by Cindy Steele

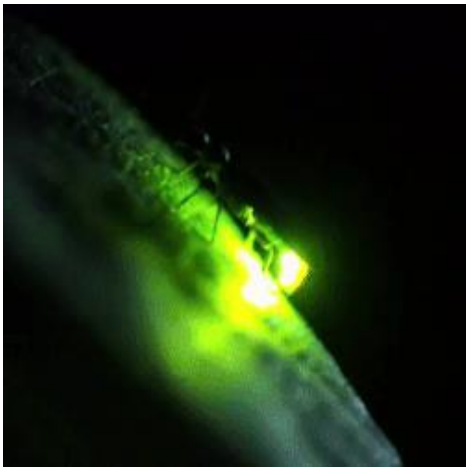
The Magical World of Fireflies!

Welcome back to Puddles' Craft Corner. It's a quiet, warm summer evening with no human in sight for miles in the woods. As the sun sets, tiny flashes of light start to flicker throughout the trees. At first, there's just a few, but soon hundreds of blinking lights are floating in the forest. Fireflies have come out for the evening.

It's the middle of the summer and it's time for one of the most magical times of the year! Most of us remember running outside at dusk with a jar in hand. Even as children, we knew that summer nights become magical when the fireflies flash their brilliant behinds in a spectacular display of lights. With approximately 2,000 firefly species around the world, these night-loving insects can be found near wet and wooded areas all over the world.

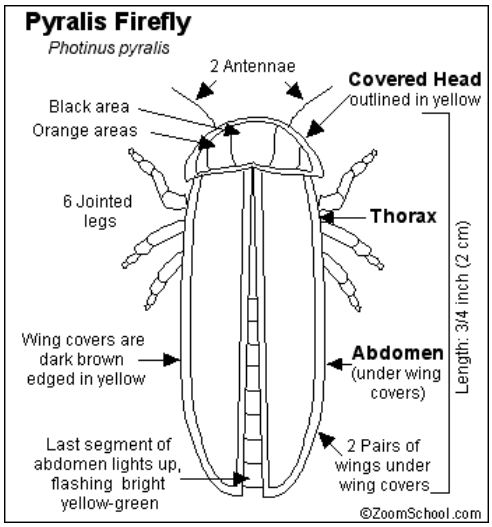
Call it a lightning bug, a glow bug, or a firefly. Just as long as you remember it's a winged beetle, not a fly! Fireflies are from the *Lampyridae (say "LAM-puh-rid-eye")* family, which sets them apart from all of the other beetles. To be a member of this special family, a beetle must be able to glow.

Fireflies have a special light-making organ, called a *photic organ*, located just below their abdomen. To make light, the fireflies take in oxygen, which mixes with a natural substance called *luciferin (say "loo-SIF-er-in")* found in the cells of these organs. A recently discovered oxygen electron, called the *superoxide anion,* causes a chemical reaction to occur and the fireflies light up. This whole process is called *bioluminescence*.



Fireflies use bioluminescence to communicate and find potential mates. Each firefly species has their own unique light pattern, so they can attract mates of the same species. It works like a flashing fingerprint, which is helpful when they need to find each other in the dark.

Here's a cool fact about the bioluminescence of fireflies: when a firefly lights up, it produces almost no heat. Unlike a light bulb, nearly all of the energy source emitted from the firefly is light. This is a win for the firefly because otherwise the poor bug would literally go down in flames!




Fireflies have two pairs of wings! The forewings, called *elytra (say "EL-i-truh")*, are hard and act as a shield to protect the abdomen. When in flight, the firefly holds out the elytra for balance—picture the wings of an airplane—while the soft and leathery hindwings beat and help control the beetle's movement. They have six legs, an orange/red section with a black dot behind their black head, and two black and white antennae.

This diagram is great to use to learn a bit about the body of the fantastic firefly.

*Another amazing firefly fact! Simultaneous bioluminescence* is an incredible phenomenon where fireflies flash at the SAME TIME! This only happens in two places (TWO!) in the ENTIRE WORLD: the Great Smoky Mountains National Park in Tennessee, USA, and southeast Asia. People travel from all over the world to these two special places to witness this phenomenon of nature.

Firefly simultaneous bioluminescence in the Great Smoky Mountain National Park

Puddles', the Blue Goose, is excited to share a fun craft about these luminous summer visitors. Hands-on activities are some of the best ways for kids to learn about something. Hands-on activities allow children to use their senses while learning. They see, touch, and move real objects to complete tasks. This means that science, nature, and more are amazingly brought to life! Children begin to understand the meaning behind what they are doing.

