

Genes and Alleles

[Click on button for more details.]

Genes

Alleles

- Alleles are various molecular forms of a gene for the trait.
- Example of alleles: If a gene is hair colour, one allele will be black hair, the other brown hair.

If the same alleles, they are called **homozygous**.

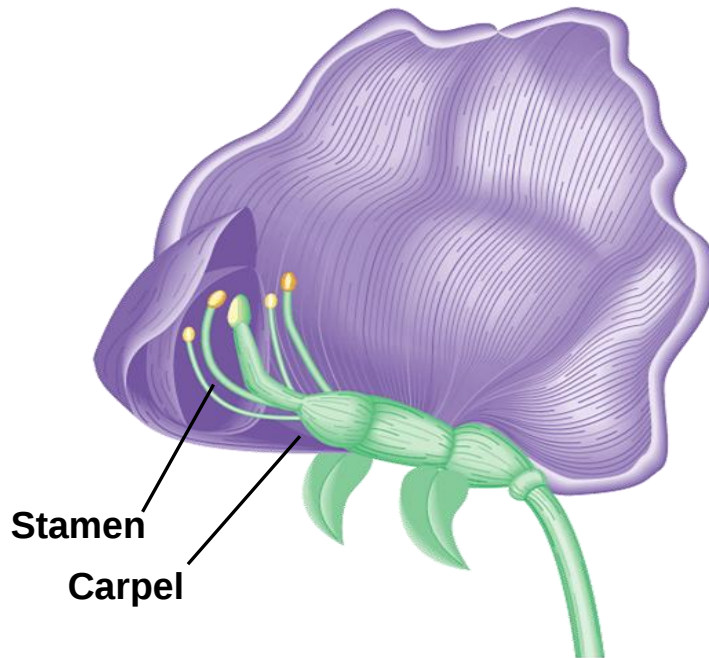
A homozygous pair of can be either dominant (AA) or recessive (aa).

If alleles are different, they are called **heterozygous**.

Heterozygous alleles will have a dominant and a recessive allele (Aa).

