



Hands-On Lab

Investigating Homeostasis and Exercise

Your body's temperature, heart rate, and blood pressure need to remain within certain set ranges. An increase in activity level will shift these values, and your body will use feedback loops to bring levels back to the target set points. Exercise particularly affects the circulatory and respiratory systems as well as perspiration levels. In this lab, you will develop an experiment to test the effect of exercise on homeostasis and then create graphs to analyze your results.



Predict How will the circulatory and respiratory systems and perspiration levels change in response to exercise? How will the body return to homeostasis?

PROCEDURE

Develop a procedure to test how the circulatory and respiratory systems and perspiration levels change in response to exercise and how the body returns to ideal conditions after exercise. Consider the following questions for your procedure:

- What will be the role of each team member? Not everyone will exercise.
- What materials will you need for the experiment?
- How will you measure the response to increased activity?
- How will you know whether the body systems are in a stable state?
- How many experimental trials will you need? How long will each trial last?
- Which variable will you change, and which variables will be kept constant?
- How will you record your data?

Your teacher must approve your materials list and procedure before you begin.

ANALYZE

1. Graph the measurements you took of changes in the circulatory and respiratory systems and perspiration levels as a function of how long a person has exercised.
2. Using your data and graphs, determine the effects of exercise over time on the circulatory and respiratory systems and on perspiration levels.
3. How would you improve your procedure to better collect data for the question asked in this activity? Did you make any errors that affected your results? What other measurements could you collect to learn about the effect of exercise?
4. How are perspiration levels related to body temperature and homeostasis?
5. Develop a feedback loop to model the relationship between exercise and either the circulatory system or respiratory system.

FIGURE 15: Increased activity can affect homeostasis.



SAFETY

- If the person exercising feels discomfort at any time, stop the experiment and inform your teacher immediately.

DISORDERS OF THE ENDOCRINE SYSTEM

EXPLAINING HOMEOSTASIS

Go online to choose one of these other paths.