

Here Come the (Bigger) Mammals

Student Discussion Worksheet

Directions:

Read the article "[Here come the \(bigger\) mammals](#)," and use the following prompts to discuss how the asteroid impact believed to be responsible for the demise of the dinosaurs altered Earth's ecosystems and shaped the evolution of life. After discussing the asteroid impact, use the prompts to consider another environmental disturbance, as instructed by your teacher.

The disturbance

1. What was the disturbance?
2. Where did it begin?
3. How far did it spread?
4. How long did it last?

Immediate impact

5. What were the immediate abiotic effects of the disturbance? Consider, for example, how the disturbance transferred energy into, out of or within the system? How did the disturbance change the soil, water or air quality? Did it lead to immediate changes in temperature or precipitation? Did it change the availability of any ecosystem resources? What other effects on the physical environment can you identify?

6. What were the immediate biotic effects of the disturbance? Consider, for example, what types of organisms might have suffered most from the disturbance and why. Would you expect the population size of any organisms to be immediately affected? If so, which ones? What about the carrying capacity? Explain. Are there organisms that weren't affected, or were positively affected? Why or why not?

7. Based on your answers above, how would the biodiversity of the ecosystem differ immediately following the disturbance? What about the quantity and distribution of organisms at various trophic levels (decomposers, producers, primary consumers, secondary consumers and so on)? Which level might be impacted the most?

8. Does the impact at the site of the disturbance differ from the impact on the surrounding environment? If so, how? How might the effects vary with distance from the disturbance?

Cascading effects

9. What effects might follow from the immediate effects described above? Of all the effects discussed, which would have repercussions beyond the end of the disturbance — for decades, centuries or even millennia? Be sure to think about the biotic and abiotic effects.

10. What ecological niches may become available due to the disturbance? Explain. What types of organisms would you expect to first dominate the newly available niches? Draw a graph indicating how the population size of an organism first dominating a new niche would likely change over time. Think about available resources, possible competition and predation, and how these factors would affect and be affected by the population size. Explain your answer.

11. Based on the quantity and distribution of organisms at various trophic levels following the disturbance, how would the composition of the community change over time? Explain what types of organisms would be most successful right after the disturbance, and how and why those organisms might be succeeded by others over time.

12. In what ways might the disturbance drive evolution over time? Explain.

Recovery

13. How would you define “recovery” for a disturbed ecosystem?

14. Based on your definition, can disturbed ecosystems ever “recover”?

15. For conservationists trying to restore or revive ecosystems after a disturbance, what might success look like?