

Teenage Explanation of Cell Division

Mitosis

Book: Prokaryotic Cells divide differently than Eukaryotic Cells.

Teen: Simple cells and complex cells do not divide in the same way.

Book: Prokaryotic Cells divide through fission ... but, you don't need to know this yet.

Teen: I don't need to know this yet.

Book: Cells divide and reproduce in two ways: mitosis and meiosis.

Teen: There are two words that kind of sound alike and are spelled alike.

Book: Mitosis is a process of cell division that results in two genetically identical daughter cells developing from a single parent cell.

Teen: The one with a "T" makes two identical cells.

Book: Meiosis, on the other hand, is the division of a germ cell involving two fissions of the nucleus and giving rise to four gametes, or sex cells, each possessing half the number of chromosomes of the original cell.

Teen: The one without a "T" makes sex cells.

Book: Mitosis is used by single-celled organisms to reproduce; it is also used for the organic growth of tissues, fibers, and membranes. Meiosis is found in sexual reproduction of organisms. The male and female sex cells (i.e., egg and sperm) are the end result of meiosis; they combine to create new, genetically different offspring.

Teen: For now, we are only studying about the one with a "T" – mitosis.

Book: A process is a series of actions or steps taken in order to achieve a particular end.

Teen: My teacher keeps talking about “process” and what a process is.

Book: The mitosis division process has several steps or phases of the cell cycle—interphase, prophase, prometaphase, metaphase, anaphase, telophase, and cytokinesis—to successfully make the new diploid cells.

Teen: I have no idea. Something about steps, or a process I think.

Book: The mitosis division process has several steps or phases of the cell cycle.

Teen: The “T” word has steps.

Book: The mitosis division process has several steps or phases of the cell cycle—interphase, prophase, prometaphase, metaphase, anaphase, telophase, and cytokinesis—to successfully make the new diploid cells.

Teen: The “T” word has steps. The steps are “something” phase – or something like that.

Book: The mitosis division process has several steps or phases of the cell cycle—interphase, prophase, prometaphase, metaphase, anaphase, telophase, and cytokinesis—to successfully make the new diploid cells.

Teen: Mitosis has steps. The steps are “something” phase – or something like that.

Book: The mitosis division process has several steps or phases of the cell cycle.

Teen: Apparently steps and phases are the same thing. Why can’t they just say “steps” or “phases” – why do they use both. Steps. Phases. Steps. Phases. Same thing! Steps and Phases – okay already.

Book: The phases of the cell cycle are interphase, prophase, prometaphase, metaphase, anaphase, telophase, and Cytokinesis.

Teen: Seriously? What? Am I supposed to write this down? How do you even spell this stuff?

Book: In plant cells only, prophase is preceded by a pre-prophase stage.

Teen: Do I have to know that?

Book: No. That's in plant cells ... This is about animal cells. Sorry.

Teen: Okay? Can we have some candy?

Book: No.

Book: Write these words down: interphase, prophase, prometaphase, metaphase, anaphase, telophase, and Cytokinesis.

Teen: No.

Book: Write these words down: interphase, prophase, prometaphase, metaphase, anaphase, telophase, and Cytokinesis.

Teen: interphase.

Book: Write ALL the words down: interphase, prophase, prometaphase, metaphase, anaphase, telophase, and Cytokinesis.

Teen: Ugh! . interphase, prophase, prometaphase, metaphase, anaphase, telophase.

Book: Write down Cytokinesis also.

Teen: Jeez! . Cytokinesis also.

Book: Not the "also" ... just "Cytokinesis."

Teen: I know. I'm just messing with you.

Book: So, once again, the mitosis division process has several steps or phases of the cell cycle—interphase, prophase, prometaphase, metaphase, anaphase, telophase, and cytokinesis—to successfully make the new diploid cells.

Teen: What was that last word?

Book: Diploid cells.

Teen: Is that a process or a step?

Book: No. A diploid cell is the kind of cell we are talking about.

Teen: I thought we were talking about animal cells.

Book: A diploid cell is a cell that contains two sets of chromosomes. This is double the haploid chromosome number. Each pair of chromosomes in a diploid cell is considered to be one homologous chromosome set. .. The somatic cells in your body are diploid cells.

Book: Never mind. Scratch that. Yes – we are talking about regular old animal cells today.

Teen: So we're talking about animal cells just like I said.

Book:

Book: ...You have written down the important words. You have written interphase, prophase, prometaphase, metaphase, anaphase, telophase, and Cytokinesis – plus diploid cells.

Teen: duh.

