**Exploring the History of DNA’s Discovery**

1. Visit the site below, there is also a link on my blog:

<http://www.dnaftb.org/>

1. Click on “Molecules of Genetics”
2. In the drop down menu click on “17 a Gene is Made of DNA”
3. Answer the following questions from the “Concept” tab in chapter 17
   1. Define transformation as is relates to the experiment in the 1920s
   2. According to the transforming principle harmless bacteria can become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Answer the following questions from the “Animation” Tab in Chapter 17
   1. What organisms did Avery use to perform his experiments?
   2. How did Griffith further the field of knowledge about the organism?
   3. Describe the R and S strains:
   4. Which strain has a capsule? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. Which strain will make the mouse sick?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. Explain what happened when Griffith added ONLY the heat killed S strain to the mice.
   7. Explain what happened when he added the heat killed S strain to the live R strain and injected them into the mice. Be sure to include ALL results and conclusions.
   8. How did Avery, MacLeod, and McCarty extend Griffith’s research? Outline each of the steps he took to determine what part of the lysate was the transforming factor. Hint: There were several steps.
5. On the right-hand navigation bar, click on Concept 18: Bacteria and Viruses have DNA, too.
6. Answer the following question from the Concept tab in section 18.
   1. What happens during bacterial conjugation?
7. Click on the Animation tab in section 18. Click on “jump to” in the animation. Click on the 3rd dot on the bar.
   1. What is a bacteriophage?
   2. Describe what Hershey and his colleagues knew about the structure of a phage. A drawing may be useful.
   3. What information did the researchers gather from electron micrographs about the method of infection phages use?
   4. Explain what Hershey and Chase knew about the elemental components of DNA and proteins in regards to phosphorous and sulfur.
   5. What was the purpose of the radioactive elements in their experiments?
   6. Once Hershey and Chase mixed the radiolabeled phages with the bacteria and disrupted the attachment they used a centrifuge. What was the purpose of the centrifuge? What made up the pellet and the supernatant?
   7. What did Hershey and Chase observe in the 35S tubes? What did they conclude from these tubes?
   8. What did Hershey and Chase observe in the 32P tubes? What did they conclude from these tubes?
8. In the right hand sidebar click on Concept 19: The DNA Molecule is Shaped Like a Twisted Ladder
9. Answer the following questions about the Animation tab in Concept 19.
   1. What is the building block of DNA? What are its subcomponents?
   2. What were the results of Erwin Chargaff’s experiments? What did he conclude from those results?
   3. What are Chargaff’s rules?
   4. What did Linus Pauling discover using X-Ray crystallography?
   5. Explain how X-Ray crystallography works.
   6. What role did Rosalind Franklin and Maurice Wilkins play in the discovery of the DNA double helix?
   7. What shape from the X-Ray crystallograph showed that DNA was twisted?
   8. How many nucleotides did Crick find were part of one helical repeat?
   9. How did paper cut-out help Watson figure out which nitrogenous bases paired?
   10. How did Watson and Crick decide that nitrogenous bases were in the middle of the twisted ladder?