SN IN HIGH SCHOOLS October 29, 2016

Rebuilding Reefs

Article-Based Observation

Directions: After reading the article "Rebuilding reefs," answer these questions:

1. **The author begins the article by comparing a coral reef to a metropolis with "high-rise apartments." Explain this metaphor and identify the point where the metaphor breaks down.**

2. **Explain the role and importance of algae to the survival of coral.**

3. **According to the article, how is the ocean changing? How do these changes affect the algae living within the coral and, ultimately, the coral reef itself?**

4. **What happens during a bleaching event and why is this a concern to scientists?**

5. **What strategies are the scientists in Florida, Hawaii and Australia using to rebuild coral reefs?**

6. **A friend asks what you're reading. Tweet (in 140 characters or less) what this article is about.**

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Rebuilding Reefs

Responses to Article-Based Observation

1. **The author begins the article by comparing a coral reef to a metropolis with "high-rise apartments." Explain this metaphor and identify the point where the metaphor breaks down.**
   Possible student response: A metropolis is a large urban setting, a bustling city. The structure of a coral reef reminds the author of a large city, with the coral polyps living on the corals' hard skeletons and many other organisms living around the coral. The corals are dependent on their symbiotic algae for survival. The reefs, like a city, have built structures. However, in our cities, animals do not grow the buildings and typically don't eat them. Those living within the buildings can interact in ways corals cannot. Also, human buildings don't get bigger with each new tenant.

2. **Explain the role and importance of algae to the survival of coral.**
   Possible student response: Algae live within the corals. They photosynthesize, capturing the sun's energy and turning it into sugar, which they share with the coral. The corals provide the algae with a home and protection from predation. Without the algae, the coral cannot get enough nutrients. This is known as a symbiotic relationship because the organisms live together and benefit.

3. **According to the article, how is the ocean changing? How do these changes affect the algae living within the coral and, ultimately, the coral reef itself?**
   Possible student response: Earth's oceans are warming and becoming more acidic (decreasing in pH). Because algae are very sensitive to the physical conditions in which they live, these changes can lead to a breakdown of the algae-coral relationship. But corals cannot survive for long without the algae. If corals and their algae cannot adapt, the corals may die and the health of the reef ecosystem could suffer.

4. **What happens during a bleaching event and why is this a concern to scientists?**
   Possible student response: A bleaching event occurs when the temperature of the water increases 1 to 2 degrees Celsius for a prolonged period of time. The algae that live within the corals become toxic and are expelled. Without their algae, the corals might not be able to continue building the reef. As bleaching events become more common and more severe, there is concern that organisms that depend on the reef ecosystem, humans included, may no longer find what they need.

5. **What strategies are the scientists in Florida, Hawaii and Australia using to rebuild coral reefs?**
   Possible student response: In Florida, reef fragments are being grown to repopulate larger reef systems. In Hawaii, scientists are breeding corals to be tolerant of conditions expected in the future. In Australia, fertilized coral embryos are being released systematically with the hope that they will take hold in areas that need to be repopulated.

6. **A friend asks what you're reading. Tweet (in 140 characters or less) what this article is about.**
   Possible student response: Coral reefs are under threat due to climate change and human activity. These scientists are finding ways to help.