*Fold along the line and glue this side down in your Biology Interactive Learning Log (BILL)*

**Unit 5: Cell Growth and Development**

**Chapter 10**

**Objectives:** Cells undergo cell division to produce new cells. In eukaryotic cells, cell division is part of a highly regulated cycle known as the cell cycle. Cancer cells do not respond to the signals that regulate the growth of most cells, therefore they divide uncontrollably.

**Key concepts:**

Surface Area : Volume ratios Chromosomes Cell cycle Mitosis

Stem Cells Cancer Differentiation Meiosis

**Essential Questions:**

1. Why do cells divide?

2. How does a cell produce a new cell?

3. What is the role of chromosomes in cell division?

4. What is the role of the cell cycle in organisms?

5. What happens if the cell cycle is not regulated?

6. How do cancer cells differ from other cells?

7. How do cells become specialized for different functions?

8. Why are stem cells sought by researchers as potential cures to medical problems?

9. What is a gamete and how is it different from a body cell?

10. Why is meiosis called “reduction division”?

11. How are mitosis, meiosis, and fertilization related in the life cycle?

Can you show what you know?

Vocabulary**:** (**+**) = Can explain it; (**-**) = Only heard it; **0** = No idea

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Pre** | **Post** | **Memory Clue** |
| 1. asexual reproduction |  |  |  |
| 2. binary fission |  |  |  |
| 3. sexual reproduction |  |  |  |
| 4. chromosome |  |  |  |
| 5. chromatin  |  |  |  |
| 6. centromere |  |  |  |
| 7. sister chromatids |  |  |  |
| 8. histone |  |  |  |
| 9. cell cycle |  |  |  |
| 10. interphase |  |  |  |
| 11. DNA replication  |  |  |  |
| 12. mitosis |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Pre** | **Post** | **Memory Clue** |
| 13. prophase |  |  |  |
| 14. centrioles |  |  |  |
| 15. spindle fibers |  |  |  |
| 16. nuclear membrane (envelope) ((envelop((enve(envelope)metaphase |  |  |  |
| 17. metaphase |  |  |  |
| 18. anaphase |  |  |  |
| 19. telophase |  |  |  |
| 20. cytokinesis |  |  |  |
| 21. cell plate |  |  |  |
| 22. cyclin |  |  |  |
| 23. apoptosis |  |  |  |
| 24. cancer |  |  |  |
| 25. benign |  |  |  |
| 26. malignant |  |  |  |
| 27. telomere |  |  |  |
| 28. differentiation |  |  |  |
| 29. stem cell |  |  |  |
| 30. totipotent |  |  |  |
| 31. pluripotent |  |  |  |
| 32. multipotent |  |  |  |
| 33. blastocyst |  |  |  |
| 34. gamete |  |  |  |
| 35. meiosis |  |  |  |
| 36. spermatogenesis |  |  |  |
| 37. oogenesis |  |  |  |
| 38. polar body |  |  |  |
| 39. fertilization |  |  |  |
| 40. zygote |  |  |  |
| 41. homologous chromosome |  |  |  |
| 42. tetrad |  |  |  |
| 43. crossing over |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Vocabulary**:** (**+**) = Can explain it; (**-**) = Only heard it; **0** = No idea

**What I Need to Know/Be able to do:**

1. **Identify** factors that limit cell size.
2. **Calculate** surface area : volume ratios and use them to **compare** efficiency of cell function
3. **Compare** and **contrast** asexual and sexual reproduction.
4. **Compare** and **contrast** chromatin and chromosomes.
5. **Describe** the role of chromosomes in cell division.
6. **Analyze** the events that occur at each phase of the cell cycle.
7. **Evaluate** the effect on the cell if DNA does not replicate before cell division.
8. **Diagram** the stages of mitosis, **identify** the major structures present at each stage, and **describe** the significance of each stage.
9. **Differentiate** mitotic stages in plant and animal cells.
10. **Evaluate** the significance of mitosis in the human body.
11. **Define** cancer, types of tumors, and the causes of cancer.
12. **Explain** the importance of checkpoints within the cell cycle.
13. **Describe** how cancer cells are different from other cells.
14. **Identify** the possible benefits and issues relating to stem cell research.
15. **Summarize** the events of meiosis.
16. **Explain** how the events of prophase I contribute to increased genetic variation.
17. **Compare and contrast** meiosis and mitosis.
18. **Compare and contrast** spermatogenesis with oogenesis.
19. **Explain** why a polar body is formed.