

Chapter 8 Part 1; Mitosis

- Chromosomes are made of _____, a combination of DNA and _____ molecules
- Are not _____ in a cell until cell _____

Eukaryotic Chromosomes The coiling of DNA

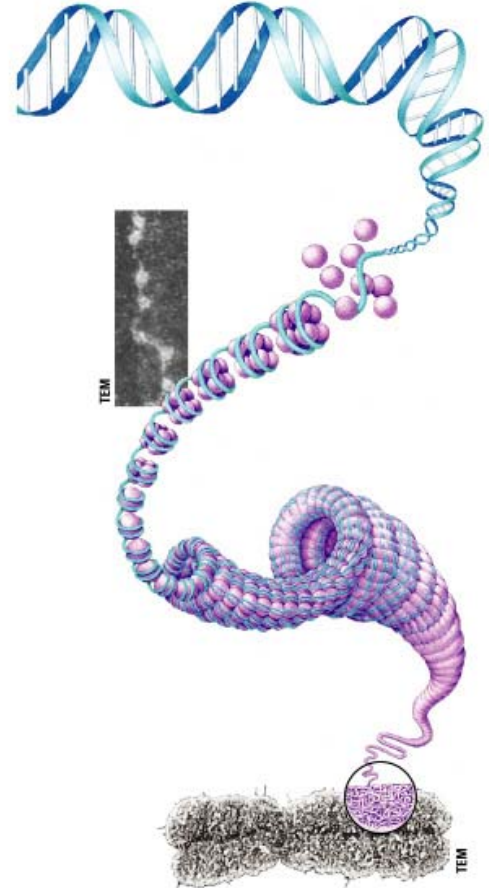
- When two loops of DNA coil around 4 histones, this unit is called a _____
- When the _____ coil together, they form a tight _____
- When the tight helical fibers coil into larger coils, these are called _____
- The supercoils are what you see during _____ and make up the _____
- Before a cell divides, it duplicates all of its _____, resulting in two copies called sister _____

Sister Chromatids

- When the cell divides, the sister chromatids _____ from each other
- Each of these sister chromatids is _____ in every way to its _____
- _____ **cells** are the cells that are the result of a cell _____

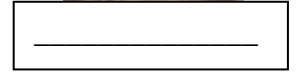
The Cell Cycle

- _____ cells that divide undergo a sequence of events called the _____
- The cell cycle consists of two distinct phases
- Interphase is made up of _____ (gap 1), S (_____ of DNA), and _____ (gap 2)
- Mitotic phase is made up of _____
- _____ (cell splitting) happens at the end of _____
- **I**'ll, **P**ay, **M**ore, **A**ttention, **T**omorrow _____



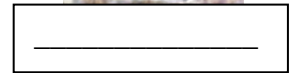
Anaphase

- Spindle fibers _____
- Sister chromatids separate at the centromeres and move toward _____ (ends) of the cell



Telophase

- _____ begin to clump back into a ball
- The _____ begins to reform
- The cytoplasm begins to split. This is called _____
- Cytokinesis is different in plant and animal cells

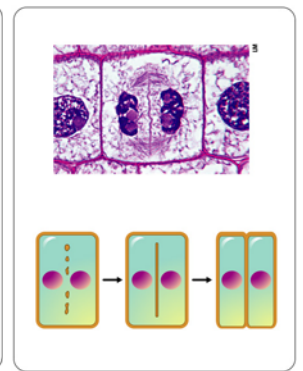
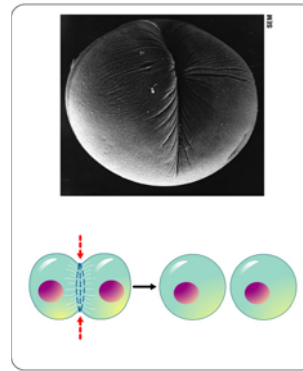


Cytokinesis in animal cells

- In animals, a _____ forms, pinching the cell like a _____.

Cytokinesis in plant cells

- In plant cells, a _____ forms.
- In plants, cytokinesis is more like dividing a room in your house by building a _____ in the middle



What Is Cancer?

- Cancer is caused by a breakdown in control of the _____
- Cancer cells divide excessively
- Cancer cells spread from a malignant tumor
- _____ is the spread of cancer from the original site.

