

April 9, 2022

Deep-sea 'Octomoms' Seek the Heat

Student Discussion Worksheet

Directions: Read the online *Science News* article "[Some deep-sea octopuses aren't the long-haul moms scientists thought they were](#)" and discuss the following questions with a partner. A version of the article, "Deep-sea 'octomoms' seek the heat," appears in the April 9, 2022 issue of *Science News*.

Reasoning through rates

1. Define rate of change and give an example of a biological rate that's not mentioned in the *Science News* article. Make sure you specify the units for your example.
2. What rate is discussed in the *Science News* article? How do you think this rate could be measured, and what might the units of measurement be? How did the researchers described in the article measure the rate, and why do you think they used that approach?
3. How could the rate of a single chemical reaction be measured? What would the units be? How might the rate of a single chemical reaction affect biological rates?
4. Are chemical and biological rates constant? Explain and give examples.
5. Do you think the rate of embryonic development remains constant from fertilization to hatching for deep-sea octopuses? What questions might scientists be able to ask if they had more detail about rate of development?

Impacting rates

1. What environmental factor discussed in the article affects the rate of embryonic development of deep-sea octopuses? Define the factor and explain how it affects the rate?

2. How does temperature typically affect the rate of a chemical reaction? Explain why the relationship exists using the collision model for chemical systems.
3. Based on the explanation above, why might increased water temperature speed rates of development for the octopus embryos?
4. What other factors might affect the rate of a chemical reaction? What other factors might affect the rate of embryonic development? Do you think some of the factors are the same? If so, why?
5. Can you think of any ways that people control biological and chemical rates by taking advantage of temperature or other factors that affect those rates?

