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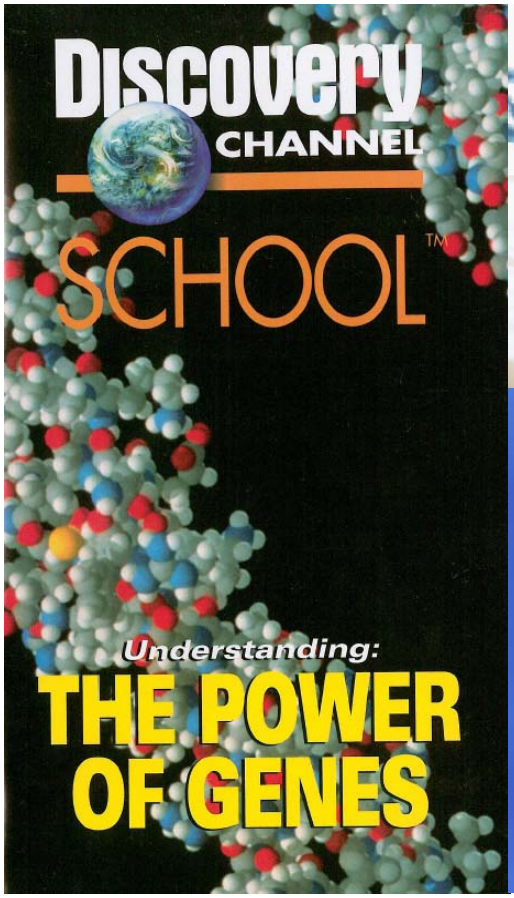
#12249
UNDERSTANDING: THE POWER OF GENES

DISCOVERY SCHOOL, 2004
Grade Level: 6–12
55 Minutes



CAPTIONED MEDIA PROGRAM RELATED RESOURCES

#9088 THE HUMAN BODY (SPANISH)
#10831 RACE--THE POWER OF AN ILLUSION: EPISODE ONE--THE DIFFERENCE BETWEEN US
#11404 GENES, GENETICS & DNA

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Understanding:
The Power of Genes

Grade Level: 9-12	**Subject:** Human Body	**Duration:** One or two class periods

Objectives

Students will

- discuss new scientific information about genes,
- consider how that information is changing thoughts about human behavior and scientific research; and
- write essays about how information about genetics affects private homes, the research laboratory, and hospitals and clinics.

Materials

1. Paper and pencils
2. Newsprint and markers
3. Computer with Internet access

Procedures

1. Begin the lesson by asking students what they know about new genetic research. Write their ideas on a large sheet of newsprint. Students may discuss cloning animals, using DNA in criminal investigations, or gene therapy for some types of cancer.

2. Divide the class into groups of three or four students. Give the groups the option of focusing on one of the following environments:

   - Private homes
   - The research laboratory
   - Hospitals or clinics

3. After students select a setting, allow enough time for them to consider how new genetic research has affected it. Students should be able to answer the following questions:

   - What is the focus of the new research?
   - Does the new research challenge earlier ideas? If so, how?
   - How can the new research be applied to the selected environment? For example, could the new research about human behavior affect how children are raised? Could it affect scientific research or future medical treatments?

4. Give students time to conduct research during class. You may have them visit the following Web sites:

   Pure Research and Medical Research
   http://www.cleveland.com/news/plaindealer/index.ssf?/base/news/1086780655199730.xml
   http://english.people.com.cn/200406/10/eng20040610_145932.html
   http://www.cancer.mgh.harvard.edu/cancer_ccr_index.htm
   http://2001.cancer.gov/genes.htm
   http://www.dnafiles.org/about/pgm14/index.html
   http://www.globalchange.com/clone_index.htm

Genes and Behavior
http://www.washingtonpost.com/wp-srv/national/longterm/twins/twins2.htm
http://www.peele.net/lib/genes.html
http://www.sptimes.com/2003/07/12/Tampabay/Twin_Mystique.shtml

5. During the next class period, have the groups work together to create a report summarizing their findings. Students should include research to document their ideas and conclusions. If time permits, have each group present its findings.

6. Conclude the lesson by referring to students' ideas at the beginning of the lesson. Have their ideas changed after working on this project? If so, how? What new insights do students have about genes and how they affect different aspects of human life.

Evaluation

Use the following three-point rubric to evaluate students' work during this lesson.

- **Three points:** Students participated actively in class discussions; worked closely within their group to conduct research; and prepared a thorough, well-written, and well-documented report.
- **Two points:** Students participated in class discussions; worked somewhat closely within their group to conduct research; and prepared a competent report.
- **One point:** Students participated minimally in class discussions; did not work well within their group to conduct research; and prepared an incomplete, poorly researched report.

Vocabulary

behavior
Definition: The range of actions an animal performs, from finding food to protecting itself to mating to taking care of its offspring.
Context: Most animal behaviors help them survive in their environment.

chromosome
Definition: Material in the cell nucleus that contains genetic information.
Context: Each chromosome contains two rods of chromatids, which contain key genetic information for cells.

clone
Definition: Two organisms that have the same genetic material so that they are exactly the same, or an organism that is genetically the same as the one from which it was made.
Context: Identical twins are clones that occur in nature; Dolly the Sheep is an example of a scientifically produced clone.

DNA
Definition: A substance known as a nucleic acid that carries the information passed from parents to their offspring; acronym for deoxyribonucleic acid.
Context: When the structure of DNA was determined in 1953 by two scientists named James Watson and Francis, it was considered a major scientific breakthrough.

gene
Definition: A specific strand of DNA that is responsible for a particular trait or characteristic.
Context: A major scientific endeavor known as the Human Genome Project has mapped each gene in all the cells in the human body.

Academic Standards

The National Academy of Sciences provides guidelines for teaching science and a coherent vision of what it means to be scientifically literate for students in grades K–12. To view the standards, visit this Web site: http://books.nap.edu/html/nses/html/overview.html#content.

This lesson plan addresses the following national standards:

- Life Science: Molecular basis of heredity; Interdependence of organisms; Behavior of organisms
- Science as Inquiry: Understandings about scientific inquiry

Credit

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