**Bozeman Science 027 – DNA & RNA Parts 1 & 2 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Part 1**

What two things did Mr. Anderson want to show you with the peanut plant?

History of DNA:

a. What was the big thing Griffith learned from his experiment?

b. Avery, McCarty, MacLeod:

Looked at Griffith’s experiment and tried to find out…

Used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that broke down DNA, protein and DNA.

What did they figure out?

c. Hershey and Chase:

What did most people think the transforming agent was?

What did they work with?

What did they show?

d. Watson, Crick, Wilkins, Franklin and Chargaff:

Wilkins and Franklin were doing experiments with:

Chargaff found out that the amount of ….

Watson and Crick used the information from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to help build models to figure out the structure of DNA.

Structure of DNA:

a. DNA is wrapped around \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

b. Prokaryotic chromosome:

Have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ not a linear shape like eukaryotic chromosomes.

Have extra DNA called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Do not have \_\_\_\_\_\_\_\_\_\_\_\_ DNA

**Part 2**

Structure of DNA and RNA:

What three parts do they have in common?

What sugar is in place of deoxyribose in RNA?

What base is in place of thymine in RNA?

DNA replication:

In order for replication to occur, the strand first has to \_\_\_\_zip.

New bases can only be added on the on the \_\_\_\_’ (prime) end.

What enzyme adds new nucleotides?

What side does it run smoothly on? What is the other side called?

Who coined the term Central Dogma?

In the space below, draw and label the diagram of transcription that Mr. Anderson explains from about 4:10 to 5:24.

Summarize the process of translation as explained from 5:24 to 6:48.

What do proteins create?

Describe what the term extended phenotype refers to.

How is bacteria “transformed”?

**The Molecular Basis of Inheritance – Chapter 13 Reading Guide Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Section 13.1** (Skip to page 248)

Look at Figure 13.5. List the three components of a nucleotide.

Read the caption to Figure 13.5. Explain what is meant by 5' and 3' ends of the nucleotide.

(Skip to page 250)

What do we mean when we say the two strands of DNA are antiparallel?

Distinguish between the structure of pyrimidines and purines.

Explain why adenine bonds only to thymine.

**Section 13.2** (Skip to page 252)

What is the semiconservative model of replication?

(Skip to page 253)

What is the direction of synthesis of a new strand of DNA?

What role do helicases play?

What is a primer and what enzyme synthesizes it?

What enzymes catalyze the synthesis of new DNA by adding nucleotides to a preexisting chain?

Distinguish between the leading and the lagging strands during DNA replication.

What are Okazaki fragments? How are they joined together?

Which enzyme does each of the following?

untwists and separates strands \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

holds DNA strands apart \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

synthesizes RNA primer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

adds DNA nucleotides to new strands \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

relieves strain caused by unwinding \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

joins DNA fragments together \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

removes RNA primer and replaces with DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Make a detailed list of the steps that occur in the synthesis of a new strand of DNA.

Make a sketch of a chromosome and label the telomeres.

Explain telomere erosion and the role of telomerase.

Explain the roles of each of the following enzymes in DNA proofreading and repair.

DNA polymerase

Nuclease

Ligase

Repair enzymes