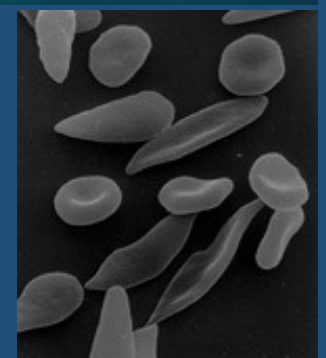
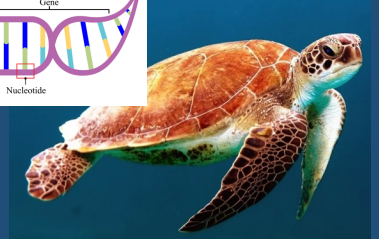
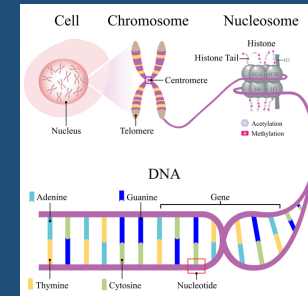


DNA, Genes, and Mutations

- What DNA and chromosomes are
- What genes are
- Common genetic features
- What proteins are
- How does changing DNA change proteins
- Mutations - what they are and what causes them
- Mutations - harmful, beneficial, or neutral effects
- Sickle cell anemia



Preview File

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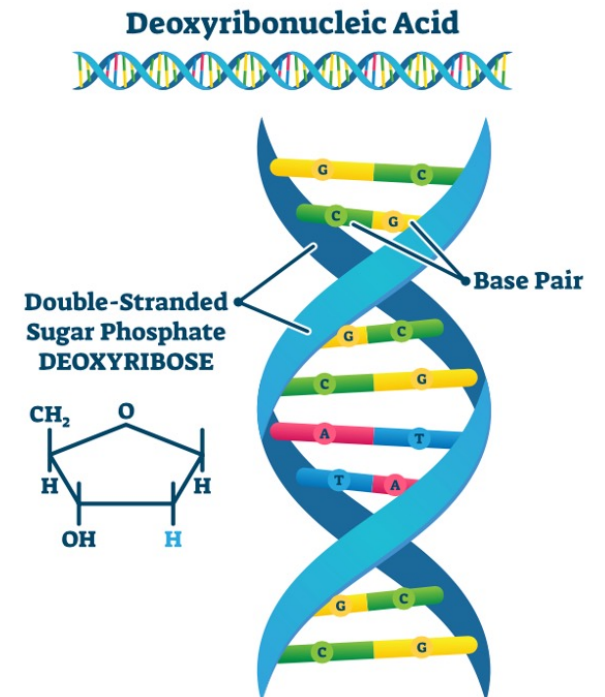
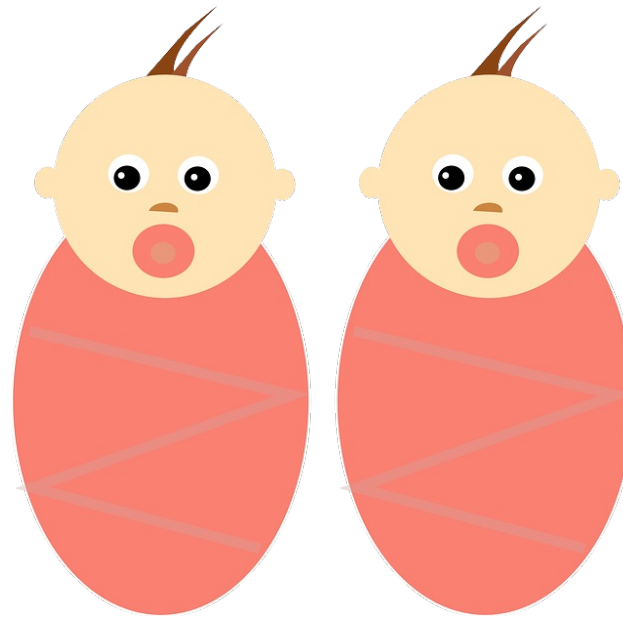
- Some slides appear blank because they have been removed
- Student versions have portions of the text removed which is given in the teacher version and appear as _____ which the students are to fill in
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DNA

- _____
- Everyone's DNA is different (except identical twins)



Although we look very different, DNA doesn't differ very much between species, especially those that are closely related.



What is the difference between human DNA and chimps?



