

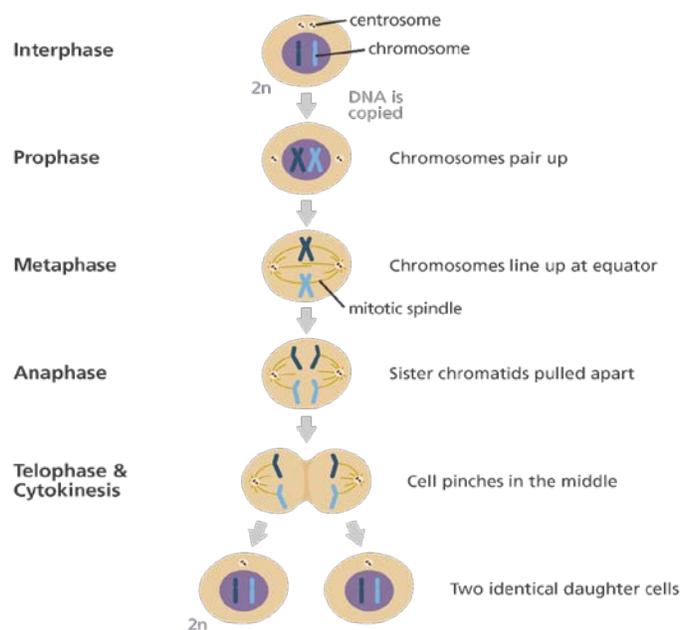


Block Coding Lesson

Lesson Title:	Mitosis by SWBAT
Grade Level:	High School
Subject:	Biology
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Engagement:

- Describe how the teacher will capture students' interest.
 - Since mitosis is a difficult concept for students without any history of it to understand, we would start off by asking questions regarding cells and chromosomes (lesson would be post intro to cells and cell parts). Then we would show them a visual (<https://www.youtube.com/watch?v=ofjyw7ARP1c>) and ask if they know which process this is.
 - We would continue by adding charts and diagrams for them to have a better understanding of the process.



2n - diploid

Source: <https://www.yourgenome.org/facts/what-is-mitosis>



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- What kind of questions should the students ask themselves after the engagement?
 - When is mitosis used in the body?
 - When does mitosis occur?
 - What is happening to different organelles within the cell
 - ex) where do they migrate to during different phases of mitosis

Exploration:

- Students will use scratch.mit.edu games to quiz themselves on which phases of mitosis a cell is in
 - Students will gather into groups
 - Students will use already made scratch codes to recognize phases of mitosis
- List “big idea” conceptual questions the teacher will use to encourage and/or focus students’ exploration.
- By using games in scratch, students will be easily able to recognize stages of cellular division (mitosis), understand the processes taking place during each step within the cell
- Teacher will ask questions such as:
 - Why might cells replicate themselves?
 - When cells go through mitosis do, they look the same or different from their parent cell
 - This leads to segway of understanding differences between mitosis and meiosis
 - What would happen if mitosis stopped?

Explanation:

- Teacher will discuss the life and death of a cell by connecting to real world situations
 - Explain how skin sheds, however, we never lose our skin
 - This is due to mitosis
 - After, teacher will ask where else this occurs? Hair, nails, etc.
- Teacher will ask questions such as
 - “Do we think every cell goes through mitosis?” → nerve cells segway
 - “How do you think mitotic cells look identical” → DNA replication segway



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Elaboration:

- Describe how students will develop a more sophisticated understanding of the concept.
 - Students will memorize the term PMATI which is the acronym to mitosis. Then we will elaborate on the steps of mitosis and when each step takes place and how it affects the body.
- What vocabulary will be introduced and how will it connect to students' observations?
 - Prophase, metaphase, anaphase, telophase
 - Mitotic spindle, nuclear envelope, chromosomes, chromatin, astromeres
- How is this knowledge applied in our daily lives?
 - Mitosis is not only applied after fertilization of the egg, allowing an embryo to grow, but also is occurring in our body as the process is replacing old dead cells.

Evaluation:

- To demonstrate understanding, students will then create their own scratch animation showing how the cell goes through mitotic phases and present to class
- Students can also individually complete a brief representation of their understanding of the steps mitosis takes.
 - I.e creating their own illustration with brief descriptions explaining each cell processes.
 - Bring illustration to next class