

# WJEC England Biology GCSE

## SP3.3: Bacterial Growth

### Practical notes



## Microbiology

### Aim

Investigation into the effect of antibiotics on bacterial growth using agar plates by measuring zones of inhibition.

### Equipment

- agar plate seeded with bacteria
- petri dish
- heatproof mat
- filter paper discs
- 4 antimicrobial agents
- disinfectant bench spray
- forceps
- clear tape
- Antibacterial hand wash
- wax pencil
- incubator set to 25°C

### Method

1. Spray the bench you are working on with disinfectant then wipe dry with paper towels and wash your hands.
2. On the bottom of the agar plate (not the lid) mark with a wax pencil:
  - 1) 3 segments
  - 2) a dot in the middle of each segment
  - 3) your initials, date, name of bacteria as in the example seen below.
3. Working close to a lit Bunsen flame, flame the forceps and use them to dip the discs into each antimicrobial agent.
4. Place on a petri dish and let them dry on a sterile petri dish, placed close to a lit Bunsen flame.
5. Lift the lid of the agar plate at an angle carefully and use forceps to place each filter paper disc onto the dots. Note down the antimicrobial agent applied to each zone.
6. Tape the lid onto the agar plate loosely so that oxygen can still reach the bacteria.
7. Place the inverted agar plate in the incubator at 25°C for 2-3 days.
8. Measure the diameter of the clear zones after 48 hours using a piece of squared paper placed under the plate.
9. Record the results in a table as seen below. The area of the clear zones can be calculated using the formula  $\pi r^2$ .<sup>1</sup>

---

<sup>1</sup> [wjec.co.uk](http://wjec.co.uk)



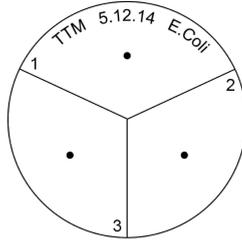


Image: [aga.org.uk](http://aga.org.uk)

Type of antiseptic	Diameter of clear zone in mm		
	1	2	Mean

### Sources of error

The clear zones may not be uniform so the width and hence the area is difficult to determine.  
Contamination of the petri dishes may have occurred.

### Risk Assessment

Make sure to wash your hands before and after handling the bacteria.  
Tie long hair up, wear goggles and keep at a safe distance from the Bunsen flame.  
Be careful do not touch forceps after flaming.

