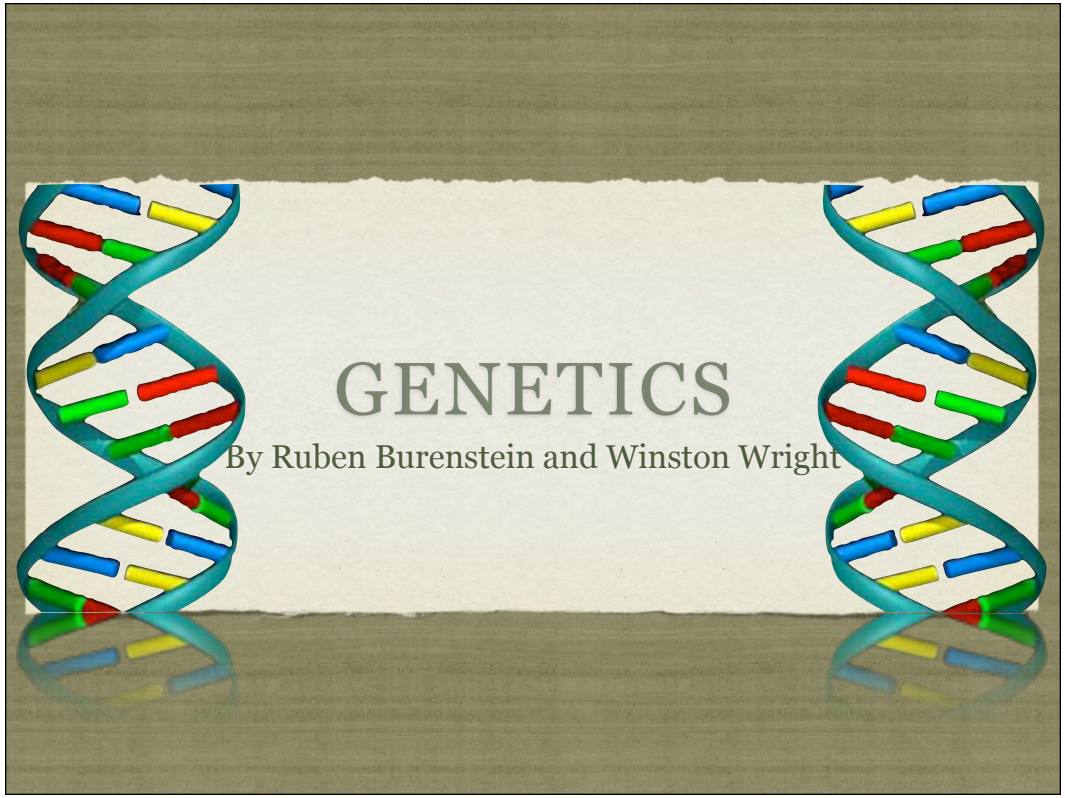
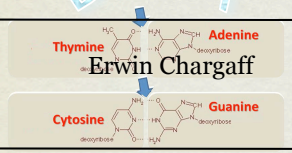

GENETICS
By Ruben Burenstein and Winston Wright

Important Experiments

Name:	Created/accomplished
 Gregor Mendel	Tested pea plants (traits) Examined traits (dominant/recessive) Noted what effected the Peas growth (phenotype/genotype)
DNA Oswald Avery	Continued another test with mice Discovered DNA
 Erwin Chargaff	Adenine is equal to Thymine A-T Cytosine is equal to Guanine C-G
 Watson and Crick	Discovered form of DNA (double helix) X rays from Rosalind Franklin
 Dolly the Sheep	First cloned Mammal Somatic cell

Gregor Mendel was the first person to record experiments on genetics. He did this by growing different kinds of pea plants, and seeing what happened when different types of peas were combined. This led to terms like dominant and recessive traits, and also sparked the interest in genetics

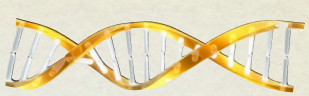
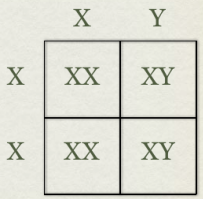
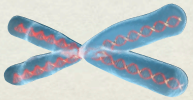
Oswald Avery tested mice by injecting them with different diseases, and recording the effects. His experimentation eventually led him to discover Deoxyribonucleic acid or DNA. Since then DNA has become important in every experiment regarding genetics, and is an essential topic in genetics.

