

RAVEN CHAPTER 10 GUIDED NOTES: HOW CELLS DIVIDE

Raven 9th edition

1. List the three essential steps of any form of cell division.

a. _____

b. _____

c. _____

2. Prokaryotes divided through the process of

3. Eukaryotes divided through the process of

4. List the key differences between prokaryotes and eukaryotes that make these two processes different.

5. Label and make notes on the diagram below to describe the organization of the eukaryotic chromosome.

6. Define the following terms.

a. karyotype

b. haploid

c. diploid

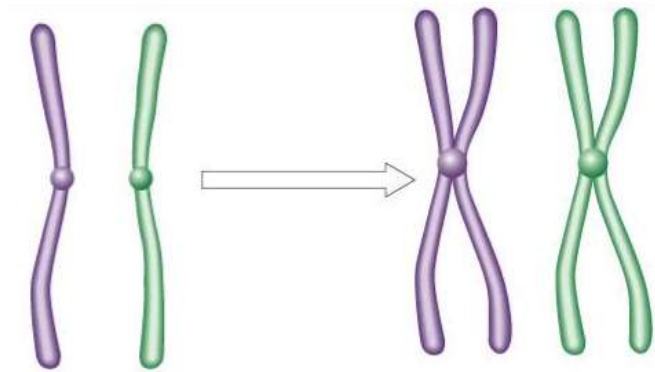
d. homologous

e. centromere

f. chromatid



7. Make notes on the following diagram to distinguish between homologous chromosomes and sister chromatids



8. Why is DNA coiled into chromosomes in eukaryotes?

9. Below is a list of the phases of the cell cycle. Write a brief description of what occurs in each phase.

a. G1 _____

b. S _____

c. G2 _____

d. M _____

e. C _____

10. How does interphase fit into this cell cycle organization listed above?

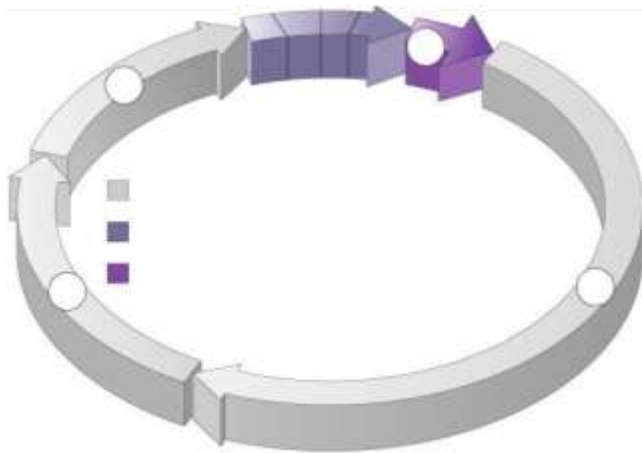
11. What is meant by the concept that cells go through a cell cycle?

12. Do all cells go through the cell cycle at the same rate or at the same frequency? Explain.

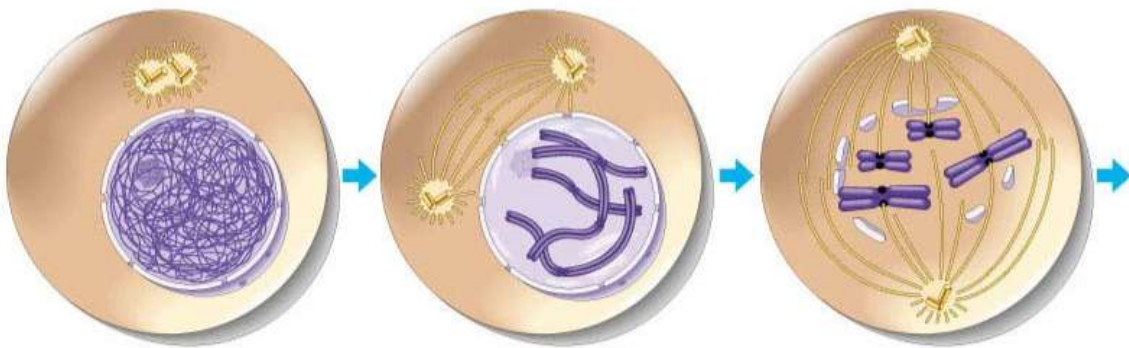
13. What is meant by the G₀ phase?

