

Cell Division

Read Chapter 5.1-5.3

Fill in the blanks

Prokaryotic Reproduction

1. Bacteria replicate _____ and have _____ chromosome that is _____ in shape.
2. Some prokaryotes have an extra small piece of DNA called a _____ that often carry _____ genes.
3. Prokaryotic cell division occurs in two steps:
 - a. _____
 - b. _____
4. Prokaryotic DNA replication begins at a single point of _____ where enzymes separate the strands of DNA by breaking the _____ bonds.
5. Once the DNA strands begin to separate, the enzyme _____ proceeds in both directions adding complementary nucleotides to each strand forming two new DNA molecules.
6. Genetic variation is important in all living things. Bacteria do not acquire new genes when they replicate by _____.
7. Bacteria gain new DNA through three mechanisms:
 - a. _____ - when they exchange DNA directly with another bacterium
 - b. _____ - when they acquire new DNA from viruses.
 - c. _____ - When they pick up new DNA from their environment.

Eukaryotic Cell Cycle

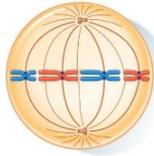
8. Eukaryotic cells contain more DNA than prokaryotes and it has to be condensed into transportable chromosomes for the more complex cell division process called _____.
9. The eukaryotic cell cycle is divided up into the following phases:
 - a. _____ - growth phase when normal cellular functions occur
 - b. _____ - when DNA replicates
 - c. _____ - Second growth phase when cells prepare for mitosis
 - d. _____ - all cell's energy is directed toward separating chromosomes and organelles into two new daughter cells

10. Humans have a total number of _____ chromosomes, we get _____ from each parent.
11. The pairs of chromosomes from each parent are similar but not exactly the same, they are called _____ chromosomes.
12. After DNA replicates, the new chromosomes are exactly the same, they are called _____ chromatids.
13. A _____ is when all chromosomes and their homologous pairs from one cell are organized according to size.
14. The sex chromosomes are X and Y. Males have _____ and females have _____.

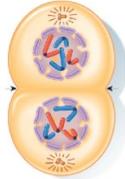
Mitosis

15. Mitosis occurs in _____ cells, which are the body's cells that have differentiated into a specific cell type such as liver, bone, or skin cells.
16. Meiosis occurs in _____ cells that give rise to sperm or eggs.
17. Sperm and egg cells are called _____.
18. Somatic cells have 46 chromosomes and are _____.
19. Gametes have 23 chromosomes and are _____.
20. The first cell formed when a sperm and egg combine is called a _____ and it is diploid.
21. Mitosis is divided into 5 distinct stages:
 - a. _____ - DNA is fully condensed and visible under a microscope, the nuclear membrane and nucleolus break down, centrioles move to opposite poles, and spindle fibers start to form
 - b. _____ - Condensed chromosomes are connected to spindle fibers at a protein complex called _____ and they line up at the center of the cell
 - c. _____ - Spindle fibers begin to break down and pull the _____ chromatids apart
 - d. _____ - Sister chromatids are at opposite ends of the cell, and a new nuclear membrane and nucleolus begin to appear
 - e. _____ - the cytoplasm divides because _____ microfilaments pinch inward forming a _____ and 2 identical daughter cells are formed.

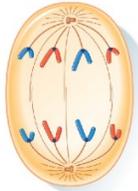
22. Label the stage of mitosis shown in the diagrams, they are not necessarily in order.



a. _____



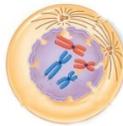
b. _____



c. _____



d. _____



e. _____



f. _____