Mendel's Principles

- Modern genetics began with Gregor Mendel's quantitative experiments with pea

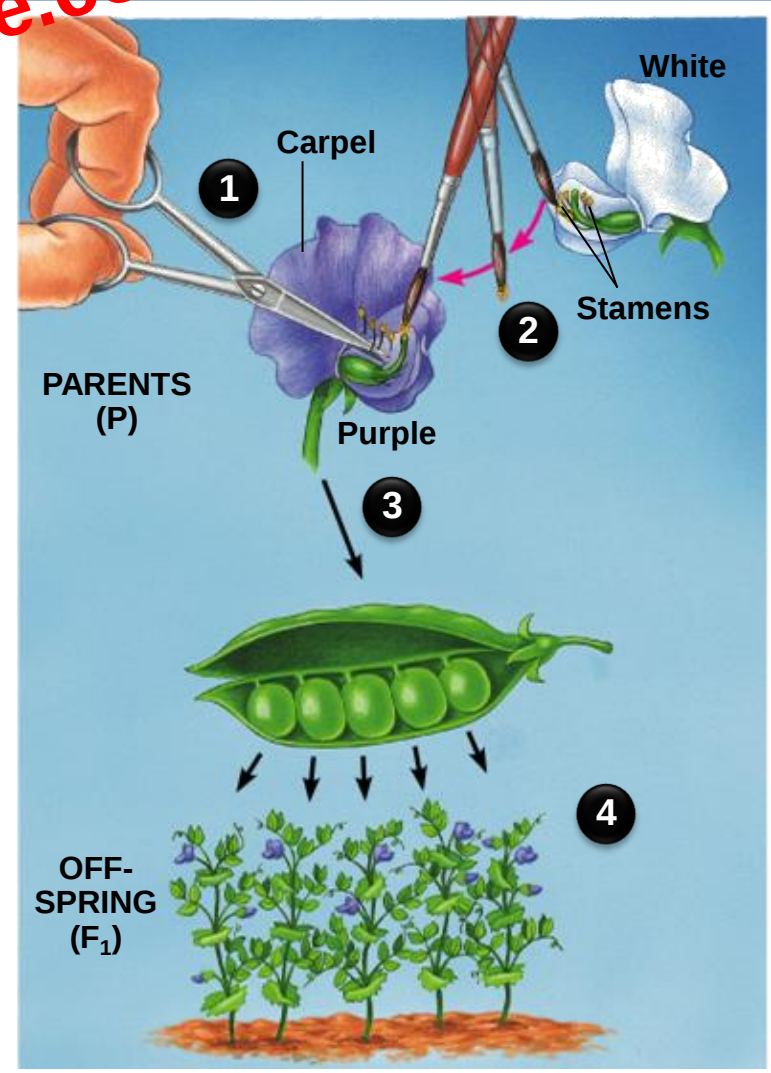


Mendel's Principles

- Mendel crossed pea plants that differed in certain characteristics and traced the traits from generation to generation.
- This illustration shows his technique for **cross-fertilization**.

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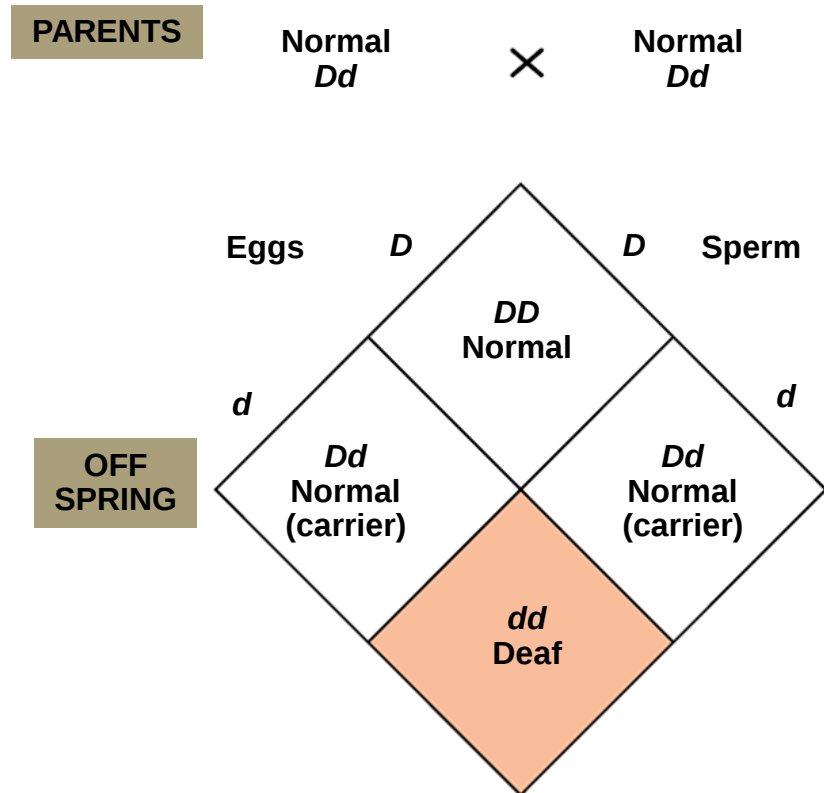
1 Removed stamens from purple flower.



