Name: _____ Group: _____ Date: _____

LAB 16 EXPERIMENT

THE EFFECT OF SUBSTANCE QUANTITY ON THE ABSORPTION OF THERMAL ENERGY

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Goal

Determe if the change of temperature is the same when an equal amount of thermal energy is applied to different quantities of a liquid.

1. What is the independent variable in this lab?

_____

2. What is the dependent variable in this lab?

_____

Hypothesis

I think that _____

because _____

Materials

- 50-mL graduated cylinder
- wash bottle of distilled water
- 2 100-mL beakers
- hot plate
- 2 thermometers
- ring stand
- 2 thermometer clamps *or* 2 universal clamps and perforated cork stoppers
- stopwatch *or* watch
- 2 glass stirring rods

Procedure

1. Measure into the graduated cylinder 25 mL of distilled water.
2. Pour the water into one beaker.
3. Measure into the graduated cylinder 50 mL of distilled water.
4. Pour the water into the second beaker.
5. Place the beakers on the hot plate.
6. Secure the thermometers to the ring stand with the clamps.
7. Ensure the bulb of each thermometer is submerged completely in water and not touching the beaker.
8. Record the temperature of the water in each beaker.

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9. Turn on the hot plate to a medium setting and start the stopwatch.
10. Stir the water in each beaker regularly with the glass stirring rod.
11. Heat for 5 minutes.
12. Turn off the hot plate. Record the temperature of the water in each beaker.
13. Clean up and put away materials.

Results

Record your results in the table below. Give the table a title.

Title:

Volume of water (mL)	Initial temperature (°C)	Final temperature (°C)	Temperature change (°C)

Analysis of the results

1. Does the water in each beaker at the start have an equal amount of thermal energy? Explain your answer.

2. What form of energy is transmitted from the hot plate to the water in each beaker?

3. Does the water in each beaker absorb the same amount of thermal energy? Explain your answer.

4. Is the temperature change of the water in each beaker the same?

5. According to your results, is temperature change an appropriate measure of thermal energy?

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6. What are the possible sources of error in this lab?

_____

_____

7. How could you improve the protocol for this lab?

_____

_____

Conclusion

1. Complete the following sentences:

a) Temperature change _____ an appropriate measure of thermal energy.

b) When samples of the same liquid are exposed to the same amount of thermal energy, the temperature change depends on _____.

2. Was your hypothesis confirmed or not? Explain your answer.

_____

_____

Application

To reheat the water in a child's pool you have at your disposal a bucket of water at 50°C and a cup of boiling water. Which container of water would be most effective in reheating the water in the pool? Explain your answer.

_____

_____

_____