# **The Cell Cycle Discussion Guide (for use during or after reading)**

1. How are cell life cycles similar to life cycles of other organisms? (Regulating Life Cycles, p. 6-7)
   1. Cells go through their own life cycle just like other organisms. Cells continue to divide and grow within your body. Eventually the cells die and are replaced. In humans, several billion cells die each day! They are passed out of the body with other waste.
2. What two structures do plant cells have that animal cells do not? (Important Differences, p. 14-15)
   1. Plant cells have a cell wall and chloroplasts whereas animal cells do not have either of these organelles. Cell walls are an additional covering, like a cell membrane, that only exist in plant cells. Chloroplasts give plants their green color.
3. Why are plant cells boxy in appearance? (Important Differences, p. 14-15)
   1. Plant cells are boxy in appearance because of their cell walls. These strong, outer coverings give the plant cells a square-like shape.
4. What is photosynthesis and what function does it serve? (The Color of Cells, p. 16-17)
   1. Photosynthesis is a process plant cells use to produce food from water and other materials. This process involves using energy from sunlight to create energy within the plant itself.
5. Cells use mitosis to divide and reproduce. What happens during interphase? (Mitosis, p. 20-21)
   1. During interphase, the cell continues to grow and it carries on its normal activities. In addition, the cell uses this time to copy its chromosomes so it can be ready to go through mitosis and divide in the future.
6. How are mitosis and cytokinesis different in plant and animal cells? (Cytokinesis, p. 22-23)
   1. Both plant and animal cells go through mitosis and cytokinesis, however, this process looks different depending on the type of cell. During the final phase of cytokinesis, plant cells develop a cell wall between the two new daughter nuclei.
7. How is meiosis different from mitosis? (Meiosis, p. 24-25)
   1. Meiosis and mitosis are both processes cells use to divide Both involve a cell splitting to create a new cell. Meiosis is a special type of cell division in sex cells. During meiosis, only half of the chromosomes are carried over into the new cell. Mitosis, on the other hand, is the process by which the nucleus divides and forms two identical nuclei in two new cells.
8. Why do new sex cells have only half of the chromosomes as typical cells? (Meiosis, p. 24-25)
   1. During meiosis, new sex cells are created but they only contain half of the chromosomes needed. This is because half of the chromosomes from the male gamete combine with half of the chromosomes from the female gamete to create the correct number of chromosomes needed.
9. Why do cells have the name they do? (Who’s Who, p. 32-33)
   1. Cells have the name they do because the Robert Hooke, a natural scientist, saw tiny boxes under his microscope. He named those tiny boxes “cells” because they reminded him of the cells monks lived in at the local monastery.
10. What fun fact stood out to you? Why? (Can You Believe It?!, p. 34-35)
    1. Students’ responses will vary.