

Serial Dilution

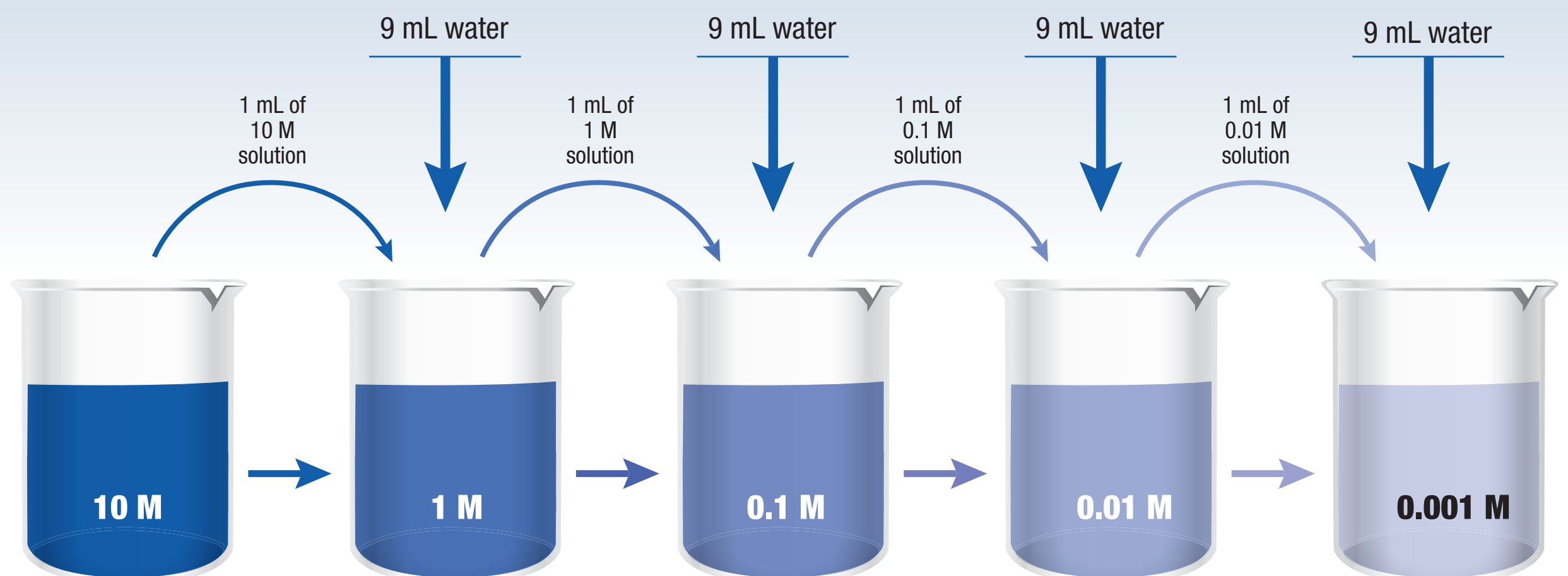


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Serial Dilution of Chemicals

