

Human thermoregulation

LT: I can follow a procedure in order to collect and present data that describes how the body responds to different external temperatures.

4.1.2c

Introduction

Normal human internal body temperature ranges between about 97.6 - 99.6°F (36.1°C to 37.8°C). In this activity, you will explore the relationship between your **internal (core) body temperature** and the **skin surface temperature** of your hand under different conditions. This exploration will help you understand how the body regulates **internal (core) temperature** in response to changes in **external temperature**.

Establish a hypothesis for the following:

Do you think that dipping your hand in cold water will cause the **skin surface temperature** of your hand to increase or decrease? Why?

Do you think that dipping your hand in cold water will cause your **internal (core) body temperature** to increase or decrease? Why?

Materials

Oral thermometer
Beaker of hot water

Thermometer probe
Beaker of cold water

Stopwatch / timer / clock

Procedure

1. Read and record the **initial ambient temperature** (room temperature) using the thermometer probe.
2. Measure and record the initial temperature of the **skin surface temperature** of the test subject by gently grasping the thermometer probe between their thumb and fingers
3. Measure and record the initial **internal (core) body temperature** using the oral thermometer.
4. Measure and record the temperature of the cold water using the thermometer probe.
5. Test subject should dip their hand into cold water for 30 seconds and then remove your hand.
6. Measure and record the **skin surface temperature** by gently grasping the thermometer probe between your thumb and fingers of the hand that you dipped into cold water.
7. Record observations about the test subject's response to the cold water (skin color change, shivering, etc)
8. Measure and record **internal (core) body temperature** using the oral thermometer.
9. Repeat the above procedure with warm water and record data by adding on to Table 2.

Use your data set to create a graph showing temperature *changes* from cold to warm water. Include one line for skin surface temperature and one for core body temperature.

Data Table 1: _____

Initial ambient <small>(room)</small> temperature (°F)	Temperature of cold water (°F)	

Data Table 2: _____

	Skin Surface Temperature (°F)	Internal (core) Body Temperature (°F)	Observations
Initial Temp			
After exposure to cold water			
Temperature change			

	3	2	1
Data Tables	Tables include a title, units and numbers (including averages) rounded to the nearest tenth. Data is calculated and recorded thoroughly and accurately. There are no major errors.	Most data is calculated and recorded thoroughly and accurately. There are few major errors.	Little data is calculated and recorded thoroughly and accurately. There are many major errors.
Graph	The graph clearly shows the relationship between both variables. The graph accurately includes all of the following: -a title -axes labels (with units of measure) -units following constant scale -bars/lines represent correct values -a key (or labels) identify all lines/bars	The graph shows the relationship between both variables. The graph accurately includes most of the following: -a title -axes labels (with units of measure) -units following constant scale -bars/lines represent correct values -a key (or labels) identify all lines/bars	The graph partially shows the relationship between both variables. The graph accurately includes few of the following: -a title -axes labels (with units of measure) -units following constant scale -bars/lines represent correct values -a key (or labels) identify all lines/bars
Conclusion	Conclusion is thorough. Specific data evidence and reasoning are included.	Conclusion is general. Specific data evidence/reasoning is limited.	Conclusion is incomplete. Specific data evidence/reasoning is not used.
Analysis	Analysis contains many thorough, thoughtful, and relevant reflections that communicate purpose, next steps and sources of error.	Analysis contains several thorough, thoughtful, and relevant reflections that communicate purpose, next steps and sources of error.	Analysis contains few thorough, thoughtful, and relevant reflections that communicate purpose, next steps and sources of error.

Participation					
I often contributed good ideas that were relevant to the topic and task. I came to meetings prepared. I did my share of the work.	4	3	2	1	I seldom contributed good ideas. Sometimes I was talking off-task. I did not come to meetings prepared. I did not do my share of the work.
Working with Others					
I often compromised and cooperated. I did take initiative when needed and/or listened and respected the ideas of others.	4	3	2	1	I seldom compromised and cooperated. I did not take initiative when needed and/or did not listen and respect the ideas of others.
Product					
My part of the task is complete and accurate. My work was submitted on time.	4	3	2	1	I did not complete my part of the task. The information I presented was inaccurate and/or not done correctly. It was not completed on time.
Understanding Content					
I can speak about the topic and group work knowledgeably. I can sum-up the lesson.	4	3	2	1	I do not understand what I did in my group. I did not ask or answer questions. I cannot sum-up the lesson.