

HELP SOLVE THE CRIME!

A horrible murder has been committed!

There were no witnesses, but the murderer was scratched and left some skin and blood behind which was analyzed for DNA content.

Seven people were picked up by police in the vicinity of the murder. You've got DNA samples from all of them. Your job is to find out "who done it"!

How to do it in Real Life:

First:

You need to add a restriction enzyme to the DNA which always breaks the DNA between the same base pairs. For example, you might have a restriction enzyme that breaks DNA wherever it finds an A and a G next to each other.

Second:

You pour the solution of DNA fragments into an agarose gel (a type of gelatin with many microscopic pores in it) and run electrical current through it. The electricity causes the DNA fragments to bounce around and move through the gel. Big clunky fragments of DNA don't get very far, but small fragments can really travel. Measuring the amount of DNA at different distances from the starting point tells you how much you've got of each sized fragment.

How to do it in this class:

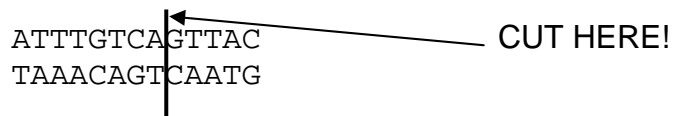
Get a blank "gel" paper for each of the seven suspects.

It is very important that you don't mix DNA from the seven suspects with each other.

Use an imaginary restriction enzyme called **AG**. This enzyme cuts the DNA every time it finds an A followed by a G on the *top* strand of DNA.

SO:

- Read your DNA from left to right. (starting with "GGG")
- Read **ONLY** the **TOP LINE** of letters for each suspect.
- Whenever you come to an A followed by a G, cut the DNA into two pieces at that point and continue reading.



You should end up with a pile of fragments of different lengths.

Count the number of bases in the top line of each fragment. Lay them out on a blank gel page, with the longest fragments at the top and the shortest at the bottom.

Paste the fragments on the gel page next to the numbers corresponding to their length

Do a separate page for each suspect.

Compare your gels to the gel of the murderer.

Who matches?

Suspect 1:

GGGAATCGCTACATCTTGAAGGGTTCACCTTGGCCACTAGGTGTGTAGAGTCATAGACG
CCCTTAGCGATGTAGAACTTCCCAAGTGGAACCGGTGATCCACACATCTCAGTATCTGC

Suspect 2:

GGGCTAGCTAGCTTTTTGCATGCGAAATCATGGCTCAGTCCCGAATCTCGTTAGCTATCT
CCCGATCGATCGAAAAACGTACGCTTTAGTACCGAGTCAGGGCTTAGAGCAATCGATAGA

Suspect 3:

GGGTCGTCAGTCTGACCCTTCTAGAGTCGTAGCTGAAAGGCTTCTTTTCGAAATGGAGAC
CCCAGCAGTCAGACTGGGAAGATCTCAGCATCGACTTTCGAAGAAAGCTTTACCTCTG

Suspect 4:

GGGATCGGGGTCCCATCGTCCGCAGGAGATTTTCGAGGGTCTGAAAGTTTTTTCTAAT
CCCTAGCCCCAAGGGTAGCAGGCGTCTCTAAAAGCTCCAGACTTTCAAAAAAGATTA

Suspect 5:

GGGAACGTCGCAGTACCGTTAGGGTCGTCAGAATCGTCAGCTGACCACAACCCGCGATT
CCCTTGCAGCGTCATGGCAATCCCAGCAGTCTTAGCAGTCGACTGGTGTTGGGCGCTAA

Suspect 6:

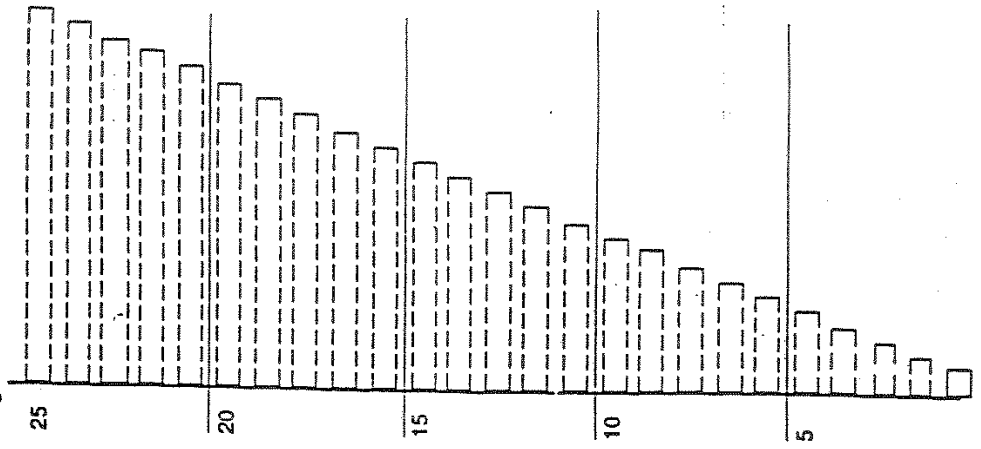
GGGCGAGGTTTCGATTTAAAGTATACGTCTGCCCGTTAAAGTCAAGCTCGTAACGGTAG
CCCGCTCCAAGCTAATTTTCATATGCAGACGGGGCAATTTTCAGTTCGAGCATTGCCATC

