

Name \_\_\_\_\_

**AP Biology**  
**TEXT: *Biology*, Campbell and Reece**  
**7<sup>th</sup> Edition**  
**Chapter 11**

**Cell Communication**  
**Thematic Review Guide**

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. Define the following terms.

a. karyotype \_\_\_\_\_

b. haploid \_\_\_\_\_

c. diploid \_\_\_\_\_

d. homologous \_\_\_\_\_

e. centromere \_\_\_\_\_

f. chromatid \_\_\_\_\_

6. Why is DNA coiled into chromosomes in eukaryotes? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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

a. G<sub>1</sub> \_\_\_\_\_

b. S \_\_\_\_\_

c. G<sub>2</sub> \_\_\_\_\_

d. M \_\_\_\_\_

e. C \_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

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

\_\_\_\_\_

\_\_\_\_\_

11. What is meant by the G<sub>0</sub> phase?

\_\_\_\_\_

\_\_\_\_\_

12. What is the significance of cells that are permanently in G<sub>0</sub> phase?

\_\_\_\_\_

\_\_\_\_\_

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

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

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

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16. What is the  $G_1/S$  checkpoint and where does it fit into the cell cycle?

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17. What cell conditions are being monitored at the  $G_1/S$  checkpoint?

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18. What is the  $G_2/M$  checkpoint and where does it fit into the cell cycle?

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19. What cell conditions are being monitored at the  $G_2/M$  checkpoint?

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

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

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

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

a. cdk's \_\_\_\_\_

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b. cyclins \_\_\_\_\_

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c. growth factors \_\_\_\_\_

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24. What is the relationship between cancer and mitosis?

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25. What is the role of the p53 gene?

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