

Observe Creatures That Glow

OVERVIEW

In these activities, students will hone their observation skills while learning about bioluminescent animals.

- **Before Your Visit:** Students will practice observing animals and identifying body parts, then be introduced to some animals that glow.
- **During Your Visit:** Students will focus on specific animals and how the light they emit helps them survive.
- **Back in the Classroom:** Students will share their findings and demonstrate how bioluminescence can help an animal communicate.

NYS Science Core Curriculum

LE 3.1a: Each animal has different structures that serve different functions in growth, survival, and reproduction.

BACKGROUND FOR EDUCATOR

Bioluminescence is a chemical reaction that takes place in an organism and produces detectable light. These organisms use a variety of body parts to emit light in different colors and for different purposes. Eighty percent of all bioluminescent groups live in the world's oceans, from the shallows to the deep sea floor; they include fish, plankton, crustaceans, and jellyfish. Although less common, bioluminescence also occurs on land in some insects and fungi. Scientists have observed organisms using bioluminescence in many different ways. These include self-defense, illuminating or luring prey, camouflage, and attracting mates.

BEFORE YOUR VISIT

1. Activity: Observe Animal Body Parts

Materials: pictures or models of animals, including (but not necessarily limited to) insects, fish, and jellyfish.

Pair students up, and give each pair one animal picture or model. Students may start by naming parts of their own bodies (e.g. arms, legs, head, eyes). Next, have them closely observe the photo/model. Ask students to identify the animals' various body parts and explain their purposes. Ask: How do these body parts help this animal live/survive? What's the corresponding part of your body? How are the two similar or different? (*Answers will vary.*) Have students discuss their observations with each other, and if time allows, share their observations with the class.

2. Activity: Prepare for the Exhibition (Animal Investigation Team Formation)

Uses worksheets with diagrams of individual bioluminescent animals to prepare students to explore the *Creatures of Light* exhibition. Use your discretion when assigning diagrams and deciding what size groups to create. For a more intensive experience, groups may be given multiple animals to investigate.

Materials: copies of animal worksheets: Firefly, Jellyfish, Deep-Sea Anglerfish, Stoptlight Loosejaw Dragonfish, Vampire Squid, Bristlemouth

Plan how your students will explore *Creatures of Light* using the Animal Investigation Worksheets (see pre-visit activity #3). Since the exhibition will be dark, we recommend that students take mental notes in the exhibition and record their observations afterwards.

Before your visit, divide your class into six teams: Firefly, Jellyfish, Deep-Sea Anglerfish, Stoptlight Loosejaw Dragonfish, Vampire Squid, and Bristlemouth.

At the Museum, each group should be facilitated by a teacher/chaperone as they explore the exhibition. Distribute copies of the corresponding **instructions** and **worksheets** to chaperones and students beforehand, and review them together to make sure everyone understands the activities. To each chaperone, also distribute the instructions and one **crayon** of each of the following colors: red, blue, purple, green, and yellow.

Tell students that these are a few of the bioluminescent animals they'll be observing in the exhibition. Split them into as many as 6 groups: (1) Firefly, (2) Jellyfish, (3) Deep-Sea Anglerfish, (4) Stoplight Loosejaw Dragonfish, (5) Vampire Squid, and (6) Bristlemouth. Tell them that each group is an Animal Investigation Team, which will learn as much as possible about its animal. Distribute the worksheets. (All members of each team should receive a diagram of the same animal.) Have the teams look carefully at the animal, then discuss it together: What kind of animal is it? What body parts of it can they identify? (*Answers may include: wings, tentacles*) Where do they think it might live? (*Answers may include: in a forest, in the ocean*) Tell the class that these animals are all bioluminescent. Explain that in the exhibition they will find and study a large model of that animal, identify which part of it lights up, and learn about how the animal might use this light to survive.