Book: So circle all of the words with the word “phase” in it. You will circle six of the words.

Teen: Circled. What are we having for lunch?

Book: You have circled all of the words containing “phase” – these are the phases, or steps, in mitosis. These are the steps you need to learn in order to understand the process of cell division.

Teen: That’s it? I just need to learn these six words?

Book: That’s not all. You also need to understand what the steps are about. Plus you still need to understand Cytokinesis. And also there is G1, S, and G2 that are important.

Teen: Seriously ... it kind of sounds like you’re making all of this up.

Book: I’m not. I’m a book.

Teen: Yea, but you’re not the internet.

Book: Can we just keep going please?

Teen: Whatever. (yawn).

Book: So from start to finish, diploid cells (regular old animal cells) go through a fascinating process. They go through G1, S, G2 ... then the six steps of mitosis ... then Cytokinesis ... then it starts all over again.

Teen: That’s kind of a lot to remember.

Book: True that.

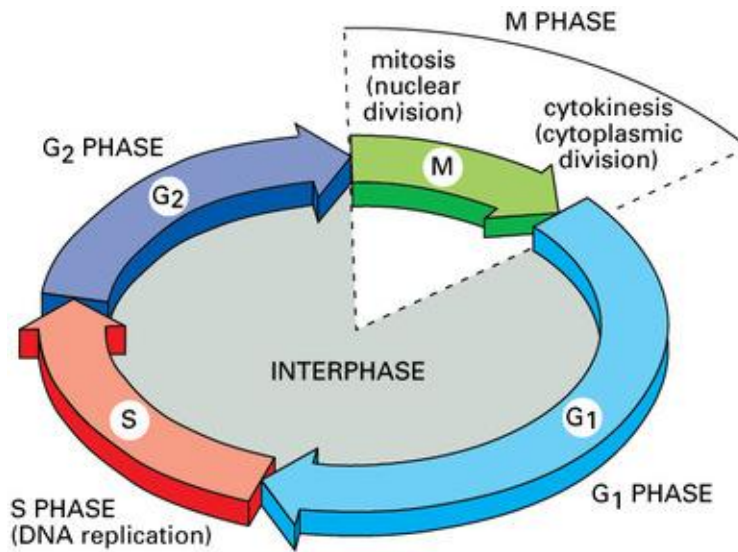
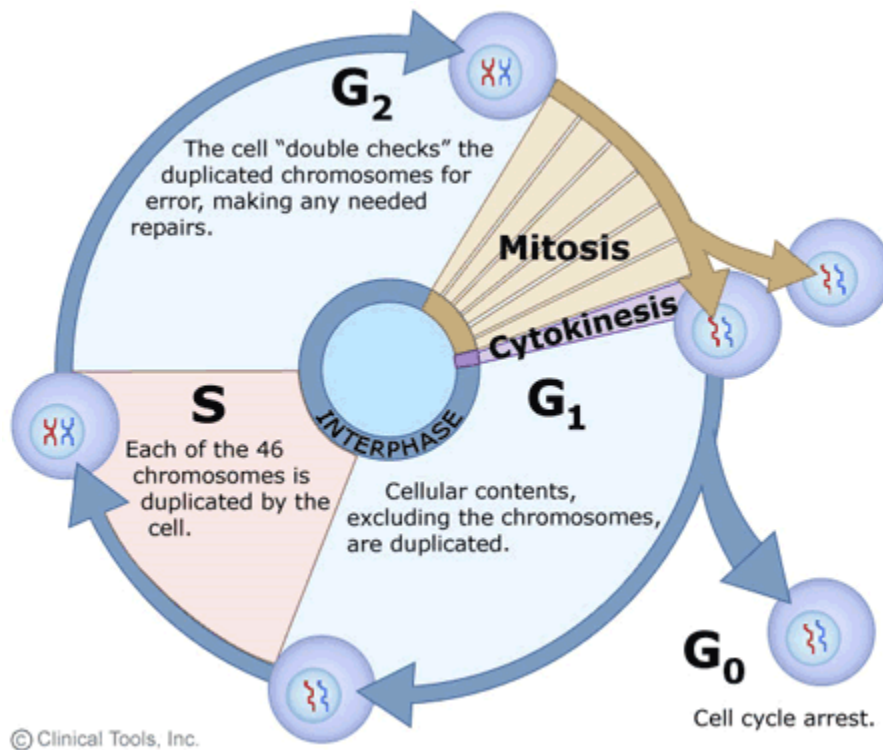


Figure 17-3. Molecular Biology of the Cell, 4th Edition.

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