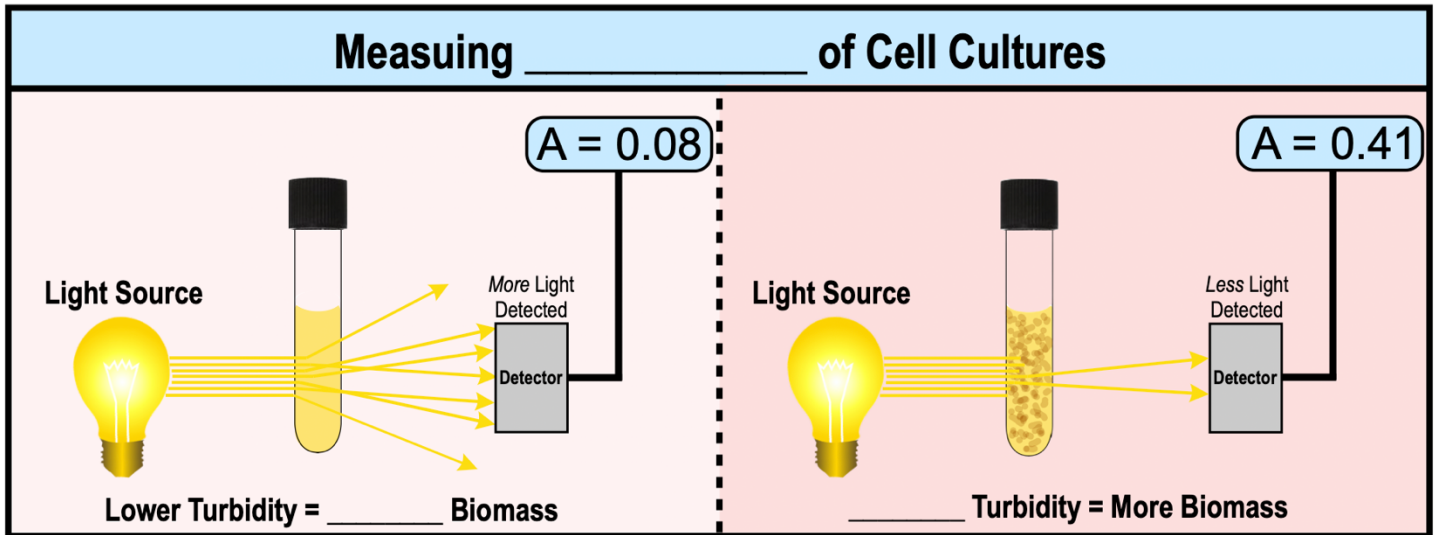


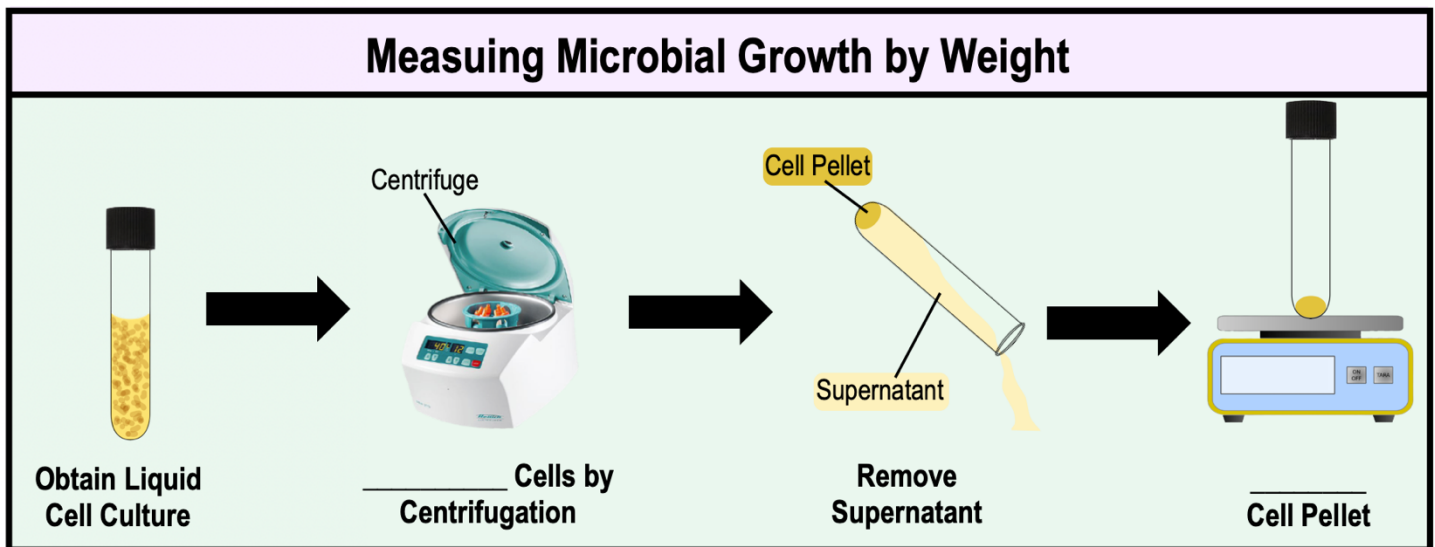
## CONCEPT: MEASURING GROWTH BY BIOMASS

- Scientists can measure microbial growth by measuring its *biomass* (\_\_\_\_\_ of an organism).
- **Spectrophotometer:** instrument that acquires light \_\_\_\_\_ values (A), used to measure *turbidity*.
  - **Turbidity:** the “\_\_\_\_\_” of a liquid sample due to microbial growth.
  - High *turbidity* = high biomass = \_\_\_\_\_ detected light (\_\_\_\_\_ absorbance value).
- **Limitation:** Must have a \_\_\_\_\_ concentration of cells in your culture for it to be “cloudy” enough to detect.



## Measuring Total Weight

- Another method to measure growth is to use the total \_\_\_\_\_ of the sample.
- To measure weight, cells in a liquid culture are centrifuged to form a \_\_\_\_\_ at the bottom of the tube.
  - The liquid media is \_\_\_\_\_ & the pelleted cells are weighed.
  - Liquid that is removed after centrifugation is called the \_\_\_\_\_.



**CONCEPT: MEASURING GROWTH BY BIOMASS**

**PRACTICE:** A scientist wants to determine the biomass of the bacterial populations in his experiment using a spectrophotometer. He finds that population A has a higher turbidity than population B. What does this tell us about the bacterial populations?

- a) More light was able to pass through population B than population A.
- b) The liquid population A is being grown in is more cloudy than the liquid population B is being grown in.
- c) Population A has more biomass than population B.
- d) All of the above.

**PRACTICE:** If a microbiologist wishes to determine the growth of her bacterial sample without removing the bacteria from the liquid they are growing in, which method should she use?

- a) Spinning her population in a centrifuge and weighing the bacterial cell pellet.
- b) Using a spectrophotometer to determine the biomass of the population in the liquid.
- c) Passing the population through a membrane filter and counting the individual cells.
- d) None of the above, all methods require the scientist to remove the bacteria from the liquid solution.