

Name _____

Date _____

Determine Central Idea

The **central idea** of an essay is the most important point conveyed in the essay. Sometimes the central idea is stated in the first paragraph, but more often, you will need to infer the central idea that is implied by specific details. You can consider the central idea in the following steps:

- Identify the topic of each paragraph.
- Examine the specific details' the author includes in the paragraph
- Ask what idea or message the details convey about the topic.
- Write a sentence that states the idea or message in your own words.

Read the following informational text and answer the questions.

The Hidden World of Bioluminescence

Deep beneath the ocean's surface exists a phenomenon that seems magical but is entirely natural: bioluminescence, the production of light by living organisms. In the darkest parts of the sea, where sunlight cannot penetrate, approximately 90% of marine creatures possess the ability to generate their own light.

This biological light production occurs when a molecule called luciferin reacts with oxygen, catalyzed by an enzyme called luciferase. The resulting chemical reaction releases energy in the form of light rather than heat,

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creating an efficient illumination that requires minimal energy expenditure—a crucial adaptation for organisms living in the deep sea where food and energy sources are scarce.

Bioluminescence serves multiple purposes in marine ecosystems. Some creatures use light to attract prey, dangling glowing lures like the fearsome anglerfish. Others employ it as a defense mechanism, either by startling predators with sudden flashes or by using illumination to expose their attackers to even larger predators. Many species use patterns of light to communicate with potential mates or to form protective groups.

Scientists have discovered practical applications for bioluminescence in medical research and biotechnology. The genes responsible for producing luciferase have been isolated and inserted into cells to track the progression of diseases, monitor pollution in water sources, and even develop methods for detecting bacterial contamination in food. Some researchers envision future applications including bioluminescent trees that could illuminate streets without electricity or biologically glowing markers for nighttime highways.

As climate change and ocean pollution threaten marine habitats, the study of bioluminescent organisms has taken on new urgency. These creatures not only represent a fascinating evolutionary adaptation but may also hold

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solutions to human problems, demonstrating once again how nature's innovations can inspire human technology.

1. What is the central idea of this passage?

2. Which detail from the text best supports the central idea?

3. How does the author develop the central idea throughout the passage?

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Determine Central Idea-**Answer Key**

1. What is the central idea of this passage?

Bioluminescence is a remarkable natural phenomenon with diverse functions in marine ecosystems and valuable applications in human technology and research.

2. Which detail from the text best supports the central idea?

The explanation of how bioluminescence serves multiple purposes in nature while also having practical applications in medical research and biotechnology.

3. How does the author develop the central idea throughout the passage?

The author moves from defining bioluminescence to explaining its mechanism, ecological purposes, human applications, and future importance, building a comprehensive understanding.