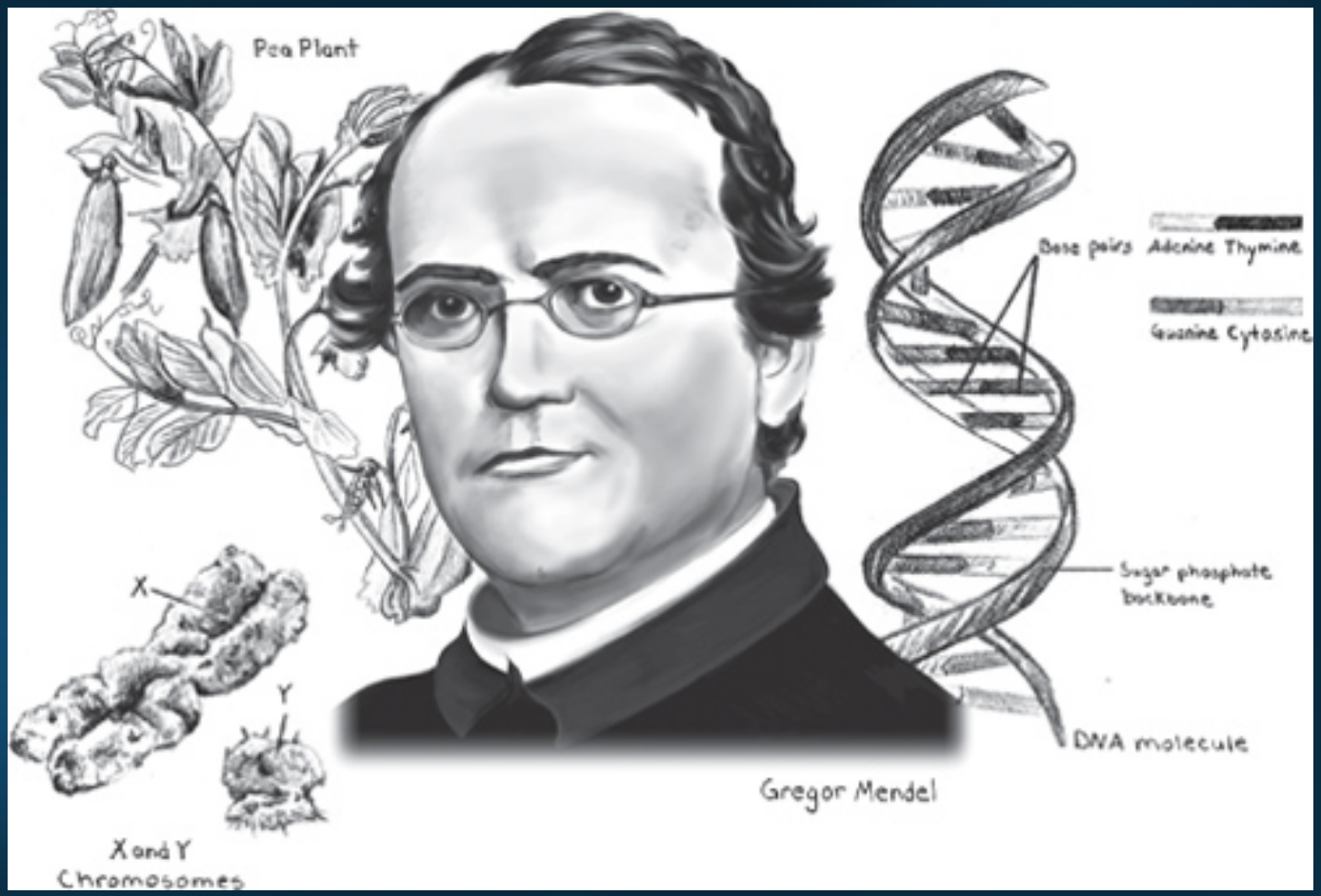
Genes, Chromosomes, and Heredity



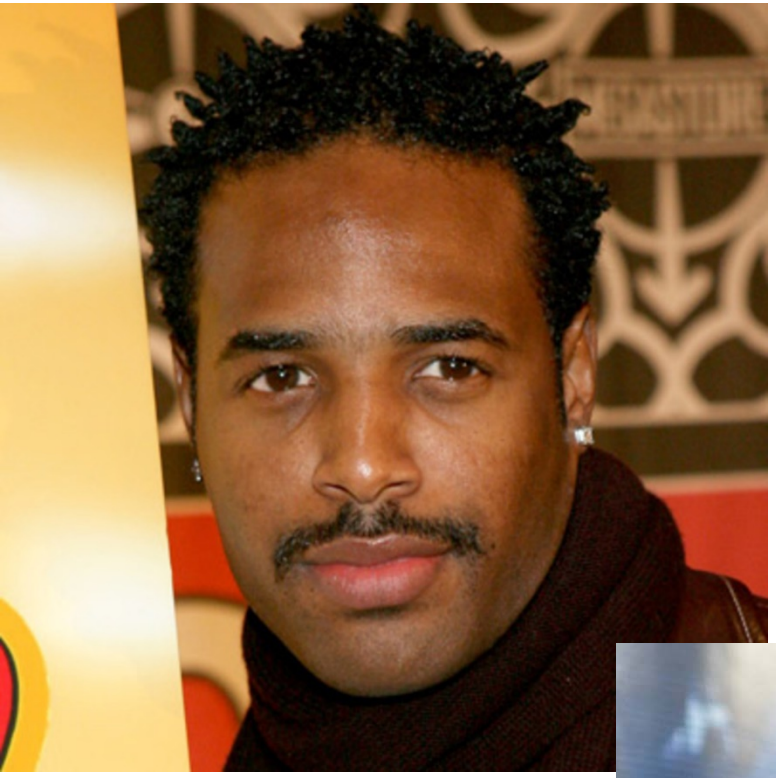
Look at the photos on the following slide of famous family members.

Identify similar characteristics between the children and the parents.

The Smith Clan

The Sheen Clan

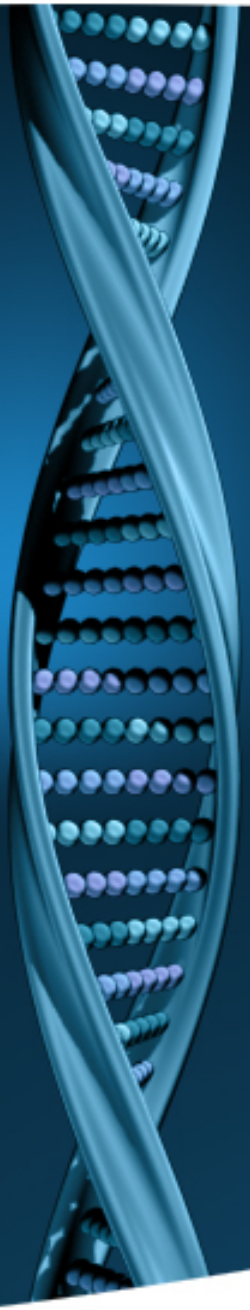
The Wayans Clan



The Royal Family

Think of a characteristic that you share with a family member.

Think of a characteristic that you have that none of your family members share.

