



The Effects of Fungicides on Bumble Bee Colonies

hhmi | BioInteractive

Interactive Video
Student Worksheet

INTRODUCTION

You will watch a short video that explores whether fungicides play a role in the decline of bee populations. The video shows an example of designing an experiment to collect data that can guide the development of sustainable agricultural practices.

PROCEDURE

Play the interactive video [The Effects of Fungicides on Bumble Bee Colonies](#). At various points, the video will pause and ask you to think about the content. You will not be able to continue watching the video until you have answered and saved your response to the prompt. You can record your answers in this worksheet or as directed by your instructor.

As you answer the prompts, keep in mind that some questions do not have a “right answer.” You will have the opportunity to revisit your responses at the end of the video.

1. Before you start the video, consider the following statement: People are concerned that bee populations throughout the world are declining.

Write down a few sentences that summarize what you know about which factors may be contributing to the decline of bee populations.

2. The narrator is interested in investigating the impact of fungicides on bees. Which of the following best describes a fungicide?
 - a. A type of pesticide that uses toxins extracted from fungi to kill pests.
 - b. A type of pesticide that kills fungi and bacteria.
 - c. A type of pesticide that makes plants resistant to fungal pathogens.
 - d. A type of pesticide that kills fungi or inhibits their growth.
3. Shawn wants to determine which species of bacteria and fungi live with bees. In a few sentences, describe a method you might use to identify the microbes.
4. Shawn has a hypothesis that fungicides harm bee development. Using what you now know, describe an experiment to test Shawn’s hypothesis. Be sure your response includes which data should be collected and how you would collect it.

5. Shawn plotted the data in a bar graph with two bars: one representing the number of bees per colony in the control cages and the other representing the number of bees per colony in the cages exposed to the fungicide.

If the results support the hypothesis that fungicides harm bee development, what would you expect this bar graph to show? Describe the expected pattern in a few sentences.

6. Are the results consistent with what you expected? (Yes/No)
7. What do you conclude from this experiment? Write your conclusion in a few sentences.
8. Shawn explains that many studies have shown that directly spraying bees with fungicides doesn't harm them. Are those results consistent with what Shawn has discovered? Explain your answer in a few sentences.
9. Shawn has made progress in understanding how fungicides may impact bee colonies, but there is still work to be done. Can you suggest additional research that you think would help us better understand how fungicides affect bees?
10. How could farmers use the knowledge gained in this study to reduce possible harmful effects of fungicides on bees?
11. Do people have a responsibility to protect bees? Write down a few sentences to capture your thoughts.