

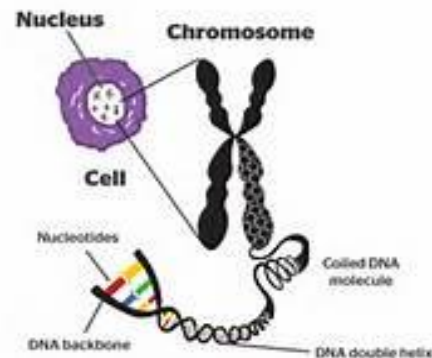
Genetic Engineering

Presented By:
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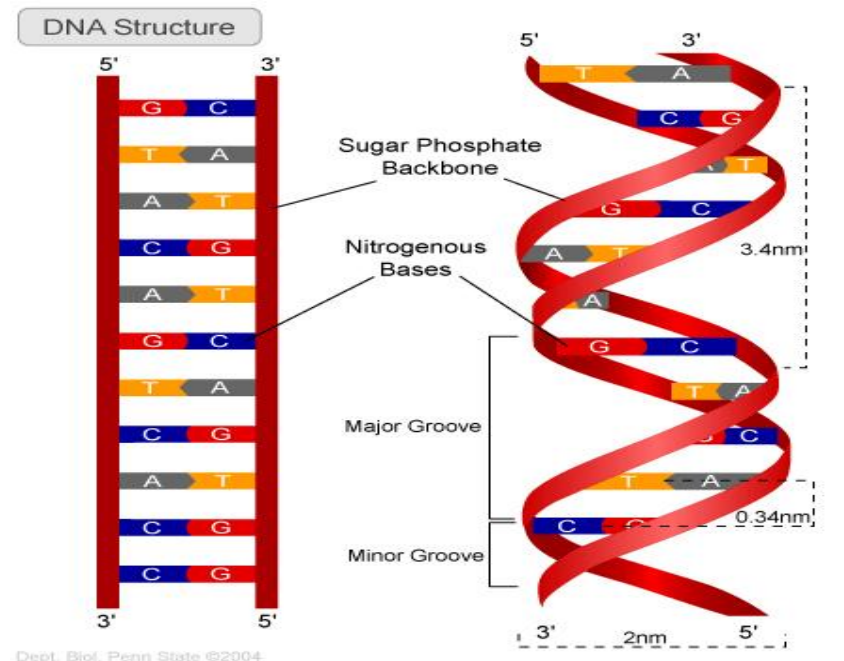


Genetics ----- what are genes

- Every living cell has sets of instructions called genes. The genes provide the instructions on what is the plant or animal, what it looks like, how it is to survive, and how it will interact with its surrounding environment.
- genes are strung together in long strands of material called deoxyribonucleic acid (DNA) and these long strands are called chromosomes. Most living things have pairs of chromosomes (one from each parent).
- humans have 23 pairs of chromosomes and the fruit fly has 4 pairs.



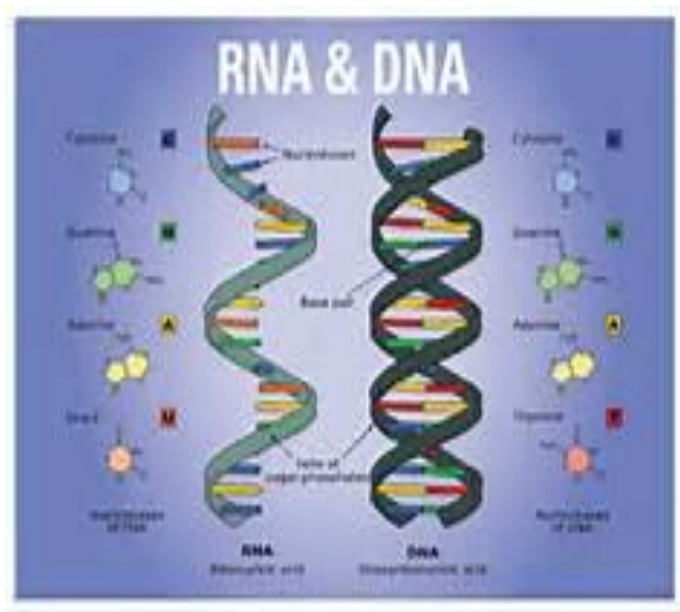
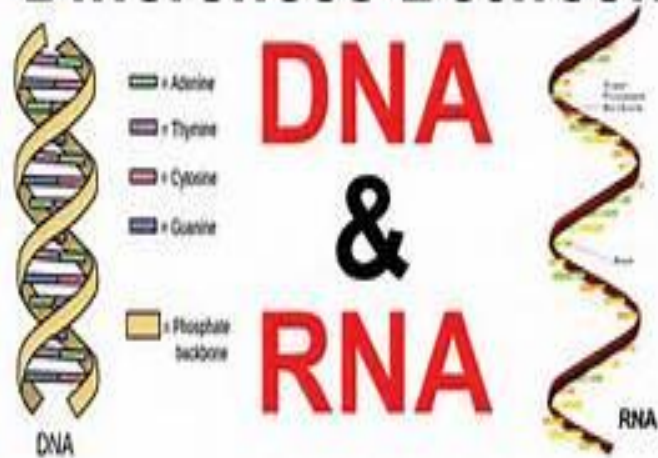
- Each gene is made up of long combinations of four different nucleotide bases. It is the various combinations of the nucleotide bases that determine everything about a living creature.
- The four nucleotides are called:
 - adenine(A),
 - cytosine (C),
 - guanine (G), and
 - thymine (T).

