



The National
Orthodox School
Shmaisani

Science summary sheet #3

Grade 8 National

Unit 1: Heredity and Reproduction

Lesson 3 Heredity

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Learning Objectives:

- Describe the factors that can affect the appearance of organisms
- Define key words related to genetic inheritance
- To use a Punnett square to predict the probability of particular characteristics being inherited

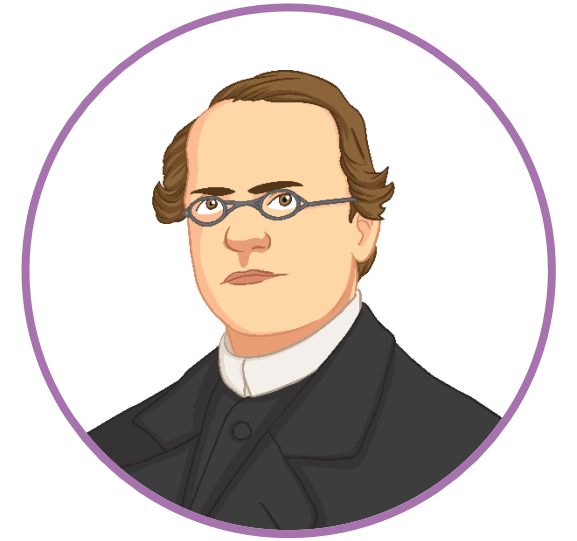
Key words:

- ❖ Self pollination
- ❖ Cross pollination
- ❖ Dominant trait
- ❖ Recessive trait
- ❖ Allele
- ❖ Homozygous trait
- ❖ Heterozygous trait
- ❖ Genotype
- ❖ Phenotype
- ❖ Punnett square

Gregor Mendel

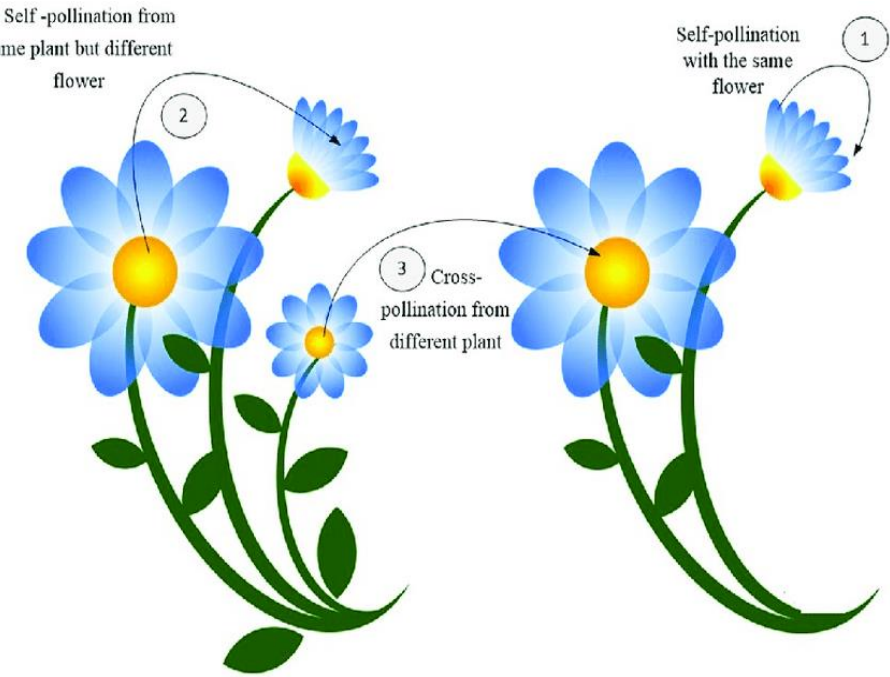
An Austrian monk born in 1822. He is considered the father of genetics. The study of inheritance and dominant and recessive traits is often referred to as Mendelian genetics.

He carried out experiments on pea plants to study genes and heredity.



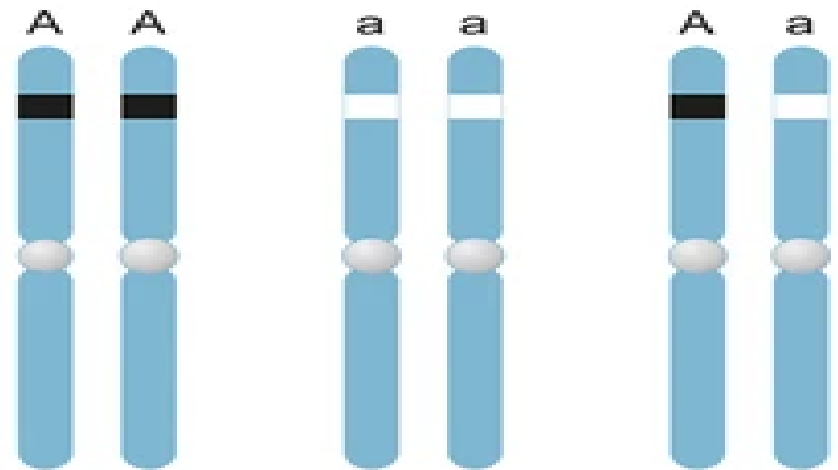
Heredity : Pollination

- **Pollination** is the transfer of pollen grains from an anther to a stigma of a flower. This transfer can occur through different ways. (Wind, water, insects and animals)
- There are two types of pollination : **Self pollination** and **Cross pollination**
- **Self pollination:** the transfer of pollen grains from an anther to a stigma on the same flower or another flower on the same plant
- **Cross pollination:** the transfer of pollen grains from an anther to a stigma of another plant of the same species

