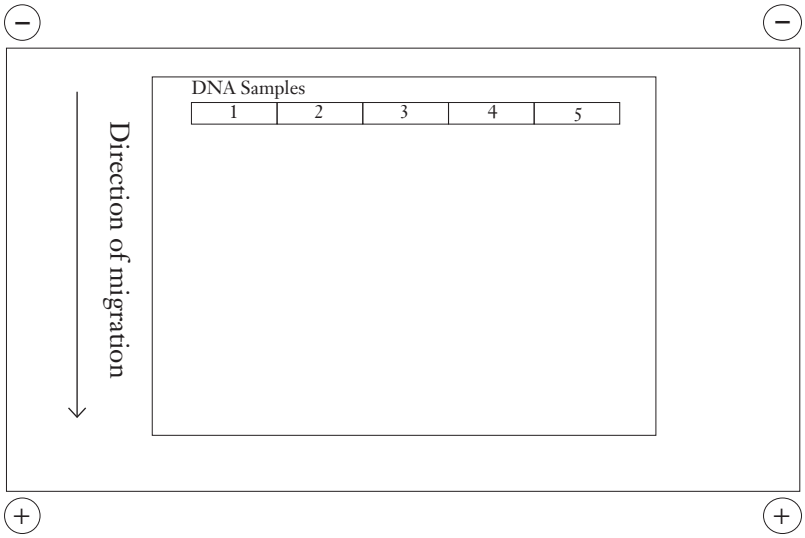
FLINN SCIENTIFIC

Name_____

# Laboratory Report

1. Sketch the approximate locations of the DNA bands in the graphic below.




2. Using a metric ruler, measure the migration distance in millimeters for each major band and enter the results in the following table.

| DNA Sample 1 | | DNA Sample 2 | | DNA Sample 3 | | DNA Sample 4 | | Reference Ladder* | |
|---|---|---|---|---|---|---|---|---|---|
| DNA Fragment No. | Migration Distance (mm) | DNA Fragment No. | Distance (mm) | DNA Fragment No. | Distance (mm) | DNA Fragment No. | Distance (mm) | DNA Fragment No. | Distance (mm) |
| 1 | | 1 | | 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | | 4 | | 4* | |

*The DNA ladder will contain 10–14 visible bands. List the migration distances separately for the additional bands in the DNA ladder. For the DNA 1-kb ladder, additional bands should appear at 75, 81, 86, 92, 97 and 103 mm. There may also be four closely spaced fragments at 108–116 mm.

3. Evaluate the banding patterns in the electrophoresis experiment and identify any matching DNA samples.

4. List three errors that could affect the outcome of any gel electrophoresis procedure.

5. Why would a forensic scientist use the polymerase chain reaction technique to prepare DNA samples for analysis?

6. The table below lists the migration distance and fragment size for Lambda DNA cut by the restriction enzyme HindIII and analyzed on a 0.8% agarose gel at 70 V. Plot the data on the semi-log graph shown below. Draw a smooth curve through the points and explain how the graph could be used to determine the fragment size for an unknown band. Estimate the base-pair fragment size for a band that appears at 30 mm in the same gel.

| Migration Distance (mm) | Fragment Size (bp) |
|---|---|
| 14 | 23,130 |
| 19 | 9,416 |
| 22 | 6,557 |
| 26 | 4,361 |
| 37 | 2,322 |
| 40 | 2,027 |