Genetics

Intro to Genetics: Pages 85-91

If a trait does not show up in an organism can it still be there? If so, HOW?

- Traits are passed from parent to offspring
- Trait may not show in 1 generation but the gene is still present in the DNA.
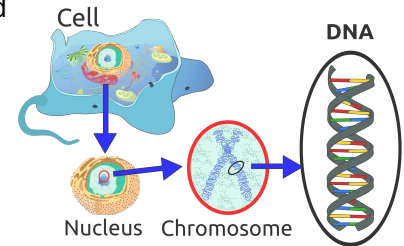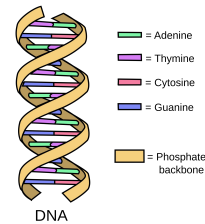 - May not be expressed.

What is Genetics?

- study of heredity and the variation of inherited characteristics

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What is DNA?

- found in our cells
- stores our genetic information
- DNA- deoxyribonucleic acid

= Adenine
= Thymine
= Cytosine
= Guanine

= Phosphate backbone
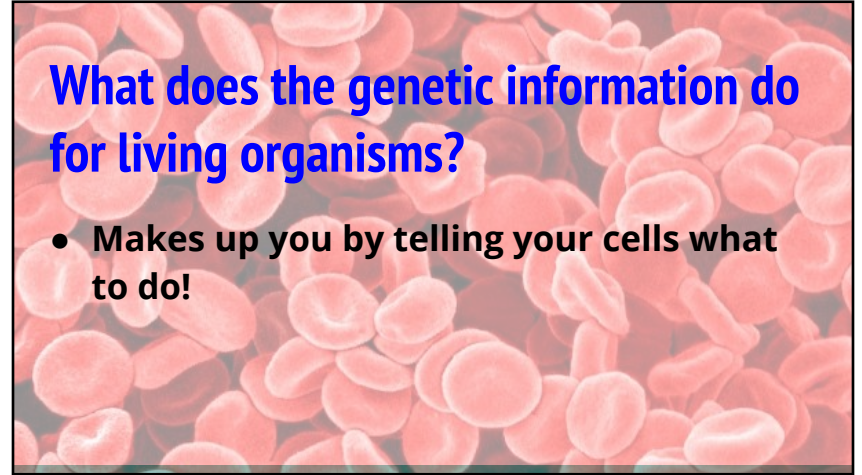
DNA

Cell

Nucleus   Chromosome

DNA

How can DNA be compared to a blueprint for a house?

- blueprint for house- set of instructions that tells you what to build
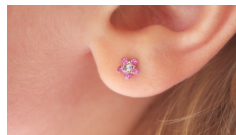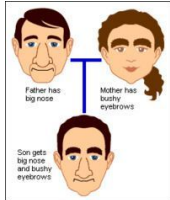- DNA tells our cells what to do
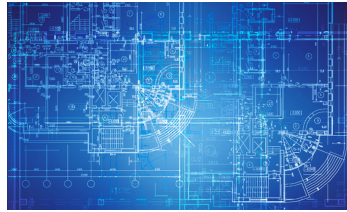
What does the genetic information do for living organisms?

- **Makes up you by telling your cells what to do!**

## Assignment 2 discussion

- Inherit: process of genetic transmission of characteristics from parent to offspring

- Acquired trait: trait that is not inherited; gained by organism after birth

What is a gene?

- Gene: section of DNA
  - comes in pairs (1 from Mom + 1 from Dad= 2 genes for offspring)
  - Use a letter as representation of what that section encodes for. (T for tall and t for short).
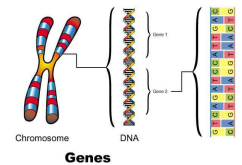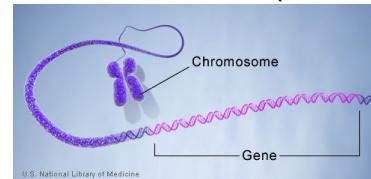
Genotype

- A particular gene or set of genes carried by an individual.
- Determined by the makeup of something called "alleles", a word that refers to the form of a gene that produces different effects.
  - For instance: the gene is "hair color" but there can be multiple alleles, such as brown or blonde hair.
- Genotype is the information contained within 2 alleles. This results in some of the physical characteristics of that organism.
- This is represented by a letter. (Example: A, e, F, T, g, etc.)

Phenotype

A description of your actual physical characteristics.

This includes straightforward visible characteristics like your height and eye color, but also your disease history, overall health, etc.

The genotype (combined with the environment) combine to influence the phenotype.
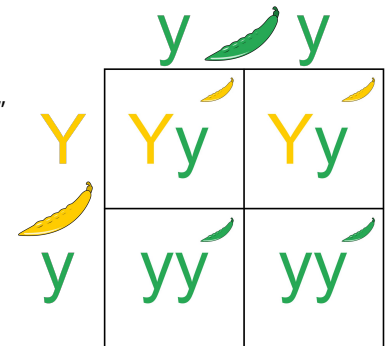
Punnett Square Practice:

- Genotype: which gene is inherited (dominant or recessive)?
  - AA, Aa, aa
- Phenotype: what does the offspring look like?
  - purple or blue

Punnett Squares...

Genotype: "gene"

Phenotype: "physical appearance"

	y	y
Y	Yy	Yy
y	yy	yy

- <u>Dominant Trait:</u>
  - This trait is always visible over the other trait
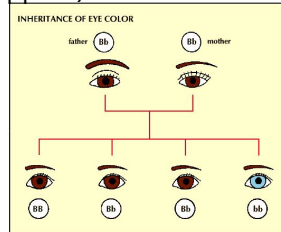 - Represented by capital letter
    - examples: "A", "G", "T"
- <u>Recessive Trait:</u>
  - Trait can be hidden (seems to disappear) when there is a dominant trait
  - Represented by lowercase letter
    - examples: "a", "g", "t"

Homozygous

- "same"
  - both genes are dominant or both recessive
- example:
  - Homozygous dominant: AA
  - Homozygous recessive: aa

Heterozygous

- "different"
  - you have 1 of each type of gene
- example: Aa
  - You will only express the dominant trait.
- Write the capital letter first
  - example: Aa
    - Do not write: aA

Work Time

- Assignment 3: finish & sign off with Teacher <u>before</u> starting Assignment 4.
  - (I need to initial Assignment 3 to check your answers.)
- Remember:
  - "Gene" for genotype
  - "Physical (appearance)" for phenotype.

Punnett Square

- Use to predict traits of offspring

	A	a
A	AA	Aa
a	Aa	aa

Punnett Square Practice:

- Parent 1: BB
- Parent 2: bb

Punnett Square -draw in packet on page 3

H: yellow

h: green

Parent 1: Hh

Parent 2: hh

Punnett Square -draw in packet on page 3

T: Tall

t: short

Parent 1:TT

Parent 2: tt