TESTING THE ACCURACY OF DIFFERENT THERMOMETERS

Homeschool Science Experiment

Name: _____

Date: _____

Teacher (if applicable): _____

QUESTION: How accurate are different thermometers when compared to a reliable reference thermometer?

HYPOTHESIS:

I think _____ will be the most accurate because _____ _____.

MATERIALS:

- 2 or more thermometers to test (e.g., digital, analog, infrared)
- 1 reliable reference thermometer (laboratory or high-quality digital)
- Ice and water
- Warm (not boiling) water
- Room temperature environment
- 3 clear cups or containers
- Stirring spoon
- Paper and pencil for recording data

PROCEDURE:

1. Set up three temperature test environments:
   - Ice water: Fill a cup with ice and add a little water. Stir.
   - Room temperature: Use a cup of room temperature air (no water).
   - Warm water: Fill a cup with warm (not boiling) water. Stir.
2. Place all thermometers in the first environment (ice water). Make sure the sensing parts are fully in the water and not touching the sides or bottom.
3. Wait 1–2 minutes for the readings to stabilize.
4. Record the temperature from each thermometer and from the reference thermometer.
5. Repeat steps 2–4 for the room temperature environment.
6. Repeat steps 2–4 for the warm water environment.
7. Calculate the error for each thermometer at each temperature. Error = Measured Temperature − Reference Temperature

DATA TABLE:

Environment (Test Point)	Reference Thermometer (°C)	Thermometer 1 (Type: _____)		Thermometer 2 (Type: _____)		Thermometer 3 (Type: _____)	
		Measured Temp (°C)	Error (°C)	Measured Temp (°C)	Error (°C)	Measured Temp (°C)	Error (°C)
Ice Water (0°C)							
Room Temperature							
Warm Water (Not Boiling)							

Note: The more accurate a thermometer is, the closer its error is to 0°C.

ANALYZE YOUR RESULTS:

1. Which thermometer had the smallest overall error? _____
2. Which thermometer had the largest overall error? _____
3. Were any thermometers more accurate at some temperatures than others? Explain. _____ _____
4. Why do you think some thermometers were more or less accurate? _____ _____
5. If you had to choose the most reliable thermometer, which one would you choose and why? _____ _____

CONCLUSION:

Write a summary of what you learned from this experiment.

_____
_____
_____
_____
_____
_____
_____

SCIENCE TIP:

Always let thermometers adjust to the temperature and read at eye level for the most accurate results.

SAFETY FIRST!

- Do not use boiling water.
- Ask an adult for help if using hot water.
- Clean up spills right away to prevent slips.