Patterns of Inheritance in Humans

Many Inherited Disorders in Humans are Controlled by a Single Gene

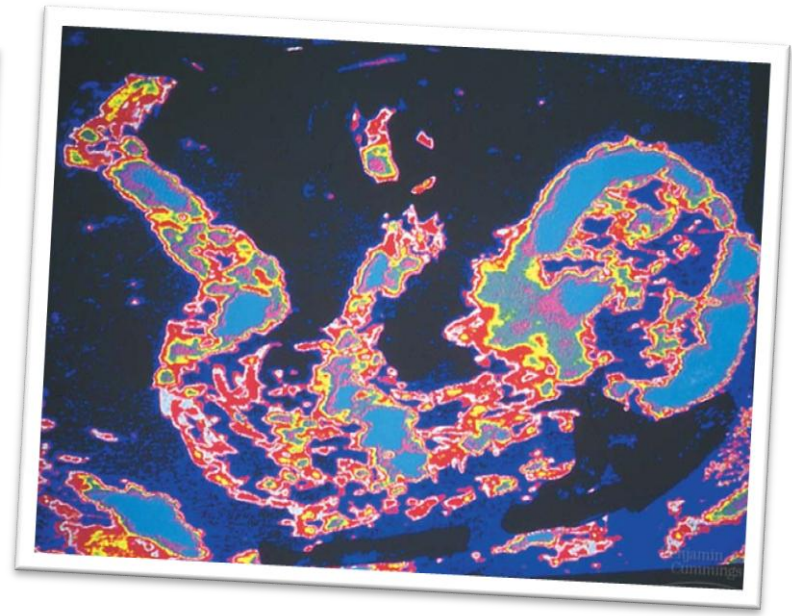
- Most such disorders are caused by autosomal recessive alleles.
- Examples: cystic fibrosis, sickle-cell disease



Patterns of Inheritance in Humans

Fetal Testing Can Spot Many Inherited Disorders Early in Pregnancy

- Examination of the fetus with ultrasound is another helpful technique.

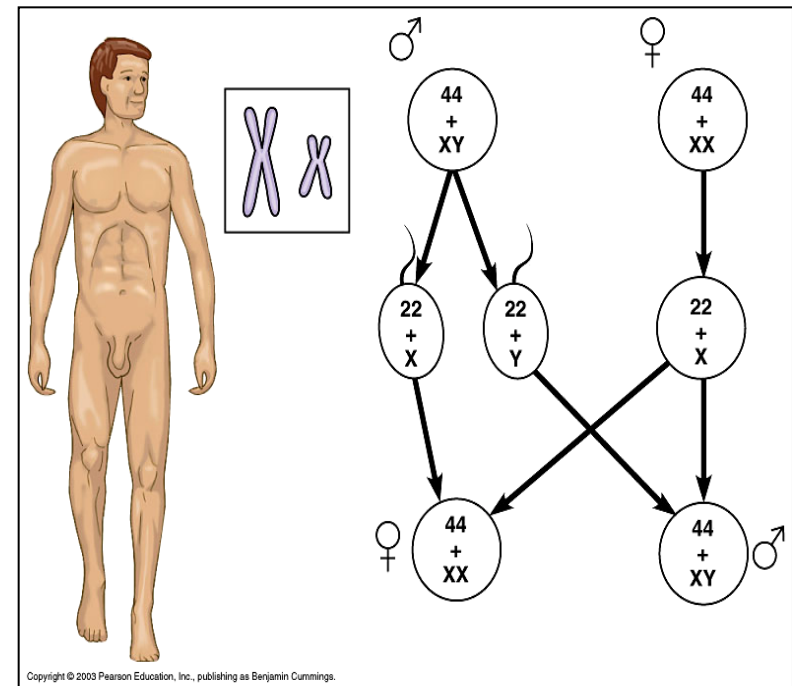


Variations On Mendel's Principles

5 Sex Chromosomes and Sex-linked Genes

Chromosomes determine sex in many species

- A human male has one X chromosome and one Y chromosome.
- A human female has two X chromosomes.
- Whether a sperm cell has an X or Y chromosome determines the sex of the offspring.



Appendix

Figure	Source
Fig.7	http://pmtazticloft.com/images/PunnettSquare.png
Fig.8	http://www.desktopclass.com/wp-content/uploads/2011/02/ch10_0_b.gif
Fig.9	http://www.acidalkalinediet.com/wp-content/uploads/2010/12/Blood-pH.jpg

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