DURING YOUR VISIT

Creatures of Light: Nature's Bioluminescence

3rd floor (45 minutes)

Divide your class into the same six groups: (1) Firefly, (2) Jellyfish, (3) Deep-Sea Anglerfish, (4) Stoplight Loosejaw Dragonfish, (5) Vampire Squid, and (6) Bristlemouth. Have an adult chaperone guide the students through the exhibition and facilitate the activity.

Materials:

- For each student: an animal diagram sheet (based on his/her team)
- For each chaperone: instructions, an animal diagram sheet, and five crayons (red, blue, purple, green, and yellow)

Milstein Hall of Ocean Life

1st floor (30 minutes)

In the open space beneath the whale, have students regroup, review, and take notes on the things they saw in the *Creatures of Light* exhibition.

Materials: Same as *Creatures of Light* materials, plus one pencil for each student.

Have students gather in front of the Deep Sea Ecosystem on the right hand side of the upper level*. With this environment as a backdrop, have them continue working on their *Creatures of Light* worksheet by labeling any parts of their animal they can identify, and answering the four questions. Alternatively, for younger students, you and/or the chaperones can use the questions to lead a group discussion and record students' responses on a single sheet.

Afterwards, have students practice their observation skills by spotting animals in the Deep Sea display and discussing which body parts they can identify and what their functions might be.

***Note:** If you have a very large group, you may choose to conduct this activity in front of one of the Lower Level dioramas under the whale, where there is more space; e.g. the Dolphin and Tuna diorama on the left-hand side.

BACK IN THE CLASSROOM

Students will share their findings, and demonstrate how bioluminescence can help an animal communicate.

Activity: Sharing Observations & Recording Findings

Materials: One clean copy of each worksheet (enlarged, if possible); blue, green, purple, red, and yellow crayons; black markers for labeling

Have student groups present what they learned in *Creatures of Light* to the rest of the class. Post clean copies of all of the animal outlines in front of the class. Have representatives from each group come up one at a time and fill in the details by coloring in the bioluminescent parts in the appropriate color and labeling the body parts. They can refer to their worksheets. With younger students, you may want to read findings aloud and label the diagrams, and then have students add color. When identifying bioluminescent parts of the animal's body, ask students how bioluminescence helps it live/survive. Include this information on the diagram.

Activity: "Lanternfish Sticks"

Students will create a simple model of a bioluminescent fish, then learn how it uses bioluminescence to communicate.

Go to montereybayaquarium.org/lc/activities/lanternfish_sticks.asp for full instructions and materials. Be sure to follow the link at the bottom for instructions on conducting the activity with the fish.

Instructions for Chaperones

Check your assigned Animal Investigation Team:

- Firefly Jellyfish Deep-Sea Anglerfish Stoplight Loosejaw Dragonfish
 Vampire Squid Bristlemouth

- deep-sea anglerfish
- stoplight loosejaw dragonfish
- bristlemouth
- vampire squid