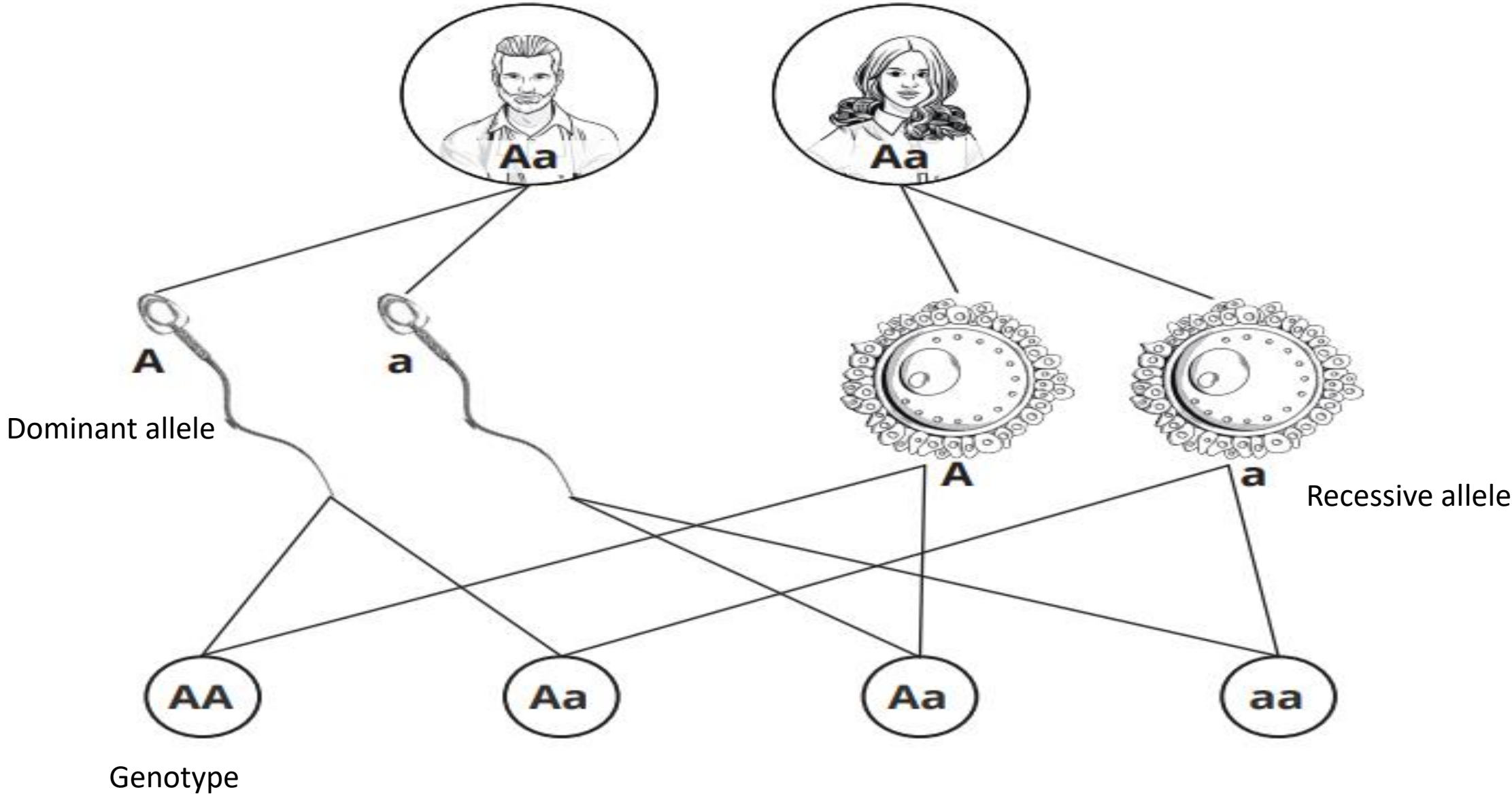


Heredity: Traits

- **Alleles:** different versions and forms of a gene
 - In this example, (A) and (a) are alleles
- **Dominant trait (allele):** an allele that is always shown, even if only one copy is present
 - In this example, (A) is the dominant allele
- **Recessive trait (allele):** An allele that is only shown if two copies of it are present
 - In this example, (a) is the recessive allele