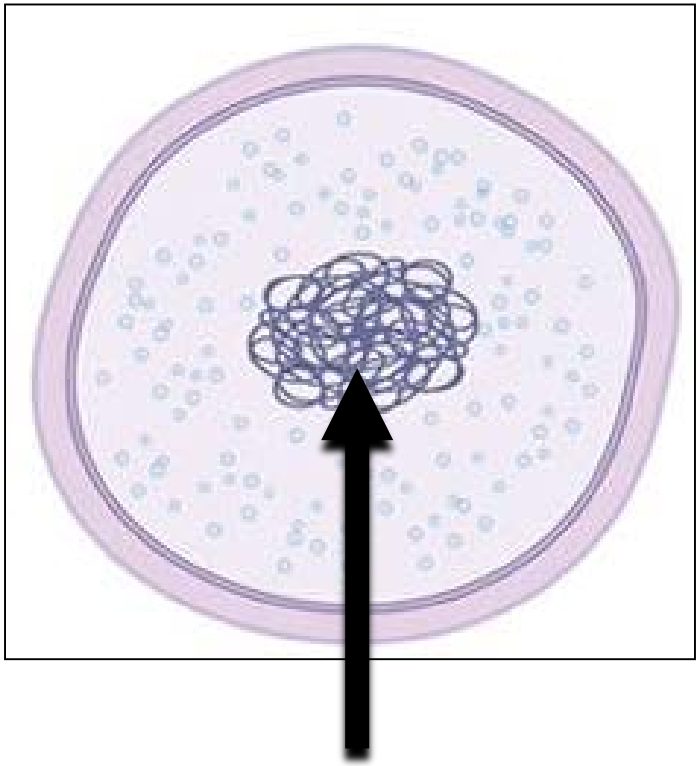


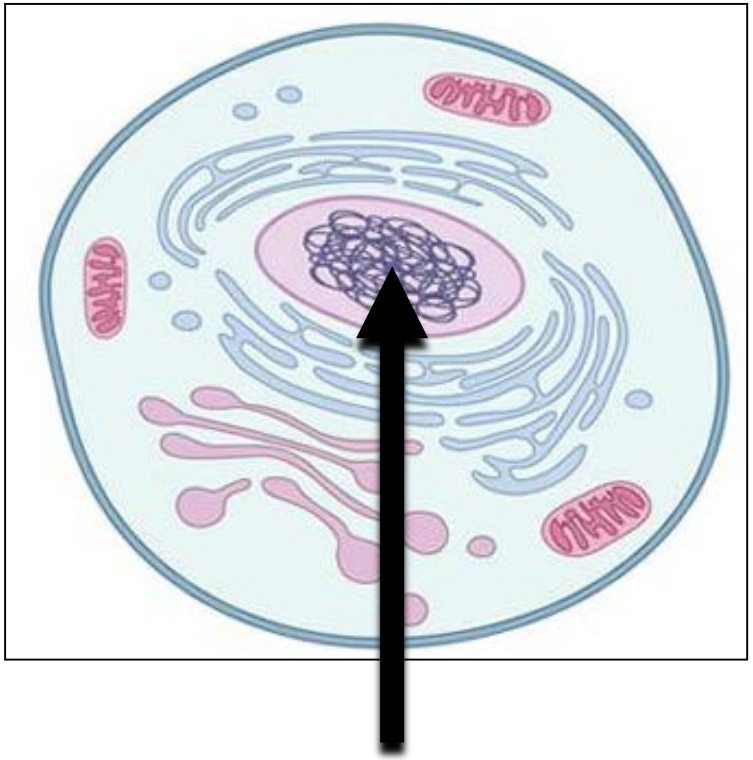
Heredity is the passing of traits from parents to offspring.

Genetics is the study of heredity.

What’s the difference between these two cells?

