

Speaker one

Ever wondered how hand rub can kill off microorganisms on your hands?

Speaker two

Antiseptics and disinfectants are biocides that kill microorganisms such as bacteria, viruses and fungi.

Antiseptics are used for living surfaces like skin, disinfectants for non-living surfaces.

Speaker one

In our experiment we're going to investigate the effect of antiseptics on bacterial growth.

We'll be using agar plates that have been inoculated with bacteria and measure the zones of inhibition around paper discs that have been soaked in different antiseptics.

Speaker two

The microorganisms we are using are not harmful to humans. But it's easy to accidentally grow harmful strains if you don't use good aseptic techniques.

These techniques are vital as they limit contamination and should provide a sterile working environment.

Speaker one

To stay safe it's also important to provide a suitable temperature to observe bacterial growth.

In this case our temperature is 25 degrees celsius to avoid growing harmful pathogens.

Speaker two

This is the equipment you'll need. Do pause the video and take a look.

Speaker one

So, first thing we're going to do is label the bottom of the petri dish with name and the date.

Speaker two

Now, light the Bunsen burner on the yellow safety flame close to where you're working.

This will keep airborne microorganisms away from the immediate area.

When opening the petri dish make sure you only open it slightly to avoid contamination.

And always hold it away from your face.

Speaker one

Ensure that your equipment is sterile.

Soak three filter-paper discs in different antiseptics for the same amount of time.

Now the fourth, your control, that's just a paper disc in sterile water.

This will ensure that the differences in bacterial growth can be linked to the antiseptic used. I'm going to label them: 1, 2, 3, 4.

Speaker one

So, let's start with Antiseptic 1. Replace the lid each time you place down a disc to reduce the risk of contamination. Fantastic, I want you to put it right here.

Speaker two

Okay.

Speaker one

Right in the middle, perfect. Once you've placed all four discs on the plate stick the lid on with tape just like this.

Speaker two

Loosely tape along the quarter lines but don't completely seal it.

Speaker one

And I'll tell you why: because allowing oxygen to be present that prevents harmful bacteria from growing as many pathogens thrive in anaerobic conditions.

Leave the plate upside down at 25°C for 48 hours. This allows the bacteria to multiply by binary fission. And then what are you going to do? You're going to disinfect your workspace.

Speaker two

This plate was set up 48 hours ago, where the concentration of the antiseptic is sufficient to prevent bacterial growth or kill bacteria. The agar jelly remained clear.

This is the zone of inhibition.

Speaker one

So we can measure the zone of inhibition to work out the efficacy of the disinfectant. We measure it using a ruler and work out the area of the circle using the equation: $\text{area} = \pi r^2$. Now it's time to analyse our results.

In your exam you may be asked to calculate, describe, explain or conclude based on the results. Antiseptic C was the most successful against bacterial growth.

Speaker two

Or maybe you could conclude that Antiseptic A does not kill bacteria because there was no zone of inhibition around it.

Speaker one

Or, C had the largest zone of inhibition and killed the most bacteria therefore is the most effective.

Speaker two

Understanding antiseptics has changed the world and saved countless lives.