

The Importance of Leaves on a Plant

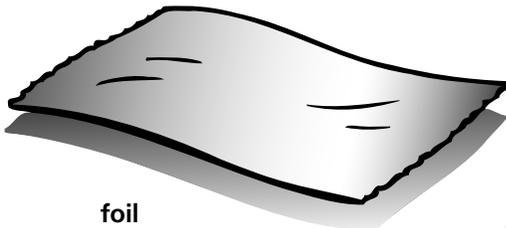
WHAT YOU NEED



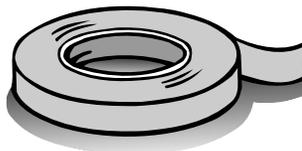
scissors



two identical houseplants



foil



masking tape



metric ruler

Find Out

Do this activity to see how an individual plant organ is important to the survival of the plant.

Process Skills

- Measuring
- Predicting
- Controlling Variables
- Observing
- Communicating
- Inferring
- Designing
- Investigations

Time

- 35 minutes the first day
- 10 minutes twice a week for three weeks

WHAT TO DO



1. Label one plant "A" and the other plant "B."
2. Cut out 15 pieces of foil, each about 20 cm square.
3. **Predict** how plant A will compare with plant B if the leaves on plant B are covered for three weeks.
4. Wrap a piece of foil around each leaf of plant B. Use the masking tape to hold the foil in place.

5. Place both plants on a sunny windowsill for three weeks. Water both plants as your teacher instructs.
6. **Observe** the plants twice a week for three weeks. **Record** your observations on the chart.
7. After three weeks, take the foil off the leaves. **Draw** a picture and describe plants A and B on the chart.



Prediction: _____

Observing the Importance of Plant Leaves				
Time	Observations			
	Plant A		Plant B	
Week 1	Day 1	Day 2	Day 1	Day 2
Week 2	Day 1	Day 2	Day 1	Day 2
Week 3	Day 1	Day 2	Day 1	Day 2
After Three Weeks				

Conclusions

1. What is the relationship between the survival of a plant and the functioning of its leaves?
2. Based on what you know about the functions that leaves perform in a plant, **infer** why there was a difference between plants A and B after the three weeks.

New Questions

1. What processes do the cells in leaf tissues perform?
2. Make a **hypothesis** about how a plant's survival would be affected if its roots did not function.
3. Plan an investigation that would test your hypothesis. Write instructions that others could follow to do your investigation.



Name _____



ACTIVITY

Investigating Plant Tissue

Predict what will happen to the celery stalk in the colored water.

What do you **observe** has happened to the celery stalk?

Draw an outline of the bottom of the celery stalk and show the parts that are stained.

Draw what the cut edge of the celery stalk looks like after you cut it in half lengthwise.

Name _____

Conclusions

- 1 Compare your prediction with your observations.
- 2 What kind of tissue was stained by the food coloring?
- 3 How did the cells in this tissue work together?

Asking New Questions

- 1 How did you know what kind of tissue was stained by the colored water?
- 2 **Predict** what might happen if you left the celery stalk in the colored water for a day. Why might this happen?

Name _____



ACTIVITY

Investigating the Lungs

Predict what will happen when the air is released into the solution.

What happened to the color of the bromothymol blue solution when the air from the balloon was released into the solution?

Name _____

Conclusions

- 1 Compare your prediction with your observations.
- 2 Was carbon dioxide present in your breath? How do you know?
- 3 What particular function of your lungs was detected by this activity?

Asking New Questions

- 1 What cellular process produces carbon dioxide as a waste product?
- 2 Would the gases released from the leaves of a plant change the color of the bromothymol blue solution?

Name _____



ACTIVITY

Investigating Systems

How many heartbeats did you feel in 20 seconds? **Record** this number in the chart below.

What is your heart rate for one minute?

How many times did you exhale in 20 seconds? **Record** this number in the chart below.

Predict how your heart rate and breathing rate might change if you run in place.

How many beats did you feel in 20 seconds after running in place for two minutes? **Record** this number in the chart below.

How many times did you exhale in 20 seconds after running in place for two minutes? **Record** this number in the chart below.

	Number of Heartbeats	Number of Exhales
While Sitting		
After Running in Place		

Name _____

Conclusions

- ① Compare your prediction with your observations.

- ② What system did you observe when you felt your neck with your fingers? When you felt your breath?

- ③ What organ pumped the blood into the carotid artery that you felt in your neck?

- ④ Did you see a relationship between your heart rate and the number of times you exhaled?

Asking New Questions

- ① Based on what you know about the flow of blood in an animal, explain why a relationship might exist between your heart rate and the number of times you exhaled.

- ② If your heart rate were measured while you were sleeping, how might it compare to the heart rates you recorded in this activity?