

Gel Electrophoresis Basics Worksheet

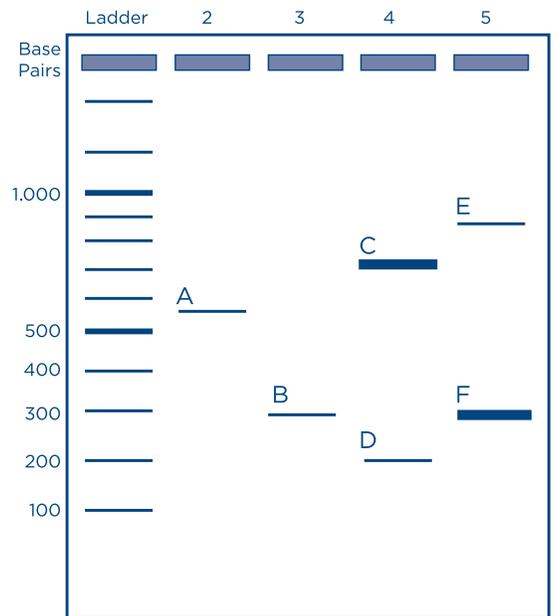
1. Evaluate the following statements. Rewrite them so that they are correct if necessary.

- a) Each band in a DNA electrophoresis gel is made up of one molecule of DNA.
- b) Gel electrophoresis can tell you the sequence of a particular DNA fragment.
- c) You can see DNA on a gel because DNA is naturally fluorescent.
- d) DNA moves through a gel because it is positively charged and is attracted to the negative electrode.
- e) The speed at which DNA moves through a gel is directly related to its charge.
- f) An electrophoresis gel used for DNA is usually made from gelatin which is a protein obtained from seaweed.
- g) When visualizing your gel, you can tell the size of the DNA fragments by seeing how wide each band is.
- h) A gel is placed in a liquid called running buffer because it is an insulator and will protect the user from electric shock.

The gel to the right contains DNA ladder in the first lane, followed by four DNA samples in lanes two through five. The DNA ladder has 10 bands that are each separated by 100 base pairs from lengths 100-1000; it also has bands at 1200 base pairs and 1500 base pairs

2. Which DNA fragment, A, B, C, D, E, or F, is the largest? Justify your answer.

3. Which two DNA fragments are the same size? How do you know this?



4. Which lane of the gel, 2, 3, 4, or 5, has a DNA fragment that is about 700 base pairs? _____

5. Which DNA fragment, B, C, D, or E is about the same size as the lengths of the fragment A and fragment F added together? _____

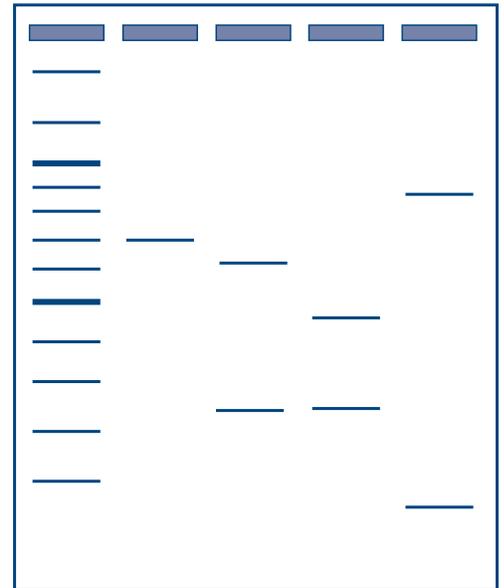
Actual gels don't have labels. Here, the labels have been removed, but the ladder remains the same as in the previous example.

6. On the gel to the right, write the approximate size of each DNA fragment. Write the sizes next to each appropriate band.

7. Imagine that you have a sample of DNA that contains a single, specific DNA sequence. Before you run your gel, you split your sample into two tubes. You run the DNA from the first tube in lane two of your gel. You take the other tube and use an enzyme called a restriction enzyme that cuts the DNA into two pieces at a specific point in the sequence. You then run this sample that was cut on the gel.

Which of the next three lanes (lane 3, 4, or 5) could be the same sample from lane two after it was cut into two pieces?

Justify your answer.



Use the image of a gel on the right to draw where you think you would see the bands described below.

8. You run the following samples on a gel:

Lane 1: DNA ladder (Drawn for you)

Lane 2: a fragment of DNA that is 375 base pairs long

Lane 3: three fragments of DNA, one that is 150 base pairs, one that is 400 base pairs and a third that is 780 base pairs

Lane 4: a 1,200 base pair fragment that has been cut in two by a restriction enzyme at base pair number 370

Lane 5: a 50 base pair fragment of DNA and a 2,400 base pair fragment of DNA

