

Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Science	Course:	IB Biology 11 SL (H)	Unit Title:	Cells	Grade Level(s):	11
Assessed Trimester:		Pacing:		Date Created:		Last Revision Date:	9/2/2014

Course Understandings: *Students will understand that:*

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DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals	
Transfer	
Students will be able to independently use their learning to: (product, high order reasoning)	
Meaning	
Unit Understanding(s): Students will understand that: - Living things are made of cells - That different kinds of cells have different structures - That there is a limit as to how large cells can be in order to maintain homeostasis - Cells have specialized forms which allow them to perform specific functions - Cells carry out a specific reproduction process which ensures the survival of that cells genetic code. - The cell membrane is a flexible barrier that regulates what enters and leaves the cell	Essential Question(s): Students will keep considering:
Acquisition	
Knowledge - Students will: - The cell theory - How to relate cellular structures to their life functions - That the rate of heat production/waste production/resource consumption of a cell is a function of it's volume - The rate of exchange of materials and energy is a function of it's surface area - The difference between prokaryotic and eukaryotic cells - The hydrophobic and hydrophilic properties of phospholipids - The role of the cell membrane as a highly selective barrier in diffusion, osmosis and active transport - The process of mitosis Reasoning - Students will:	Skills - Students will: - Outline and discuss the evidence for the cell theory - Compare the relative sizes of molecules, cell membrane thickness, viruses, bacteria, organelles and cells using the appropriate SI unit - Calculate the linear magnification of drawings and actual size of specimens in images of known magnification - Explain the importance of the surface area to volume ratio as a factor limiting cell size - State that multi-cellular organisms show emergent properties and explain how these organisms differentiate to carry out specialized functions by expressing some of their genes but not others - Outline one therapeutic use of stem cells. - Draw and label a diagram of the ultra-structure of E.Coli as an example of a prokaryote and include the functions of each named structure. - Identify structures from the diagram in electron micrographs of E.Coli - State that prokaryotic cells divide by binary fission.

	● Draw and label a diagram of the liver cell as an example of an animal cell. Annotate that diagram with the functions of each named structure and identify structures in an electron micrograph of the liver cell. ● Compare prokaryotic and eukaryotic cells ● State three differences between plant and animal cells ● Outline two roles of extracellular components. ● Draw and label a diagram to show the structure of membranes ● Explain how the hydrophobic and hydrophilic properties of phospholipids help to maintain the structure of cell membranes ● List the functions of membrane proteins ● Define diffusion and osmosis ● Explain passive transport across membranes by simple diffusion and facilitated diffusion ● Explain the role of protein pumps and ATP in active transport across membranes ● Outline the stages in cell cycle, including interphase, mitosis and cytokinesis ● State that tumors are the result of uncontrolled cell division and that these can occur in any organ or tissue ● Describe the events that occur in the four phases of mitosis (prophase, metaphase, anaphase and telophase) ● Explain how mitosis produces two genetically identical nuclei ● State that growth, embryonic development, tissue repair and asexual reproduction involve mitosis.

Common Misunderstandings ●	Essential new vocabulary ● Cell Theory ● Osmosis ● Diffusion ● Active Transport ● Passive Transport ● Stem cells ● Hydrophobic ● Hydrophilic ● Endocytosis ● Exocytosis
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