Erwin Chargaff did experiments to figure out what held the genetic information of organisms. He was the first person to discover that this was in the DNA of organisms. These tests wouldn't have been possible without the previous knowledge, like what DNA is, or how traits are passed on. He also figured out that Adenine and Thymine were always equal, and Cytosine and Guanine were always equal.

James Watson and Francis Crick followed the trend, and expanded on the work that had previously been done. They realized that because there A-T, and C-G needed to meet, the structure had to be different than a normal helix, which is what the structure had been thought to be. They used work done by Rosalind Franklin to come to the conclusion that the structure of DNA was a double helix.

Dolly the sheep was the first mammal ever successfully cloned. This was a gigantic breakthrough in genetics, because it had been widely questioned whether this would be possible, and what possibilities this could hold for the future. It also created a lot of controversy, is it morally right to use clones, and for what purposes could they be used for?

Important Features

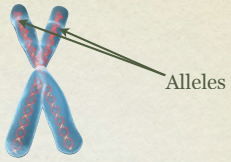
Feature	Short Description	Image
DNA	This is where all of the genetic information is stored. It is in the form of a double helix	
Traits	This is how you physically are, for example eye color and hair color. There are dominant and recessive traits.	
Chromosomes	These contain DNA and protein, there are 46 chromosomes in humans, 23 from each parent. Each pair of chromosomes is unique.	

Deoxyribonucleic acid, also known as DNA is the genetic make up for organisms. Inside of this DNA is the information that makes organisms how they are, the variations also make them unique. DNA is in the form of a double helix, where there are bonds of Adenine and Thymine, Cytosine and Guanine.

Traits are the descriptive part of some of the information the DNA holds. Traits are why an organism looks a certain way. There are dominant and recessive traits, punnett squares can be used to calculate what the offspring might look like. These can show how likely it is that a person will have brown eyes vs blue eyes, and many other traits.

DNA and protein are stored inside of chromosomes. Animals have different numbers of chromosomes, which means that different traits are controlled by the chromosomes. This is one of the reasons that different animals are unique, for example humans have 46 chromosomes, and sheep have 54 chromosomes.

Important Features

Feature	Short Description	Image
Allele	Part of the chromosome that controls how the person is. Some are dominant and recessive, a punnett square can be used to see the probabilities of which will show.	
Genotype	This is the genetic structure of the trait, for example XY is the sex chromosome for boys	
Phenotype	This is the description of what the genotype does, for example male, or blue eyes.	

Alleles are where the trait is stored in the chromosome. The alleles can be messed up something, which can cause mutations in the chromosome, and possibly the organism. Once again, alleles depend on the dominant and recessive traits that the organism receives from its parents.

Genotype is the structure for a trait, or the way that they are recognized as. These are used when making a punnett square, for the top and side to. These are different than phenotypes, because phenotypes are descriptively how the thing is, while genotype is how it genetically is described.

As said before Phenotype is how the trait is described, like gender would be described boy or girl instead of XY or YY. This is what is used in common day life, instead of saying that someone's hair is Bb, we say it is brown, or some other color. Phenotype can be changed by the environment somewhat, because your hair can tint depending on the sunlight exposure, and other factors.

The Main Idea

- Genetics explains why we are the way we are. It explains how our parents effect our lives, and the traits that we inherit, and generally how our body works. Genetics also explains what can effect our lives, for example how our environment changes how we act or look. It could impact our future greatly, depending on what happens with cloning. Cloning people could provide endless organs, which would save a lot of lives but it is very controversial whether this is morally correct to do or not.

