CREATURES OF LIGHT

BIOFLUORESCENCE/BIOLUMINESCENCE

Instructions: In Part 1A, you will learn about the process of biofluorescence. Set up the "Fluorescence in Spinach Experiment" with your group. While waiting during Step 4, proceed to Part 1B and answer Questions 4–8.
Proceed with Part 2A instructions and

CAUTION: Wear goggles while handling ethanol.

Materials:

- Two 250 mL (1 cup) beaker
- 100 g (½ cup) of spinach
- 75mL (⅓ cup) of ethanol
- Plastic knife
- Coffee filter
- UV light
- Glow stick
- Pencil
- Computer

Part 1A. FLUORESCENCE IN SPINACH EXPERIMENT

Set up your experiment to view fluorescence in spinach. While you're waiting during Step 4, complete Part 1B.

Procedures
1. Finely chop up your 100 g of spinach and place into a 250 mL (1 cup) beaker.
2. Add 75 mL (⅓ cup) of ethanol to the same 250 mL beaker.
3. **Let stand for 20 minutes.** (**Proceed to Part 1B as you wait**).
4. Place the coffee filter above the clean empty 250 mL beaker.
5. Pour your ethanol–spinach solution through the coffee filter into the clean beaker. You should have a clear, green-tinged solution.
6. Turn off the lights in the room (or use a separate room for viewing) and turn on your UV light. Shine the UV light on the side of the beaker through the solution.

Observe the **fluorescence** and answer the questions below:

1. What color do you see? Write down your observations.

2. Why does the spinach solution fluoresce this color? Write a prediction as to why you believe that spinach fluoresces this color.

Part 1B. HOW BIOFLUORESCENCE WORKS
While watching the Biofluorescence video, answer the questions. Make sure to turn them in.

Part 2A. BIOLUMINESCENCE
After cracking your glow stick, write down what you think causes it to glow.

Hypothesis:

Part 2B. HOW BIOLUMINESCENCE WORKS
After you watch the Bioluminescence video and submit your questions in Edpuzzle.

Part 3. DISCUSSION
Class discussion.

1. Hypothesis

2. How is cracking a glow stick similar to the chemical reaction of bioluminescence?

3. What is the difference between bioluminescence and biofluorescence? Compare the spinach experiment to the glow stick model.

4. What is the importance of studying these traits in organisms?

Answer Key