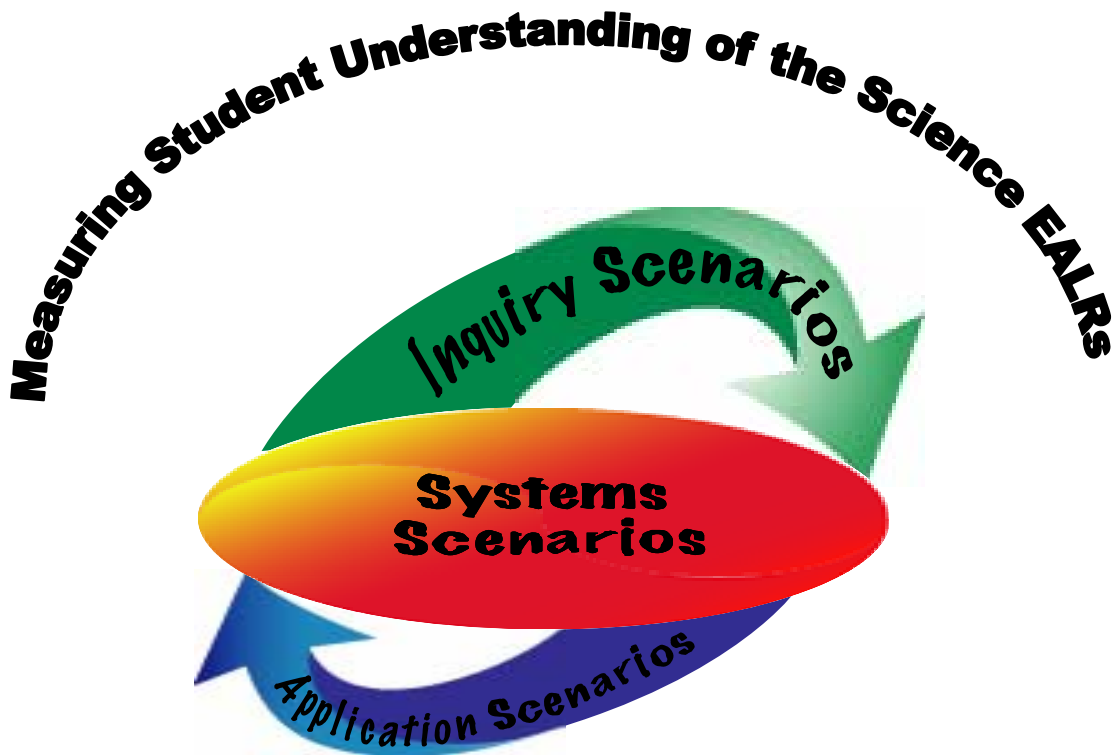


Powerful Classroom Assessment

In the Doghouse

Grade 8 Inquiry Scenario



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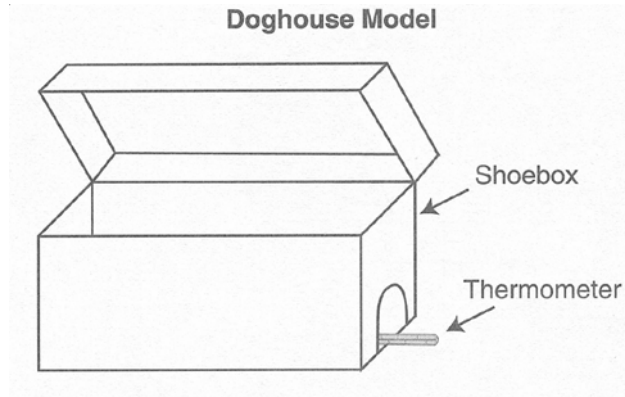
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Powerful Classroom Assessment: Grade 8 Inquiry Scenario In the Doghouse

Paul and Dalia live in eastern Washington. They want to build a new doghouse for their dog, Fido, that will keep him warm in the winter. They built a model of their doghouse using a shoebox as shown in the diagram below.



Paul and Dalia conducted the following investigation using their doghouse model.

Question:

How does insulating the walls and ceiling of a doghouse model with different materials (none, foam, and cardboard) affect the inside temperature of the doghouse model?

Hypothesis (prediction):

The inside temperature of the doghouse model will be warmest when insulated with foam insulation because foam insulation is used when building houses for people.

