



Practical Guide Biology Microbiology

This document contains:

- Links to YouTube clips showing the practical procedure
- Information from examination boards AQA, OCR, Edexcel
- Potential examination questions and answers

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- AQA

Required practical activity	Apparatus and techniques
Investigate the effect of antiseptics or antibiotics on bacterial growth using agar plates and measuring zones of inhibition.	AT 1, AT 3, AT 4, AT 8

- Edexcel

5.18B	<i>Investigate the effects of antiseptics, antibiotics or plant extracts on microbial cultures</i>	<p>This practical provides the opportunity for learners to carry out aseptic techniques (Biology statement 5.17). Petri dishes pre-poured with agar must be inoculated with bacteria and discs of antiseptic/antibiotics/plant extracts can be used to determine their effect on bacterial growth.</p> <p>Sterile aseptic technique must include the use of a Bunsen burner.</p>
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- OCR **PAG 7: Microbiological techniques**

Investigate the effectiveness of antimicrobial agents on the growth of a bacterial lawn.



Video 1

Video 2



1. Explain the term 'zone of inhibition'.
2. Describe how to calculate the area of a zone of inhibition.
3. Explain how to carry out a practical to investigate the effectiveness of two antiseptics.
4. Describe the aseptic precautions that should be used when transferring bacteria .



1. Explain the term 'zone of inhibition'.

ANS:

- **Area around an antibiotic or antiseptic disc**
- **Contains no bacterial growth**



2. Describe how to calculate the area of a zone of inhibition.

ANS:

- **Measure diameter of zone of inhibition**
- **Divide by 2 to give the radius**
- **πr^2**

3. Explain how to carry out a practical to investigate the effectiveness of two antiseptics.

ANS:

- **Create a lawn of bacteria on an agar plate**
- **Using aseptic techniques**
- **Place discs containing the two antiseptics on the lawn/ surface**
- **Incubate**
- **Calculate the area of inhibition for each**
- **Repeats**



4. Describe the aseptic precautions that should be used when transferring bacteria .

ANS:

- **Alcohol to wipe down surfaces**
- **Flaming of loop/ rod/ rim of bottle**
- **Antiseptic handwash**
- **Any sensible**

Key questions:



- Why are aseptic precautions necessary when handling bacteria and other microorganisms?
- Why are bacteria used in this investigation?
- What types of bacteria should be used for this type of investigation?
- Why should a temperature of 30°C be used to culture microorganisms in a school laboratory?
- Why should the plates and cultures only be opened close to a Bunsen flame?
- What are the different variables that need to be controlled during this investigation?
- Why are the chemicals added to the plate on a filter disc?

Key questions:



- What does the agar used for culturing the bacteria contain?
- What is the difference between antiseptics, antibiotics and plant extracts?
- How could investigations similar to this core practical be used in a clinical environment?
- How could investigations similar to this core practical be used in the search for new antibiotics or antiseptics?
- Why do antibiotics only target bacterial cells?



A summary document is also available on Huddle which contains all the relevant information about this practical from the different examination boards. This document includes practical methods and other potential examination questions