

Name: _____ Class: _____ Date: _____

Absorb that Energy



Learner Outcomes:

- Compare heat transmission in different materials (e.g., compare the absorption of radiant heat by different surfaces)

Key terms:

Heat

Absorption

Radiant energy

Energy source

Radiation

Electromagnetic radiation

Background Information: An object that absorbs more radiant energy will heat up faster than an object that absorbs less. The amount of radiant energy an object absorbs depends upon the surface of the object.

Question: What impact do different surfaces have on the absorption of radiant energy?

Hypothesis: Write an hypothesis to predict what kinds of surfaces will absorb the most radiant energy.

Materials:

Heat lamp

Lamp (min 100W)

Aluminum foil

Thermometers

Dark and light colored

Rubber bands

Empty pop cans

paper or cloth

Cooking oil

Procedure:

1. Use an appropriate choice of materials to cover the pop cans so that you can test the effect of different surfaces on the absorption of energy.
2. Pour 100 mL of cooking oil into each can. Place the cans at equal distance away from the light (about 10 cm)
3. Record the initial temperature of the oil in each can and record the temperature every 5 minutes for 15 minutes.
4. Calculate the total temperature change of the oil in each can.

Observations:

Temperature (°C)		
Initial Temperature		
After 5 min		
After 10 min		
After 15 min		
Calculated Temperature Change		

Analysis:

1. Graph your results.

2. What was the manipulated variable in your experiment?

3. What was the responding variable in your experiment?

4. What were 3 controlled variables in your experiment?

5. What other factors, besides the one that you tested, may be affecting the temperature change in the oil?

6. Would this experiment work if you used water instead of oil? Why or why not?

Conclusion: Did your results support your hypothesis? Explain.

Extension: According to scientific theory, the same materials that absorb radiant energy should also radiate energy as well. Investigate how we change the properties of surfaces in **building and construction** so that they radiate energy better, and thus cool down or heat up more quickly.