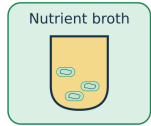


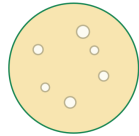
Culturing microorganisms

AQA Separate Biology 8461 | Paper 1 extras | Foundation + Higher

1 Growing bacteria



A liquid culture



Colonies on nutrient agar

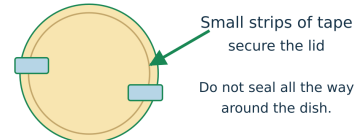
Binary fission: one cell becomes two. Bacteria need nutrients and a suitable temperature.

Broth: liquid nutrient medium.

Agar: nutrient gel in a Petri dish.

A visible colony contains many cells.

2 Aseptic technique

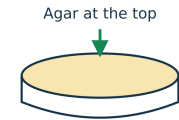
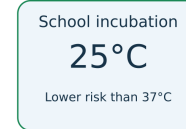


Lid on • keep closed after growth

Aseptic = prevents contamination.

Sterilise dishes and medium. Flame a loop, then let it cool before transferring bacteria. Disinfect the bench; lift the lid only briefly. Secure with short tape strips; do not seal the whole rim.

3 Incubation and observation



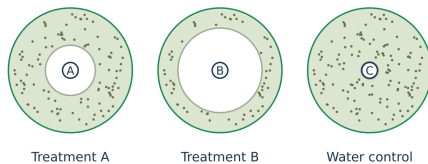
Store upside down

Store plates **upside down**: condensation cannot drip onto the agar and spread colonies.

School incubation: about **25°C**, reducing risk compared with 37°C. It does not make cultures risk-free. Observe through the closed lid.

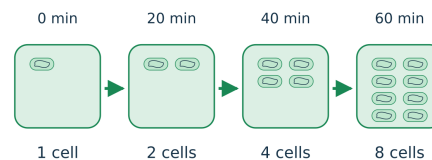
4 Required practical 2

Same bacterium • same conditions



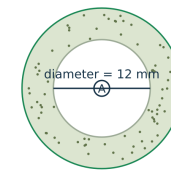
Compare antiseptics or antibiotics. Use the same bacterial culture, equal discs and a **sterile-water control**. Keep dose, agar, time and temperature comparable. Measure clear-zone diameters; repeat on independent plates and find means.

5 Double after each division



Number of divisions = time ÷ division time.
Start with 5 cells, division every 20 min.
After 60 min: 3 divisions.
 $5 \times 2 \times 2 \times 2 = 40$ cells.
Model assumes all divide and none die.
Standard form: Higher Tier extra.

6 Clear-zone area



$$\text{radius} = 12 \div 2 = 6 \text{ mm}$$

$$\text{area} = \pi \times \text{radius}^2$$

$$\pi \times 6^2 \approx 113 \text{ mm}^2$$

Whole clear circle

Radius = diameter ÷ 2.

Area = πr^2 ; use squared units, e.g. mm².

Check whether to include the disc.

Larger zone: more inhibition in this test.

Different diffusion rates can affect results; a plate test cannot prove clinical effectiveness.