Sample Questions

- 1. What determines your characteristics?
  - A. Alleles
  - B. Double helix
  - C. Punnett square
  - D. Adenine

Sample Questions

- 1. What determines your characteristics?
  - A. Alleles _____ These are where traits are controlled
  - B. Double helix _____ The shape of DNA strands
  - C. Punnett square _____ Used to predict genetic outcomes
  - D. Adenine _____ One of the parts of DNA

Sample Questions

- 2. What cannot be inherited/passed through genes?
  - A. Cancer
  - B. Traits
  - C. Hemophilia
  - D. Chromosomes

Sample Questions

- 2. What cannot be inherited/passed through genes?
  - A. Cancer ——— A disease that cannot be inherited
  - B. Traits ——— These are what defines people, passed through parents
  - C. Hemophilia ——— A blood disease passed through genetics
  - D. Chromosomes ——— DNA and proteins, passed through parents

Sample Questions

- 3. Which of these can effect phenotype?
  - A. Cloning
  - B. Guanine
  - C. Environment
  - D. Chromosomes

Sample Questions

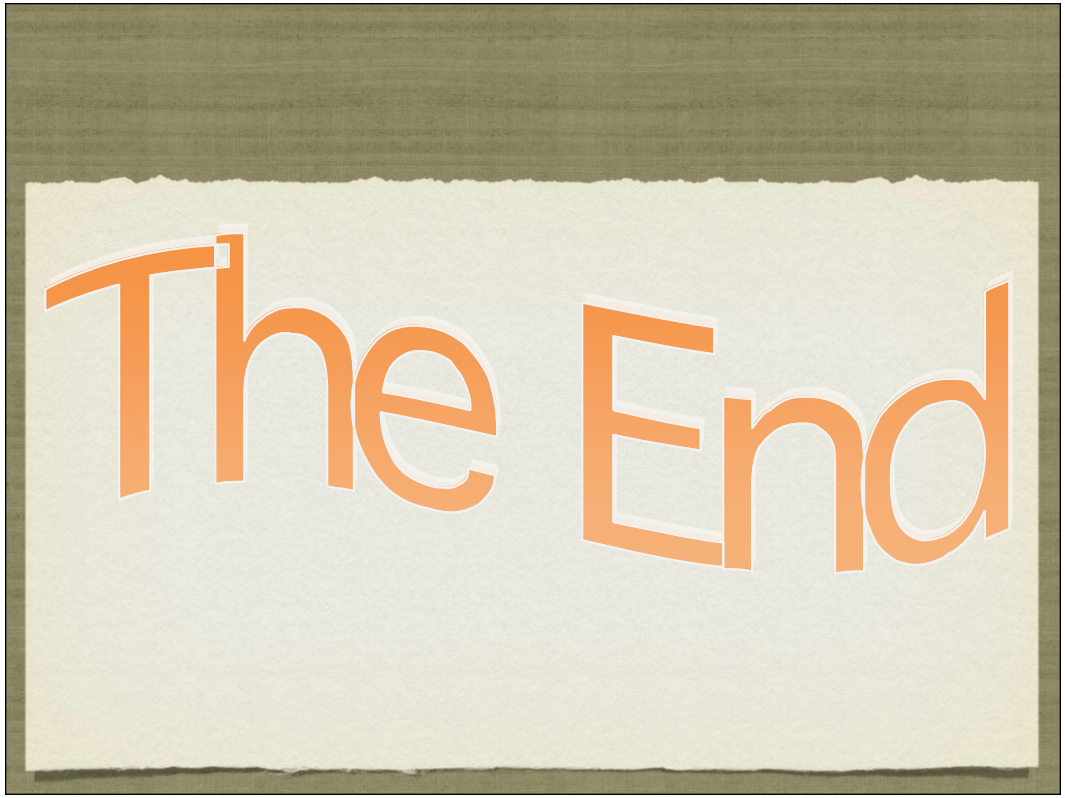
- 3. Which of these can effect phenotype?
  - A. Cloning ——— Making an exact copy of something
  - B. Guanine ——— One of the parts of DNA
  - C. Environment ——— Surrounds, can change how you are
  - D. Chromosomes ——— Where the DNA, alleles, and protein are stored

Sample Questions

- 4. What are the letter pairs for DNA?
  - A. A-T, C-C
  - B. C-T, A-G
  - C. A-C, G-T
  - D. A-T, C-G

Sample Questions

- 4. What are the letter pairs for DNA?
  - A. A-T, C-C ——— It's Adenine-Thymine, Cytosine, Guanine
  - B. C-T, A-G ——— It's Adenine-Thymine, Cytosine, Guanine
  - C. A-C, G-T ——— It's Adenine-Thymine, Cytosine, Guanine
  - D. A-T, C-G ——— It's Adenine-Thymine, Cytosine, Guanine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