Name: _____ Period: _____ Date: _____

Chapter 9: Genetic Engineering Study Guide

1. Define: Genetic Engineering

Recombinant DNA

2. List and describe the 3 steps of GE (steps to make a recombinant DNA):

3. Explain the roles of the following:
Vector-
Restriction enzyme-
DNA ligase-
Plasmid-
Cloning-
PCR-

4. Why do we use bacterial cells in Genetic Engineering?

5. Why do we use plasmids and not the actual bacterial DNA?

6. Describe genetic engineering in:
Medicine:

Vaccines:

Gene therapy:

DNA fingerprinting:

7. Describe the role of gel electrophoresis: What does it show? Why does DNA move toward the positive end?

8. In Polymerase Chain Reaction (PCR), what does raising the temperature do in step1 and 3? And what is the role of a primer?

9. What is the Human Genome Project? Why is it significant?

10. What is a transgenic animal? And what are some examples of transgenic animals?

11. What are 3 advantages of transgenic plants?

12. Draw and label how you make a recombinant DNA.

13. If I have a restriction enzyme that cuts at 5' G-AATTC 3', how many fragments would be produced in the DNA. And what kind of ends are produced?

5' ACG ACGTATTAGAATTCTTAT CCGCCGCCGGAATTCT CATCA 3'
3' TGC TGCATAATCTTAAGAATAGGCGGCGGCCTTAAGAGTAGT 5'

14. Describe how genetic engineering is applied in crops and transgenic animals.

15. Describe how genetic engineering is applied in medicine.

16. How are restriction enzymes used to make **both** recombinant DNA and transgenic organisms?

*know the steps to PCR, RE, and Recomb. DNA