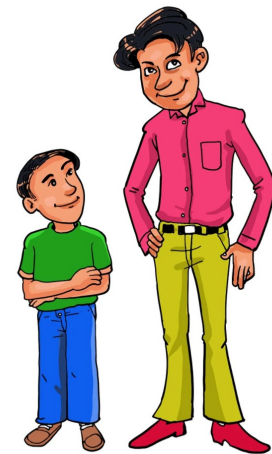
Our DNA



Human Chromosomes

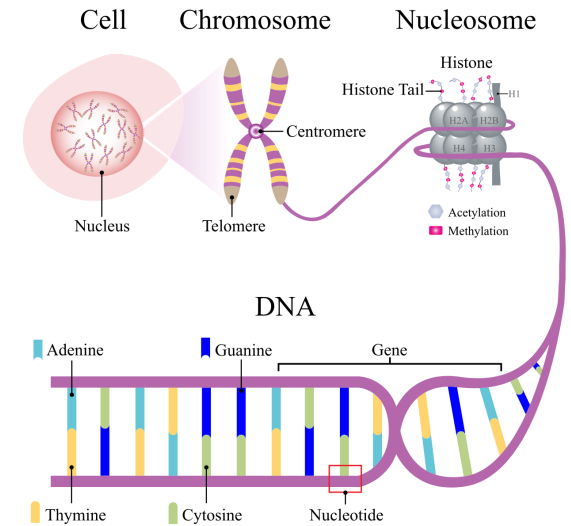
- _____

- There are 46 chromosomes total ($23 \times 2 = 46$ total) in every cell in your body
- Each chromosome determines something



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Genes

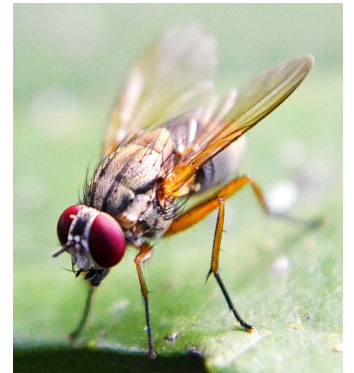


-
- Genes are passed down from parents to offspring
- Determine your traits – Example: eye color, hair color, height, etc.

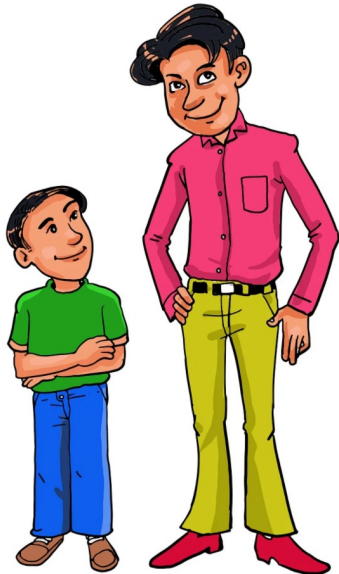


Genes

- _____
- More genes doesn't mean more complex
 - Fruit flies ~13,600 genes
 - Rice ~50,000 genes
 - Mouse ~25,000 genes
 - Dog ~25,000 genes



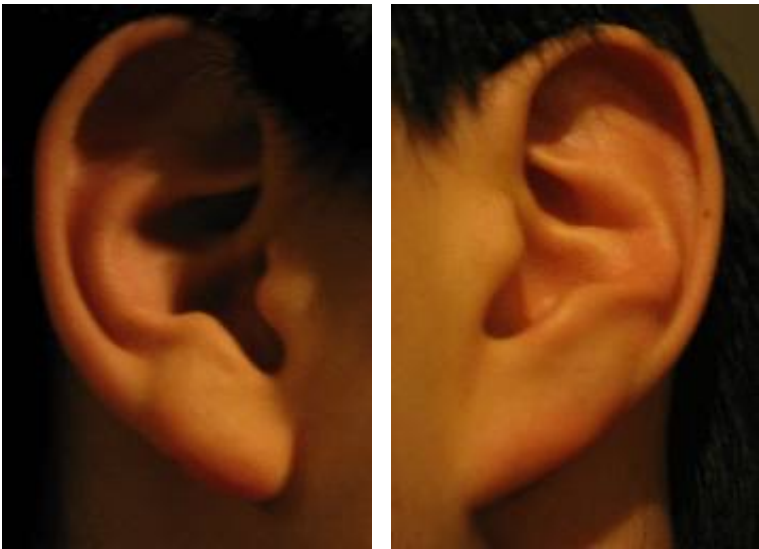
Genes code for everything including:



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Genetic Features

Earlobes



Rolling Tongue



Proteins

- _____
- _____
- Proteins are responsible for:
 - motion – cause muscles to move
 - chemical reactions – enzymes
 - cell structures – collagen, keratin
 - carrying oxygen in blood – hemoglobin

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Mutations

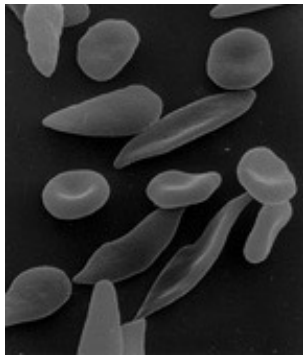
- Genetic mutations are changes in the DNA
- These changes can be caused by genetic or environmental factors
- _____



