

Culturing and measuring microorganisms What is the purpose of aseptic technique?	Culturing and measuring microorganisms Why is an inoculating loop heated until red hot and then cooled before use?
Culturing and measuring microorganisms Why are plate lids taped with short strips only, and not sealed all round?	Culturing and measuring microorganisms How is a culture medium sterilised in the laboratory?
Culturing and measuring microorganisms What is a colony-forming unit (cfu)?	Culturing and measuring microorganisms How is the number of cfu per cm³ of the original culture calculated?
Culturing and measuring microorganisms Which method of measuring microbial growth counts only living cells?	Culturing and measuring microorganisms Why is dry mass a better measure than wet mass?

Red hot kills microorganisms on it. Cooling stops it killing the culture being transferred.

To stop unwanted microorganisms contaminating a culture and to stop the cultured organisms escaping or infecting the worker.

In an autoclave: steam at 121 °C under pressure for at least 15 minutes.

So oxygen can still enter and anaerobic pathogens are not selected for.

$(\text{Colonies} \div \text{volume plated in cm}^3) \times \text{dilution factor}$

A single living cell or small clump of cells that grows into one visible colony on agar.

Wet mass includes a variable amount of water.

Dilution plating (a viable count).

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How does turbidity change as a culture grows, and what instrument measures it?

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Name the four phases of the bacterial growth curve.

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What is happening to the cells in the lag phase?

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Why does the growth curve level off in the stationary phase?

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Write the formula for the number of generations (n).

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What is the exponential growth rate constant (k)?

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Which variables are controlled in core practical 13?

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Why must only non-pathogenic strains be used in school culturing?

Lag phase, exponential (log) phase, stationary phase, death phase.

It rises, as more cells scatter light. A colorimeter records absorbance.

Nutrients become limiting and waste builds up, so the rate of division equals the rate of death.

They adjust to the medium, take up nutrients and make enzymes. Little division occurs.

The number of generations per unit time in the exponential phase: $k = n \div t$.

$$n = (\log_{10} N_t - \log_{10} N_0) \div 0.301.$$

Samples could otherwise contain harmful pathogens. Safe strains such as yeast or E. coli K12 are used.

Volume and type of broth, starting cell density, strain, temperature (or the variable not being tested), aeration and timing of readings.

How is the rate of growth found from a graph of absorbance against time?

The gradient of the exponential section, or
of a tangent drawn to the curve.