



Red Tide Activity 3: What is Bioluminescence?

Purpose:

To enable students to better understand what bioluminescence is and why it is an advantage for some marine organisms to have the ability to bioluminesce.

Time Required:

- 30 to 40 minutes

Safety issues:

None

Materials:

- Copy of article entitled "Caribbean Nightlight" by Tom Verde
- Copy of "Bioluminescent Dinoflagellates"
- Copy of worksheet entitled "What is Bioluminescence"?

Procedure:

- Either read to the students or have them read the article by Tom Verde on Mosquito Bay.
- Students need access to the print-out on bioluminescent dinoflagellates.
- Have students answer the questions on the worksheet. They may work individually or in groups.
- Discuss answers as a group. Encourage discussion.

Assessment:

As a class, discuss the answers to the questions.

1. Light which is produced as a result of a chemical reaction within specialized structures in the dinoflagellate cell.
2. It acts as a burglar alarm to attract a secondary predator. The primary predator is more likely to be eaten than the tiny dinoflagellate.
3. Chemiluminescent reaction - A chemical called luciferin reacts with oxygen to produce "cold" light, which gives off no heat.

4. **No, due to circadian rhythm you get the greatest build up of chemicals approximately 2 hours into darkness.**
5. **Nutrients, vitamins, currents, light levels, evaporation rates and salinity all play a role in the health of an area.**
6. **Garbage, waste water runoff, fertilizers and boaters all add foreign chemicals to the environment which ultimately affect the health of the dinoflagellates.**

Extensions:

Further research topics could include:

1. **Other areas where bioluminescence occurs**
2. **How pollution affects dinoflagellate blooms**
3. **How tourism impacts these coastal areas.**

Internet Links:

Bioluminescent dinoflagellates

Key Words

- **luciferin**
- **circadian rhythm**