# **Cells to Organ Systems Discussion Guide (for use during or after reading)**

1. What are cells and what can they do? (What Are Cells?, p. 4-5)
   1. Cells are like the building blocks of life. Most are microscopic but serve many functions in living things! For example, cells “breathe,” take in food, get rid of waste, reproduce, and eventually die.
2. How many cells are in a bacterium? How many cells make up the human body? (What Are Cells?, p.4-5)
   1. Some organisms are made up of only one cell, like bacteria! Humans, however, are made of more than 10 trillion cells!
3. Explain how organisms can start as one cell but grow to contain many cells. (Growth, p. 6-7)
   1. All organisms begin as just one cell! Over time, that cell grows and divides. When cells divide, they create new cells with new instructions. Those new cells develop and take on different jobs in the body. Dividing is a way cells grow your body.
4. Describe the functions of the organelles shown on pages 10-17. (Inside a Cell, Organelles, Nucleus, p. 10-17)
   1. Mitochondria – the “power plant” of a cell, uses nutrients from food for energy for the cell
   2. Vacuole – a small storage space in a cell that can hold waste before it is removed
   3. Nucleus – the “control center” of a cell
   4. Cell membrane – a covering that separates the inside of a cell from the outside environment, uses osmosis to allow certain substances into the cell
   5. Chromosomes – threadlike strands that contain DNA and direct cell activity
5. What are tissues and what functions do they serve within the human body?
   1. Tissues are groups of similar cells that come together to do a certain job. For example, connective tissues like bones and cartilage support and protect your body. Muscle tissues contract and control your body’s movements. Epithelial tissues cover the body and some structures such as blood vessels. Nervous tissue is used to send signals from your brain to the cells throughout your body, and back again.
6. What are organs?
   1. Organs are made of two or more tissues. These tissues work together to do certain jobs throughout the body.
7. What types of tissues work together to form the organ the heart?
   1. Your heart consists of connective tissue, epithelial tissue, muscle tissue, and nervous tissue. These tissues all work together to pump blood through your body.
8. How are organs found within organ systems similar to organelles found within cells?
   1. Organs within organ systems each have different jobs but work together to serve one greater function. Organelles found within cells are similar because each has its own job used to support the function of the cell as a whole.
9. Describe the general functions of the organ systems found within the human body.
   1. Digestive System - This system allows your body to use the food you eat.
   2. Urinary System - This system is responsible for removing waste from your body.
   3. Respiratory System - This system is responsible for bringing oxygen into your body and removing carbon dioxide from it.
   4. Circulatory System - This system is responsible for moving fresh blood throughout your body so your organs have access to oxygen and other substances.
   5. Nervous System - This system is like the command center for your body. It carries messages from one part of your body to another.
   6. Skeletal System - This system protects the body’s internal organs and is a framework for your shape.
   7. Muscular System - This system moves the body.
10. Which fun fact was most interesting to you? Why? (Can You Believe It?, p.32-33)
    1. Students’ answers will vary.