Materials:

doghouse model

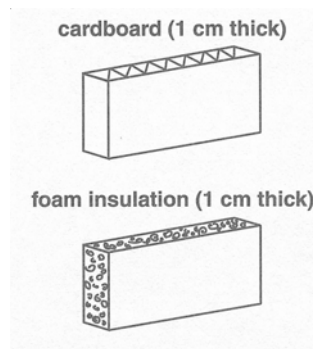
timer

thermometer

freezer

insulating materials

- cardboard
- foam insulation



Powerful Classroom Assessment: Grade 8 Inquiry Scenario In the Doghouse

Procedure:

1. Measure the inside temperature of the doghouse model and record as Starting temperature.
2. Place the doghouse model in the freezer.
3. After five minutes in the freezer, measure the inside temperature of the doghouse model and record as Inside Temperature for Trial 1.
4. Remove the doghouse model from the freezer and let the model return to the starting temperature.
5. Repeat steps 2 through 4 for Trials 2 and 3.
6. Insulate the inside walls and ceiling of the doghouse model with foam insulation. Repeat steps 1 through 5.
7. Insulate the inside walls and ceiling of the doghouse model with cardboard insulation. Repeat steps 1 through 5.
8. Calculate and record the average inside temperature for each type of insulation.

Data:

Insulation vs. Inside Temperature

Insulation	Inside Temperature (°C)			
	Trial 1	Trial 2	Trial 3	Average
None	4.0	3.0	4.0	3.7
Foam	11.0	11.0	10.0	10.7
Cardboard	13.0	12.0	12.0	12.3

Note: Starting temperature for all trials was 22°C.



Powerful Classroom Assessment: Grade 8 Inquiry Scenario In the Doghouse

Directions: Use the scenario to answer the following questions.

- 1** Which variable was a controlled (kept the same) variable in this investigation?
- A. Temperature after being in the freezer
 - B. Time to reach room temperature
 - C. Size of doghouse model
 - D. Insulating material
- 2** Which variable was the manipulated (changed) variable in this investigation?
- A. Final temperature
 - B. Freezer temperature
 - C. Time in the freezer
 - D. Insulation material
- 3** Which variable was the responding (dependent) variable in this investigation?
- A. Temperature inside the freezer
 - B. Temperature inside the doghouse model
 - C. Length of time the doghouse model was in the freezer
 - D. Type of insulating material added to the doghouse model



**Powerful Classroom Assessment: Grade 8 Inquiry Scenario
In the Doghouse**

4 Write a conclusion for this investigation.

In your conclusion, be sure to:

- Answer the investigative question.
- Include **supporting** data from the Insulation vs. Inside Temperature table.
- Explain how these data **support** your conclusion.

<p>Question: How does insulating the walls and ceiling of a doghouse model with different materials (none, foam, and cardboard) affect the inside temperature of the doghouse model?</p>



Powerful Classroom Assessment: Grade 8 Inquiry Scenario In the Doghouse

- 5 Dalia wants to use red paint on the outside of the doghouse. Why does the paint appear red?
- A. The paint traps red light.
 - B. The paint attracts red light.
 - C. The paint reflects red light.
 - D. The paint absorbs red light.
- 6 Which transfer of energy occurs between the Sun and the roof of the doghouse on a sunny day?
- A. Light energy from the Sun to heat energy of the roof
 - B. Light energy from the Sun to sound energy of the roof
 - C. Heat energy from the Sun to potential energy of the roof
 - D. Heat energy from the Sun to chemical energy of the roof



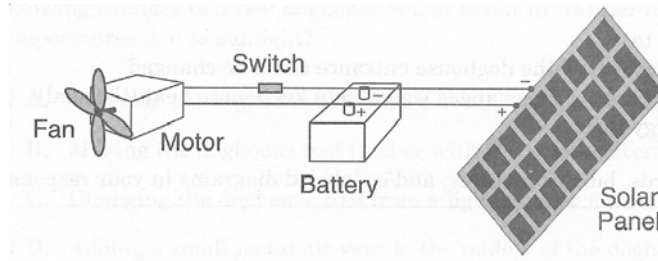
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- 7 Sunlight can raise the inside temperature of a real doghouse. Which of the following changes to a real doghouse would result in warmer inside temperatures due to sunlight?
- A. Covering the doghouse roof with a shiny metal material
 - B. Making the doghouse roof thicker with the same material
 - C. Adding a metal air vent to the middle of the doghouse roof
 - D. Changing the doghouse roof from a light color to a dark color



Powerful Classroom Assessment: Grade 8 Inquiry Scenario In the Doghouse

- 8 Paul and Dalia considered using a solar-powered fan in Fido's doghouse. The solar fan system is pictured below.



Where is energy stored in the solar fan system?

- A. Solar panel
- B. Battery
- C. Motor
- D. Fan

Powerful Classroom Assessment: Grade 8 Inquiry Scenario In the Doghouse

10 Dalia wondered if a large, insulated doghouse would stay warmer in winter than a small, insulated doghouse. Plan an investigation to answer Dalia's question.

Be sure to include:

- Prediction (hypothesis) of the investigation results
- Procedure that includes:
 - logical steps to do the investigation
 - one controlled (kept the same) variable
 - one manipulated (changed) variable
 - one responding (dependent) variable
 - how often measurements are taken and recorded

Question: How does the size of an insulated doghouse model affect the inside temperature of the
doghouse model?
Hypothesis (prediction):
Materials:



