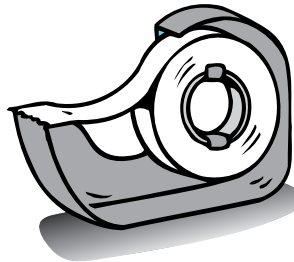


Investigating the Interaction of Organ Systems

WHAT YOU NEED

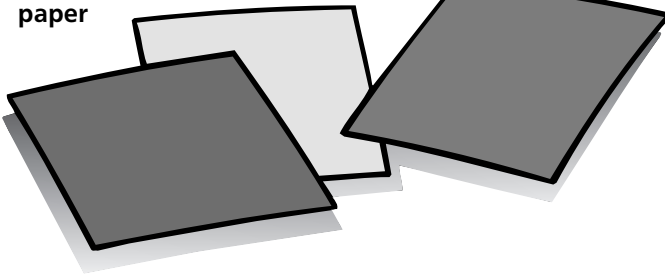


scissors

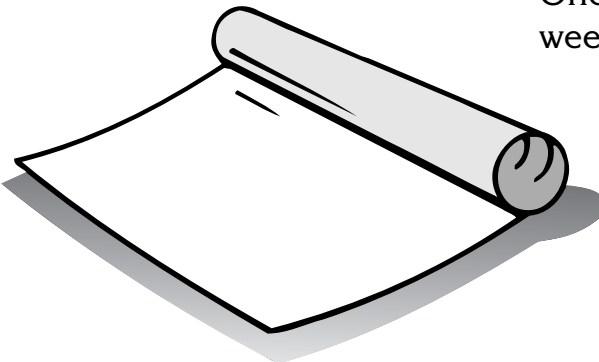


tape

sheets of colored paper



sheet of white roll paper, large enough for a life-sized outline of yourself



Find Out

Do this activity to find out how the body's systems interact to form a bigger system.

Process Skills

Measuring
Classifying
Observing
Inferring

Time

- One hour once a week for three weeks



WHAT TO DO

1. Have a classmate draw an outline of your body on the roll paper. **Measure** the height and width of the drawing.
2. As you study each system in the human body, use colored paper to cut shapes that represent the major organs in each system (for example, digestive, excretory, and so on). Each body system should be a different color.
3. Attach the shapes to their corresponding places on the human outline and **label** each organ by its name and by the system of which it is a part. Try to keep from entirely covering any one organ or system with another.
4. **Record** the names of the organs and their functions, and identify the body system with which each is associated.
5. Indicate the connections that each system has to other systems in the body with arrows linking the system labels that are written outside of the human outline. **Observe** how the systems interact.



Conclusions

1. What organ systems does your life-sized figure show?
organs that make up the digestive, circulatory, respiratory, and excretory systems

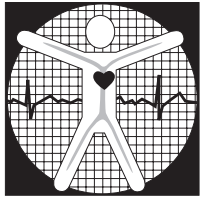
2. What are some ways in which the organ systems interact?
Answers will vary; answers may include that the circulatory and respiratory systems—heart and lungs—work together to exchange gases, the excretory and cardiovascular systems work together to remove wastes from blood (kidneys, heart, and blood vessels), and so on.

New Questions

1. **Infer** how the removal of one organ could affect the way that an organ system is able to perform its function in the body.
Answers will vary according to the organ in question. Without the heart or brain, the organism would die. If one kidney was removed, the other kidney would compensate and the organism would survive. The system in each case would function differently.
2. What organs are not shown in your life-sized figure?
Answers will vary; answers may include the brain, spinal cord, eyes, ears, and so on.



Name _____



ACTIVITY

Investigating Blood Pressure

Predict whether the hard plastic or flexible plastic tube will squirt farther when you squeeze the bottle.

Answers will vary.

Record the observations you make during the activity in the data table below.

Answers in the chart will vary.

Data and Observations

Distance Water Squirts (cm)		
Trial	Hard Tube	Flexible Tube
1		
2		
3		
Total		
Average		

Activity Journal

Lesson 1 • The Cardiovascular System

Name _____

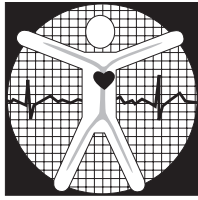
Conclusions

- 1** Infer what body organ the plastic bottle represents. What does the water represent?
the heart; the blood
- 2** Compare your prediction with your observations. Which tube squirted water farther?
Answers will vary. Water should squirt farther from the glass, or hard plastic tube.
- 3** Which tube was under higher pressure? Lower pressure?
glass or hard plastic tube; flexible, plastic tube

Asking New Questions

- 1** Artery walls are more muscular, but less elastic or flexible, than veins. Which tube represents an artery, and which represents a vein?
glass tube—artery; flexible, plastic tube—vein
- 2** On the basis of your answer to the previous question, compare blood pressure in arteries and veins.
Blood pressure is higher in arteries than in veins.

Name _____



ACTIVITY

Investigating Absorption

Make a **hypothesis** by telling in which beaker the most water will be absorbed and why.

Hypotheses will vary.

Record how much water is in each beaker and the amount of water absorbed in the table below.

Answers in the table will vary.

	Amount of Water Before Paper Towels Added	Amount of Water After Paper Towels Removed	Amount of Water Absorbed
Beaker A			
Beaker B			
Beaker C			
Beaker D			

Name _____

Conclusions

- ① Compare your hypothesis with your results.
Answers will depend on hypothesis made.

- ② Explain why some beakers absorbed more water than others.
The more paper towels there were, the more water was absorbed. Four paper towels will absorb more water than one paper towel because there is a greater absorbing surface area.

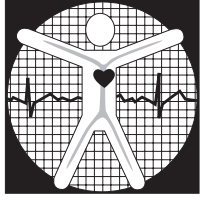
- ③ In what ways are the paper towels like villi in your small intestine?
Villi absorb digested food and paper towels absorb water. Like the paper towels, the villi provide a greater surface area into which substances can be absorbed.

Asking New Questions

- ① How would a beaker that had five paper towels in it compare with those that you observed in the activity?
It would absorb even more water.

- ② On the basis of the results of your activity, **infer** how the number of villi in your small intestine increases the surface area of your small intestine and allows more food to be absorbed.
By inference, villi projections provide more surface area for food to be absorbed, just as more paper towels meant more water absorbed.

Name _____



ACTIVITY

Filtering a Mixture

Predict what will happen as the water and crushed chalk mixture is poured through the filter.

Answers will vary.

What did you see in the filter? **Record** your observations.

The students should observe that the chalk particles collected in the filter but that the water passed through.

Name _____

Conclusions

1

Compare your prediction with your observations.
Answers will vary depending on predictions made.

2

What happened when the mixture was poured through the filter paper?

Particles of crushed chalk were filtered out of the mixture.

3

Describe how this filtering process compares to the kidney's filtering process.

The filter paper removed the crushed chalk particles from the water. The kidneys remove wastes from the blood.

Asking New Questions

1

What would happen if you kept adding larger particles of chalk to the mixture? What kinds of further information would be helpful to support your conclusion or to answer new questions that you have?

Answers will vary but may include that larger particles also would be filtered out of the mixture. Eventually the filter paper would become clogged and not work very effectively. If the kidneys become clogged by undissolved particles, they will not work very efficiently. Answers will vary.

2

Describe how this activity could be changed to make it more like the filter system in your kidneys.

Accept all reasonable answers. Answers may include constructing two filters, like the two kidneys, or connecting a tube to the filter to represent the ureter, and so on.