14. What is the significance of cells that are permanently in G₀ phase?

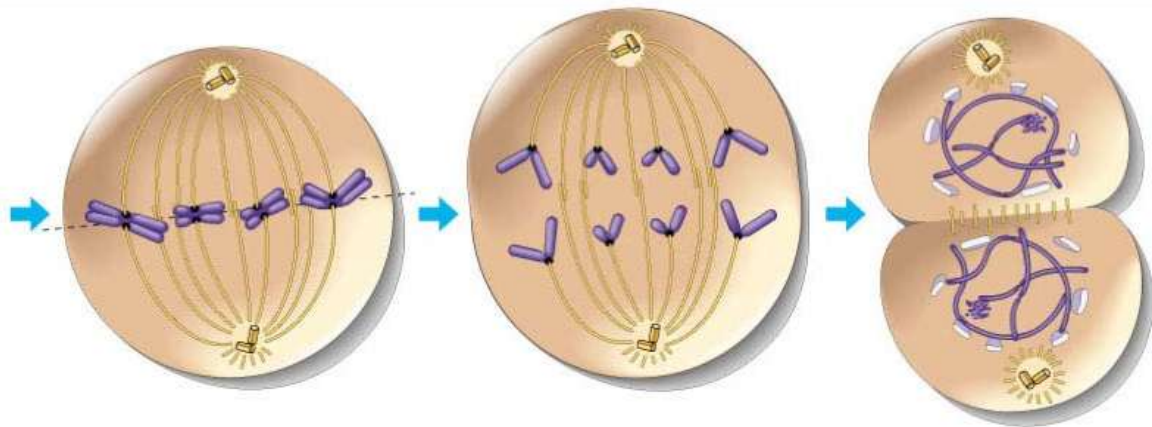
15. Label the diagram of the cell cycle.



16. Although these are not the diagrams from your text, they better illustrate the stages of mitosis. Label the stages and list the key features of each stage.



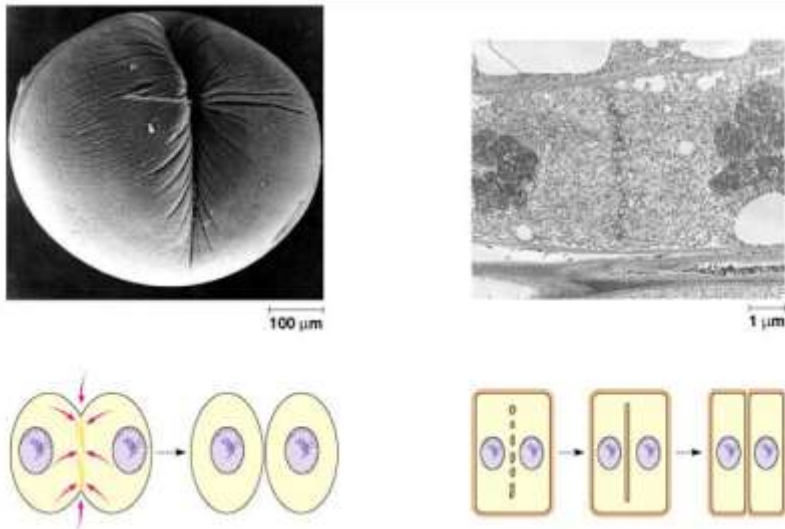
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Telophase & Cytokinesis

17. Explain the role of the centromere, kinetochores, and the microtubules in mitosis. _____

18. How does cytokinesis differ in animal and plant cells? Label the diagrams below.



19. Describe the two irreversible points in the cell cycle.

20. What is the G1/S checkpoint and where does it fit into the cell cycle?

21. What cell conditions are being monitored at the G1/S checkpoint?

22. What is the G2/M checkpoint and where does it fit into the cell cycle?

23. What cell conditions are being monitored at the G2/M checkpoint?

24. What is the spindle checkpoint and where does it fit into the cell cycle?

25. What cell conditions are being monitored at the spindle checkpoint?

26. Why is the regulation of the cell cycle critical to normal function in the multicellular organism?

27. For each of the following, takes notes about what type of molecule they are and their role in the cell cycle.

a. Cdk's _____

b. cyclin _____

c. growth factors _____

28. What is the relationship between cancer and mitosis?

29. What is the role of the p53 gene?

30. What are proto-oncogenes?

31. What are tumor suppressor genes?