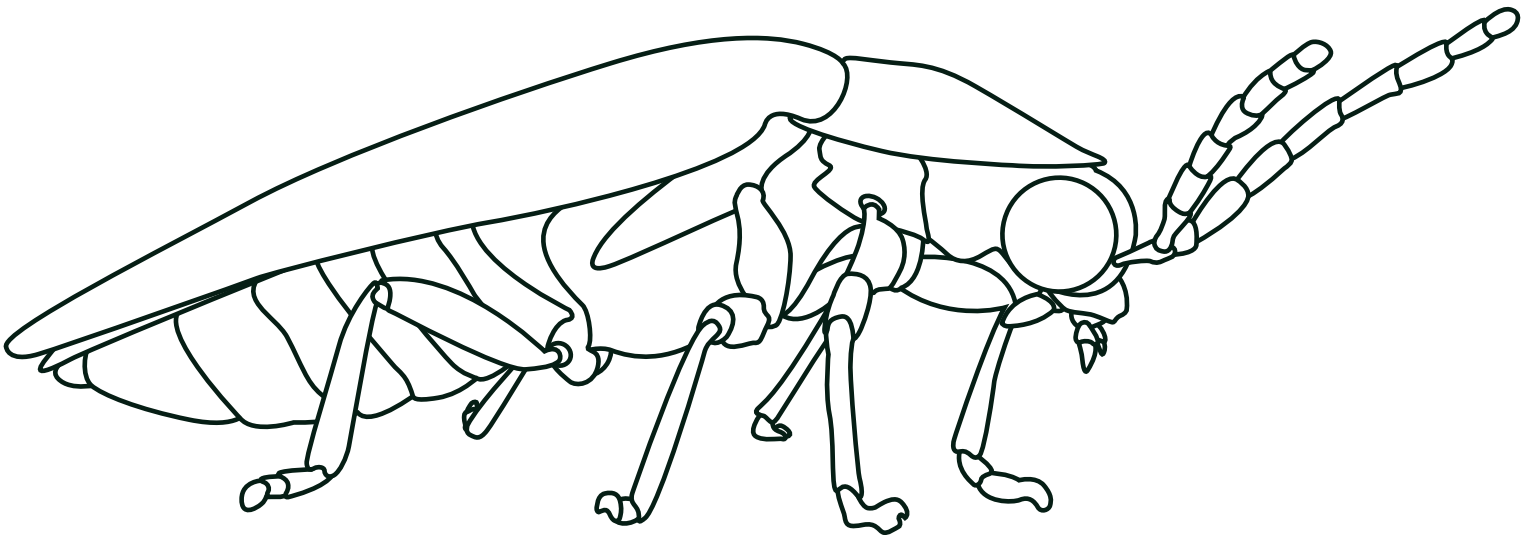
1. **Before entering the exhibition**, tell students that they will need to pay attention to each animal model they encounter so that each group can find and recognize its animal.
2. **When a group of students has found its animal**, gather around the model.
3. **Ask students to identify** which part of the animal is glowing and what color that part is.
4. **Pass around the corresponding color crayon** and have students take turns coloring in that body part on their sheet. (If it's too dark, do this step after the exhibition.)
5. **While students are coloring**, prompt students to make observations about the animal. (They do *not* need to write these answers down while in the exhibition.)
 - How many body parts (glowing or not) can you identify?
 - What does the animal use these parts for?
 - What purpose might the bioluminescence serve?
 - Are there any clues around the animal or on the panels nearby?



