Forensic Investigation!

*Note: There are two versions of this presentation: the one entitled “Forensic Investigation” is for if the materials are available to perform an electrophoresis experiment, or to show a Youtube video which covers the experiment; the one entitled “Forensic Investigation – Computers” is an option for if the materials for electrophoresis are not available and instead a class set of computers can be used for a virtual experiment.

Materials:!

- Bottled water
- Clear dish soap
- Food dye (blue was good for contrast)
- Table salt
- Isopropyl alcohol
- Stir sticks (wooden were fine)
- Small rectangular plastic box
- Stainless steel wire (24-18 gauge) and wire cutters if need be.
- 5 – 9 Volt batteries
- 2 – Alligator clip leads
- Styrofoam tray or flat piece
- Measuring spoons
- Baking soda
- Agarose powder (available online or at chemical retailers on-campus)
- Microwave
- Food colouring dyes (3 colours)
- Graduated cylinder or other measuring utensil

***Note: IF YOU’RE DOING YOUR OWN ELECTROPHORESIS, prepare the gel ahead**

What is DNA?!

1. …stands for Deoxyribonucleic Acid
2. What is DNA made of? *Building blocks called* ***nucleotides****, which contain a phosphate group, a sugar group, and a nitrogen base: one of* ***adenine (A), thymine (T), guanine (G), and cytosine (C).***
3. Where is DNA found? *In the nucleus of cells.*
4. What is the function of DNA? *It carries the instructions for an organism to develop, survive and reproduce.*
5. Why is it important? *It's what makes us all different, and lets us survive! Our cells could not live and reproduce to replace themselves* if there was no DNA.

Extracting DNA!

1. Explain that we are going to do a DNA extraction from the students' cheek cells. Students may opt to not participate.
2. Instructions:
    a. Hand out a clear cup to each participant
    b. Mix 500 mL drinking water with 1 tbsp of salt. *We prepared salt water*

2. (If available) Afterwards, revisit the real gel electrophoresis set-up to see if things have changed.

Sources:!

1. DNA information: <https://www.genome.gov/25520880>
2. “Gel Electrophoresis and Forensic Science: Biotechnology Science Fair Project”: https://www.youtube.com/watch?v=QWkfXjGohVk
3. “Create a DNA Fingerprint”: