1. Who was Griffith? What were his experiments?

He was the scientist that discovered the phenomenon of translation. He transferred different strains of live and heat killed bacteria to mice and observed the results.

1. Who was Avery? What were his experiments?

He expanded upon the discovery of Griffith and used different chemicals and enzymes to break down and destroy various parts of the cell before transformation. He hypothesized that if transformation did not occur, they would have destroyed the genetic material for the cell.

1. What structure is DNA?

Double helix

1. DNA is made up of billions of small monomers called…

Nucelotides

1. Draw and label a nucleotide below.



1. What are the three steps to DNA replication?
2. Unzip DNA
3. Match base pairs
4. Proofread DNA
5. 1 strand of DNA undergoes replication. This results in 2 strands of DNA. That same piece of DNA undergoes replication again and we discover we have 4 strands of DNA.
6. DNA replication uses two different molecules. What are they and what are their functions?

DNA Polymerase – Matches base pairs and proofreads DNA

DNA Helicase – Unzips DNA

1. What are the three different types of RNA?

mRNA, tRNA, rRNA

1. Draw a picture of each type of RNA below.



1. What are functions of all three different types of RNA?
   1. mRNA – carry message from DNA to ribosome

* 1. tRNA – bring amino acids to ribosome

* 1. rRNA – Where proteins are assembled.

1. What type of RNA enters and leaves the nucleus?

mRNA

1. What types of RNA never enter the nucleus?

tRNA, rRNA

1. Does DNA ever leave the nucleus?

No

1. Define protein synthesis.

Going from the information in DNA to building proteins

1. What process involves taking the message of DNA and converting it to RNA?

Transcription

1. What are the four steps to transcription?
2. Locate a section of DNA
3. Unzip the section of DNA
4. Copy DNA with mRNA
5. Rezip DNA
6. Where does transcription happen?

nucleus

1. How fast does transcription happen?

Extraordinarily fast

1. Where does transcription start on DNA?

A promoter site

1. If you were looking at transcription under a microscope, what is the telltale sign that it is being performed?

The transcription bubble

1. What enzyme is largely responsible for the processes of transcription?

RNA Polymerase

1. What are the four steps to translation?
2. mRNA attaches to the rRNA
3. rRNA reads the mRNA
4. tRNA brings the proper amino acids
5. The completed protein detaches
6. What types of RNA are involved in translation?

mRNA, tRNA, rRNA

1. Translation is performed in the…

ribosomes

1. tRNA carries what building block to proteins?

Amino acids

1. If two strings of amino acids have one amino acid difference, is their protein the same?

No.

1. What is a codon? Where is it located?

Three nucleotide sequences located in mRNA

1. What is an anitcodon? Where is it located?

Three nitrogen bases located on the tRNA

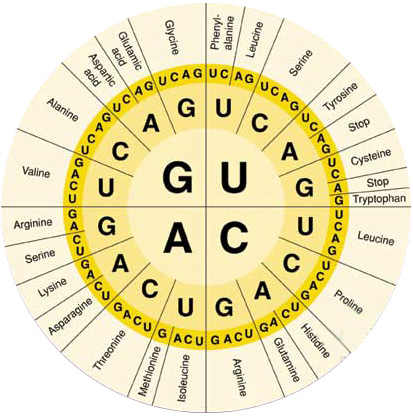
1. What is the end result of translation?

A completed protein

1. Convert this string of DNA to protein.

ACATTGCCCGTATCG

UGUAACGGGCAUAGC



1. Define mutation.

A change in the sequence of DNA

1. Draw an example of a substitution mutation. Why is a good example

AAAAAA 🡪 AGAAAA

Substitutes one base for another

1. Draw an example of a frameshift mutation. Why is it a good example?

AAAAAA 🡪 ACAAAAA

Inserts a nucleotide into the DNA sequence shifting the frame of reading.

1. Why do mutations harm organisms?

Can messup/destroy essential proteins that are needed for the cell.

1. Why are mutations bad? Why might they be good?

Can kill the organisms.

Very rarely can benefit the organisms.