Chapter 11.1, 11.2, 11.3, 11.7

*Bozeman Videos: Cell Cycle, Mitosis and Meiosis*

11.1

1. What is binary fission?
2. Where do we find circular chromosomes?
3. What is cytokinesis?
4. Why is the process of DNA replication and DNA segregation more intricate in eukaryotes than in prokaryotes?

11.2

1. Describe the eukaryotic cell cycle.
2. What happens during S phase?
3. Progress through the cell cycle depends on the activities of what?
4. What are growth factors?

11.3

1. What is the spindle?
2. Using only one sentence for each, describe what is happening during each of these phases of mitosis:
   1. Prophase/Prometaphase:
   2. Metaphase:
   3. Anaphase:
   4. Telophase:
3. How does the genetic material in the two daughter cells that result from mitotic division compare to the original parent cell’s genetic material?

11.7

1. How do cancer cells differ from the normal cells from which they originate?
2. What is a tumor?
3. What’s the difference between a benign tumor and a malignant tumor?
4. What is the role of oncogenes and tumor suppressors in cancer?
5. Discuss a couple examples of cancer treatments that target the cell cycle.

Chapter 4.1

*Bozeman Video: Biological Molecules*

1. What are nucleotides?
2. What does it mean that DNA has an “antiparallel orientation”?
3. What bases are purines? What bases are pyrimidines?
4. How is RNA different from DNA? How is it similar?
5. What is complementary base pairing?
6. What is the “central dogma of molecular biology”?
7. What’s the difference between a genome and genes?

Chapter 13.1, 13.2, 13.3, 13.4

*Bozeman Videos: Part I & II DNA and RNA*

13.1

1. Summarize the contributions of the following historical experiments:
   1. Avery-MacLeod-McCarty experiment
   2. Hershey-Chase experiment
2. What is a bacteriophage?

13.2

1. Summarize the contributions of Franklin, Wilkins, Chargaff, Watson and Crick on the structure of DNA.
2. DNA performs four important functions. What are they? (p. 275)

13.3

1. What does it mean that DNA replication is semiconservative?
2. True or False: Each new DNA strand grows from its 3’ end. Nucleotides are added to the 3’ end. (Figure 13.12)
3. What does DNA polymerase do?
4. What does DNA helicase do?
5. During replication, the two new DNA strands are formed differently. Can you explain the difference between the leading and the lagging strand? What are Okazaki fragments?
6. What does DNA ligase do?
7. True or False: Small circular chromosomes replicate from a single origin, but large linear chromosomes have many origins of replication.
8. What are telomeres? What is the role of telomerase?

13.4

1. Cells have at least three DNA repair mechanisms at their disposal, what are they?