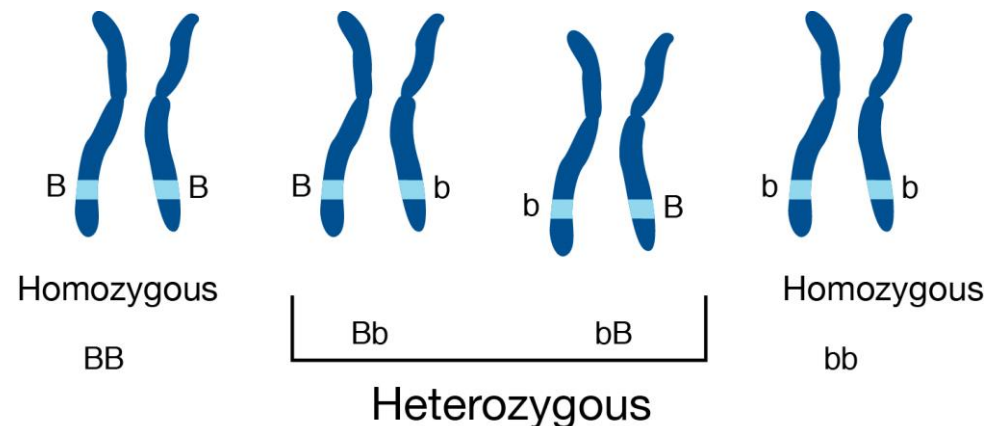


You inherit one allele from each parent.



Heredity: Traits

- **Genotype:** a combination of alleles
- **Homozygous trait:** A genotype that has two of the same alleles; either 2 dominant alleles or 2 recessive alleles
 - In the previous example the homozygous trait would be (AA) and (aa)
- **Heterozygous trait:** A genotype that has two different alleles; one dominant and one recessive
 - In the previous example the heterozygous trait would be (Aa)



Heredity: Traits

- Phenotype: the name of the characteristic shown because of the genotype

Genotype vs Phenotype

GENOTYPE

The genotype is an organism's genetic information.

BB

homozygous dominant

Bb

heterozygous

bb

homozygous recessive

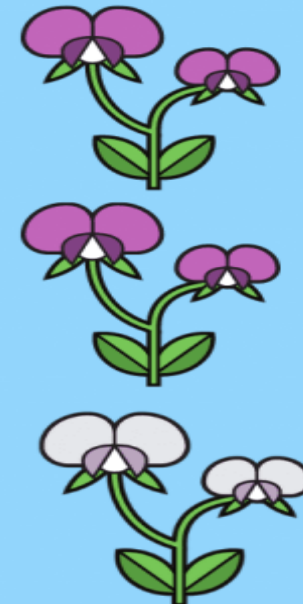
PHENOTYPE

The phenotype is the set of observable physical traits.

purple

purple

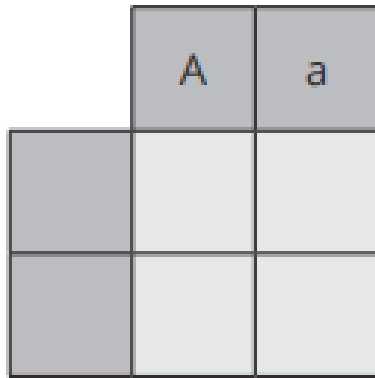
white



Heredity: Punnett Square

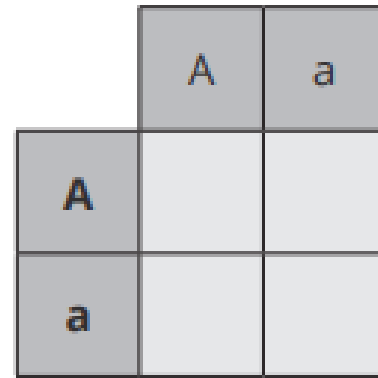
We can use a Punnett square to show this information more clearly.

Step 1:



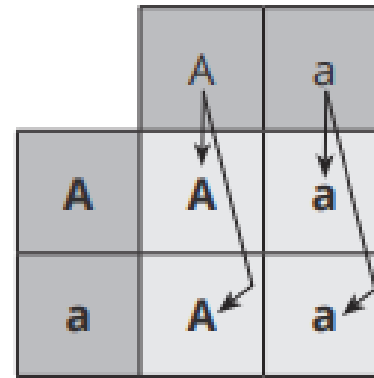
Put the two alleles from one parent into the boxes at the top. This parent is a heterozygote. This means they have one dominant and one recessive allele.

Step 2:



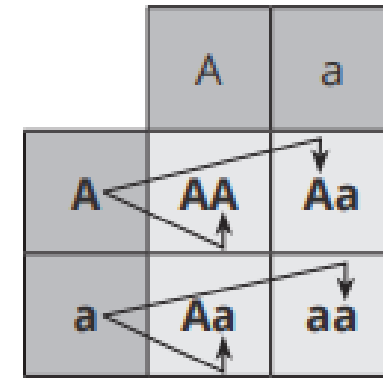
Put the two alleles from the second parent into the boxes on the left. This parent is also a heterozygote.

Step 3:



Put the alleles from the first parent into the two boxes underneath them.

Step 4:



Put the alleles from the second parent into the two boxes to the right of them.