



Discussion Guide for

GENETICS AND HEREDITY: THE BLUEPRINT OF LIFE

Objectives

After viewing this program, students will be able to:

- Outline the importance of the work of Gregor Mendel.
- Illustrate the shape and composition of DNA molecules.
- Describe genes and chromosomes.
- Illustrate and explain the process of mitosis.
- Explain the difference between dominant and recessive traits.
- Describe the difference between being pure and hybrid for a trait.
- Predict the likelihood of a single gene trait being passed to an offspring by using Punnett square.
- List a number of genetic illnesses.

About This Program

This program is part of the AIMS Interactive Science Essentials Series. This twenty-four part series covers four subject areas- Earth Science, Biology, Physics, and Chemistry. There are six programs in each subject area. The individual programs are divided into randomly accessible sections. A glossary provides written definitions of terms used in the program, and in most cases will run a section of the video where the word is used in context. A script of the narration is accessible, as well as a bulletin board containing a general introduction to the subject. A quiz allows the student to test their knowledge and the results are recorded for you. In the teacher's section you can view each student's test responses and edit or create your own quiz and rest questions.

Overview

Genetic and Heredity: The Blueprint of Life is part four of the Biology Essentials series which examines modern day biology. The program illustrates the structure of DNA and the processes of mitosis and meiosis with high quality 3-D animation. It explains how traits are passed between generations, the difference between pure and hybrid traits, recessive and dominant genes, and the use of the Punnett square to predict the probability of offspring inheriting a given trait. The program also looks at common genetic disorders and the importance of genetics in medicine and biotechnology.

Teacher's Preparation

Before the student uses the program set up the computer so that they can easily reach the mouse and the keyboard. Load the CD-ROM into the computer so that it is ready for the student to begin using. While students are able to work at their own pace, some students may benefit from using the program more than once.

Suggested Discussion Questions

1. What other scientific discoveries, besides Mendel's prediction of the existence of genes, can you think of where scientists predicted something would happen or that something existed before they actually saw it?
2. What other scientific discoveries are as important as Mendel's in terms of their impact on our view of the world and on our day-to-day lives?
3. Why do genetic illnesses still exist? Why haven't they been eliminated by the process of natural selection?
4. List all the human traits you possibly can. Can you come up with a list of hundreds or thousands of traits?
5. Human beings are made up largely of water, what category of chemical compounds largely defines what our individual traits are?
6. How are mitosis and meiosis different? The same?



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7. Describe why the offspring of the same parents are often so different in terms of their traits.

8. Would you want to know if you had a fatal genetic illness?

9. Do you think we should use genetic engineering to "improve" farm animals and agriculture crops? Human beings? What would an improved human being consist of? Would there be any drawbacks to a world full of "improved" human beings?

10. Would you go to a genetic counselor before having a child?

Vocabulary

anaphase
 anemia
 centromere
 chromosomes
 DNA
 genes
 genetic
 hemophilia
 hybrid trait
 interphase
 meiosis
 Mendel
 metaphase
 mitosis
 mutations
 prophase
 prophase one
 punnett
 pure trait
 telophase
 traits

Additional Benefits

Students will be able to:

- Describe some of the difficult issues raised by genetic counseling and engineering.

21 Minutes

Biology Junior-Senior High

Programs Details

Length:

21 minutes

Subject Areas:

Biology

Audience Levels:

Junior-Senior High

Order Number:

1-9078SG

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