

## Check your understanding



**1** Why did the scientists move the mice outdoors?

*Answer* Scientists hypothesized that the environment affects a host's susceptibility to gut worms. Here, the environment is the independent variable (manipulated variable). To test that hypothesis they needed to change the environmental conditions. So they moved some groups of mice outdoors and kept a group in the lab.

**2** Why did the scientists test genetically identical mice?

*Answer* Scientists know that genetics have an impact on a host's susceptibility to gut worms. Because they decided to test the effects of the environment, scientists had to keep genetics constant (controlled). For this reason they tested genetically identical mice – like human twins.

**3** Living outdoors exposed mice to natural microbes. How did this environment affect the ecosystem living inside the mice?

*Answer* The mice's gut microbes became more diverse in general. The scientists also identified different types of bacteria in the gut ecosystem.

**4** How did the changes in the mice's gut microbes affect the mice's susceptibility?

*Answer* The outdoor mice became more susceptible to worm infections. Their gut microbes provided food to the worms and prevented the mice from producing effective immune responses to combat worms.

**5** Scientists use models to study the natural world, to mimic human diseases, and to communicate explanations for what they observe. Although models are very useful and helpful, they may have limitations. Think about a model you used or created in science class. How was the model helpful? In what ways was it limited in representing the real world?

*Answer* Answers will vary. Students use models to represent an idea, an object, a process or system. Models are very helpful when working on the actual test subject is not possible, lengthy, or too pricey. All models have limitations. No model can completely represent the real world and incorporate all the factors affecting the system in nature.