

Solutions

Each answer shows the steps, then the **result**.

2.1

- penicillin prevents the bacterium making/repairing its cell wall; so as it grows, water enters by osmosis and the weak wall lets the cell burst

2.2

- any two: only use antibiotics when needed; finish the full course; use the correct antibiotic; reduce use in farming

3.1 B

- Viruses have no cell wall or metabolism of their own, so there is no antibiotic target

3.2 B

- Resistant bacteria survive treatment and reproduce, passing on the resistance

3.3

- there is variation in the population — a chance mutation makes some bacteria resistant; when the antibiotic is used, the non-resistant bacteria die; the resistant ones survive and reproduce; so the proportion of resistant bacteria increases over generations

3.4

(a)

- $\frac{12}{800} \times 100 = 1.5\%$

(b)

- finishing the course kills all the bacteria, including any that are slightly less susceptible, so none survive to reproduce and spread resistance