Student Worksheet

TEAM: Firefly

Name: _____

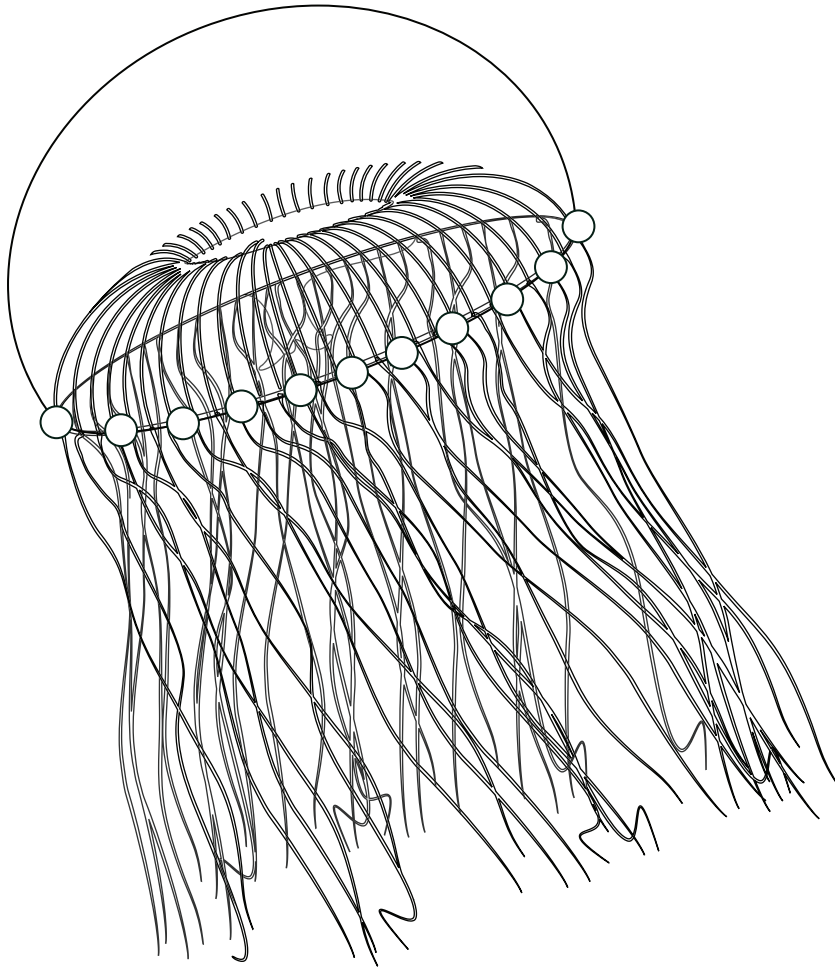


Describe the environment that your animal lives in.	How does your animal use this light?
What parts of your animal are glowing?	What color is the light?

Student Worksheet

TEAM: Jellyfish

Name: _____



Describe the environment that your animal lives in.

How does your animal use this light?

What parts of your animal are glowing?

What color is the light?

Student Worksheet

TEAM: Deep-Sea Anglerfish

Name: _____



Describe the environment that your animal lives in.	How does your animal use this light?
What parts of your animal are glowing?	What color is the light?

Student Worksheet

TEAM: Stoplight Loosejaw Dragonfish

Name: _____

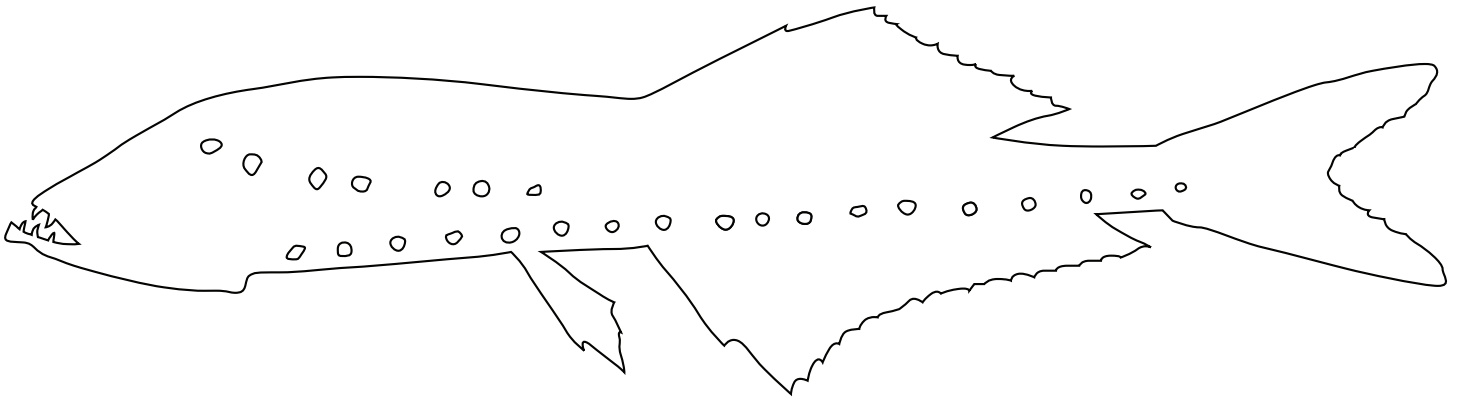


Describe the environment that your animal lives in.	How does your animal use this light?
What parts of your animal are glowing?	What color is the light?

