How Earth’s Gravity Affects Plants

One of the most important issues in biology is understanding how plants grow. By applying the results of research on this issue, American farmers now grow twice as much food as they did 50 years ago.

One aspect of plant growth is the direction in which plants grow. After a plant sprouts from a seed, some of its cells form a shoot that grows upward. Other cells grow downward, becoming roots. How does this happen? Biologists think that plants usually respond to signals from the Sun and from the force of gravity.

Gravity and Plant Growth

To test the importance of sunlight, biologists can grow plants in the dark on Earth. Testing the impact of gravity, though, is more difficult. In 1997, a space shuttle carried moss plants into space. The plants grew for two weeks in microgravity, an environment in which objects are almost weightless. When the shuttle returned the plants to Earth, biologists studied how they had grown.

**Prediction**

Biologists had predicted that the moss would grow randomly. They expected that without signals from sunlight or the force of gravity, the moss would grow in no particular pattern.

**Results**

The biologists were surprised by what they saw. The moss had not grown randomly. Instead, the plants had spread out in a clear pattern. Each plant had formed a clockwise spiral.

**Significance**

The moss experiment may be important for future space exploration. Can plants provide the food and oxygen that astronauts will need on long voyages to other planets? Experiments with moss are among the first steps in finding out.

**EXPLORE**

1. PROVIDE EXAMPLES Make a list of other spiral formations that occur in nature. Discuss why spirals may be common.
2. CHALLENGE Use library or Internet resources to learn about other experiments that test the effects of microgravity on plants and seeds.