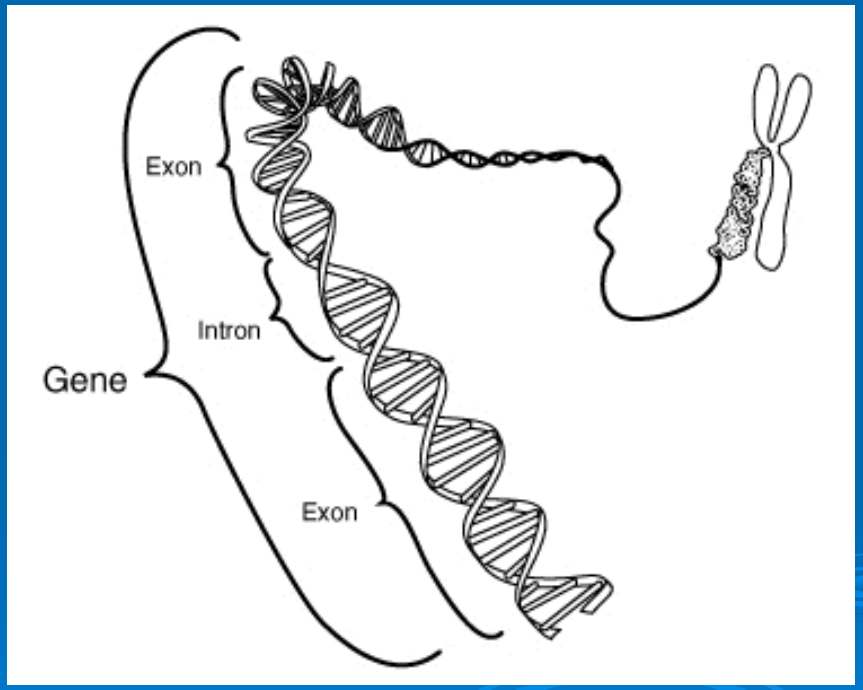
Genes Versus Alleles

Genes

- A **gene** is a *location* on a chromosome that codes for different traits.
- A gene carries traits such as hair, eye and skin color.
- The Human Genome Project has estimated there to be between 20,000 and 25,000 genes in the human body.



Alleles

- An **allele** is a *variation* of a gene.

- For example; say our gene carries the trait for skin color. *Variations* (**alleles**) of skin color can be; white, brown, black, olive, etc.

How Can We Tell the Difference?

- An easy way to tell if what we are looking at is represented by a gene or allele is to use the following sentences;

"Everyone has _____" (Gene)

"Not everyone has _____" (Allele)

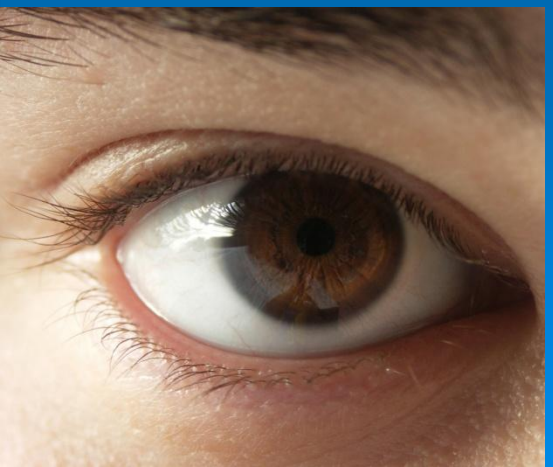
EXAMPLE

Say we say someone and they had blue eyes. Is blue eyes represented by a gene or allele?

"Everyone has blue eyes" NOT TRUE

"Not everyone has blue eyes" TRUE

So we know blue eyes are represented by alleles. So in this case, what is the trait that the gene is representing? Well… blue eyes, green eyes, brown eyes…. They are all eye colors right? Lets try it!



"Everyone has eye color" TRUE

"Not everyone has eye color" FALSE

Eye color is represented by a gene!

To reinforce some terms….

- **Genotype**- Genetic composition, determines the phenotype.
- **Phenotype**- observed characteristic of an organism (how it looks, acts, etc). Determined by the genotype.
- **Homozygous** is when you have 2 of the SAME alleles (example; AA, aa)
- **Heterozygous** is when you have two DIFFERENT alleles (example; Aa)
- **Dominant**- when a dominant allele is in a genotype, it will express its trait over the recessive allele
- **Recessive**-There needs to be TWO of these alleles for the recessive trait to show

  Example; Aa- the dominant trait will mask the recessive. However if the genotype was aa the recessive trait WILL show.