Cancer Treatment

- _____ therapy disrupts cell division
- _____ involves drugs that disrupt cell division
- Cancer cells are often grown in _____ for study

Review Questions; over →

1. What specific molecule composed of protein and DNA makes up chromosomes?
 - A. Chromosomes
 - B. RNA
 - C. Chromatin
 - D. Histones
 - E. None of the above are correct
2. When do chromosomes become visible?
 - A. All of the time
 - B. During cell division
 - C. Only during prophase
 - D. They are never visible
 - E. None of the above are correct
3. When two loops of DNA coil around 4 histones, this unit is called;
 - A. Helical fiber(s)
 - B. Nucleosome(s)
 - C. Supercoil(s)
 - D. Chromatid(s)
 - E. None of the above are correct
4. When the nucleosomes coil together, they form;
 - A. Helical fiber(s)
 - B. Nucleosome(s)
 - C. Supercoil(s)
 - D. Chromatid(s)
 - E. None of the above are correct
5. When tight helical fibers coil into larger coils, these are called;
 - A. Helical fiber(s)
 - B. Nucleosome(s)
 - C. Supercoil(s)
 - D. Chromatid(s)
 - E. None of the above are correct
6. What level of chromosome organization do you see during prophase?
 - A. Helical fiber(s)
 - B. Nucleosome(s)
 - C. Supercoil(s)
 - D. Chromatid(s)
 - E. None of the above are correct
7. What are the two identical copies of the chromosomes called?
 - A. Helical fiber(s)
 - B. Nucleosome(s)
 - C. Supercoil(s)
 - D. Chromatid(s)
 - E. None of the above are correct
8. What does a cell have to do before it divides (physically)?
 - A. Duplicate its chromosomes
 - B. Nothing
 - C. Run for president
 - D. Duplicate its cell membrane
 - E. None of the above are correct
9. What happens to the sister chromatids during anaphase?
 - A. They stay together
 - B. They disappear
 - C. They separate from the cell
 - D. They separate from each other
 - E. None of the above are correct
10. In what way(s) is/are the sister chromatids different from each other?
 - A. They have different DNA
 - B. They are different sizes
 - C. They contain different genes
 - D. They each come from a different parent
 - E. None of the above are correct
11. What is the name of the two resulting cells following cell division?
 - A. Sister cells
 - B. Siamese cells
 - C. Daughter cells
 - D. Nuclear cells
 - E. None of the above are correct
12. What is a sequence of events that eukaryotic cells undergo that involves cell division?
 - A. Mitosis
 - B. Cell cycle
 - C. Cancer
 - D. Growing
 - E. None of the above are correct
13. What are the two distinct phases of the cell cycle?
 - A. Interphase and Prophase
 - B. Mitosis and meiosis
 - C. Interphase and mitotic phase
 - D. Prokaryotic and eukaryotic
 - E. None of the above are correct
14. Interphase is made up of what stage(s)?
 - A. Synthesis (S)
 - B. Gap 1 (G1)
 - C. Gap 2 (G2)
 - D. All of the above, but not in that order
 - E. None of the above are correct
15. What is happening during the S phase of interphase that is so important?
 - A. Cytokinesis
 - B. Replication of all organelles
 - C. Replication of the DNA
 - D. Nothing; it is a resting phase
 - E. None of the above are correct
16. Which stages and in what order make up the mitotic phase of the cell cycle?
 - A. I'll Pay More Attention Tomorrow
 - B. Prophase, Interphase, Metaphase, Telophase, Metaphase
 - C. Interphase, Prophase, Metaphase, Anaphase,

- Telophase
- D. Interphase, mitotic phase
- E. None of the above are correct

17. What term means the physical spitting of a cell during mitosis, resulting in two new daughter cells?
- A. Synthesis
 - B. Hydrolysis
 - C. Dehydration synthesis
 - D. Anaphase
 - E. None of the above are correct

18. When does cytokinesis occur?
- A. During anaphase
 - B. During metaphase
 - C. During interphase
 - D. During telophase
 - E. None of the above are correct

19. What does the phrase **I'll, Pay, More, Attention, Tomorrow** mean?
- A. It is important to focus while taking notes
 - B. It is not a good idea to procrastinate about due dates
 - C. That is how you remember the stages of mitosis, in order
 - D. If you don't get this one right, I am really worried about you!
 - E. None of the above are correct