Now, let's gather up some simple materials to create our very own glowing, "bioluminescence" firefly.

# Firefly Craft

In order to make our glowing firefly anatomically correct, let's look at a close-up picture.

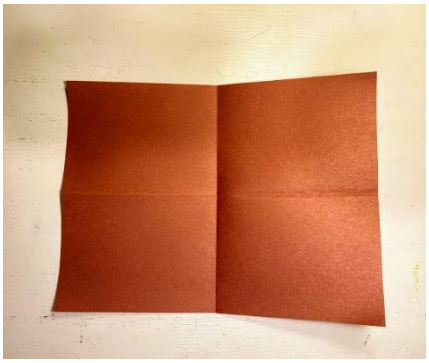
**Materials**

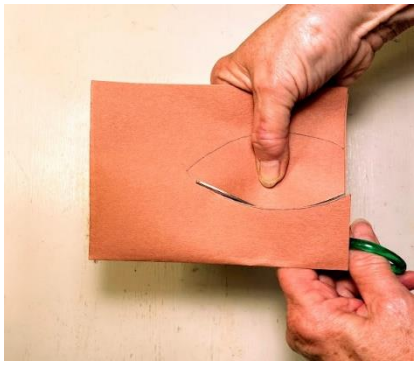
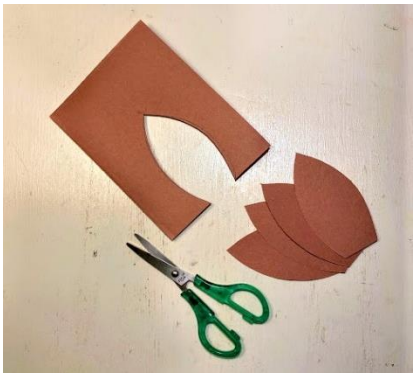
1. One empty plastic bottle
2. Glow-in-the-Dark sticks
3. One piece of brown construction paper
4. Four black chenille stems (pipe cleaners)
5. One white chenille stem (pipe cleaner)
6. Two googly eyes
7. Red and black acrylic paint
8. Paint brush
9. Pencil
10. Scissors
11. Glue
12. Yellow crayon, marker, or paint marker

1. Gather all materials.

2. Paint the bottle cap black and the neck of the bottle red.

3. While paint is drying, cut out the four wings. Since fireflies have four wings, we want to be sure we add all four. It's easy to cut all four wings at one time. Fold the piece of brown construction paper twice to make it four layers thick. Draw on a wing and cut out all four wings at once.



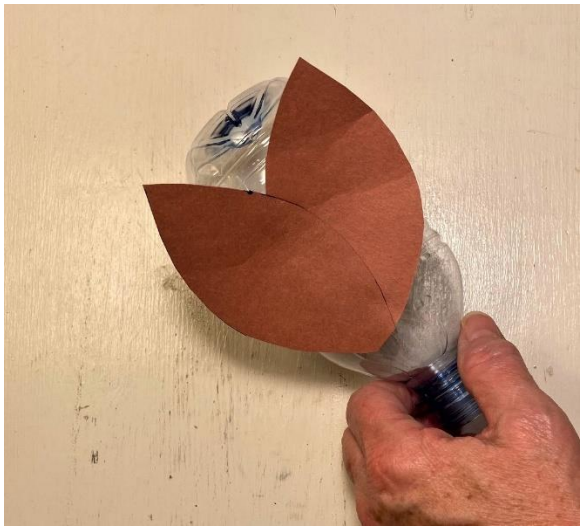



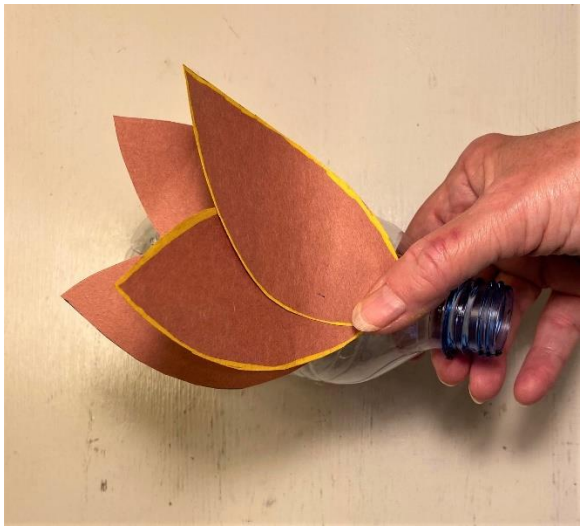
4. The top two hard wings, called elytra, are outlined with a yellow line. Use a yellow crayon, marker, or paint marker to line two of the wings. Next, glue those two yellow-lined wings together and glue the other two wings together.