Prokaryote **Eukaryote**

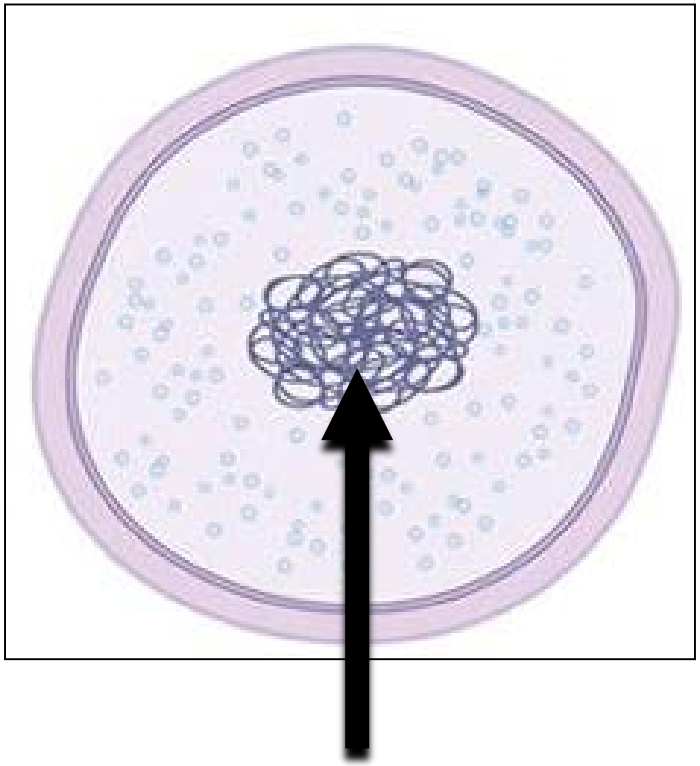




Genetic Material **Genetic Material**

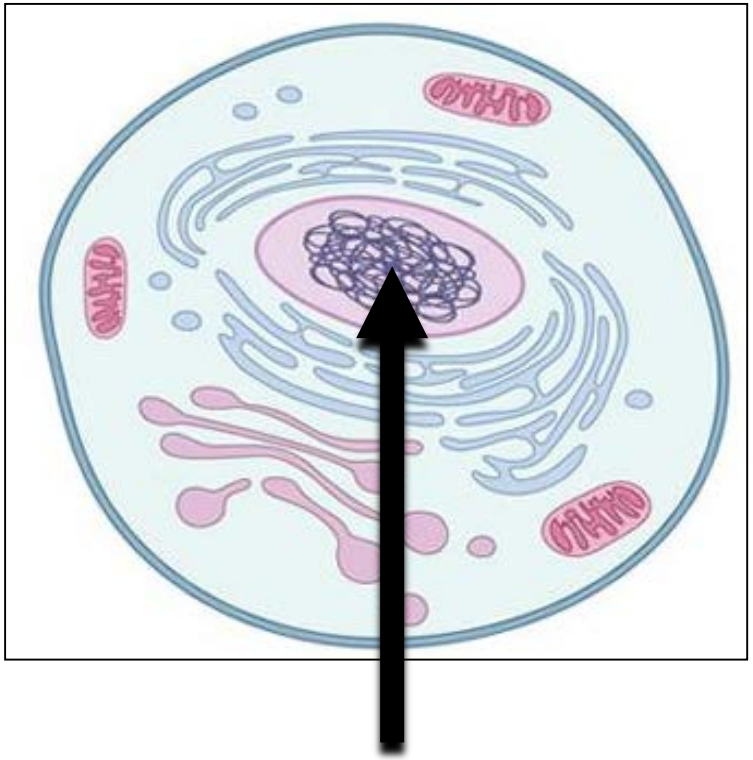
What’s the purpose of the genetic material?