Mutations

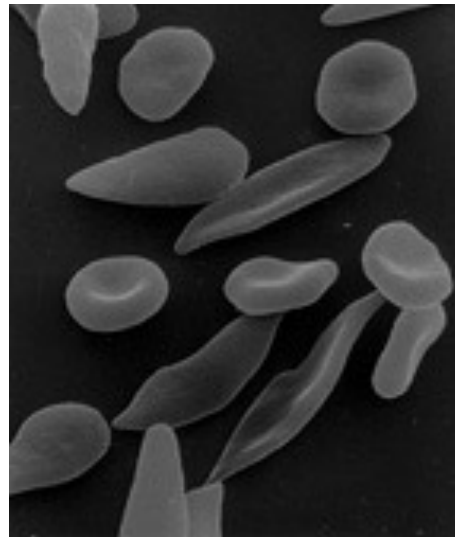
- Mutations are caused when the DNA is changed

- _____

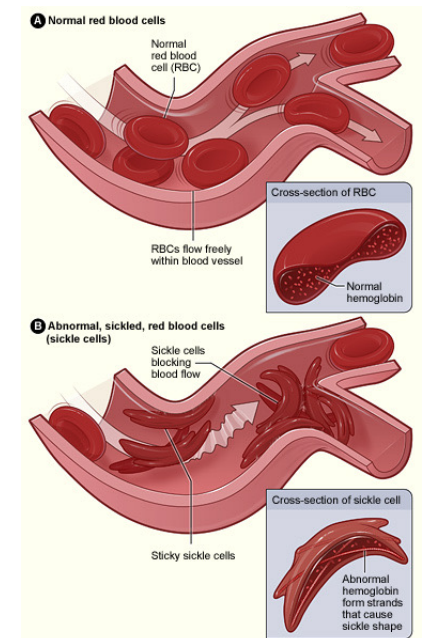


Harmful Mutation: Sickle Cell Anemia

- _____
- As a result, the protein that is created is different



A sickle red blood cell

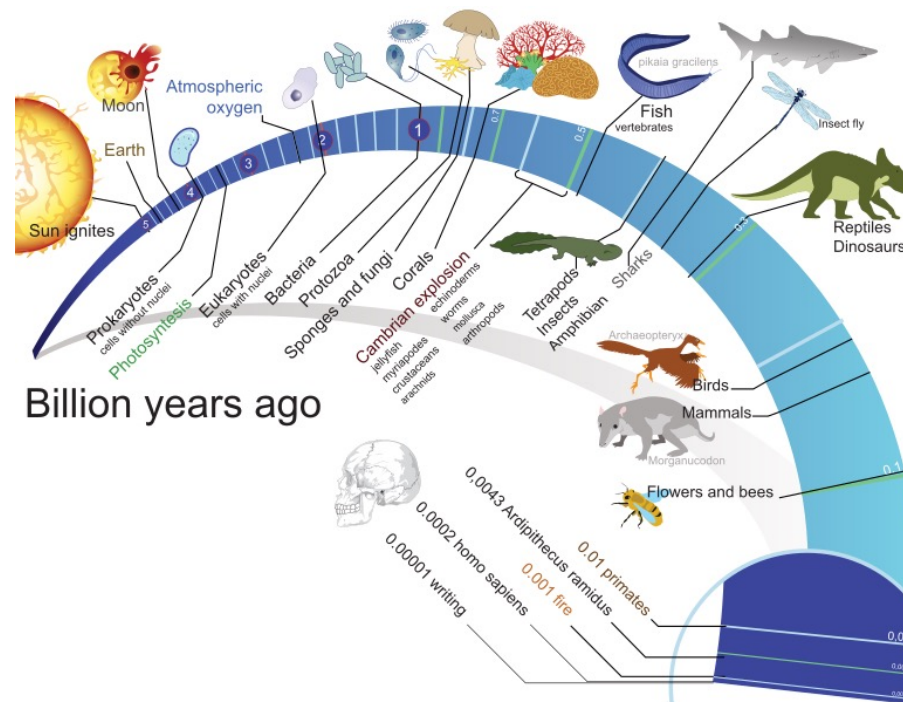


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Positive Mutation

- Mutations can also be good as they can lead to changes and are responsible for the variety of species on Earth

- _____



Positive Mutation

A mutation that is good for the organism will probably be passed on to their children who will also have that characteristic.



Neutral Mutation: No Impact

- _____
- Since it does not make a protein, changing that portion of DNA most likely will not even be noticed



Causes of Mutations

Mutations can happen when

1. the DNA is not copied properly for new cells in the body.
2. a mutagen (environmental agent like sunlight or chemicals) rips the DNA apart causing it to become different

