MSP

Measurements of Student Progress

Science
Grade 8

Released Scenarios and Items
Student Edition
2012

Student's Name _____ / Date _____

Hot Lamp

Directions: Use the following information to answer questions 1 through 5.

Brandi and Jerry did the following controlled experiment to find out how the color of an object affects its temperature.

Question: What is the effect of different lid colors on the air temperature inside a glass jar exposed to a lamp?

Hypothesis: The darker the lid color, the greater the increase in air temperature in the glass jar, because darker colors absorb more energy.

Materials:
glass jar
lamp
four colored lids: black, dark gray, light gray, and white
thermometer
meterstick
stopwatch

Controlled Experiment Setup

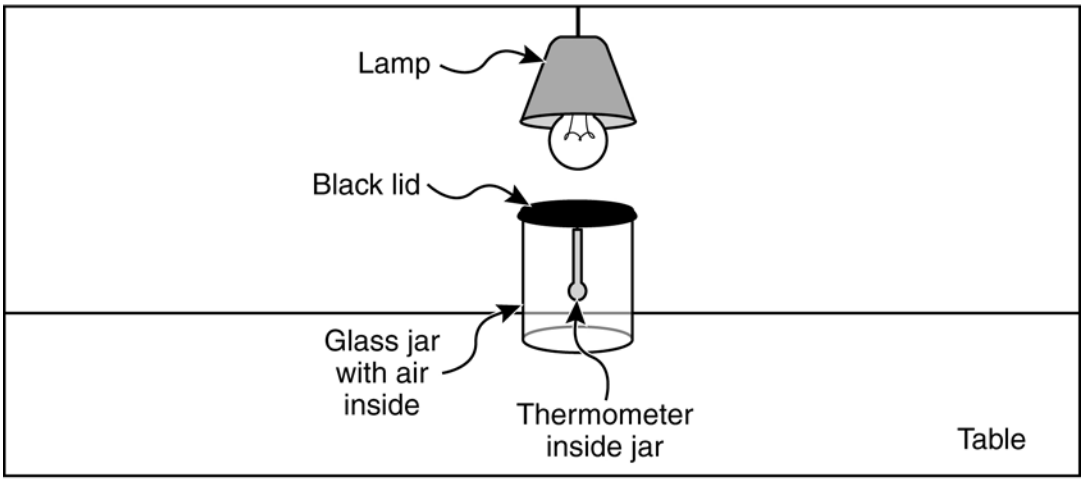

Diagram not to scale

Procedure:

1. Put the black lid with the attached thermometer on the glass jar.
2. Make sure the starting temperature inside the jar is 24º C.
3. Place lamp 5 centimeters away from the lid and turn on the lamp.
4. After 10 minutes measure the air temperature inside the glass jar and record as Trial 1.
5. Turn off lamp and wait until the air in the jar returns to the starting temperature.
6. Repeat steps 2 through 5 for Trials 2 and 3.
7. Repeat steps 1 through 6 for the dark gray, light gray, and white lids.
8. Calculate and record the average air temperature for each lid color.

Data:

Lid Color vs. Air Temperature Inside Glass Jar

Lid Color	Air Temperature Inside Glass Jar After 10 Minutes (° C)			
	Trial 1	Trial 2	Trial 3	Average
Black	54	52	54	53
Dark gray	48	48	48	48
Light gray	44	45	46	45
White	42	43	41	42

Note: Starting temperature was 24° C for every trial.

1 What variable was the manipulated (independent) variable in this experiment?

- O **A**. Lid color
- O **B**. Size of jar
- O **C**. Air temperature in the room
- O **D**. Distance between lamp and lid

2 What variable was the responding (dependent) variable in this experiment?

Write your answer in the box.

3 Brandi and Jerry were designing a doghouse. Use the results from the experiment to describe the best paint color for the doghouse.

In your description, be sure to:

- Choose a paint color.
- Describe how that color might affect the inside of the doghouse.
- Use results from the experiment to support your description.

Choose a color:

O Black O Dark gray O Light gray O White

How that color might affect the doghouse:

4 What was the purpose of waiting until the air in the jar returned to the starting temperature in Brandi and Jerry's experiment?

- O **A**. To have the same time between trials
- O **B**. To keep a variable the same for every trial
- O **C**. To allow the lamp to cool down after every trial
- O **D**. To provide time to change the lid color between trials

5 Plan a controlled experiment to answer the question in the box. In your procedure, you may use any materials and equipment.

Be sure your procedure includes:

- logical steps to do the experiment
- one controlled (kept the same) variable
- one manipulated (independent) variable
- one responding (dependent) variable
- how often measurements should be taken and recorded

Question: What is the effect of different amounts of water in a jar on the time for the water to reach 50º C?

Procedure:

Glossary of Non-Science Terms for Released Item Document

Science Grade 8 – Published Fall 2012

Students are permitted to use this Glossary sheet as a reference.

bank (river bank)	Land at the edge of a river.
beaker	A glass container used for science experiments.
clay soil	A type of soil that is sticky and easily molded when wet.
graduated cylinder	A container used for measuring.
potting soil	Dirt that is used for growing plants in pots.
sandy soil	A type of soil that is mostly sand.
stopwatch	A watch used to time events like a car race.