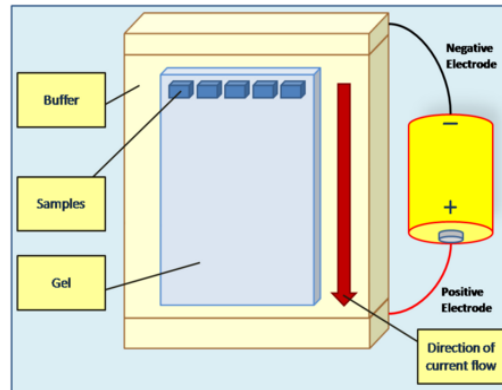
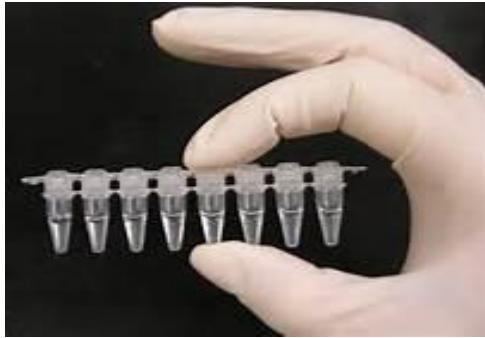


- The gene for green eyes might have this nucleotide sequence.
- AAACCGGTTTTT
- The gene for blue eyes might have this nucleotide sequence.
- AAACCGGTTTAA
- Notice how the nucleotide sequences below are very similar. The only difference being the last two bases. They both describe an eye with the last two characters stating the color of the eye.



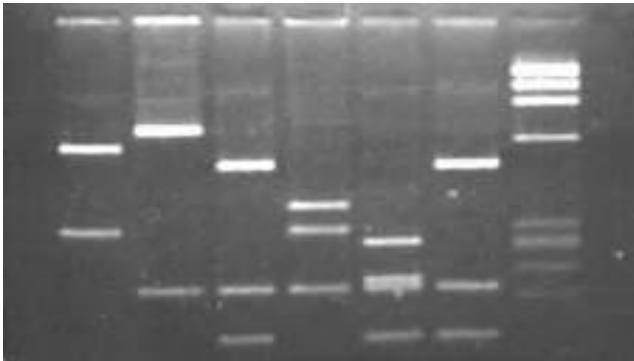
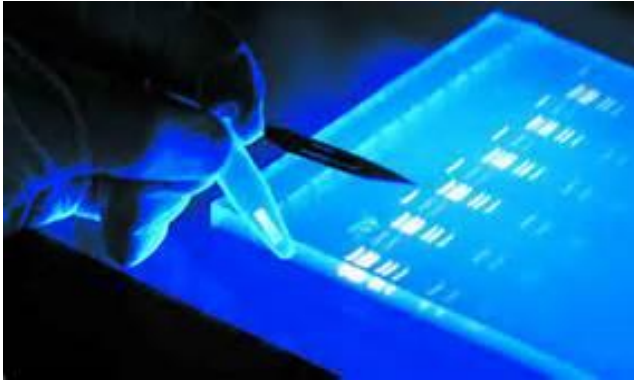
Differences Between

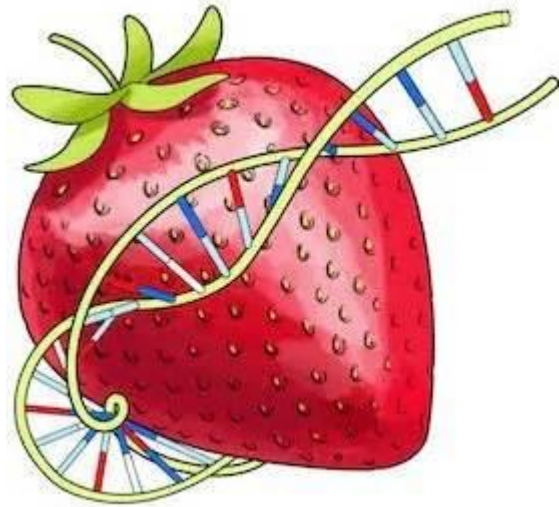




DNA amplification using PCR







DNA EXTRACTION

FOR A STRAWBERRY

GOAL: extracting strawberry DNA by lysing open the cell membrane


MATERIALS: fresh or frozen strawberry, plastic zip top bag, measuring cup (in mL), water, dish soap, salt, cheesecloth or thin fabric, chilled rubbing alcohol

STEPS

1. Put a strawberry in a plastic bag and mash it up
2. Add a mixture of 15mL water + 3 drops of soap + a pinch of salt to the bag
3. Carefully mix the mixture trying not to form bubbles
4. Pour the mixture into cheesecloth or fabric and strain out the juice
5. Carefully pour 15mL of chilled rubbing alcohol down the side of the tube so it forms a separate layer on top of your strawberry juice (do not mix!)
6. Wait 3 minutes until a cloudy layer forms in-between the strawberry and rubbing alcohol
... THAT'S YOUR DNA!

*Dominant
Recessive*

Mendel and His Peas



1865




Diagram illustrating Mendel's pea plants. It shows a tall plant and a short plant. Below, it lists traits that Mendel observed: purple vs. white flower, round vs. wrinkled seed, green vs. yellow seed, and smooth vs. wrinkled seed.



Thanks

