Genetic Testing for Huntington's Disease

Teacher Information

Summary:

Jenny is a young woman with a family history of Huntington's disease (an inherited disease caused by a defective dominant gene). In this multiple part activity, students:

- Use models and pedigrees to understand Jenny's chances of inheriting the gene for Huntington's disease.
- Weigh the benefits and risks of genetic testing.
- Perform a simulated genetic test to determine if Jenny or other family members have inherited the gene for Huntington's disease.

Core Concepts:

- Defective genes that cause disease may be passed to offspring.
- Genetic tests can be used to determine if individuals carry genes for genetic diseases.
- Individuals considering genetic testing should understand and weigh the benefits and risks of genetic testing.

Time Required:

- Part 1: *A Family Disease* - 40 minutes to allow for computer research
- Part 2: *Jenny's Chances* - 40 minutes
- Part 3: *Jenny's Family History* - 20 minutes
- Part 4: *Jenny's Choices* - 40 minutes
- Part 5: *The Huntington Gene and Genetic Testing* - 40 minutes

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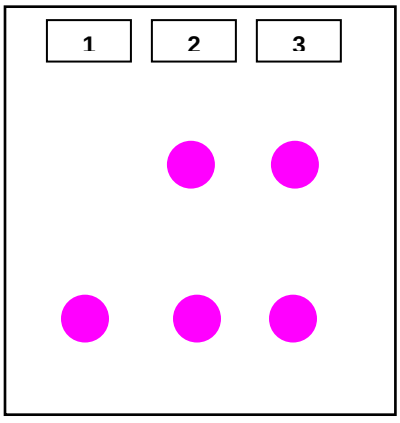
Teacher Preparation

Each student will need:

- Safety goggles
- 1 copy of ***Genetic Testing for Huntington's Disease***

Each team of 2-3 students will need:

- Paper towels for clean-up
- Access to water
- Access to a computer and Internet for research on Huntington's disease
- Opaque bag labeled "Grandmother Hh" that contains 20 black beads and 20 clear beads.
- Opaque bag labeled "Grandfather hh" that contains 40 clear beads.
- Bag labeled "PCR Huntington Gene Copies from Person A" that contains five 6" and five 4" pieces of ribbon or colored paper.
- Bag labeled "PCR Huntington Gene Copies from Person B" that contains ten 4" pieces of ribbon or colored paper.
- Tube labeled "DNA Stain" that contains approximately 1/8 teaspoon of washing soda (purchase in laundry area of local grocery store).
- Plastic stirrer
- Plastic plate (6" - 7" size) for DNA staining
- "Electrophoresis Gel for Jenny's Family". Print the simulated electrophoresis gels on the following page on card stock. Use a cotton swab to apply small spots of 1% phenolphthalein on the paper in the locations shown below.



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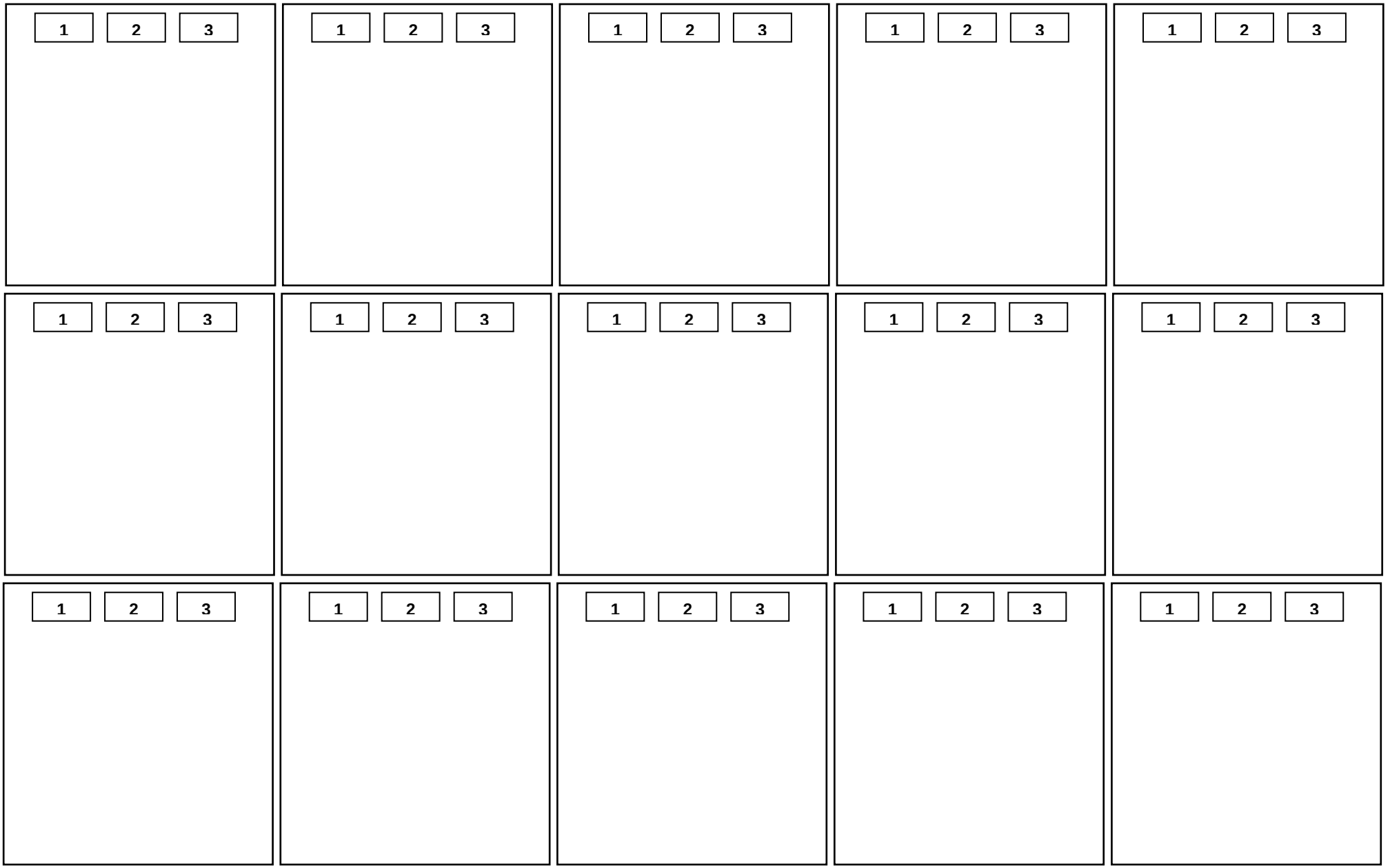

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