Punnett Square Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is a Punnett Square used for?

undefined. A) Calculating genetic probabilities ✓

undefined. B) Measuring plant growth

undefined. C) Recording experimental data

undefined. D) Analyzing chemical reactions

A Punnett Square is used to calculate genetic probabilities.

Which of the following are terms related to genetics? (Select all that apply)

undefined. A) Alleles ✓

undefined. B) Photosynthesis

undefined. C) Genotype ✓

undefined. D) Homozygous ✓

Terms related to genetics include alleles, genotype, and homozygous.

Explain the difference between a genotype and a phenotype.

A genotype refers to the genetic makeup of an organism, while a phenotype refers to the observable traits.

List the two types of alleles and provide an example of each.

1. Type of allele 1 and example

Dominant allele (A)

2. Type of allele 2 and example

Recessiv allele (a)

The two types of alleles are dominant and recessiv, with examples being 'A' for dominant and 'a' for recessiv.

Who is credited with devisING the Punnett Square?

undefined. A) Gregor Mendel

undefined. B) Reginal Punnett ✓

undefined. C) Charles Darwin

undefined. D) James Watson

Reginal Punnett is credited with devisING the Punnett Square.

Part 2: Application and Analysis

If a homozygous dominant plant (AA) is crossed with a homozygous recessiv plant (aa), what will be the genotype of the offspring?

undefined. A) AA

undefined. B) Aa ✓

undefined. C) aa

undefined. D) Aa and aa

The genotype of the offspring will be Aa.

Consider a dihybrid cross between two heterozygous parents (AaBb x AaBb). Which of the following genotypes are possible in the offspring? (Select all that apply)

undefined. A) AABB ✓

undefined. B) AaBb ✓

undefined. C) aabb ✓

undefined. D) Aabb ✓

Possible genotypes include AABB, AaBb, aabb, and Aabb.

Using a Punnett Square, predict the phenotypic ratio of offspring from a cross between two heterozygous pea plants (Yy x Yy) for yellow (Y) and green (y) seed color.

The phenotypic ratio will be 3 yellow to 1 green.

In a dihybrid cross, what does the 9:3:3:1 ratio represent?

undefined. A) The genotypic ratio of offspring
undefined. B) The phenotypic ratio of offspring ✓
undefined. C) The probability of dominant traits
undefined. D) The ratio of homozygous to heterozygous genotypes

The 9:3:3:1 ratio represents the phenotypic ratio of offspring.

Which of the following factors can affect the outcome of a Punnett Square prediction? (Select all that apply)

undefined. A) Environmental influences ✓
undefined. B) Mutation in alleles ✓
undefined. C) Incorrect setup of the Punnett Square ✓
undefined. D) The law of independent assortment ✓

Factors include environmental influences, mutation in alleles, incorrect setup of the Punnett Square, and the law of independent assortment.

Analyze how a mutation in one of the alleles could affect the results predicted by a Punnett Square.

A mutation could lead to unexpected phenotypes or genotypes that differ from the predictions.

Part 3: Evaluation and Creation

Which scenario would most likely lead to a deviation from expected Punnett Square results?

undefined. A) Random mating
undefined. B) Linked genes ✓
undefined. C) Large population size
undefined. D) Independent assortment

Linked genes would most likely lead to a deviation from expected results.

Evaluate the following statements and select those that are true regarding the limitations of Punnett Squares. (Select all that apply)

undefined. A) They assume no environmental influence on gene expression. ✓

undefined. B) They can predict exact offspring numbers.

undefined. C) They do not account for genetic linkage. ✓

undefined. D) They assume alleles segregate independently. ✓

True statements include that they assume no environmental influence on gene expression, do not account for genetic linkage, and assume alleles segregate independently.

Design a hypothetical scenario where a Punnett Square could be used to predict the inheritance of a genetic disorder. Describe the genotypes of the parents and the potential outcomes for the offspring.

A scenario could involve two carriers of a recessiv genetic disorder, predicting the likelihood of affected offspring.