5. Take three of the chenille stems (pipe cleaners) and twist them around the bottle to make six legs. Adjust the legs so the firefly will sit steadily. *I trimmed the back four legs a bit shorter to help the firefly sit straight.

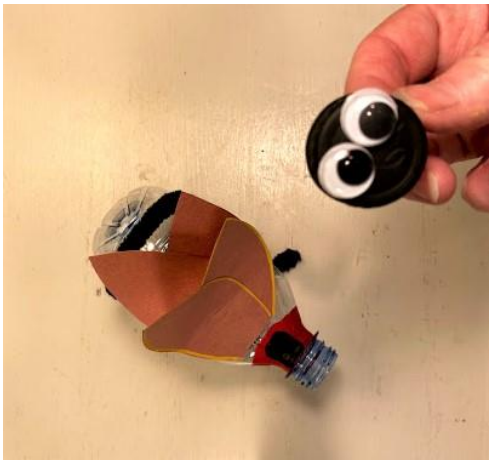
6. Draw the black spot that is on the red section behind the head.  You can draw it on with a permanent marker or paint it on with the black paint.

7. Glue the wings to the bottle.  Glue the lower wings that aren't lined in yellow first.  Glue them a bit back from the red ring.  Next, glue the yellow-lined wings in front of the unlined wings.  Curl the wings a bit.

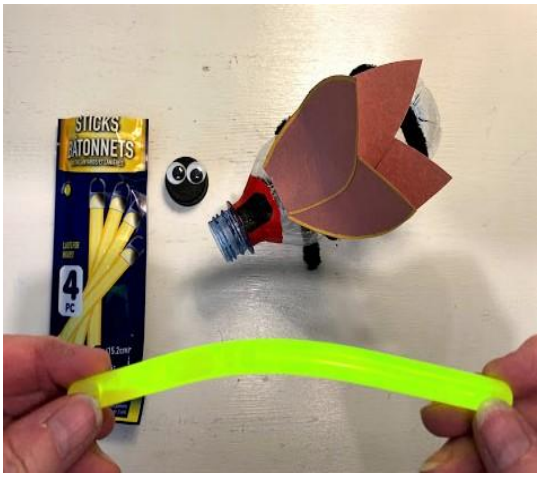




8. Glue wiggly eyes on the front of the black-painted bottle lid.



9. Take out one of the light-up tubes. Bend it to crack the interior so it will glow. Once it is fully glowing, place the tube inside the bottle and screw on the lid making sure the eyes are straight.



10. Since the antennae on the firefly are black and white in color, we're going to make our antennae anatomically correct.  Take the last black chenille stem and the white chenille stem, twist them together, bend in half, trim to shorten, and glue the antennae right behind the head.

11. Finally, turn out the lights and marvel at your very own glowing firefly!  The only thing better than seeing it like this will be taking it outside at night to make a light-filled flight around your yard!

**Books About Fireflies**

If you would like to take this one step further and learn more about fireflies while reading a charming children's book, here are some great books with beautiful artwork:

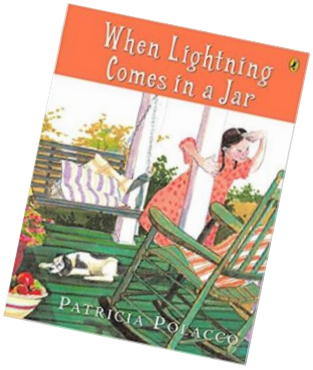
*When Lightning Comes in a Jar* by Patricia Polacco

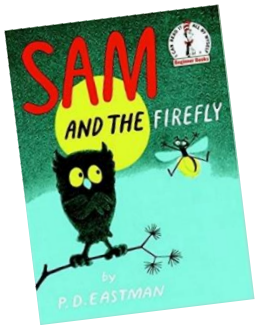
*The Very Lonely Firefly* by Eric Carle

*Fireflies!* by Julie Brinckloe

*How to Survive as a Firefly* by Kristen Foote

*Sam and the Firefly* by P. D. Eastman






Puddles is so excited about our upcoming August craft. We'll be making something that just screams, or "buzzes", summer! Hint…it is something that we "hear" in late summer every year. See you next month!