

Heredity

Phenotype: _____ characteristics or traits.

Genotype: _____ makeup. Capital letters represent dominant genes and lowercase represent recessive genes.

Pure bred: Offspring that are _____ to their parents

Hybrid: _____ of two pure breeds

P generation: _____ generation.

F1 generation: Filial generation 1, offspring of the parents (P generation).

F2 generation: Filial generation 2, offspring of the F1 generation.

Dominant: Traits that dominate over other traits and are expressed.

Recessive: Traits that are not expressed _____.

Allele: _____ form of the same trait.

Phenotypic Ratio: Ratio of _____ in an offspring.

Ex. 3 tall plants for every 1 dwarf plant has a ratio of 3:1

Genotypic Ratio: Ratio of _____ in offspring.

Sex Determination

- _____ of the 46 chromosomes is the sex chromosomes.
- Mom gives ____ or ____, Dad gives ____ or ____, _____ determines sex.
 - If sperm Y joins with X from egg ->boy
 - If sperm X joins with X from egg ->girl

Genes

- Each chromosome carries many _____.
- Some traits have one gene (ie. blood type).
- Some traits are the result of _____ of genes together:
Ex. Hair colour, eye colour, height
- Genes can either be dominant or recessive
- Dominant: _____ out trait carried by recessive gene
Ex. Brown eye colour is dominant over blue
- Recessive: for trait to appear must get recessive gene from _____ parents
Ex. Both parents have blue eyes child will have blue eyes

Punnett Squares

Used to illustrate the possible outcomes (_____) of a mating or cross

Steps to construct a Punnett Square:

- 1) Determine parental _____.
- 2) Determine the possible genotypes of the _____ of each parent.
- 3) Write these genotypes in the exterior of the squares.
- 4) Fill in the interior and interpret the genotype and phenotype of the

Example

Consider the cross between a purebred tall plant (TT) and a purebred dwarf plant (tt)

1) Determine parental genotypes

TT – tall and tt - dwarf

2) Determine the possible genotypes of the gametes of each parent

Tall can only have T gametes, dwarf can only have t gametes

3) Write these genotypes in the exterior of the squares

4) Fill in the interior and interpret the genotype and phenotype of the next

Example

Consider the cross of 2 F1 plants from the last cross

Parental genotypes: _____

Gametes: _____ or _____ for both parents

Harry Potter Genetics

Harry's Hair Colour:

Harry has dark brown hair like his dad James, but his mother Lily has red hair. Brown hair is dominant and red is recessive. Using the genotypes of rr , Rr , and RR , what possible genotypes does each of the Potters have?

The phenotypes of the Potters are:

James Potter (dad) — dark/brown hair

Lily Potter (mom) — red hair

Harry Potter — dark/brown hair

Possible genotypes for James:

Possible genotypes for Lily:

Harry's Genotype:

The Weasley's Hair Colour

All of the Weasley's have red hair. Is it possible for Arthur and Molly Weasley to have children who have brown hair? Remember brown hair is dominant and red is recessive.

Use the letters R and r to show Arthur and Molly's genotypes:

Arthur Weasley =

Molly Weasley =

Weasley children genotypic ratio:

Harry and Ginny's children

Harry marries Ginny who has red hair. What are possible genotypes of their children's hair colours?

First, what are the genotypes for Harry and Ginny's hair colors?

Harry's genotype=

Ginny's genotype =

Children's Genotypic Ratio