Honors Biology

*DNA Study Guide: Part 1*

**You need to be able to do the following objectives:**

**Compare and contrast inferences and observations, illustrate using Frederick Griffith’s experiment.**

**Compare and contrast qualitative and quantitative observations, illustrate using Griffith’s experiment.**

**List and explain the three jobs DNA is responsible for in a cell.**

**Describe the components of DNA (the nucleotides and the three parts that they are composed of.**

**List the years in which the six experiments leading to the discovery of DNA occurred.**

**Compare and contrast the r-strain and s-strain of the *Streptococcus* *pnumoniae* used in Griffith’s experiment.**

**Explain how Griffith’s experiment worked.**

**Formulate a hypothesis for Griffith’s investigation.**

**Define transformation (as it relates to Griffith’s experiment).**

**Discuss how a transforming factor and a gene are related.**

**Summarize the results of Griffith’s experiment.**

**Identify the goal of Oswald Avery’s investigation.**

**Explain how Avery’s experiment worked.**

**Formulate a hypothesis for Avery’s work.**

**Construct a data table to display the results from Avery’s experiment.**

**Discuss the use of enzymes in Avery’s experiment.**

**Summarize the results of Avery’s experiment.**

**Discuss the goal of Martha Chase and Alfred Hershey’s investigation.**

**Diagram the structure of a virus.**

**Diagram the Lytic Cycle.**

**Formulate a hypothesis for Hershey and Chase’s experiment.**

**Explain how Hershey and Chase’s experiment worked.**

**Create step-by-step instructions for executing Hershey and Chase’s experiment.**

**Discuss why Hershey and Chase used radioactive phosphorus and sulfur in their experiment.**

**Summarize the results of Hershey and Chase’s experiment.**

**Evaluate which experiment was more effective at demonstrating how DNA must contain the genetic material.**

**Discuss the goal of Erwin Chargaff’s investigation**

**Summarize the findings of Chargaff’s investigation**

**Graph data from Chargaff’s investigation**

**List the four nitrogenous bases and describe what bases bond together.**

**Diagram how X-ray crystallography works.**

**Explain why Rosalind Franklin and Maurice Wilkins were not really partners although they worked in the same building on the same project.**

**Describe what Watson and Crick learned from photo 51.**

**Formulate an argument: Rosalind Franklin should have gotten the Nobel Prize—agree or disagree.**

**Summarize what was learned from Franklin and Wilkins investigation.**

**Describe the backgrounds of James Watson and Francis Crick.**

**Describe the method Watson and Crick used for their investigation.**

**Discuss how theoretical research is different from experimental research, evaluate the methods.**

**Explain how the five previous investigations helped Watson and Crick determine the structure of DNA. Use examples from their article in the journal *Nature*.**

**Explain what the term *Double Helix* means concerning DNA.**

**Compare and contrast Purines and Pyrimidines (mainly structural differences, as well as examples and pairing rules).**

**Diagram a deoxyribose molecule.**

**Diagram a phosphate molecule.**

**Explain what makes a molecule polar.**

**Compare and contrast a hydrogen bond with a covalent bond.**

**Explain what is meant by the term complementary strands.**

**Explain what 5 prime and 3 prime means and why it is important.**