

Unit 4: Cell Cycle

Standard(s): 2.5 Construct an explanation about the role of mitosis in the production, growth, and maintenance of systems within complex organisms. Emphasize the major events of the cell cycle including cell growth and DNA replication, separation of chromosomes, and separation of cell contents. (LS1.B)		
Science and Engineering Practices Constructing Explanations Students construct explanations about the world using observations that are consistent with current evidence and scientific principles.	Disciplinary Core Ideas LS1.A Structure and Function LS1.B Growth and Development of Organisms LS3.A Inheritance of Traits	Crosscutting Concepts Systems Students use models to explain the parameters and relationships that describe complex systems.
Big Ideas: In multicellular organisms, cell division is an essential component of growth, development, and repair. Cell division occurs via a process called mitosis: when a cell divides in two, it passes identical genetic material to two daughter cells. Successive divisions produce many cells.		
Preceding Grade Bands: Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring.	Target Grade Bands: In multicellular organisms individual cells grow and then divide via a process called mitosis, thereby allowing the organism to grow. The organism begins as a single cell (fertilized egg) that divides successively to produce many cells, with each parent cell passing identical genetic material (two variants of each chromosome pair) to both daughter cells.	Following Grade Bands:

Unit 4 Proficiency Scale

4 Advanced	3 Proficient	2 Approaching Proficiency	1 Beginning Proficiency
I can: Construct an explanation based on valid evidence and accepted scientific reasoning for why mitosis is important for maintaining <u>systems</u> within complex organisms.	I can: Construct an explanation based on valid evidence and accepted scientific reasoning for why mitosis is important for maintaining <u>systems</u> within complex organisms.	I can: Construct an explanation for why mitosis is important for maintaining <u>systems</u> within complex organisms.	I can: Explain why growth and repair <u>systems</u> are necessary for the survival of an organism.

Anchoring Phenomenon:

[Salamander](#)

Essential Question:

How does our body grow and repair itself?

Learning Goals:

Students will be able to:

- Explain the role of mitosis in complex organisms.
- Construct a model that shows why daughter cells are genetically identical to parent cells.

	Learning Opportunities	Formative Assessments
Engage	Anchoring Phenomenon: Salamander Teacher Copy Student Copy	Suggested for this activity: Options: ● Student answers to questions ● Student Discussions ● Exit Ticket

Learning Goals ● Construct a model that shows why daughter cells are genetically identical to parent cells. ● Explain the role of mitosis in complex organisms.		
Explore	The goal of these activities is for students to collect evidence they can use to answer the question: What is the role of mitosis? Why are daughter cells identical to parent cells? Students do NOT need to complete all activities; 1-2 should suffice. - Mitosis Lab - Real Microscopic Mitosis Video	Suggested for this activity: Options: ● Student answers to questions ● Student Discussions ● Exit Ticket
Explain	1. Discuss evidence from the investigation(s). What is the role of mitosis? Why are daughter cells identical to parent cells? 2. Use one of the following resources. What evidence do you find in the resource (text, video, etc.) that helps to explain the role of mitosis and why daughter cells are genetically identical to parent cells? - Mitosis explanation 1 - Mitosis explanation 2 - Wound Heal Video - Regrowth of planaria - Human growth time lapse 3. CER paragraph that answers the question: What is the role of mitosis? Why are daughter cells identical to parent cells?	Suggested for this activity: Options: ● Revised Models ● CER Paragraph ● Student Discussions ● Demonstrate a skill ● Student answers to Questions ● Quiz ● Exit Tickets

	4. Revisit student questions from engage What questions did we answer? Do we have any new questions? 5. Revisit phenomenon and revise initial models based on evidence gathered and scientific principles learned.	
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Elaborate	Cell Differentiation • Article • Stem cells and SCID (severe combined immunodeficiency disorder) • Making hearts from stem cells	New test
Evaluate	Please complete this SURVEY to request access to the summative assessments for the JSD High School Science Exemplar Units.	