Suspect 7:

GGGCTGACAATAAGGTTCCCCCTTGTCGTCGTAGTAGAGATCGGCGATGGGTCAGATAT
CCCGACTGTTATTCCAAGGGGGAACAGCAGCATCATCTCTAGCCGCTACCCAGTCTATA

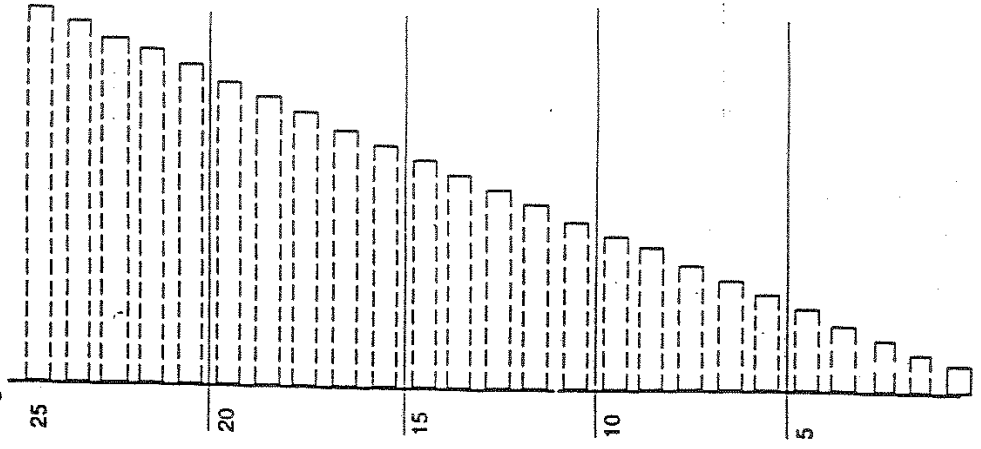
GEL for SUSPECT # _____

number of
bases in the
fragment



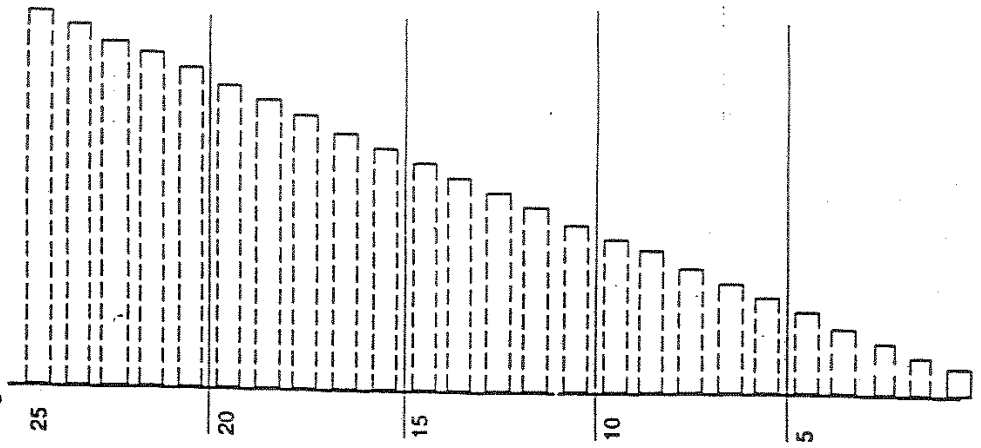
GEL for SUSPECT # _____

number of
bases in the
fragment



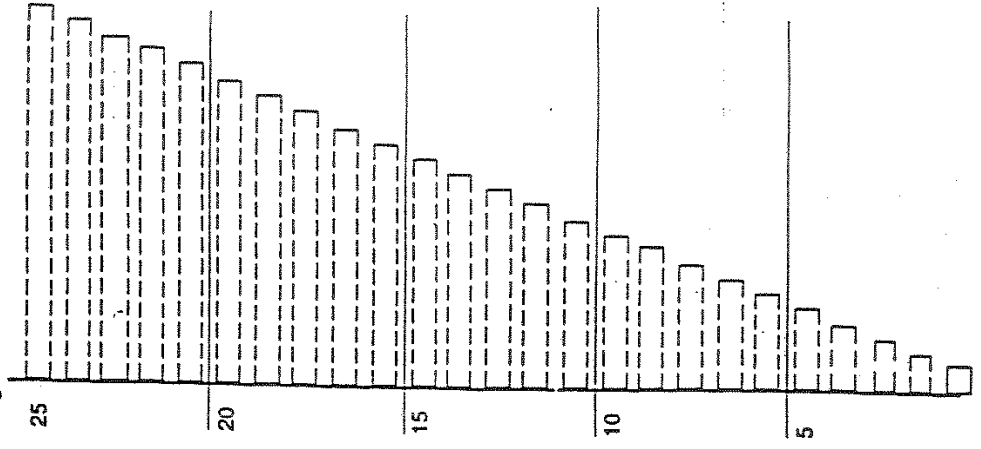
GEL for SUSPECT # _____

number of
bases in the
