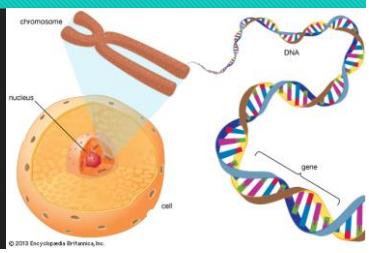
DNA

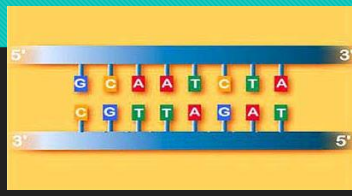
What do you remember about 1 gene 1 protein theory?

Deoxyribonucleic Acid

- Heredity material in organisms
- Located in the nucleus
- Stored as a code



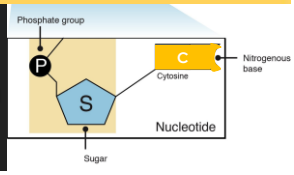
Genetic Code



- Four chemical bases
  - Adenine (A)
  - Guanine (G)
  - Cytosine (C)
  - Thymine (T)
- Human have 3 billion bases
- The order of the bases determines how to build and maintain the organism

Base pairing

- Base pairs are bonded bases
- Each base is also attached to a sugar/phosphate combo
- Together, a base, a sugar and phosphate is called a nucleotide



Catch Factor

- Important property of DNA is that it can divide
  - this supports cell division, both sexually and asexually

Gummy Bear DNA

- Step 1 – determine which DNA strand you will reproduce
  - Each one of these DNA strand codes for a different gene

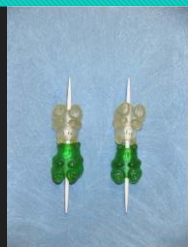
1: CTGGTGGTGC
2: CACAGCCTGG
3: CCTTCCTCCT
4: GGCAACCAGT

Gummy Bear DNA

- Step 2 – label your papers with your names and sections for 4 base pairs with their colors. Put like-colored gummy bears in each section

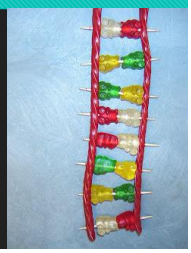
Gummy Bear DNA

- Step 3 – using toothpicks (bonds), put base pairs together *remember which bases go together in DNA



Gummy Bear DNA

- Step 4 – twizzlers are the backbone (sugar/phosphates) of DNA. Line up your base pairs in order and stick them into the twizzlers
- Step 5 – twist the twizzlers to create your double helix



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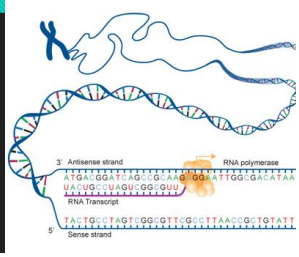
From Gene to Protein

Genes

- Unit of DNA that gives directions to create proteins
- Proteins are the reason for how we look and act

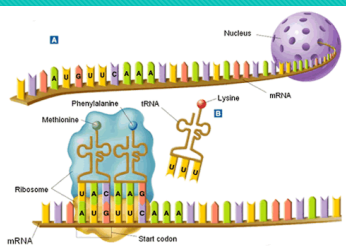
Step 1 – Transcription

- A gene is expressed than transcribed
- making a mRNA copy of the DNA
- RNA is different
  - Single stranded
  - Uracil replaces thymine
  - Unstable and degraded within several hours
- mRNA brings message from nucleus to ribosome



Step 2 – Translation

- Three RNA bases are a **codon**
- tRNA
  - one end recognizes genetic code in mRNA, one end binds to corresponding amino acid



Step 3 – Protein Synthesis

- Protein is a chain of amino acids
- Particular codons tell the tRNA when to stop called "stop codons"
- Completed proteins are released from tRNA