The following is a description of a semester-long series of activities based upon a seed producing plant’s life cycle. Specifically, seeds are used as a venue to allow students to explore some of the aspects of life cycles, plant structure and needs, ecological relationships, the role of sunlight in a system, and plant reproduction. The sequence of activities closely resembles the 5 E Learning Cycle described by Bybee et al. (1989).

Theoretical Basis

The *National Science Education Standards* (National Research Council [NRC], 1996) provide a vision and standard of science instruction that includes not only the factual, content-rich history of science but also an understanding of the processes and skills necessary to “do” science. Moreover, the *Standards* provide the framework for science instruction that embodies the use of scientific reasoning and problem-solving skills.

As important as it is for pre-service teachers to learn about inquiry, they must also learn to use the skills of inquiry and they must learn how to teach using inquiry (NRC, 2000). The study of growing plants is a common biology topic in elementary classrooms. Some teachers will have students plant a seed to become a gift for a parent while others will use Wisconsin Fast Plants™ to study the entire life cycle. For many undergraduates, this is their first experience growing a new plant.

There are numerous investigations that teachers can use to help K-6 students develop an understanding of plant growth. Osborne and Freyberg (1985) noted that children and adults develop alternative conceptions (misconceptions) about nature that are different from concepts accepted by the scientific community. It is anticipated that the plant growing experiences will result in children’s understandings becoming more scientifically accurate. Cox-Peterson and Olson (2001) reported that having K-6 students construct annotated drawings helped students develop a more complete understanding about plants and how they grow.

Previous research by Roth (1985) identified five common misconceptions about plants and plant growth. They were:

1. Plants can live and grow in dark.
2. Food for a plant is either fertilizer or other plants while some plants need raw materials (e.g., water, sun, fertilizer, shelter) or things taken in/“eaten” by plants (e.g., water fertilizer, sun).
3. Plants get food from soil and water.
4. Plants (like people) get food from many sources.
5. Food is anything that helps an organism live or is taken into the body.

Cox-Peterson and Olson (2001) reported that pre-service students’ drawings of plants frequently included roots, stems, and leaves but only a limited number of students included flowers. For plant growth, light, water, and soil/nutrients were identified but less than 10% of drawings included air/carbon dioxide. Overall, the pre-service students’ drawings lacked detail. Cox-Peterson and Olson (2001) reported that pre-service students’ drawings of plants frequently included roots, stems, and leaves but only a limited number of students included flowers. For plant growth, light, water, and soil/nutrients were identified but less than 10% of drawings included air/carbon dioxide. Overall, the pre-service students’ drawings lacked detail.

The *National Science Education Standards* (NRC, 1996) recommend that by the end of the fourth grade, students should have an understanding of the plant life cycle, that plants are essential to animals, that plants have basic needs, and that plants have specialized structures and functions. For grades 5-8, additional concepts include diversity, ecological