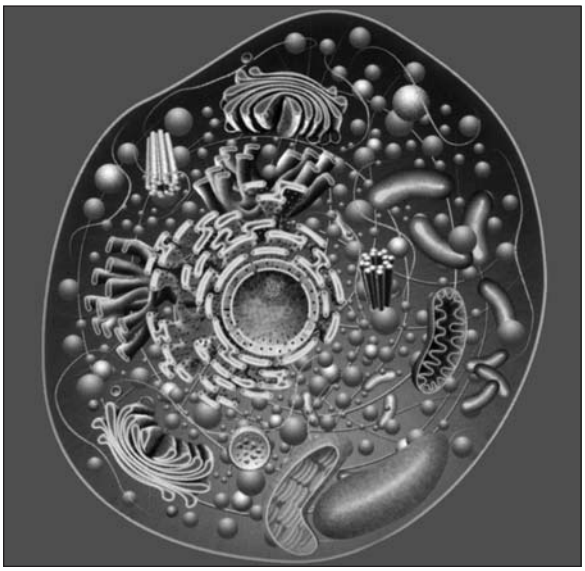
2008



INSIDE THE LIVING CELL

Life Science
Biology

5 15-min. Programs
Grades 6-9
Teacher's Guide
SOL Correlations Below

INSIDE THE LIVING CELL is an excellent 75-minute presentation that begins with the discovery of prokaryotic and eukaryotic cells and continues with the most recent and modern insights, garnered from the electron microscope and a variety of new techniques. Divided into four distinct sections, this series challenges students to uncover the mystery of cells and cell processes. The program utilizes extremely fine, abundant examples and animations of cells in various environments. Thi series is recommended by the AAAS Science Books and Films.
Section 1 relates cells to the macromolecules, carbohydrates, fats, proteins, and nucleic acids and to their respective components: simple sugars, fatty acids, amino acids, and nucleotides.
Section 2 explains the cell membrane thoroughly as a bilipid layer with embedded and surface proteins, functioning as a selectively permeable membrane in osmosis and diffusion, active and passive transport, and endocytosis and exocytosis. ATP is stressed in relation to such things as gating proteins. Also included are discussions of pinocytosis, hormones and their receptors in relation to cell vacuoles, and the electric charges of the cell membrane.
Section 3 deals with energy. In it, the active transport of simple components of macromolecules is related to the use of chemical bond energy in anaerobic and aerobic exchanges of ADP and ATP. Aerobic electron transport in mitochondria is show in great detail, as are the light-dependent and light independent reactions in chloroplasts.
Section 4 continues detailing biochemistry by relating enzymes to the breakdown of H2o2, replication, transcription, and translation.
Section 5 presents DNA replication, mitosis, and cell division in unicellular and higher organisms, thoroughly incorporating the role of polymerase and error correction.

1. The Cell-Unit of Life — This program shows the kinds of cells and emphasizes that all cells have a common organization and they all carry out similar biochemical processes.
Science: LS.4, BIO.4

2. The Outer Envelope — Here students become acquainted with the properties of the plasma membrane, how it governs the kinds of molecules that go in and out of cells, and how cells feed by engulfing (phagocytosis) and drinking in fluids by pinocytosis.
Science: LS.3, LS. 4, BIO.4

3. How Cells Obtain Energy — This program illustrates the mechanisms of photosynthesis and cellular respiration. It introduces ATP, the universal energy carrier molecules that supply energy-hungry reactions. It also shows the structure and function of Chloroplasts and Mitochondria, energy transforming organelles.
Science: LS.3, LS. 6, BIO.3

4. How Cells Are Controlled — Illustrations show how genetic instructions carried on DNA are transcribed into RNA, leading to the production of specific enzymes that control the thousands of biochemical processes going on in living cells.
Science: LS.3, BIO.4, BIO. 6

5. How Cells Reproduce —This program shows how DNA replicates, how copy errors occur and are fixed by repair enzymes, and how DNA is compressed into chromosomes making possible mitosis and cell division.
Science: LS.2, LS.3, BIO.6

Additional Resource Information:

The website to support this series is found at http://www.scctv.net/BIOMEDIA/