Prokaryote



Genetic Material

Eukaryote

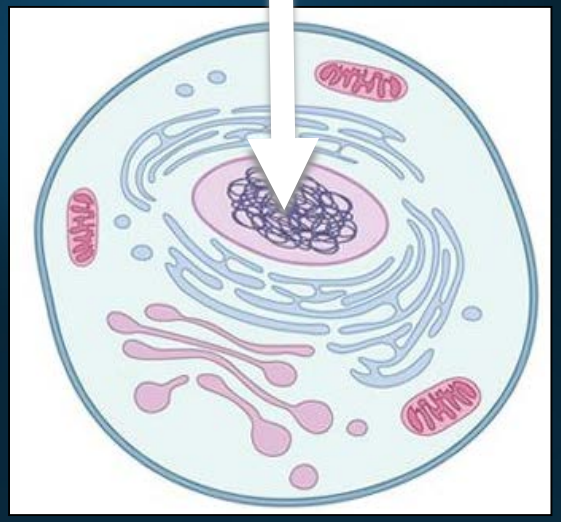


Genetic Material

The genetic material is

DNA

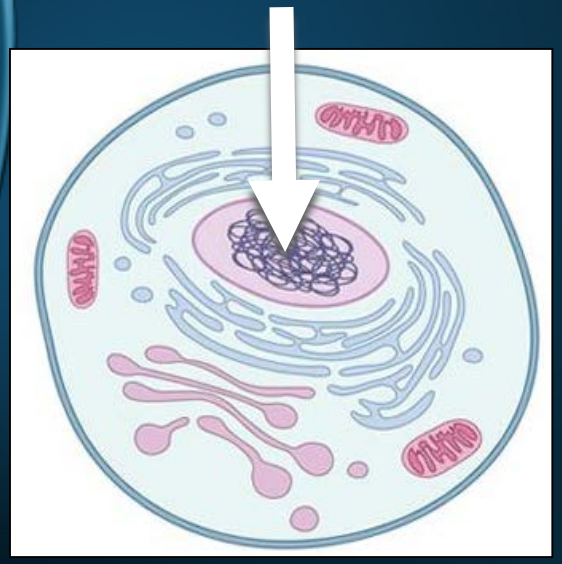
Genetic Material



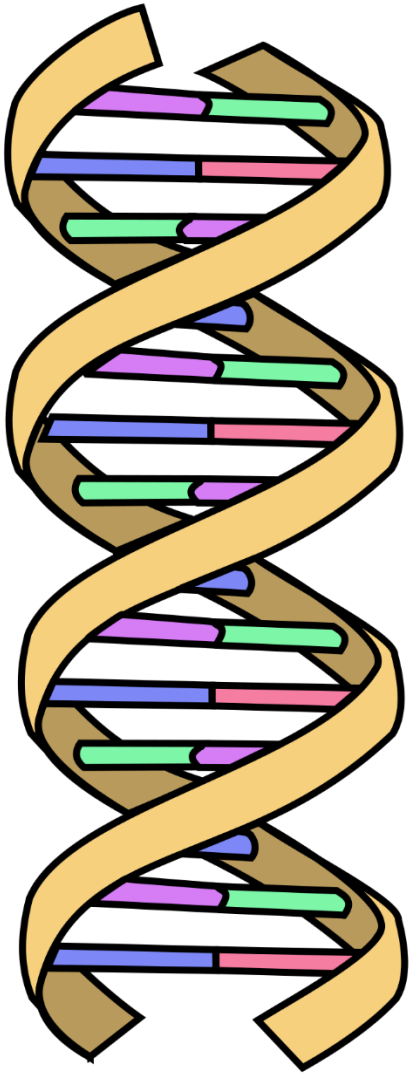
DNA stands for…

Deoxyribonucleic Acid

Genetic Material: DNA



DNA is often referred to as a blueprint because it contains the instructions needed for an organism to grow, maintain itself, and reproduce.



DNA

= Adenine

= Thymine

= Cytosine

= Guanine

= Phosphate backbone

The basic unit of our genetic instructions: DNA instructions are encoded in the sequence of its chemical 'letters' or bases. There are four bases: adenine (A), cytosine (C), guanine (G) and thymine (T). Another base, uracil (U) replaces T in RNA.

Genetic material (DNA) makes you a individual with a unique combination of characteristics. These characteristics are also known as **traits.**

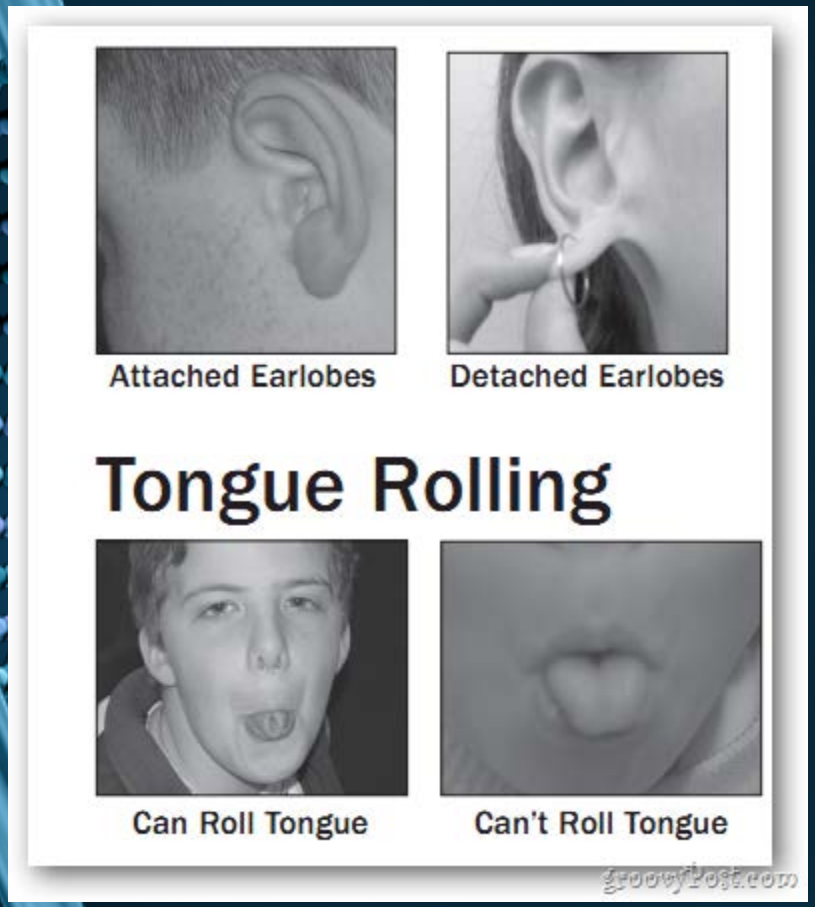
Turn to a seat partner and describe a few Traits that make you different from others.

