Case Details

Case Title:

Who's Your Daddy?

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Grade Level(s):

Middle School

Subject(s):

Life Science

Summary:

Did you see that crazy episode of Maury Povich yesterday? Those DNA cases are always interesting, but this time, he had a twist to it. I recorded it so that I can watch it again; why don't you come over and we'll watch it together?

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Learning Objectives:

1. Explain the experiments of Gregor Mendel.
2. Explain how genes and alleles are related to genotypes and phenotypes.
3. Use genotype and phenotype to create a Punnett square.
4. Define key terms: heredity, dominant trait, recessive trait, genes, alleles, genotype, phenotype, and probability.
5. Explain and demonstrate the role of probability in genetics.
6. Perform theoretical genetic crosses through the construction and use of Punnet Squares.
7. Apply probability principles to genetic crosses.
8. Determine phenotypes and genotypes using Punnet Square crosses.

National/State Standards:

Georgia Performance Standards

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science. (NSES Content Standard A)

S7CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities. (NSES Content Standard A) a. Use appropriate technology to store and retrieve scientific information

in topical, alphabetical, numerical, and keyword files, and create simple files.

S7CS6. Students will communicate scientific ideas and activities clearly. (NSES Content Standard A) a. Write clear, step-by-step instructions for conducting particular scientific investigations, operating a piece of equipment, or following a procedure. b. Write for scientific purposes incorporating data from circle, bar, and line graphs, two-way data tables, diagrams, and symbols. c. Organize scientific information using appropriate simple tables, charts, and graphs, and identify relationships they reveal.

S7CS8. Students will investigate the characteristics of scientific knowledge and how that knowledge is achieved. (NSES Content Standard A) Students will apply the following to scientific concepts: a. When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, which often requires further study. Even with similar results, scientists may wait until an investigation has been repeated many times before accepting the results as meaningful. b. When new experimental results are inconsistent with an existing, well established theory, scientists may pursue further experimentation to determine whether the results are flawed or the theory requires modification. c. As prevailing theories are challenged by new information, scientific knowledge may change.

S7CS9. Students will investigate the features of the process of scientific inquiry. (NSES Content Standard A) Students will apply the following to inquiry learning practices: a. Investigations are conducted for different reasons, which include exploring new phenomena, confirming previous results, testing how well a theory predicts, and comparing competing theories. b. Scientific investigations usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations to make sense of collected evidence. c. Scientific experiments investigate the effect of one variable on another. All other variables are kept constant. d. Scientists often collaborate to design research. To prevent bias, scientists conduct independent studies of the same questions. e. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator s credibility with other scientists and society. f. Scientists use technology and mathematics to enhance the process of scientific inquiry. g. The ethics of science require that special care must be taken and used for human subjects and animals in scientific research. Scientists must adhere to the appropriate rules and guidelines when conducting research.

S7L3. Students will recognize how biological traits are passed on to successive generations. (NSES Content Standard C) a. Explain the role of genes and chromosomes in the process of inheriting a specific trait.