Student Worksheet

TEAM: Bristlemouth

Name: _____

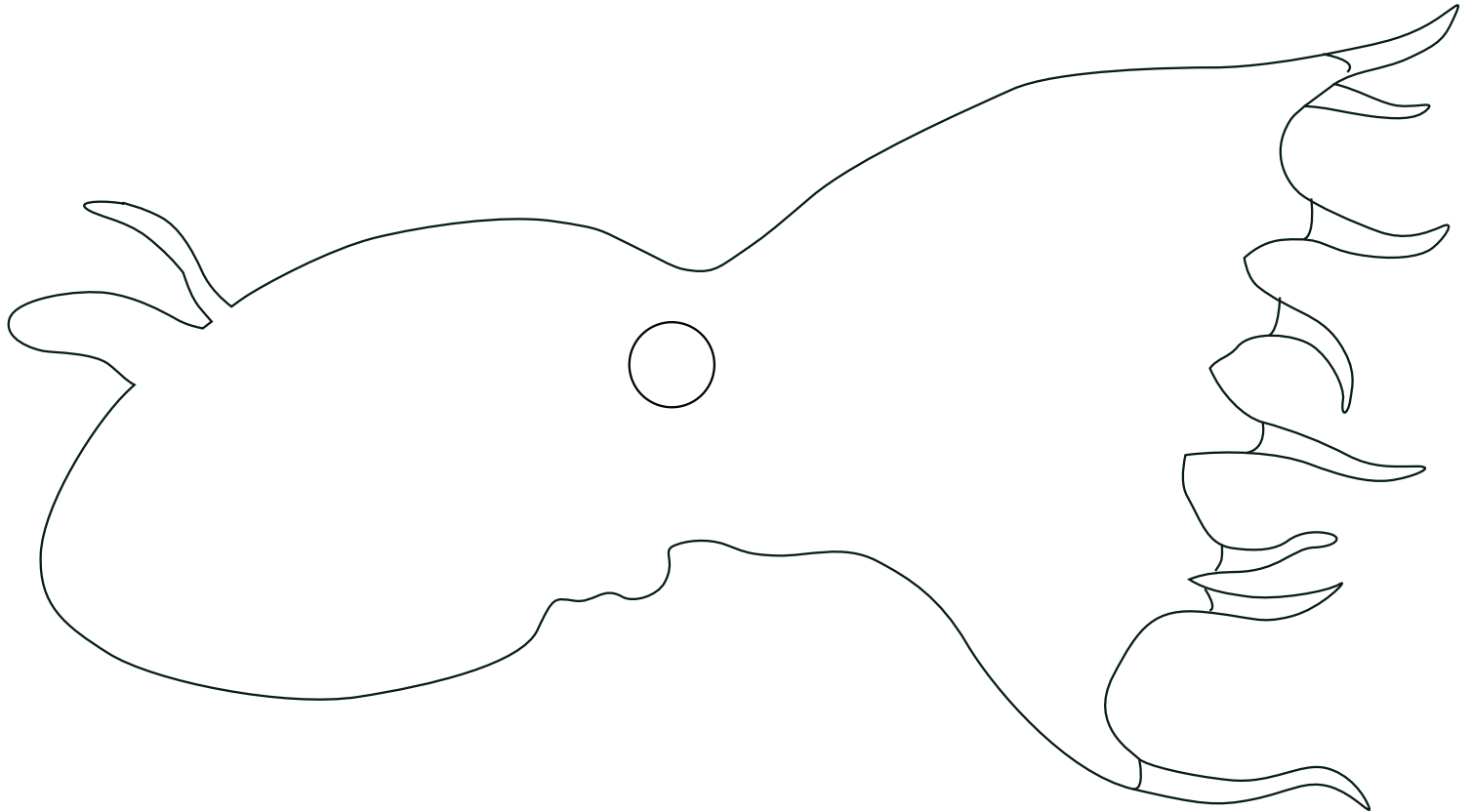


Describe the environment that your animal lives in.	How does your animal use this light?
What parts of your animal are glowing?	What color is the light?

Student Worksheet

TEAM: Vampire Squid

Name: _____



Describe the environment that your animal lives in.	How does your animal use this light?
What parts of your animal are glowing?	What color is the light?