SfS Away from the Classroom!

C09: Electrophoresis (Recommended for Grades 6-8)

Please use the following resources to learn about electrophoresis!

Watch this Videos: https://www.youtube.com/watch?v=ZDZUAIeWX78

Answer these questions:

- What charge does DNA have?
- What characteristic does electrophoresis sort for?
- What can electrophoresis be used for?

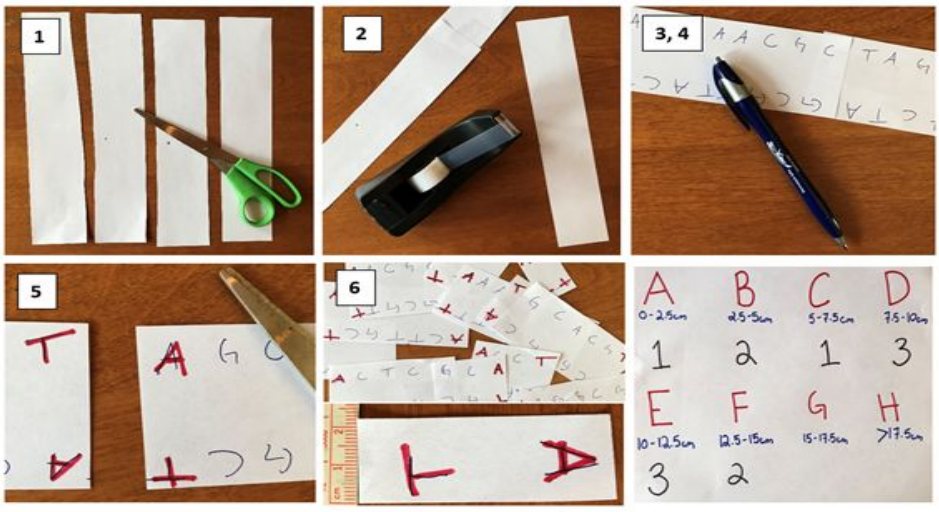
Activity 1: Follow these directions to practice the steps of electrophoresis.

You will need:

• 8.5” x 11” paper • Pencil	• Scissors • Tape	• 1 Die • Ruler (cm)

1. Cut a piece of computer paper into four strips the long way.

2. Tape the four strips together at the short ends to make one long strip of paper. This will be your DNA strand!



3. Starting at one end of the strip of paper.
   - Roll the die and write a letter on the edge of the paper.

   If you roll:
   - 1 or 2: write C (cytosine)
   - 3: write T (thymine)
   - 4: write G (guanine)
   - 5 or 6: write A (adenine)

   Continue rolling the die and writing a letter until you’ve reached the end of the strip of paper.

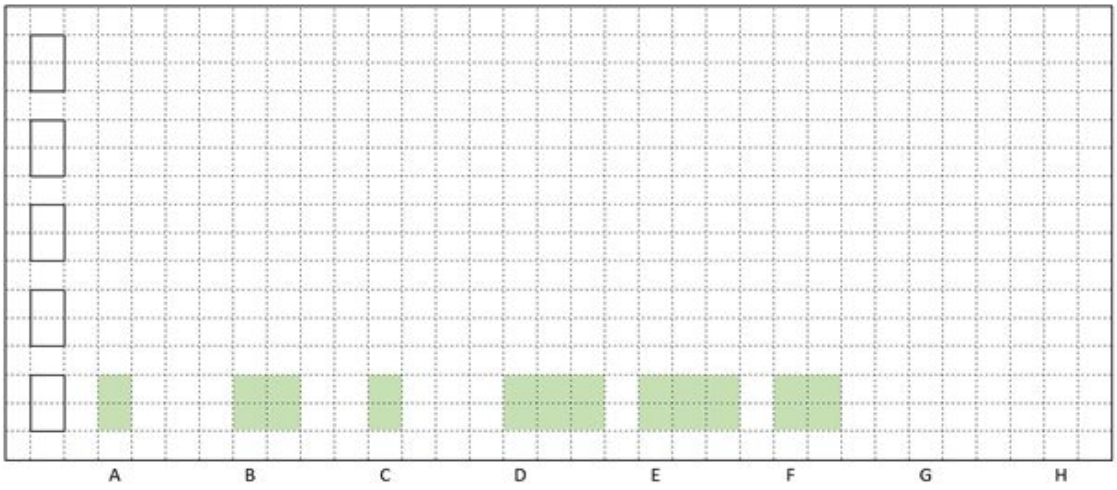
4. Write the complementary strand on the opposite edge of the paper.
   Adenine (A) pairs with thymine (T). Guanine (G) pairs with cytosine (C). This means that anywhere you see a G, write a C on the complementary strand, and vice versa! Anywhere you see an A, write a T on the complementary strand, and vice versa.

5. Wherever you see an A followed by a T in the DNA sequence (reading along the first side of the strand), cut the paper between the A and the T using your restriction enzyme (scissors). This will give you stacks of spliced DNA.

6. Measure the lengths of the spliced DNA and separate into piles:

DNA length	0-2.5 cm	2.5-5 cm	5-7.5 cm	7.5-10 cm	10-12.5 cm	12.5-25 cm	15-17.5 cm	>17.5cm
Group	A	B	C	D	E	F	G	H

7. Count the number of DNA sections in each letter group and plot them on this electrophoresis gel chart. (example is shown in green). Each section of DNA is one square above each letter section.



Make observations & use Claims, Evidence, and Reasoning!

1. **Claim**: Electrophoresis separates molecules based on their sizes.
   - **Evidence**:
   - **Reasoning**:

2. **Claim**: Small molecules move faster than large molecules.
   - **Evidence**:
   - **Reasoning**: