Year 11 Science: Bacteria, fungi and viruses: how microorganisms live

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Give two differences in structure between a bacterium and a yeast cell.

2. A bacterium divides every 30 minutes. Starting from one cell, how many cells are there after 4 hours?

3. Write the word equation for anaerobic respiration in yeast, and say which product makes bread rise.

4. Explain why a virus is described as not fully living.

5. Explain why dried apricots keep for months but fresh apricots go mouldy within a week or two.

Fix the mistake

6. Correct this statement: "Viruses are just very small bacteria."

7. Correct this statement: "Fungi take in their food and digest it inside, like animals do."

8. Correct this statement: "At high temperatures the enzymes die."

9. Correct this statement: "Yeast only makes carbon dioxide when it ferments."

Answer key (for parents and tutors)

1. Give two differences in structure between a bacterium and a yeast cell.
   A yeast cell has a nucleus, but a bacterium has its DNA as a loop free in the cytoplasm; the yeast cell wall is made of chitin; a yeast cell is also bigger (3 to 10 µm against 1 to 5 µm).
2. A bacterium divides every 30 minutes. Starting from one cell, how many cells are there after 4 hours?
   4 hours = 240 minutes, 240 ÷ 30 = 8 divisions, 2^8 = 256 cells.
3. Write the word equation for anaerobic respiration in yeast, and say which product makes bread rise.
   glucose → ethanol + carbon dioxide; the carbon dioxide makes bread rise.
4. Explain why a virus is described as not fully living.
   A virus is not a cell and carries out no life processes on its own: it can only replicate, and only inside a host cell using the host's machinery.
5. Explain why dried apricots keep for months but fresh apricots go mouldy within a week or two.
   Mould needs water: without moisture, the enzymes released by the hyphae cannot digest the fruit and the hyphae cannot absorb nutrients, and spores cannot germinate, so the dried fruit keeps.
6. Correct this statement: "Viruses are just very small bacteria."
   Viruses are not cells at all: they are genetic material in a protein coat, many times smaller than a bacterium.
7. Correct this statement: "Fungi take in their food and digest it inside, like animals do."
   Fungi release enzymes onto the food and absorb the digested small molecules through their hyphae, which is extracellular digestion.
8. Correct this statement: "At high temperatures the enzymes die."
   Enzymes are proteins, not living things; heat denatures them, changing their shape so they stop working.
9. Correct this statement: "Yeast only makes carbon dioxide when it ferments."
   Yeast makes carbon dioxide in both aerobic and anaerobic respiration; only the anaerobic route also makes ethanol.