

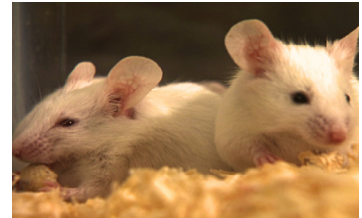
The Basics of Genetics Series

All programs in the series are curriculum-based and cover essential biological concepts and principles. Each program reflects the latest scientific and educational concepts and is full of widescreen images from laboratories and landscapes around the world. All programs are written in a concise way that makes complex concepts clear to students and intertitles enable teachers to stop and discuss major points without interrupting program flow. A teacher's guide, crossword puzzle and multiple choice questions are included on each DVD!



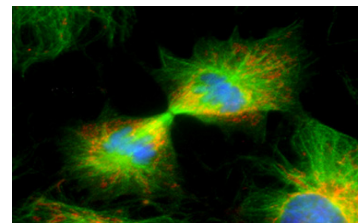
Biotechnology: Engineering Genomes (GPM0031)

First looks at major research areas in biotechnology such as the Human Genome Project and the various forms of recombinant DNA technology that produce transgenic plants and animals. The program then goes on to look at the tools used by biotechnologists such as restriction enzymes, plasmids, vector and vector less insertion of genes into genomes, and the production of genes via polymerase chain reactions. The program then concludes by looking at the future of biotechnology and some of the environmental, economic, and ethical issues raised by biotech. (30 min.)



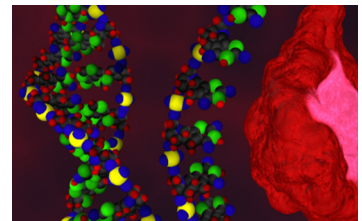
Cellular Reproduction: Mitosis, Cytokinesis, and the Cell Cycle (GPM0032)

Starts by introducing the cell cycle and briefly describing the process of binary fusion in prokaryotic cells before going on to a detailed look at the eukaryotic cell cycle from the G1, S and G2 phases of interphase through the prophase, metaphase, anaphase and telophase phases of mitosis. The difference between cytokinesis in animal and plant cells is then illustrated. The program concludes by explaining why an understanding of cellular division is critical to: conquering cancer, cloning organs, and perhaps even reversing aging. (30 min.)



DNA, RNA, and Protein Synthesis: Information to Structure (GPM0033)

Looks at the structure of DNA and then describes how DNA carries out its four major functions: the storage of information; the replication of information; creating slight changes in the information through mutations that forces of natural selection act upon; and the translating of information into the proteins that define an individual. During this discussion students are introduced to: point mutations; insertions and deletions; the genetic code; transfer, messenger, and ribosomal RNA; and the process of replication and translation. (31 min.)



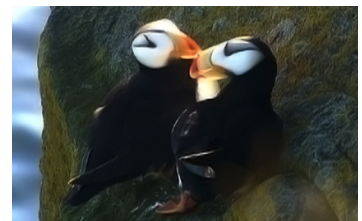
The Human Genome: Traits, Disorders, and Treatments (GPM0034)

Begins by looking at single gene genetic disorders including recessive disorders such as Tay-Sachs and sickle-cell anemia, dominant disorders such as Huntington's disease, and sex-linked disorders such as hemophilia and color blindness. The program then looks at polygenic inheritance and environmental influences on the expression of genes. Chromosomal inheritance of disorders such as Down syndrome are then explored before looking at the ethical issues involved in genetic testing and the hope promised by the Human Genome Project. (31 min.)



Meiosis, Sexual Reproduction & Genetic Variability (GPM0035)

Begins by comparing asexual and sexual reproduction and describing chromosomes and homologous pairs. The difference between haploid and diploid cells and the three major eukaryotic life cycles are then described. The program goes on to describe all the stages of Meiosis I & II including prophase I & II, metaphase I & II, anaphase I & II, and telophase I & II. In the process students are introduced to phenomena such as crossing over and provided an explanation of how meiosis creates genetic variability in a species. (22 min.)



Understanding Inheritance: Mendel, Method, and Mapping (GPM0036)

Delves into the fundamental aspects of genetic inheritance and how Mendel discovered the principles that form the foundation of modern genetics. The program first goes to Mendel's pea garden to investigate how Mendel came to propose the Laws of Dominance, Independent Assortment and Segregation and how those laws have been modified as a result of work done by those that followed Mendel. The program later explores sex-linked traits, the use of Punnet squares, incomplete dominance, codominance, and polygenic inheritance. (34 min.)



6x22-34 min. • Gr. 9-12,C,A • 2006 • S0003098
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