***HISTORY OF DNA WEBQUEST***

**Many, many years ago**

1. What have people wondered since the beginning of human history?

2. Who discovered that individual traits are passed on from one generation to the next?

In what year?

**I. Friedrich (Fritz) Miescher**

Click on “animation” at the top.

1. What did he collect from the bandages at the local hospital?
2. In 1869, he extracted a substance from white blood cells that he called nuclein. What do you think he was actually extracting?

**II. Frederick Griffith**

Griffith’s Experiment – The following questions pertain to Griffith’s experiment:

1. What organism(s) did Griffith use in his experiment? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What are the two strains of pneumococcus and the distinguishing characteristics of each?

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| **Strain** | **Distinguishing Characteristics** |
| S |  |
| R |  |

1. How did Griffith determine which strain caused disease?
2. In one experiment, Griffith injected heat-killed S strain bacteria into the mice.
   1. What was the result of the experiment?
   2. What conclusion did he reach based on these results?
3. In another experiment, Griffith mixed heat-killed S strain with live R strain bacteria and injected the mixture into mice.
   1. What strain of the bacteria was found in the blood samples of the mice?
   2. What conclusion did he reach based on these results?

**III. Oswald Avery, McCarty and McLeod**

Avery’s experiment – The following questions pertain to Avery’s experiment:

1. For each molecule listed, indicate whether they caused a transformation (Yes) or did not cause a transformation (No):
2. RNA \_\_\_\_\_\_\_\_\_\_\_\_ d. Carbohydrate \_\_\_\_\_\_\_\_\_\_\_\_
3. DNA \_\_\_\_\_\_\_\_\_\_\_\_ e. Lipid \_\_\_\_\_\_\_\_\_\_\_
4. Proteins \_\_\_\_\_\_\_\_\_\_\_
5. In 1944, what did he discover that DNA is responsible for?

**IV. Alfred Hershey and Martha Chase**

1. What are bacteriophages?
2. Sketch a diagram of a bacteriophage in the space provided. Label the protein coat and the DNA of the virus.

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1. What effect does a bacteriophage have on E. coli bacteria?
2. In one experiment, they grew bacteriophages in a culture with radioactive sulfur (35S).
   1. Into what part of the phage was the 35S incorporated? (protein coat or DNA)
   2. The phages were then allowed to infect E. coli. Where was the 35S found after mixing with the E. coli?
   3. What conclusion did Hershey and Chase make, based on these results?
3. In another experiment, they grew bacteriophages in a culture with radioactive phosphorus (32P).
   1. Into what part of the phage was the 32P incorporated? (protein coat or DNA)
   2. The phages were then allowed to infect E. coli. Where was the 32P found after mixing with the E. coli?
   3. What conclusion did Hershey and Chase make, based on these results?
   4. The Hershey/Chase experiment provided evidence that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ was the genetic material.

**V. Erwin Chargaff**

1. What is the difference between a purine and a pyrimidine?

2. Adenine (A) pairs with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Guanine (G) pairs with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. The bases that are purines include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. The bases that are pyrimidines include \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

6. How many hydrogen bonds forms between A & T? \_\_\_\_\_\_\_\_\_\_ C & G? \_\_\_\_\_\_\_\_\_\_

7. If an organisms genome consists of 10% thymine, what percent should be cytosine?

**VI. Rosalind Franklin**

1. What technique did Franklin learn, use and improve upon?
2. What did she discover about the probable shape of DNA? (What shape do we know DNA to be today?)
3. What controversy surrounds Rosalind Franklin?

**VII. James Watson and Francis Crick**

1. What did they receive the Nobel Prize for?
2. Describe the following parts of the DNA model proposed by Watson and Crick:
   1. Backbone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Rungs: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

