

# Edexcel Biology GCSE

## CP 05: Microbial cultures

### Practical notes

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## Microbiology

### Aim

Investigate the effect of different antiseptics or antibiotics on bacterial growth using agar plates by measuring zones of inhibition.

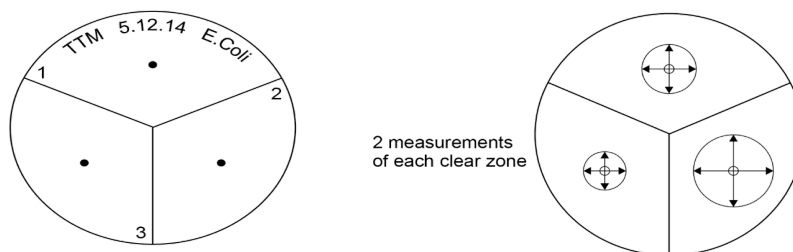
### Equipment

- agar plate
- heatproof mat
- filter paper discs
- three antiseptics eg. mouthwash, TCP, and antiseptic cream
- disinfectant bench spray
- 1% Virkon disinfectant
- Antibacterial handwash
- forceps
- clear tape
- hand wash
- wax pencil or permanent marker
- incubator set to 25°C

### Method

1. Spray the bench you are working on with disinfectant then wipe dry with paper towels.
2. On the bottom of the agar plate (not the lid) mark with a wax pencil / permanent marker:
  - a. 3 segments
  - b. a dot in the middle of each segment
  - c. your initials, date, name of bacteria as seen below
3. Wash your hands with antibacterial handwash.
4. Place the different antiseptics onto different filter paper discs.
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 antiseptic applied to each zone.
6. Tape the lid onto the agar plate securely, but loosely enough that oxygen can still reach the bacteria.
7. Place the agar plate in the incubator at 25°C for 48 hours.
8. Measure the diameter of the clear zones after 48 hours using a ruler. Take a second measurement at 90 degrees from your first measurement and take a mean for the diameter. Do not remove the lid when taking measurements.
9. Record the results in a table as seen below. The area of the clear zones can be calculated using the formula  $\pi r^2$ .
10. Present your results in a bar chart.





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

**Controlled variables**

- Species of bacteria
- Area of filter paper disc

**Extension**

Repeat the procedure with different concentrations of the same antiseptic on the filter paper discs to investigate the optimum concentration of antiseptic used to kill bacteria.

**Sources of error**

The area of the clear zone may be irregular and it is difficult to determine a suitable width to be recorded.

Contamination may have occurred.

**Safety precautions**

Wear safety goggles when handling Virkon disinfectant.

Make sure to wash your hands before and after handling the bacteria.

