



**Lesson Plan: A Bug's Life**

<b>Lesson Plan: A Bug's Life</b>	
<b>Lesson Objectives</b>	Students will study and illustrate the life cycle of a lightning bug.
<b>Project Objectives</b>	
<b>Grade Level</b>	3-5
<b>Background Information</b>	<p>Lightning bugs, also known as fireflies belongs to the insect family. There are four stages in the life cycle of a lightning bug: egg, larva, pupa, and adult. In mid-summer, females give birth to about 100 spherical eggs and deposit them in the soil. These eggs take 3-4 weeks to hatch. Some eggs are bioluminescent. Next, the lightning bugs enter the larval stage. The larva of lightning bugs are worm-like, with flattened dorsal segments that extend to the back and sides. Firefly larvae glow, so they are sometimes called glowworms. Larvae emerge from their eggs in the summer, and live throughout the winter. In the spring the enter the pupal stage. At this point the worm measures about <math>\frac{3}{4}</math>" in length. When the larva is ready to pupate, it creates a mud chamber in the soil. During this stage, the pupa undergo a process called histolysis in which the larva's body breaks down and special cells called histoblasts trigger processes that transform the larva into its adult form. After 10 days to several weeks, the metamorphosis is completed and the adult firefly emerges. After the firefly emerges its main purpose is to reproduce. They focus on finding a mate and use their bioluminescence to signal compatible fireflies of the opposite sex.</p>

<b>Materials/Resources</b>	-colored construction paper -pencils -erasers -sharpies -glow in the dark paint -paint brushes
<b>Vocabulary</b>	Bioluminescence Histolysis Histoblasts Metamorphosis
<b>Activities</b>	Students will illustrate the life cycle of a lightning bug using glow in the dark paint. <ol style="list-style-type: none"> <li>1. Demonstrate how to draw the life cycle using simplified shapes, patterns, and objects.</li> <li>2. Students will draw each stage of the lightning bug's life separating each stage with an arrow and arranging it so that it forms a circle. Use a pencil to draw each stage.</li> <li>3. Students will outline their drawings with a black sharpie.</li> <li>4. Students will fill in the outlines with glow in the dark paint.</li> </ol>
<b>Student Reflection</b>	<ol style="list-style-type: none"> <li>1. How do fireflies get their signature glow?</li> <li>2. What did you learn about the four stages in the life cycle of a lightning bug?</li> <li>3. Why are the fireflies disappearing? How can you help them recover?</li> <li>4. Have you done a similar type of science illustration activity before? How is this activity similar to and different from the previous activity?</li> </ol>

References

<http://insects.about.com/od/beetles/p/Life-Cycle-Of-Fireflies-And-Lightning-Bugs.htm>

<https://www.pinterest.com/amywinnick/1st-grade-insects/>

<http://animals.nationalgeographic.com/animals/bugs/firefly/>

<http://www.firefly.org/>