**Name**_____ **Date**_____ **Period**_____

# Medical Interventions Mayhem

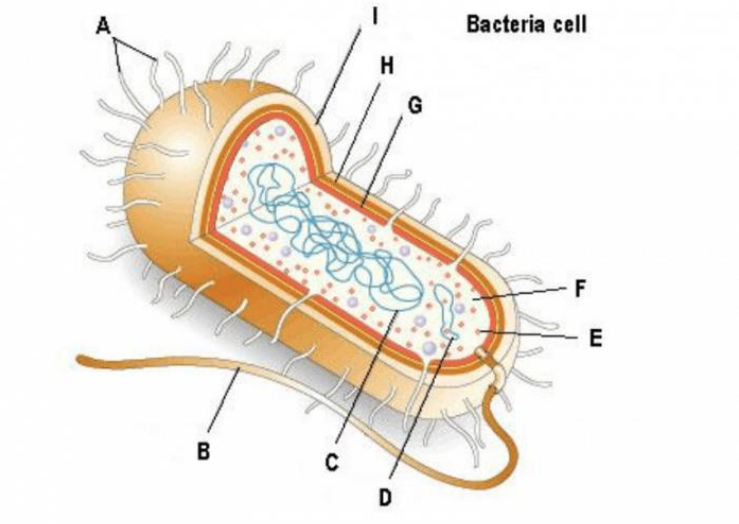
Below is a series of questions about things you have learned previously in biology and biomed and will use again in MI. Please print this sheet out, complete it, and return it on the first Friday of the school year.

1. Make sure you know how to measure length. Using a ruler, measure the…

   a. Length of the line in cm_____
   b. Convert that to mm _____
   c. Width of the line in mm _____
   d. Convert that to nm _____
      (hint: 1 mm = $10^{-3}$ m. 1 nm= $10^{-9}$ m)

2. You and your family encounter medical interventions everyday. A medical intervention is something that is used to change the course of disease. It can be as simple as a band-aid or as complex as a bypass surgery. Document 10 medical interventions you have encountered this summer.

3. **Back to Bacteria Basics:**
   a. The image below shows the basic structure of a bacterium. Label the diagram with the structure and give a brief 2-3 word description of its function.



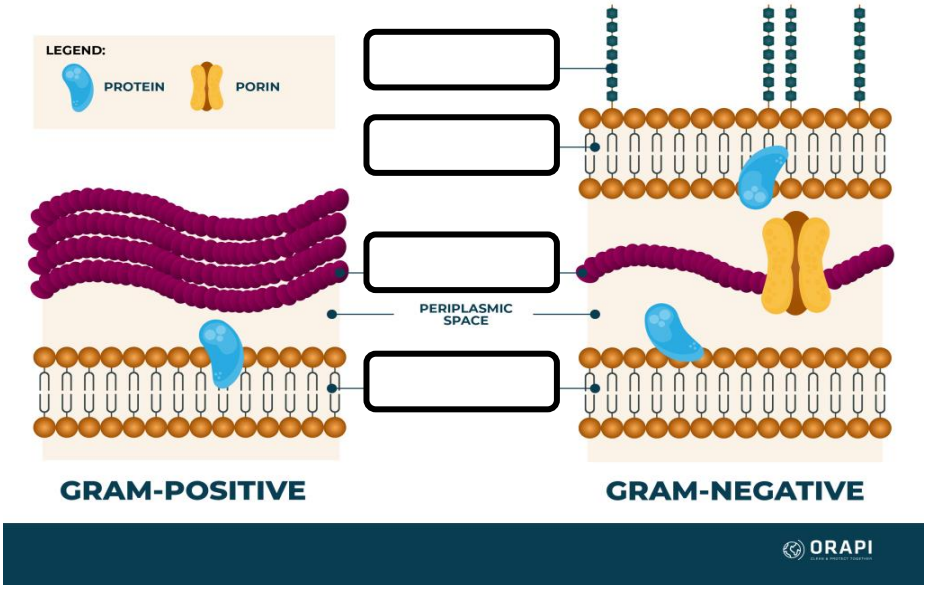
b. Gram staining can be used to help characterize bacteria, and thus, determine the treatment for a patient's infection. In the diagram below, label the cell membrane, peptidoglycan cell wall, endotoxin (also known as lipopolysaccharide) and outer membrane. What are 3 differences you see between the gram positive and gram-negative bacteria?

**Three Differences I Notice:**

1.

2.

3.



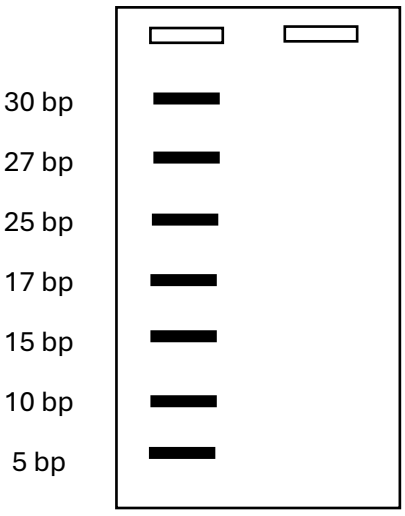

**4. Electrophoresis Extravaganza**

The following DNA sequence was cut using HaeIII, a restriction enzyme that cuts at 5'-GG-CC-3'.

5'–ATGGAACGCGGCCATATTTACCGGACAGTGATGCAGGCCCCCATAGGGGCTAAGCCGGATGGCCAGA–3'
3'–TACCTTGCGCCGGTATAAATGGCCTGTCACTACGTCCGGGGGTATCCCCGATTCGGCCTACCGGTCT–5'

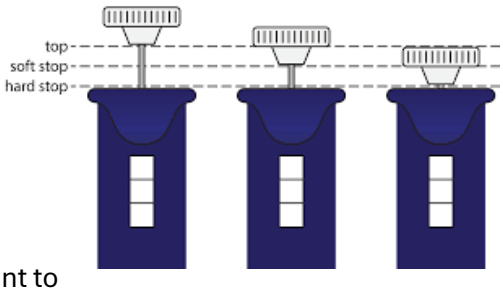
a. Show where the DNA strand would be cut by drawing a vertical line between the base pairs where the cut occurs.

b. Count the number of base pairs in each fragment and add the pattern to the gel diagram below. The first lane shows the DNA standard with known lengths.




c. Label the positive and negative sides of the gel. Draw an arrow to show the direction the DNA migrates.

d. How can gel electrophoresis be used to diagnose genetic disease?




e. Micropipetting will be used frequently in MI. Which "stop" do you use when drawing up a sample? _____
Which stop do you use when loading a gel? _____
Which stop do you use if you want to dispense the entire contents of the pipette? _____