1. **Genetics:** The study of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and how \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**What is a Trait? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Traits are expressed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Examples: hair color and texture, skin color, etc… - EX -Tongue Rolling, Widow’s Peak, Attached Earlobes, Hitchhiker thumb, bent pinky finger (PHENOTYPES)

**How are traits inherited?**

Traits are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_found in the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Chromosomes are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



DNA is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ for how living things develop and function

The DNA molecule looks \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The steps of the ladder are made of chemical compounds \_\_\_\_\_\_\_\_\_

The 4 bases are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The bases are arranged in different ways to form different chemical messages that control different traits



**Adenine always pairs Identical twins are the only human beings who**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have identical DNA**

**Guanine always pairs Everyone else on EARTH**

 **has different DNA**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ combinations that make us each**

 **UNIQUE.**

1. **Gregor Mendel: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**He studied \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ due to their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Mendel concluded that traits occur \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ not at random.**

Each parent contributes one gene \_\_\_\_\_\_\_\_\_\_\_\_\_ to the offspring

Therefore, offspring are \_\_\_\_\_ identical to their parents.

**Parents can pass on one of two types of traits:**

1. **Dominant trait**- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. **Recessive trait**-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
|   | **DOMINANT TRAITS** | **RECESSIVE TRAITS** |
| Eye Coloring |  |  |
| Vision |  |  |
| Hair |  |  |
| Facial Features |  |  |

A capital letter represents a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Tallness = \_\_\_\_\_

A small letter represents a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** Shortness = \_\_\_

Remember, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**III. Types of Traits**

**Pure Dominant- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Pure Recessive-** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Heterozygote (hybrid)-** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| **Genotype =**the Gene combinations | **Phenotype=** the physical appearance |
|  |  |
|  |  |
|  |  |



If you pair a TALL female with a short male it will look like this:

The child will be tall but will be a **HYBRID or Heterozygous**

Can we ever know if a Tall person has pure dominant tall genes (TT) or is a hybrid (Tt) for tallness?

It is impossible to know \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**IV Pedigree Chart**

**Reading a pedigree chart**

 =Female = Male

**Shaded** circles or squares **Unshaded** circles or squares

show the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **show the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* **Here’s a pedigree for curly hair, which is a dominant trait…**
* **Punnett Squares**

 Shows the probability that a child will have a specific trait

Each box represents 25%

* **First, the father’s genes are listed along the top of the Punnett Square and the mother’s genes are listed along the side
(Freckles (F) vs. No Freckles (f))**
* **Next, we fill in the boxes with the letters that represent the genes…**
* **In this example, offspring have a 100% chance of having freckles, but…**

 F F

f

f

* **Freckles can be pure dominant or heterozygous, so two punnett squares are needed**
* **Blue-Eyed Father and Blue-Eyed Mother**

 **b** **b**

**b**

**b**

* **Gender**

 **In Females, the chromosome pair is XX**

 **In Males, the chromosome pair is XY**

 **Some human diseases are a result of genetic defects:**

* **Color blindness**
* **Tourette Syndrome**
* **Tay Sachs Disease**
* **Muscular Dystrophy**
* **Cystic Fibrosis**
* **Hemophilia**
* **Down Syndrome**
* **Dwarfism**
* **Albinism**
* **Mutations**

 Genetic “mistakes” that effect the way traits are inherited. (A change in a gene or chromosome)

 If a mutation takes place in a body cell, it effects only the individual.

 If it occurs in a sex cell, the mutation can be passed onto the offspring.

 Usually caused by environmental factors such as chemicals, x-rays or radiation.

* Mutations may reduce the organisms chance of survival or reproduction.
* Some mutations are actually helpful and improve the chances of survival
* Seedless navel oranges are sweeter and juicier
* Potatoes that resist diseases that attack other potatoes
* Mutations provide variations in species and can result in brand new species (this is called evolution)
* Before body cells divide, the DNA code of the parent is duplicated and a copy is passed on to the new cells
* The new cells recognize the DNA code and determine how each trait is expressed.