

The father of genetics is Gregor Mendel (1822-1844) an Austrian monk who conducted experiments with peas.

-he discovered that inheritance of traits was NOT due to a blending but rather to the transmission of specific units of inheritance (genes)

Modern Principles of Inheritance

- 1) Inherited traits are transmitted by **genes**, which occur in pairs called **alleles**

Alleles are inherited as parts of chromosomes

- 2) **The Principle of dominance:**

-When two alternate forms of the same gene are present in an individual, often only one-the dominant allele is expressed.

- 3) **The principle of segregation**

-when gametes are formed in meiosis, the two alleles of each gene segregate (separate) from one another, and each gamete receives only one allele

- 4) The **Principle of independent assortment:**

- genes on separate chromosomes separate independently from one another

genotype- the complete genetic makeup of an organism

ex. Aa

-can either be **homozygous** (2 copies of the same allele)

ex. TT or tt

or **heterozygous** (2 different alleles of the same gene)

ex Tt

Dominant Alleles mask the expression of recessive alleles.

For ex. Big T is dominant for Brown eyes and little t is recessive for blue .

If an individual has a genotype Tt then they will have brown eyes.

Phenotype-the physical expression of the genotype

Ex- eye, hair, skin color

DNA- The basis of inheritance

-found in nucleus

-contains genetic information

Physical Structure of DNA

- similar to a ladder
- the sides of the ladder are made up of sugar- phosphate backbone
- the rungs of a ladder are made up of the base pairs

Bases

-Adenine (A)

-Guanine (G)

-Thymine (T)

-Cytosine (C)

How the bases pair

- A pairs with T
- G pairs with C

The ladder is twisted into a double helix. Figure 13-6&7

Protein Synthesis

DNA-contains the instructions for making proteins

The instruction within the DNA is converted to mRNA (messenger RNA) via transcription and leaves the nucleus.

mRNA travels to the Ribosome where proteins are made from the instructions via translation. Figure 14-1