PLANT mAGic Kit - Background Information

Corn:

- The Corn Belt is where most of the corn in the U.S. is produced. Illinois, Iowa, Nebraska and Minnesota produce 50% of all the corn grown in the nation.
- The major feed grain grown by U.S. farmers is corn.
- Foods like cereals, peanut butter and snack foods use corn as a major component.
- An average ear of corn has 16 rows with approximately 800 kernels.
- Most of the weight of a bushel of corn is starch, oil, protein and fiber.
- Corn grows everywhere in the world except Antarctica.
- Corn can be made into fuel, solvents, charcoal, animal feed, insulation, adhesives and many more products.

Soybeans:

- Soybeans are produced for food, livestock feed, consumer and industrial products.
- Soybeans were not grown in our country until the 1800s.
- George Washington Carver developed over 300 products from soybeans.
- Biodiesel fuel, soybean crayons, soy ink and building materials are some products made from soybeans.

Photosynthesis:

- Photosynthesis is the process by which cells in green plants convert light to energy. In this process, carbon dioxide and water in the presence of chlorophyll (the green pigment) and light energy are changed into glucose (a sugar). This energy-rich sugar is the source of food used by most plants. Photosynthesis is unique to green plants and supplies food for the plant and oxygen for other forms of life.
- Plants need light, air, water, soil or some media to grow in, nutrients, space, proper temperature, and time to grow.
- Plants are a vital part of the Earth. In the food chain, plants provide nourishment for both animals and people. They provide a place for wildlife to live. Plants are used to make clothing, medicine, shelter, and many more products. Plants enhance the air animals breathe by taking in carbon dioxide and putting out oxygen. Without plants, animals would not survive.

Photosynthesis Continued:

- Cotyledons are the seed's "lunch box." They feed the seed until it grows leaves to begin the process of photosynthesis through which it makes its own food.
- Only plants and algae containing the green material chlorophyll can carry on photosynthesis. Chlorophyll is found in the chloroplast of a plant cell.
- Factors that affect the photosynthetic rate include the water supply, amount of carbon dioxide available, temperature, light quality and intensity, and availability of certain plant nutrients.
- Leaves are the main area of photosynthetic activity. They are the food-making organ of most plants. However, photosynthesis can occur in other parts of the plant.
- Generally for photosynthesis to occur the temperature must be between 5 degrees C and 45 degrees C (40 degrees F -110 degrees F).

Water Cycle:

- Water is an important factor for seeds to germinate. Absorption of water is the first step in the germination process.
- The terrarium is a small ecosystem consisting of all the living and nonliving parts enclosed in a container. This provides an opportunity to talk about the Earth's water cycle and the fact that there is as much water on the Earth today as there ever was or ever will be.
- Water only changes in form and moves around.
- The water cycle is the process in which water continuously moves through nature. Water is a limited, natural resource. The oceans contain 97% of the water on Earth. This water is too salty for drinking, for agriculture, or for industry. This leaves only 3% fresh water on the earth and most of that is in glaciers and polar ice caps. Much of the remaining water is beneath the Earth's surface. Less than 1% of the Earth's water is in the lakes, rivers, and other above ground reservoirs and can be used for our daily needs.
- The air holds a great deal of moisture in the form of water vapor. Roughly 85% of the water vapor comes from the oceans by evaporation. However, plants also breathe out water vapor through a process called transpiration. For example, a mature birch tree gives off 70 gallons of water a day. Corn will give off about 4,000 gallons of water per acre per day. (An acre is about the size of a football field.)

Light:

- Light is the transfer of energy in the form of radiation. Plant and animal life depend on light energy which permits food production through the process of photosynthesis. Three key aspects of light affect plant growth. They are color, duration and intensity.

- Sunlight is actually a blend of colors. We can see the colors when light passes through a prism. Objects that absorb all colors of the spectrum appear black. Those that reflect all colors are white. If an object absorbs all colors but green, it will appear green to us because only green is reflected into our eyes. Plant growth is most responsive to the blue and red light wavelengths. Generally, blue has an effect on photosynthesis while red influences flowering and growth.

- Plants are responsive to the length of exposure to light. Day length will trigger flowering in many plants. This factor is called photoperiodism. Chrysanthemums and poinsettias are short day plants that flower naturally in fall as the day length gets shorter. Radishes and lettuce are long day plants that flower when the days lengthen in summer. Some plant seeds, such as lettuce, need to be exposed to light before they will germinate.

- The third effect light may have on plants is intensity. Light intensity depends on the source of light and the distance from the light to the plants. Different plants have different light requirements.

- Most vegetables and food crops require a high light intensity or full sunlight to produce good yields. Impatiens, ferns and wax begonias need lower light intensities and do best in shaded areas.

- Most of the available house plants have been selected because of their ability to tolerate low levels of light. Plants receiving an inadequate amount of light will stretch or become spindly, and the leaves will be smaller and more yellow than normal. Excessive light can cause a bleached appearance of the leaves and even cause death of the leaf tissue.