

# Data Sheet

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**Name(s):**

**Class:**

**Date:**

One of the important features of the human body is its ability to regulate the biological processes that take place within its confines. In this activity, you are going to investigate some of these processes and the ways in which they are regulated.

## Data Collection

Data is to be collected at home, over a weekend (Friday through Sunday), so be sure to make the time to complete this assignment. You will need to collect the data at four-hour intervals, beginning Friday afternoon, and ending Sunday evening. Yes, that means that you will have to get up in the middle of the night to take a set of measurements. Don't forget to set your alarm! There are three pieces of data that you will be collecting at each interval. Follow the indicated procedures to collect the data and record your measurements in Table 1.

1. Use an oral thermometer to record your body temperature. Place the thermometer under your tongue, close your mouth, and record the temperature registered by the thermometer after two minutes. If you are using a digital thermometer, the thermometer should remain in your mouth until it beeps.
2. Measure your pulse, either at your wrist or on your neck (carotid artery). Using a stopwatch or watch with a second hand, count the number of beats that occurs in ten seconds and multiply this count by 6 to determine your pulse in beats/minute.
3. Reaction time is the amount of time that it takes for your body to respond to a stimulus. For example, when a driver sees brake lights ahead, it takes some time before this information is processed by the brain and his/her foot presses down on the brake pedal.
  - a. You are going to measure your reaction time using a meter stick. Enlist the help of a family member or friend. Have your assistant hold the meter stick vertically. Place your hand around the bottom of the meter stick, but don't actually touch it. Note the position of the top of your hand relative to the centimeter markings on the meter stick. Record this starting value to the nearest 0.1 cm.
  - b. Your assistant needs to let go of the meter stick, without giving you any advance warning. You need to grab the meter stick as soon as possible after he/she releases it. Note the new location of the top of your hand relative to the centimeter markings on the stick. Record this final value to the nearest 0.1 cm.

Although these measurements are in centimeters, the student should convert to meters.

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- c. If you can't get your assistant to help you with the reaction time measurements scheduled for the middle of the night, please make a note of this problem in Table 1. Those measurements really are needed to ensure that the data are valid, however, so do your best to convince him/her to aid the cause of science!
- d. When you collect data after having been asleep, take the measurements immediately, while you are still in bed. Make sure the thermometer, watch/stopwatch, and data table are handy.



**Data Analysis: Graphing** (to be done in class)

Prepare three graphs of the data. For each one, plot the body measurements on the *y*-axis, and the time on the *x*-axis. Choose appropriate scales for each graph, label the axes, include a title, and draw circles around the data points (point protectors). Connect each data point to the next with a straight line.

**Data Analysis: Questions** (to be done in class)

1. Compare and contrast the three graphs. Is there any pattern to the data you collected?
2. What appears to regulate these patterns?
3. How could you prove what the regulating factor(s) are?
4. What other biological processes might exhibit similar patterns?
5. What are the implications of these rhythms for someone who works on a rotating shift schedule, or frequently travels long distances?
6. What are the implications of these rhythms for the diagnosis of a condition such as hypertension (high blood pressure)?
7. What concerns do you have regarding the effect of these rhythms upon reaction time?

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