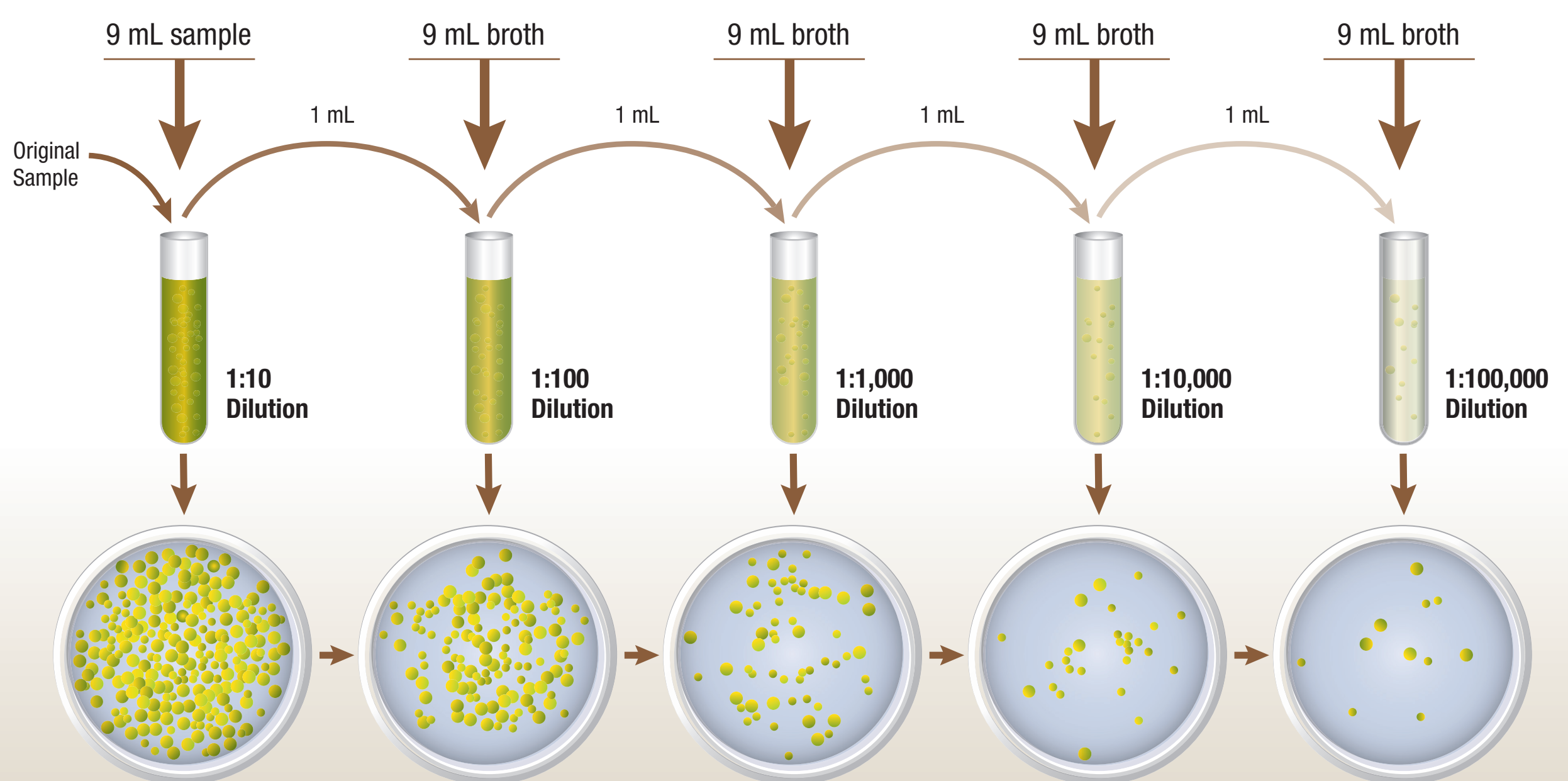
A serial dilution is a simple technique for reducing the concentration of a solution in a systematic way.

In a dose-dependent study (e.g., an LC50 experiment), you can use the technique to produce experimental concentrations of dilution factors. Start by taking 1 mL of the stock concentration of your chemical, transferring it into 9 mL of water, and mixing. Use this dilution factor throughout the series to produce experimental concentrations as shown in the illustration.



Serial Dilution of Living Materials

The technique also works with living organisms such as bacteria. It allows you to reduce the number of bacterial cells on a plate to make counting colonies more manageable. Simply use the dilution factor in conjunction with the bacterial count on the plate to determine the number of bacteria in the original sample.



Real World Connections



Blood Bank Specialist

Blood banks use serial dilutions to perform titers. Titers report the highest dilution at which a specific antibody of interest is still detectable. Titers are used to determine pathogen exposure, vaccination status, and immune system function.



Microbiologist

To reduce the concentration of a sample to a countable level while retaining the ability to calculate the initial concentration, microbiologists employ serial dilutions. This may be used to determine the amounts of fungi or bacteria in environmental or clinical samples.



Quality Control Analyst

Quality control analysts prepare serial dilutions of standard solutions to calibrate analytical instruments. These standards cover a range of concentrations, allowing for accurate and precise instrument calibration.



Toxicologist

Serial dilutions are used to determine the lethal dose of a substance, such as LD50 (the dose at which 50% of exposed organisms die). This information is critical for understanding the toxicity and potential risks associated with a substance.