

The Science of Crime Scene Investigation - Instructor Copy

This lesson uses stations, as supplies are limited. Have your group start on either part A or part B depending on how crowded each station is. Once you've finished the first part, go on to the next one (either B or A). Finally, do part C. The reason for this is that parts A and B should produce conflicting results (both suspects use this bathroom, after all). C is a little less ambiguous and should lead them to the more likely "criminal" (Cary).

A. Fingerprints

No special instructions for doing the activity - they just put their prints on the worksheet and analyze the differences present in fingerprints. If the transfer device isn't working, or we don't have one, this alternative method should work:

Backup method:

Materials:

- Paper
- A soft (e.g. #2) pencil

1. Make a fingerprint-sized square on the piece of paper
2. Fill it in with the soft pencil for ~30-60 seconds. The goal is to deposit a lot of graphite.
3. Press the finger you want to get a print of into the square. Pick up as much graphite as you can.
4. Carefully (without smudging) press your finger onto a blank part of the piece of paper.

Answer to the matching question:

Kelly is a match, Cary is not

B. The Chemistry of Identifying Unknown Substances

The unknowns are:

- A. Corn starch
- B. Sugar
- C. Alka-Seltzer

The match in this case is Kelly.

C. Genetic Analysis of DNA (do this last!)

If you're running low on time, you can skip the first exercise (or just do BamHI as a group)

The example DNA sample should be read as one long piece - the numbers 1-6 don't mean anything and they aren't separate samples.

The enzymes recognize the DNA pattern and cut - so one match = 1 cut = makes 2 fragments.
Count the number of bases to get the length.

Answers:

Enzyme	# cuts	# fragments	lengths
BamHI	3	4	9, 54, 67, 8
HindIII	4	5	19, 32, 49, 22, 20
EcoRI	3	4	32, 46, 31, 29

The match in this case is Cary.