# **Plant Life Cycles Discussion Guide (for use during or after reading)**

1. What is photosynthesis? Why is it important for humans as well as plants? (Plant Life Cycles, p. 4-5)
   1. Photosynthesis is the process plants use to create energy. They mix carbon dioxide, water, and sunlight through complex steps. It is not only important for plants but for animals like humans, as well! People gain energy from eating plants (and animals that eat plants) and that original energy came from the sun. During photosynthesis, plants also give off or produce oxygen. Without oxygen, our cells would die.
2. What is the process of pollination? How does it work? (Flowers, p. 8-9)
   1. Pollination is the process of carrying pollen from the anther to the pistil of the same kind of plant. This helps plants reproduce because the process delivers the seed to the ovary and egg so it can be fertilized. Such animals as bees, butterflies, and hummingbirds are attracted to the flower’s nectar. While they drink the nectar, they get covered in pollen. Once they land on another flower to drink its nectar, the pollen rubs off and can begin the process of fertilization.
3. What happens during cross-pollination and why is this process important for plant variety and biodiversity? (Cross-pollination, p. 10-11)
   1. Cross-pollination is a similar process. It involves carrying pollen from the anther of one plant to the pistil of another kind of plant. This is important because it helps create new varieties of plants. When cross-pollination occurs, new species of plants can develop.
4. Explain how seeds are fertilized on conifer plants. (Conifers, p. 14-15)
   1. Conifer plants produce structures on their surface called cones. Male cones produce seeds and pollen that can be carried away by the wind. Female cones are typically higher on conifers and make a sticky fluid that is used to catch the flying pollen. If an egg becomes fertilized, it will develop into its own naked seed to start its own life cycle.
5. Explain the process of germination. (Germination, p. 18-19)
   1. Germination is the process through which a seed sprouts and a plant begins to grow. When the embryo is ready, the seed coat splits open and a root pushes through to grow in the ground. Next, a stem pushes upward toward the sun and the plant can begin to develop its own energy through photosynthesis. Leaves begin to grow and the plant develops into an adult.
6. Division is the most basic kind of asexual reproduction plants use to create offspring. Another kind of asexual reproduction is called vegetative propagation. What is that process? (Asexual Reproduction, p. 20-21)
   1. Vegetative propagation is a kind of plant asexual reproduction where offspring develop from part of a parent plant that grows or breaks off. For example, strawberries grow stems that run along the ground. Sometimes these runners take root and develop into their own, new plant.
7. What does the phrase “alternation of generations” mean? (Seedless Plants, p. 22-23)
   1. Alternation of Generations refers to a specific type of life cycle in which a plant moves through both asexual and sexual reproduction. The fern is an example of this.
8. Plants rely on the sun, water, and carbon dioxide to produce their energy through the process of photosynthesis. That said, how is possible for plants to survive in such diverse climates with a variety of those necessary resources? (Growth in Different Climates, p. 24-25)
   1. Plants are able to grow in such diverse climates with a variety of resources because they have adapted to survive and thrive. For example, many desert plants have vast root systems that allow them to get water and nutrients from large areas so they are more likely to survive.
9. What major life cycle disruption have humans caused for many plants? Why is this problematic? (Life Cycle Disruptions, p. 26-27)
   1. Humans have created a major life cycle disruption for plants through deforestation. This happens when logging trees and cutting them down in massive amounts. Sometimes humans cut down trees to make room for farmland or new homes. Other times, deforestation comes from a demand for wood and materials to create new products. This is problematic because it cuts short the life cycles of all the other plants and animals living in that environment. All of these sudden changes can create further problems for other ecosystems.
10. Who is Norman Borlaug and what is his claim to fame? (Who’s Who, p. 36-38)
    1. Norman Borlaug was an American agricultural scientist who developed varieties of staple foods that were able to produce higher crop yields. This was important in helping double worldwide harvests between 1961 and 1985. Norman Borlaug and the Green Revolution worked to combat world hunger.