Scenarios: Gel electrophoresis

Crime Scene setup - who killed the pet?

Materials

<table>
<thead>
<tr>
<th>Aquarium with dead pet (rubber snake)</th>
<th>Bottle of poison (water with a skull and cross bone)</th>
<th>Criminal’s hair left at the crime scene</th>
<th>Ziplock bag for evidence</th>
<th>Water dish</th>
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</thead>
<tbody>
<tr>
<td>Fingerprint</td>
<td>(4) 1.5 mL tubes</td>
<td>Tweezers</td>
<td>Ink pad</td>
<td>Cue tips</td>
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Day 1 Crime scene setup:

Mrs. McCook and Mrs. Lewis have been fighting over the pet snake that they found abandoned on the side of the road for weeks now. They both want to have it in their classroom and haven’t been able to come to an agreement. It has recently been kept in Mrs. Baisden’s room until an agreement could be made. This morning we found the snake and it had been poisoned. Left at the crime scene was a note that said “If I can’t have him no one can have him”

We need to figure out who killed the pet snake?

Students can then be taken to the crime scene where they will collect evidence, (hair from criminal, fingerprint, scales from snake)

Evidence must also be taken from suspects (Lewis and McCook)

- Could use spit (water)
- Skin cells (swab hand)
- Hair

DNA

Student will then collect DNA from the different teachers. The DNA will be sent out for extraction at a DNA lab. DNA banding patterns will include

1) Lambda DNA uncut (Suspect 1 and killer)
2) Lambda Hind III (Suspect 2)
3) Lambda EcoR I (Pet snake)

So the students can see what will be happening at the DNA lab they will then do a virtual DNA extraction lab [http://learn.genetics.utah.edu/content/labs/extraction/]
Day 2: Gel electrophoresis

Students will be given different Suspects DNA and will micropipette loading dye and DNA together.

Each student will get the chance to load a DNA sample into Agarose gel. The gels will be run in a gel electrophoresis box in 0.25 TAE running buffer, stained using 5x fast blast stain, and then dried down.

During the time it takes the gel to run a short power point on how gel electrophoresis and agarose gel works can be given.

Materials:
- 1 gel box
- 1 10mL agarose gel
- 1 tube rack
- 1 box of pipette tips
- 1 micropipetter
- 4 DNA samples (Pet, CS, S1, S2)
- 1 power box
- 500 mL 1X TAE buffer
- 1 plastic tray (for staining)
- 50 mL 5X FastBlast stain

Procedure:

1. _____ The gel and the buffer have already been prepped and placed in the gel box.

2. _____ Remembering correct pipetting procedures, add 5.0 µl loading dye to all 4 DNA samples.

3. _____ Pipette 10.0 µl of DNA into their appropriate wells using the figure above.

4. _____ We will be running 2 gels to a box. Once both groups have loaded their DNA, place the lid on the gel box. Do not hook up the power box until both groups have loaded the DNA into their gels.
5. ____ Make sure the power box is off and plugged into the outlet. Connect the black and red wires to the appropriate outlets on the power box. Power on the gel box and make sure the current is set to 100 V.

6. ____ Once the box is turned on there should be bubbles rising on the sides of the gel box.

7. ____ It will take some time before we can analyze the results (20 – 30 minutes). You need to let the colored dye run ½ to ¾ of the way down the gel.

8. ____ Once your DNA has migrated to an appropriate length, power down the power box and remove the lid.

9. ____ Using gloves, remove the gel carefully and place it in the tray with the FastBlast stain. Leave it in the stain until you begin to see bands. You can then compare each suspect to the DNA left behind by the suspect.