

# Concept Review

## Section: Temperature

1. Define temperature in terms of kinetic energy.

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2. Explain the difference between total and average molecular kinetic energy of a gas contained in a box.

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3. Explain how a liquid thermometer measures temperature.

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4. Convert the following temperatures as indicated.

- \_\_\_\_\_ a. What is  $16^{\circ}\text{C}$  on the Fahrenheit scale?
- \_\_\_\_\_ b. What is  $95^{\circ}\text{F}$  on the Celsius scale?
- \_\_\_\_\_ c. What is  $-30^{\circ}\text{C}$  on the Kelvin scale?
- \_\_\_\_\_ d. What is 100 K on the Celsius scale?

5. Predict what will happen if a block of hot iron is placed in a glass of cool water.

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6. Evaluate the following newspaper headline. Is it realistic? Explain.

*Scientists Create a Thermometer to Measure Temperatures Below 0 Kelvin*

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7. Explain why a metal door should not be built to fit tightly to the frame of a door, especially in a region where the weather gets hot.

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# Concept Review

## Section: Energy Transfer

1. **Explain** why a ceramic bowl will keep oatmeal hot longer than a stainless steel bowl.

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2. **Explain** which method of heat transfer can take place if two objects at different temperatures are placed without touching each other in a vacuum.

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3. **Calculate** how much energy must be transferred as heat in each of the following situations. Use the following equation:

$$\text{energy} = (\text{specific heat}) \times \text{mass} \times (\text{temperature change})$$

- a. A 100 kg tank of water is warmed from 10°C to 25°C; specific heat = 4180 J/kg · K

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- b. 100 kg of steam is raised from 120°C to 135°C; specific heat = 1870 J/kg · K

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4. **Explain** why steam (gas) has a lower specific heat than water (liquid).

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5. **Describe** the method of heat transfer involved when you mix hot water with cold water to make lukewarm water.

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6. **Determine** which is the best type of skillet. Some people prefer a heavy cast iron skillet while others prefer a thin stainless steel one. (**Hint:** Think about how each skillet conducts heat.)

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