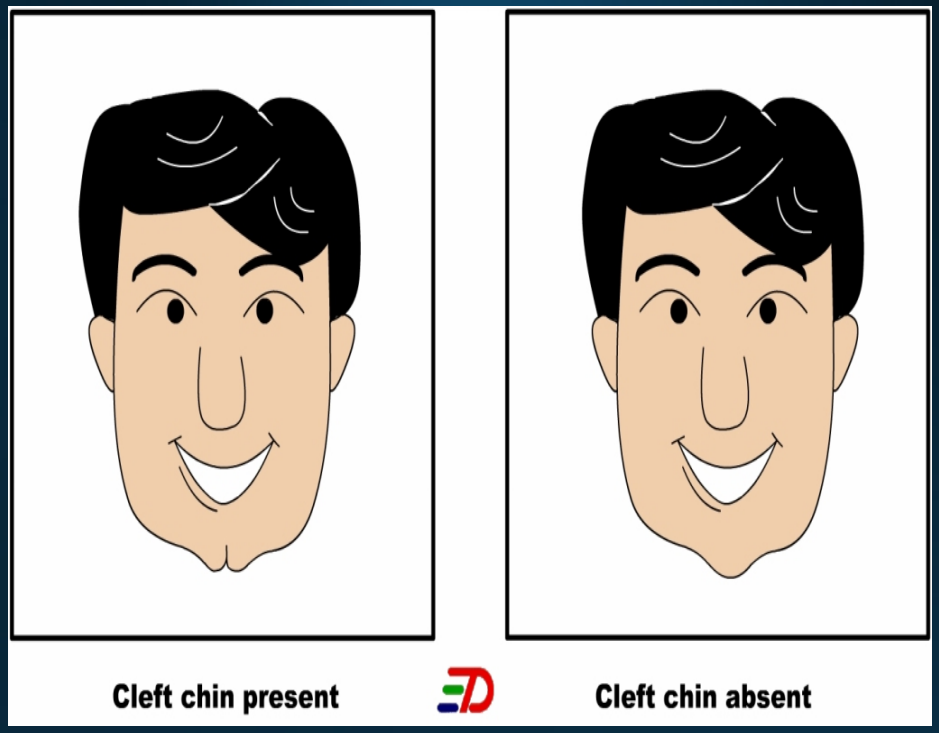
DNA Model

Inherited Traits

- Many of your traits may resemble those your parents have, including your hair color, eye color, and blood type. These characteristics are called inherited traits.
- Some traits are acquired, not inherited. Which means the trait is developed during your life.
- Some traits are both inherited and acquired. For example, skin color has both an inherited component and an environmental one.

Inherited Traits





Inherited Traits?

- If a mother works out as a body builder for many years, will her offspring inherit strong muscles? Why or Why Not?
- If a father speaks several languages fluently, will his children be able to understand what he is saying in different languages? Why or Why Not?

Inherited and Acquired Traits

Turn to a seat partner and share a trait that you inherited and a trait that you may have just acquired.

Traits Inventory Activity

Based on our trait sorting activity, we know that we have characteristics of our parents, yet we are unique individuals. Why is this?

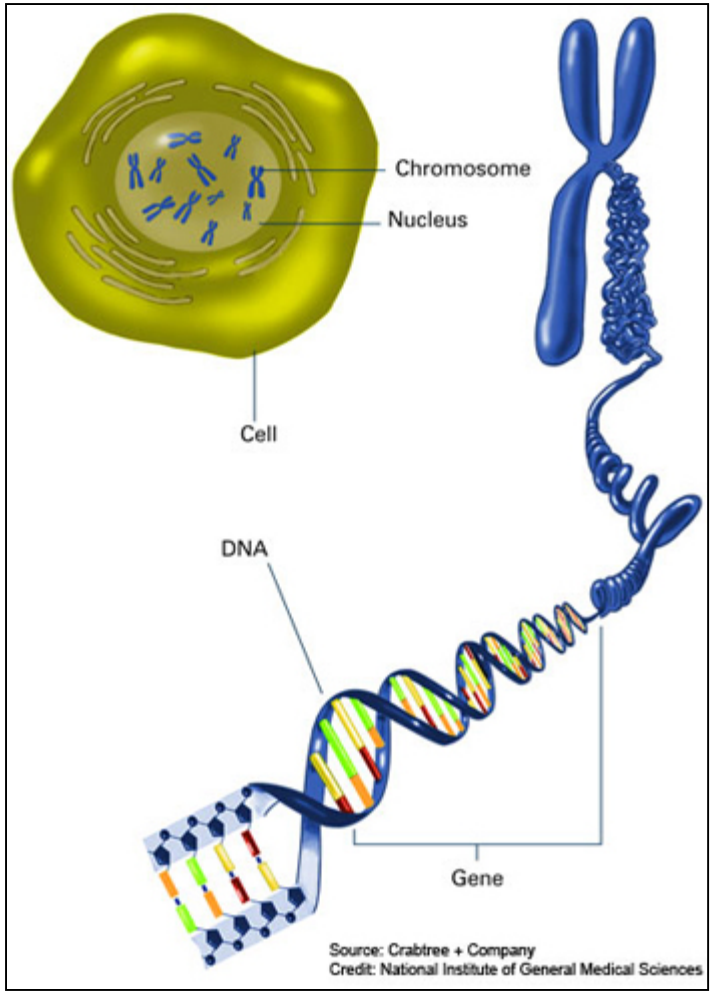
The answer is in the understanding of Heredity.