fragment



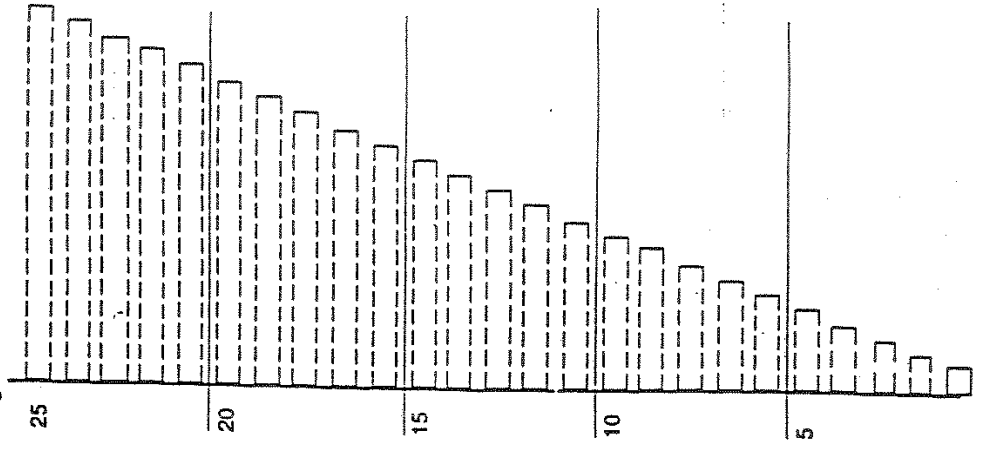
GEL for SUSPECT # _____

number of
bases in the
fragment



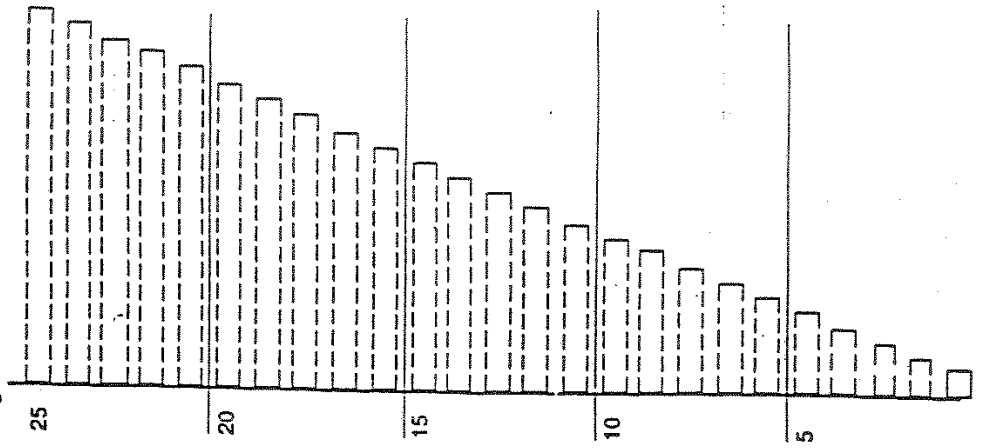
GEL for SUSPECT # _____

number of
bases in the
fragment



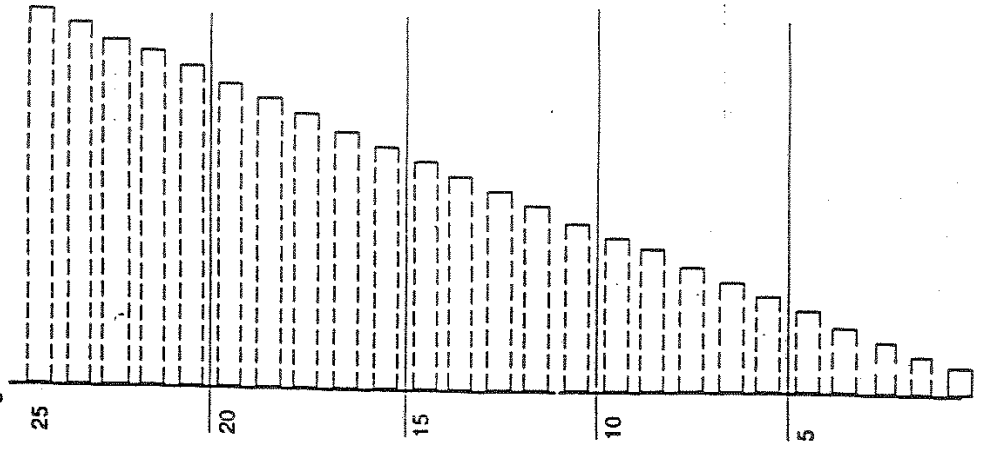
GEL for SUSPECT # _____

number of
bases in the
fragment



GEL for SUSPECT # _____

number of
bases in the
fragment



GEL for MURDERER

number of
bases in the
fragment

