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Topic: Incomplete Dominant and Codominant Traits Worksheet

Summary: Students will learn the difference between incomplete dominance and codominant traits by completing Punnett squares.

Goals & Objectives: Students will be able to recognize the differences between inheritance patterns.

NGSS Standards: *HS-LS3-3.* Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

Time Length: 20 minutes

Prerequisite Knowledge: Students know how to complete a Punnett square for dominant and recessive traits. Students know vocabulary words like homozygous, heterozygous, dominant, recessive, genotype and phenotype. Students know how to calculate ratios.

Materials:

Calculators

Class notes or textbook or online textbook:

- <https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/3.11/primary/lesson/mendelian-inheritance-in-humans-bio/>
- <https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/3.6/primary/lesson/punnett-squares-bio/>
- <https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/3.12/primary/lesson/genetic-disorders-bio/>

Procedures:

1. Students work on the handout by themselves.

Accommodations: Students with an IEP can take the handout home if they need extra time, and/or do the even number of questions.

Editable DOCX File and Answer Key:

Available at www.ngsslifescience.com

Incomplete and Codominant Traits WS

Background Information: In incomplete dominance, the heterozygous genotype will express a phenotype somewhere in-between the dominant and the recessive. With codominance, the heterozygous genotype will express both phenotypes.

1) In a chestnut horse, their coat (hair) color can be reddish brown (AA), light red/pink (Aa), and creamy white (aa). Fill in the Punnett square and determine the expected genotypes and phenotypes from crossing heterozygous and heterozygous parents.

Offspring Genotypes: _____

Offspring Phenotypes: _____

Is this an example of incomplete or codominance? _____

2) Camellia flowers can be red, white or white and red. The red color is dominant. Fill in the Punnett square and determine the expected genotypes and phenotypes from crossing homozygous red and heterozygous red white parents.

	R	R
R		
W		

Offspring Genotypes: _____

Offspring Phenotypes: _____

Is this an example of incomplete or codominance? _____

3) Humans can be one of the four possible blood types. Blood types A and B are dominant over type O. Fill in the Punnett square and determine the expected genotypes and phenotypes from crossing a person who has homozygous type A and a person with type AB.

	I ^A	I ^A
I ^A		
I ^B		

Offspring Genotypes: _____

Offspring Phenotypes: _____

Is this an example of incomplete or codominance? _____

4) Blood types A and B are dominant over type O. Fill in the Punnett square and determine the expected genotypes and phenotypes from crossing a person who has heterozygous type B and a person with heterozygous type A.

	I^B	i
I^A		
i		

Offspring Genotypes: _____

Offspring Phenotypes: _____

Is this an example of incomplete or codominance? _____

5) Blood types A and B are dominant over type O. Fill in the Punnett square and determine the expected genotypes and phenotypes from crossing a person who has type AB and a person with type O.

Offspring Genotypes: _____

Offspring Phenotypes: _____

Is this an example of incomplete or codominance? _____

6) Blood types A and B are dominant over type O. Fill in the Punnett square and determine the expected genotypes and phenotypes from crossing a person who has heterozygous type B with a person who has type AB.

Offspring Genotypes: _____

Offspring Phenotypes: _____

Is this an example of incomplete or codominance? _____

7) In humans, sickle-cell anemia is an autosomal recessive genetic disorder that causes red blood cells to change shape and can cause the red blood cells to become stuck in blood vessels. This blocking can deprive tissues of oxygen and cause organ damage like strokes. One benefit of is that people who have one or two alleles of the sickle cell disease are resistant to malaria since their red blood cells are not conducive to the parasites. People with a heterozygous genotype don't have the disease but their red blood cells are slightly changed and have immunity to malaria. Fill in the Punnett square and determine the expected genotypes and phenotypes from crossing homozygous recessive (aa) and homozygous dominant parents (AA).

Offspring Genotypes: _____

Offspring Phenotypes: _____

Is this an example of incomplete or codominance? _____