

Topic: Punnett Square Dihybrid Cross Worksheet

Summary: Students will practice performing two trait crosses and make the connection with Mendel's law of independent assortment.

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, phenotype, and genes are located on chromosomes. Students know how to calculate percentages.

Materials:

Class notes or textbook or online textbook:

- <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/3.11/primary/lesson/mendelian-inheritance-in-humans-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 first Punnett square and questions and the question on independent assortment.

Editable DOCX File and Answer Key:

Available at www.ngsslifescience.com

Punnett Square Dihybrid Crosses Worksheet

Complete the following Punnett squares and answer the corresponding questions for human.

1) For humans, pretend freckles and broad noses are dominant to no freckles and narrow noses. Use the Punnett square below to determine the possible offspring from a cross between two heterozygous freckled broad nose people.

Phenotypes: _____

Percentage of offspring with freckles & broad noses

_____ %

2) For humans, pretend large eyes and nearsightedness are dominant to small eyes and normal vision. Use the Punnett square below to determine the possible offspring from a *cross between a person who is homozygous dominant for both traits and homozygous recessive for both traits*. Mate one offspring from the F₁ generation with a person who is homozygous recessive for both traits.

F₁

F₂

3) Percentage of F₂ offspring with large eyes & nearsightedness _____ %

4) Percentage of offspring with small eyes & nearsightedness _____ %

5) Explain how the two-trait Punnett square demonstrates the law of independent assortment.
