

Punnett Squares Notes

I. Introduction

A. What are genes? A specific region of DNA that codes for a specific protein.

What are alleles?

What is an example?

B. Every organism has ____ alleles for each trait: ____ from mom and ____ from dad.

a. _____ alleles are represented by a CAPITAL LETTER

b. _____ alleles are represented by a lower case letter

Example: Brown is dominant = B

Blue is recessive = b

c. _____ trait is expressed unless both alleles are _____

II. Genotype vs. Phenotype

a. Genotype

-

-

b. Phenotype

-

-

c. Example: Bb (genotype) carries one allele for brown and one for blue eyes, however they will have brown eyes (phenotype)

III. Homozygous vs. Heterozygous

Homozygous: _____

-

-

Heterozygous: _____

-

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Genotype	Phenotype	Heterozygous/Homozygous
BB		
	Brown Eyes	
bb		

IV. Sample Problems

a. If brown hair is dominant over blond, which genotype would be blond?

b. Which is an example of a phenotype?

c. Which genotype is heterozygous brown?

d. Which genotype is homozygous recessive?

V. Probability

a. The likelihood that an event will occur

Probability = $\frac{\text{\# of one kind of possible outcome}}{\text{total \# of all possible outcomes}} = \%$

When the word or is used you add the odds i.e. rolling a 3 or 5 on a die
 $1/6 + 1/6 = 2/6$

When the word and is used you multiply the odds i.e. rolling a 3 & 5 on a die
 $1/6 \times 1/6 = 1/36$

VI. Punnett Squares

a. General information

- Predicts all possible _____ resulting from a cross

- Mendel's Generations:

P = parents

F1 = offspring (1st generation)

F2 = offspring of F1 (2nd generation)

b. 6 Steps to Completing a Punnett Square Problem

1. Identify the dominant and recessive traits

2. Identify the phenotype of each parent

3. Identify the genotype of each parent

4.

5.

c. Example: Suppose you cross a plant that is heterozygous for purple flower with a plant that is homozygous recessive for white flowers

Step 1: identify the dominant and recessive traits

Step 2: identify the phenotype of each parent

Step 3: identify the genotype of each parent

Step 4: fill in Punnett Square

Step 5: Write the genotype ratio

Step 6: Write the phenotype ratio

VII. Laws

a. Law of _____

- Organisms inherit 2 copies of each gene, one from each parent

- During gamete formation genes separate and only one version makes it into the gamete (egg or sperm)

b. Law of _____

- allele pairs separate independently of each other during meiosis

c. Law of _____

- Some alleles are dominant (A) and some are recessive (a)