## 1 Genetics

**What You'll Learn:**

**Explain how traits are inherited.**

**Identify Mendel's role in the history of genetics.**

**Use a Punnett square to predict the results of crosses.**

**Compare and contrast the difference between an individual's genotype/phenotype.**

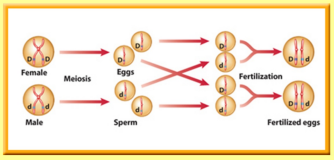
## Inheriting Traits

***An organism is a collection of traits inherited from its parents.**

## What is Genetics?

***genes control form and function**

***chromosome pairs separate alleles for each trait and are separated into different sex cells.**




***every sex cell has one allele for each trait**

## Mendel-The Father of Genetics

***He did the 1st recorded study of how traits pass from one generation to the next.**

Gregor Mendel began experimenting with garden peas in 1856

•He was also the first to use the mathematics of probability to explain heredity.

## Genetics in a Garden

•An organism that always produces the same traits generation after generation is called a purebred.

•He called these new plants **hybrids** because they received different genetic information, or different alleles, for a trait from each parent.

Traits Compared by Mendel

| Traits | Shape of Seeds | Color of Seeds | Color of Pods | Shape of Pods | Plant Height | Position of Flowers | Flower Color |
|---|---|---|---|---|---|---|---|
| Dominant Trait | Round | Yellow | Green | Full | Tall | At leaf junctions | Purple |
| Recessive Trait | Wrinkled | Green | Yellow | Flat, constricted | Short | At tips of branches | White |

## Dominant and Recessive Factors

**dominant** factor because it dominated, or covered up

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He called the form that seemed to disappear the **recessive** factor

## Using Probability to Make Predictions

***Mendel's predictions were accurate because he worked with over 30,000 plants.**

•By doing so, Mendel increased his chances of seeing a repeatable pattern.

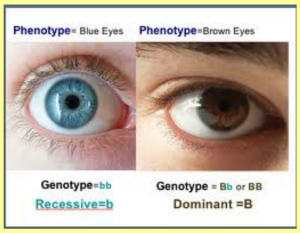
## Punnett Squares

***Capital letters represent dominant traits and lower case letters represent recessive traits.**

| Parent (Y y) | Y | y |
|---|---|---|
| Y | Y Y | Y y |
| y | Y y | y y |

**genotype** or genetic makeup of an organism

The way an organism looks and behaves as a result of its genotype is its **phenotype**




## Alleles Determine Traits

***Most cells have 2 alleles for every trait located on the chromosomes.**

•An organism that has two different alleles for a trait is called **heterozygous**.

•An organism with two alleles that are the same is called **homozygous**.