Name _____ Date _____ Period _____

Lab: Gel Electrophoresis Online Simulation

HONORS BIOLOGY: UNIT 7

DIRECTIONS: Go to the website (http://learn.genetics.utah.edu/content/labs/gel/) to answer the questions below. You will have to navigate through the electrophoresis interactive/simulation and it is quite obnoxious with beeps and noises so use your headphones if you like.

Questions:

1. What is electrophoresis used for?

2. What is the material of the gel similar to?

3. Why is electricity required for electrophoresis to work?

4. Describe how the DNA fragments migrate through the gel matrix.

5. What moves farther – shorter or longer fragments? Why?

6. If two lanes had bands/fragments at the same location could you assume that the DNA at these locations was the same length? Why or why not?

Run the Gel

Follow the instructions to run the gel.

7. What ingredients/materials are necessary to perform an electrophoresis experiment?

8. Why do you need to use buffer?

9. Why do you need a microwave? Could you use something else? What?

10. What is the tape for on the gel casting tray?

11. What is the comb for?

12. What is the buffer for in the chamber?

13. Why would you need a clean pipette tip?

14. What is the DNA size standard for?

15. What would happen if you switched the black and red wires?

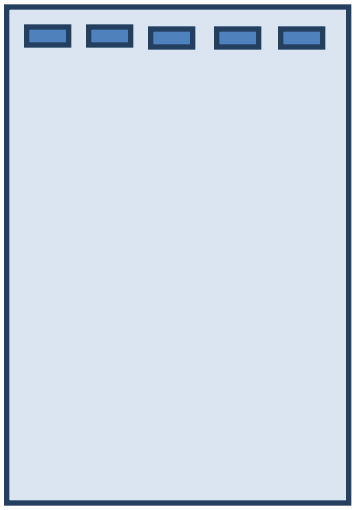
16. Are bubbles good? How/why could they be helpful?

17. Does DNA move toward red or black? Why is this?

18. What is the point of the Ethidium Bromide?

19. What is the UV box for?

20. Draw the resulting gel with appropriate size bands in the diagram on the right.



DNA and Forensics

On the bottom of the Gel Electrophoresis Virtual Lab click on “Can DNA Demand a Verdit” or the following link. http://learn.genetics.utah.edu/content/labs/gel/forensics/

Read the page and answer the questions below.

21. Is there any difference between “DNA fingerprinting” and “DNA profiling?”

22. What percent of our DNA is unique to us as individuals?

23. What is the NRC and why are they important?

24. What are their regulations for sample collection and handling? Why do you think this is important?

25. Is DNA enough to convict? Why or why not?

26. What is the innocence project?

27. Using the flow chart on the right side of the webpage, who is the guilty suspect?

28. What are some drawbacks of using this technology alone in court cases?

Extension

Find a major / influential court case that used DNA forensic evidence to help convict or acquit the defendant. What were the details of this case? How was the DNA used properly or improperly? Basically give a summary of the case and why the DNA evidence was important.