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| **Following the Big Ideas** | |
| **Big Idea 3** | For Unicellular organisms, cell division results in the formation of two new organisms, while in multicellular organisms, it is the basis of growth and repair |

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| **Essential Questions** |
| * Why do all cells- archaea, bacteria, and eukaryotes- have to divide? What does this suggest about the evolution of the process of cellular reproduction * How is the normal sequence of events in the process of cellular reproduction in a eukaryotic cell? * How do internal and external signals regulate the cell cycle? What is the relationship between cancer and regulation? |

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| **Vocabulary** | | |
| 1. Cell Cycle 2. Genome 3. Chromatin 4. Chromatid 5. Chromosome 6. Centromere | 1. Mitosis 2. Cytokinesis 3. Meiosis 4. Kinetochore 5. Cleavage Furrow 6. Cell Plate | 1. Binary Fission 2. Protein Kinase 3. Benign Tumor 4. Malignant Tumor 5. Somatic Cell 6. Gamete |

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| **Chapter Outline and Reading Guide** | |
| **Section 1**   1. Sketch of a chromosome and label the following areas: chromosome, chromatid, centromere, chromatin. 2. Using Figure 9.5 summarize what occurs at the DNA level in each stage. 3. Make a Venn Diagram to compare and contrast Mitosis vs. Meiosis   **Section 2**   1. Give a brief explanation of what happens in each phase of the cell cycle- G1, S, G2, M 2. What are the components of the mitotic spindle? What is the source of these components? 3. What is another name for the centrosome? 4. Sketch and label a centrosome with two centrioles. 5. What are the components of the mitotic spindle? 6. Describe what happens to the centrosome during interphase and then prophase. 7. Explain the difference between kinetochore and nonkinetechore microtubules. 8. At which end do kinetochore microtubules shorten during anaphase? Explain the Inquiry Figure (Figure 9.9) that supports where this shortening occurs | **Section 3**   1. Using Figure 9.14, What controls the cell cycle? 2. Make a T Table for the four check points of the cell cycle. Describe what happens at each check point and how it is controlled 3. What is the G0 phase? Describe this phase. 4. How do protein kinases work? How are they regulated? 5. Why does the activity of CDk’s rise and fall? 6. Cancer cells exhibit different behaviors than normal cells. Here are two normal behaviors they no longer show. Explain each behavior.    1. density-dependent inhibition:    2. anchorage dependence: 7. Where do HeLa cells come from? Why are they unique? 8. What is transformation? What is metastasis? 9. List two specific cancer treatments, and tell how each treatment works. |

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| **After You Have Read…** |
| 1. Why do all cells- archaea, bacteria, and eukaryotes- have to divide? What does this suggest about the evolution of the process of cellular reproduction 2. What is the normal sequence of events in the process of cellular reproduction in a eukaryotic cell? 3. How do internal and external signals regulate the cell cycle? What is the relationship between cancer and regulation? |