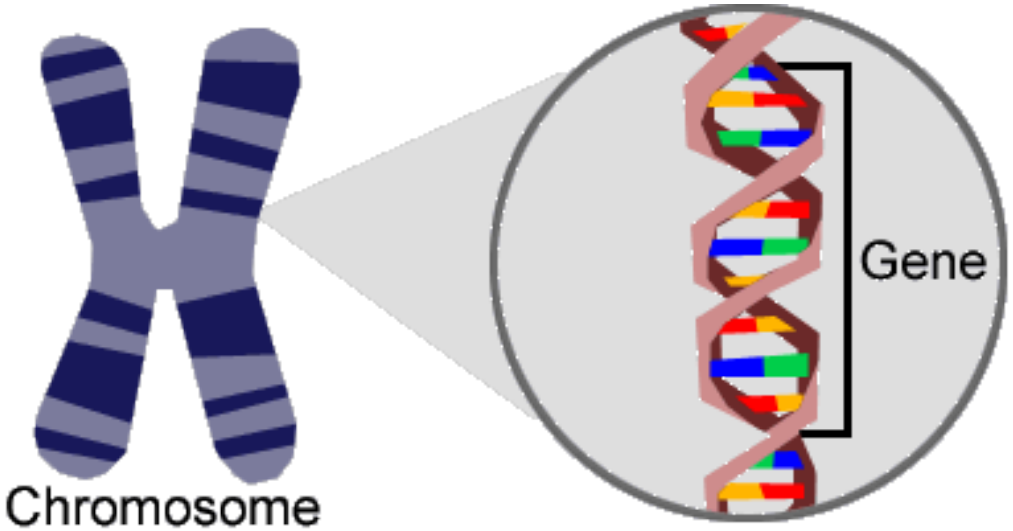
Gregor Mendel discovered that there are **patterns** to **inheritance**. He did this by studying pea plants while living at a monastery.

Through Mendel's discoveries, we found out that inherited **traits** (characteristics) are determined by **genes**.

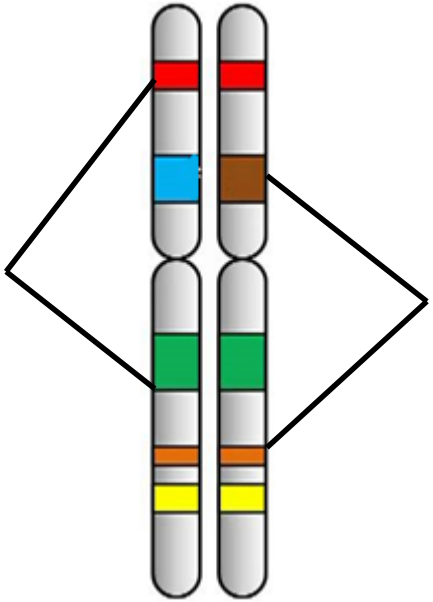
Genes, Chromosomes, Heredity, and DNA, what’s the difference?

Genes, Chromosomes and DNA

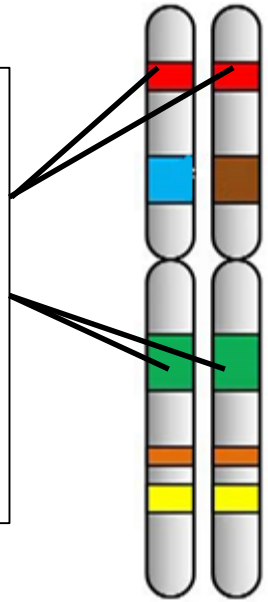




Chromosomes



Each set of Genes codes for a different trait



A Recipe for Traits Activity