Unit 6: Study Guide
Cell Division

1. Define:
   - chromatin
   - chromosome
   - chromatid pair (sister chromatid)
   - centromere
   - spindle fibers
   - haploid
   - diploid
   - gene
   - allele
   - interphase (G1, S, G2)
   - prophase
   - metaphase
   - anaphase
   - telophase
   - cytokinesis
   - cleavage furrow
   - cell plate
   - centrioles

2. Stages of Cell Division:
   - Identify each stage if given a picture.
   - Identify each stage if given a description of identifying characteristics.
   - Draw the stages of cell division with identifying characteristics labelled such as:
     - cell membrane
     - cell wall
     - spindle fibers
     - chromatin/chromosomes/chromatid pairs
     - nuclear membrane
     - centrioles

3. Purpose of Cell Division
   - number of times the nucleus divides
   - number of daughter cells produced
   - chromosome # of daughter cells compared to parent cell

POSSIBLE ESSAY QUESTIONS:
1. Considering all the stages of the Cell Cycle, what stage will the cell spend the most time? WHY?
2. What is the main difference between cell division in plant cells vs. cell/nuclear division in animal cells (be specific)?
3. Cells in plant roots divide many times as the root grows longer and thicker. With each cell division, the chromatid pairs are divided between two daughter cells, yet the number of chromosomes in each cell remains the same. What ensures that the normal number of chromosomes is restored after each cell division (include the phase of cell/nuclear division where this event occurs)? JUSTIFY your answer.
1. What is the difference between chromatin, chromosomes, and chromatid pairs (include pictures)?

2. What is the difference between haploid and diploid?

3. Identify each as an example of a gene or an allele.

4. Fill in the missing information regarding nuclear division.

5. What is the structure that separates the cytoplasm at the end of telophase in plant cells?

6. The process of forming cells with identical nuclei is called __________________________.

7. The structure that holds the chromatid pair together is called the __________________________.
8. Place the following stages of nuclear division in order by placing a 1 next to the first event.

   ______ chromatid pairs separate and move toward opposite ends of the cell
   ______ nuclear membrane dismantles
   ______ chromatid pairs line up in the middle of the cell
   ______ a copy of each chromosome is made
   ______ nuclear membrane reassemble around each group of chromosomes

9. If a parent cell has 10 chromosomes at the beginning of nuclear division, how many chromosomes will the parent cell have during anaphase? ______________________________________________________________

10. During normal nuclear division, a parent cell with 10 chromosomes will produce ____ daughter cells each with ____ chromosomes. These daughter cells are __identical / similar / different__ when compared to the parent cells.

11. Identify each phase of nuclear division by name & number.

   A ________________  B ________________  C ________________  D ________________  E ________________  F ________________

12. Label each part of the structure found below

   _____________________________________________________________________________________

13. How can you tell the # of chromosomes that are present in each cell? __________________________

14. How many chromosomes are present in the cells below?

   A _________  B _________  C _________
22. Assume that prophase begins with 5 chromatid pairs. When telophase ends, how many chromosomes will be present in each new nucleus? WHY?

23. If a parent cell has 10 chromosomes at the beginning of nuclear division, how many chromosomes will the parent cell have during anaphase? ____________________________________________________________________________________

24. During normal nuclear division, a parent cell with 10 chromosomes will produce _____ daughter cells each with _____ chromosomes.

25. When looking at a slide of real cells, what phase of nuclear division is see most often? WHY?