MICROBIOME SCIENCE WITH DR SARAH KNOWLES

TALKING POINTS

KNOWLEDGE

1. Where are the two field sites that Sarah's team visits?
2. Roughly, how many microbial cells are present within a human body?

COMPREHENSION

3. In what ways are laboratory studies different from studies conducted in the wild?
4. Why are mice good animals to study in the wild?

APPLICATION

5. What data would you need if you wanted to find out how a mouse's diet affects its gut microbiome, and how would you collect this data?
6. How could a similar study be designed to understand how a human's microbiome is affected by different foods?

ANALYSIS

7. Sarah and her team are very careful to avoid distressing any mice they capture by using humane traps and treating them with care. Why is this important to the success of their study?
8. In what ways is the gut microbiome within a mouse similar to the community of animals found within an ecosystem?

SYNTHESIS

9. How would you design a laboratory study to investigate how a mouse's gut microbiome affects its body mass?
10. How do you think Sarah's research might be applied in other sectors and industries such as medicine, agriculture and disease management?

EVALUATION

11. What do you think are the pros and cons of studying wild animals to further scientific knowledge? How does this compare to studying animals in laboratories?

CREATIVITY

12. Scientists have discovered that we have more foreign cells, such as bacteria, viruses and fungi, in our bodies than we do human cells. This means that more than half of the cells in your body are not actually your own. How might this knowledge change the way humans think about themselves as individuals? To what extent does this change the way you view yourself?

ACTIVITIES

1. Mapping our Microbiome

Sarah's work focuses specifically on the gut microbiome. However, microbes live in many other places all over the human body, both inside and out.

Draw an outline of a human body. Using your own research, label the places on the human body where microbes are commonly found. Find out which species of microbes live in each place and what effects they might have on our bodies.

2. Exploring the effects of our microbiomes

As the field of microbiome science is still young, scientists are constantly discovering new ways in which our microbiomes affect us. We have already seen that our gut microbiome can help us digest food, help us fight diseases and even influence our mental health.

Conducting some research of your own, explore one of the many effects that our microbiomes can have on our bodies. Think about:

- the kinds of microbes involved
- where they are found in the body
- how they cause an effect.

You could also investigate which techniques scientists use to study the microbes and their impacts on our bodies.

MORE RESOURCES

- Explore Sarah's research in more detail: **www.knowleslab.com**
- Explore Oxford University's research woodlands, Wytham Woods, through the videos on its website: **www.ox.ac.uk/content/wytham-woods-laboratory-leaves**