Science
Biology: Honors
Unit 5: The Cell

Essential Understandings	▪ All living organisms are made of cells. ▪ There are prokaryotic and eukaryotic cells. ▪ Cell structures perform specific functions. ▪ Materials move in and out of cells. ▪ Cells vary in specialization.
Essential Questions	▪ What is the cell theory? ▪ What are the characteristics of prokaryotic and eukaryotic cells? ▪ What are the functions of the major cell structures? ▪ How does the plasma membrane maintain homeostasis? ▪ How are living organisms organized?
Essential Knowledge	▪ All living organisms are made of cells. ▪ There are prokaryotic and eukaryotic cells. ▪ Cell structures perform specific functions. ▪ Materials move in and out of cells. ▪ Cells vary in specialization.
Vocabulary	▪ <u>Terms</u>: ○ microscopy, cell plasma membrane, cell wall, cytoplasm, nucleus, prokaryote, eukaryote, organelle, chromatin, chromosome, nucleolus, nuclear envelope, cytoskeleton, microtubules, microfilaments, ribosome, endoplasmic reticulum, mitochondria, Golgi apparatus, lysosome, vacuole, chloroplast, osmosis, hypnotic solution, hypertonic solution, isotonic solution, plasmolysis, cytolysis, diffusion, active transport, endocytosis, exocutosis, passive transport, tissue, organ, organ system, cancer
Essential Skills	▪ Use a microscope correctly. ▪ Identify different types of cells. ▪ Differentiate between prokaryotic and eukaryotic cells. ▪ Differentiate between plant and animal cells. ▪ Measure items precisely and accurately. ▪ Correctly organize data into analytical format.

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Related Maine Learning Results	Science B. The Skills and Traits of Scientific Inquiry and Technological Design B1.Skills and Traits of Scientific Inquiry Students methodically plan, conduct, analyze data from, and communicate results of in-depth scientific investigations, including experiments guided by a testable hypothesis. e. Use a variety of tools and technologies to improve investigations and communications. E. The Living Environment E3.Cells Students describe structure and function of cells at the intracellular and molecular level including differentiation to form systems, interactions between cells and their environment, and the impact of cellular processes and changes on individuals. a. Describe the similarities and differences in the basic functions of cell membranes and of the specialized parts within cells that allow them to transport materials, capture and release energy, build proteins, dispose of waste, communicate, and move. b. Describe the relationship among DNA, protein molecules, and amino acids in carrying out the work of cells and how this is similar among all organisms. c. Describe the interactions that lead to cell growth and division (mitosis) and allow new cells to carry the same information as the original cell (meiosis). d. Describe ways in which cells can malfunction and put an organism at risk. e. Describe the role of regulation and the processes that maintain an internal environment amidst changes in the external environment. f. Describe the process of metabolism that allows a few key biomolecules to provide cells with necessary materials to perform their functions. g. Describe how cells differentiate to form specialized systems for carrying out life functions.
Sample Lessons and Activities	▪ Microscope Lab – comparing plant and animal cells ▪ Diffusion Lab ▪ Create cell model
Sample Classroom Assessment Methods	▪ Quiz ▪ Chapter Test ▪ Lab Reports

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Sample Resources	▪ Publications: o Biology - Kenneth Miller and Joseph Levine ▪ Videos: o Cycles of Life