20. What two organelles are still visible during interphase (using a regular microscope)?
- A. Golgi and Rough ER
 - B. Nucleus and mitochondria
 - C. Nucleus and nucleolus
 - D. Chloroplasts and ribosomes
 - E. None of the above are correct

(Be able to identify the stages of mitosis pictures [in the notes] for the quiz)

21. Why is it incorrect to label interphase as a resting phase?
- A. Because it is prophase that is the resting phase
 - B. Because there are many things happening during interphase
 - C. Because DNA is synthesized during this stage
 - D. Because the cell grows in size and increases the number of organelles during this stage
 - E. All of the above are correct, except A

22. What structures help to organize the spindle apparatus?
- A. Centromeres
 - B. Chromosomes
 - C. Centrioles
 - D. Chloroplasts
 - E. None of the above are correct

23. What structure separates the chromatids during anaphase?
- A. Centromeres

- B. Chromosomes
- C. Centrioles
- D. Chloroplasts
- E. None of the above are correct

24. In what stage of mitosis does DNA coil up into visible chromosomes?
- A. Interphase
 - B. Prophase
 - C. Metaphase
 - D. Anaphase
 - E. None of the above are correct

25. What cellular organelle disappears during prophase?
- A. Mitochondria
 - B. Nucleus/Nuclear envelope
 - C. Golgi bodies
 - D. Chloroplasts
 - E. None of the above are correct

26. What mitotic structure begins to form across the cell during prophase?
- A. Spindle apparatus
 - B. Chromosomes
 - C. Chromatin
 - D. Cell plate
 - E. None of the above are correct

27. In what stage of mitosis do sister chromatids line up at the equator?
- A. Interphase
 - B. Prophase
 - C. Metaphase
 - D. Anaphase
 - E. None of the above are correct

28. What is the name of the center part of a cell at which the chromosomes line up during metaphase?
- A. Centriole
 - B. Centromere
 - C. Equator
 - D. Poles
 - E. None of the above are correct

29. To what part of the chromosome do the spindle fibers attach during metaphase?
- A. Centriole
 - B. Centromere
 - C. Equator
 - D. Poles
 - E. None of the above are correct

30. What is the location on a chromosome where the two sister chromatids are still attached like Siamese twins?
- A. Centriole
 - B. Centromere
 - C. Equator
 - D. Poles
 - E. None of the above are correct

31. What are the two major events that occur during anaphase?
- A. Replication of DNA and cytokinesis
 - B. Lining up of chromosomes at equator and separation of sister chromatids
 - C. Contraction of the centromere and replication of DNA
 - D. Contraction of spindle fibers and separation of sister chromatids
 - E. None of the above are correct
32. What is the name for the ends of a cell or the top and bottom of our planet?
- A. Centriole
 - B. Centromere
 - C. Equator
 - D. Poles
 - E. None of the above are correct
33. In what stage of mitosis do the chromosomes begin to clump back together into a ball (that will eventually become the nucleus)?
- A. Interphase
 - B. Prophase
 - C. Metaphase
 - D. Anaphase
 - E. None of the above are correct
34. In what way(s) is/are cytokinesis different in plants and animals?
- A. Animals cells do mitosis while plant cells do meiosis
 - B. Animal cells use a cell plate while plant cells use a cleavage furrow
 - C. Animal cells use a cleavage furrow while plant cells use a cell plate
 - D. There is no real difference in how they divide; they are both eukaryotes
 - E. None of the above are correct
35. What is a cleavage furrow?
- A. A flat separator used in plant cells during telophase
 - B. A pinching off of an animal cell used during telophase
 - C. What a clown uses to make a balloon animal
 - D. Something that is dug into the ground
 - E. None of the above are correct
36. What is the name of the structure that forms between two new plant cells during telophase?
- A. Cleavage furrow
 - B. Centromere
 - C. Cell wall
 - D. Cell plate
 - E. None of the above are correct
37. What is caused by a breakdown in control of the cell cycle?
- A. Mitosis
 - B. Meiosis
 - C. Cancer
 - D. Death
 - E. None of the above are correct
38. What is the spread of cancer from the original site?
- A. Mitosis
 - B. Metastasis
 - C. Meiosis
 - D. Chemotherapy
 - E. None of the above are correct
39. What involves drugs that disrupt cell division especially to treat cancer?
- A. Mitosis
 - B. Metastasis
 - C. Meiosis
 - D. Chemotherapy
 - E. None of the above are correct