Module 9: Cell Division and Mitosis

1. Name the three stages of interphase (G_1, S, G_2) and describe what occurs in each.
2. List the four phases of mitosis in order: Prophase, Metaphase, Anaphase, Telophase.
3. Distinguish between chromatin and chromosomes.
4. After DNA replication, what are sister chromatids? When do they separate?
5. Compare cytokinesis in animal cells (cleavage furrow) and plant cells (cell plate).
6. What are the three main checkpoints (G_1, G_2, M)? What is evaluated at each?
7. Why are checkpoints critical for preventing cancer?
8. Scenario**: A mutation inactivates the Rb (retinoblastoma) protein, a tumor suppressor.
9. Apply**: Predict the effect on cell division.
10. Normal cells divide approximately 50 times before senescence (Hayflick limit). Cancer cells are "immortal." Analyze how telomerase reactivation contributes to this.
11. Compare mitosis in eukaryotes with binary fission in prokaryotes. Which is faster? Why?