Genetics

Autosomal or Mendelian Genetics

**Learning Outcomes**

* **I can describe how Gregor Medel discovered genetics and patterns of inheritance.**
* **I can define the terms homozygous dominant, homozygous recessive and heterozygous, and correctly write out an allele pairing for each.**
* **I can differentiate between genotype and phenotype.**

**Genetics**

* the study of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of traits (traits are what we see)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* known about long before it was understood how genetics actually worked 🡪 seen in the selective breeding of livestock

**Gregor Mendel (1822-1884)**

* Known as the “father of genetics”
* First person to carefully conduct planned \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and accurately record the results
* Before starting his experiments, he had already hypothesized that:

1. there are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that pass from parent to offspring
2. different elements control different \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. elements remain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in an organism and are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the same form
4. the elements are passed on in the same form

* Mendel tested these hypotheses using \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Tested seven different traits, each of which had only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Experiment 🡪 tested seed colour (yellow and green forms)

1. self-fertilized pea plants to get pure strains of each seed type
2. cross-bred \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of pea plants to get a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

green seed yellow seed

G Y

Y Y Y Y F1 generation 🡪 all had yellow

seeds

1. cross-bred two plants from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Y Y

Y Y Y G F2 generation 🡪 ratio of 3:1 for seed

colour

1. Conclusion
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_did exist
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. One form of each element is dominant 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Alleles**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are different forms of a gene that result in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Each\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (seed colour, wrinkled or smooth seeds, etc), but not always the same alleles

Green seed Yellow seed

Allele pair

Chromatid pair

* When comparing alleles, a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is always used to represent the gene being studied
* Y 🡪 yellow seed (capital used for dominant allele)
* y 🡪 green seed (lower case used for recessive allele)
* Since there are two genes for each allele pair, there are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* YY 🡪 homozygous dominant
* Yy 🡪 heterozygous
* yy 🡪 homozygous recessive

**Genotype vs. Phenotype**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the genetic combination of the alleles
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the visual characteristic of the gene

|  |  |
| --- | --- |
| Genotype | Phenotype |
| YY |
| Yy |
| yy |