; store filtrate in tightly capped labeled bottle. Caution: calcium hydroxide is caustic and should be handled with gloves.*)

Safety Notice: All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

Procedure

1. Cover the bottom of the fish tank with 8 centimeters of sand or gravel.
2. Place 30 to 40 matches upright in a tight circle in the center of the tank.
3. Fill the two beakers with equal amounts of limewater (calcium hydroxide solution). Place one beaker inside the tank. In the presence of carbon dioxide, limewater (calcium hydroxide) will turn cloudy in color and a white sediment (calcium carbonate) will collect at the bottom of the beaker.

4. Place one beaker of limewater just outside the tank as a control. Why is it necessary to have a control?

5. Have an adult light the "forest" of matches with one of the long, fireplace matches and then immediately slide the lid onto the tank. Write down your observations.

6. After the fire has extinguished itself, leave the lid on the tank and observe the beakers of limewater. Record your observations in the data table.

7. Continue to make observations for the next three days and record your observations in the data table. Do the two beakers of limewater look the same after three days?

Conclusions

How does calcium hydroxide act as indicator, allowing us to see the effects of a fire and the presence of carbon dioxide gas in the air?

How are forest fires beneficial to the environment?

Data Table

Observations	Beaker 1 (inside tank)	Beaker 2 (control)
Day 1		
Day 2		
Day 3		