

Lab practice 1

25/26

29th September and 2nd October 2025

Lab Safety

- Emergency exit
- No food
- No drinks
- Appropriate code of conduct
- No telephone, checking messages or smart phone calls or video, you can go outside

Lab Safety

- **Wear Lab coat with name tag**
- **Wear goggles**
- **No open shoes and sandals**
- **No shorts, skirts**
- **No long pendants (earrings and neckless)**
- **No bracelets**
- **Tie your hairs**
- **Write your name on the foolscap (one per group)**
- **Take a break when you need it, inform your lab mates**

Vocabulary

Scale

Spatula

Petri dish

Tubes, 50 mL

Vials, 1 mL

L-spreaders

Micropipettes

Tips

Waste

Serological pipette

Pipettor

Saline solution

LB medium

Bunsen burner

Alu-foil

Ethanol

Parafilm

Proficiency in pipetting

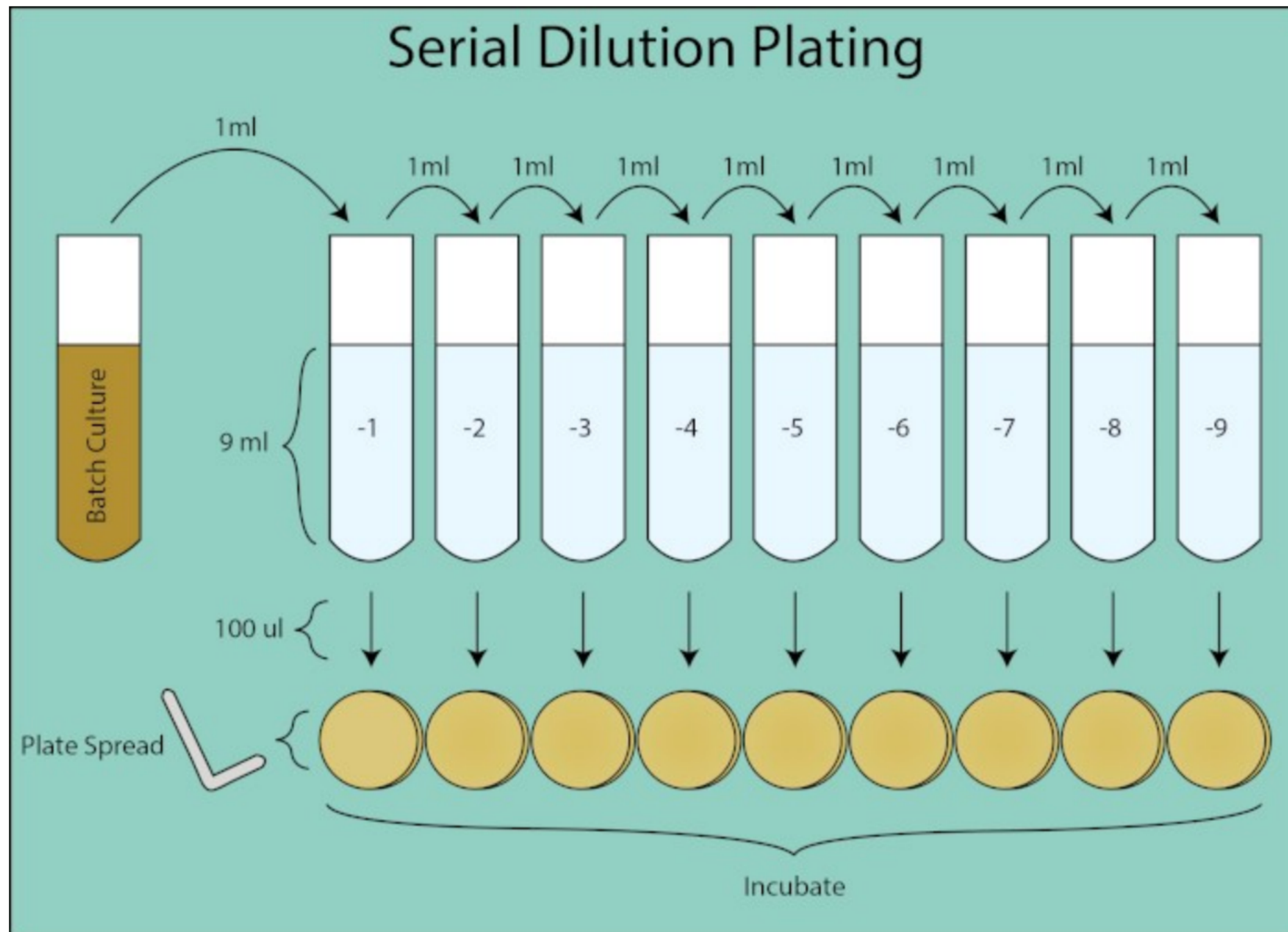
1 mL = 1000 μ L

0.1 mL = 100 μ L

0.01 mL = 10 μ L

Color coding for tips and pipettes

Serial dilution



1. How many culturable **soil/freshwater-**microbes there are on a nutrient-rich solid medium **under constant light?**
2. Are there more culturable microbes in the **soil** or in the **freshwater** sample **under constant light?**

Experiment flow 1

- A. Samples collection
- B. Measurement of soil and water
- C. Dilution series
- D. Plating on solid medium
- E. Turn in the foolscap paper with A,B,C data
- F. Incubating for 1 week and taking pictures
- G. Counting colonies and plotting growth dynamic
- H. Writing final RESULT report on e-book (pictures and number)
and answer picture

Experiment 1 A-B

A. Samples collection

B. Measurement of soil and water

- Collect with the spatula some soil (no rocks or grass)
- Describe the sampling location on foolscap and **annotate all the numbers and computations you make**
- Weight sample from 0.5 to 1 g
- Add the sample into 10 mL saline solution
- Shake gently to make soil slurry

Experiment 1C-D

C. Dilution series

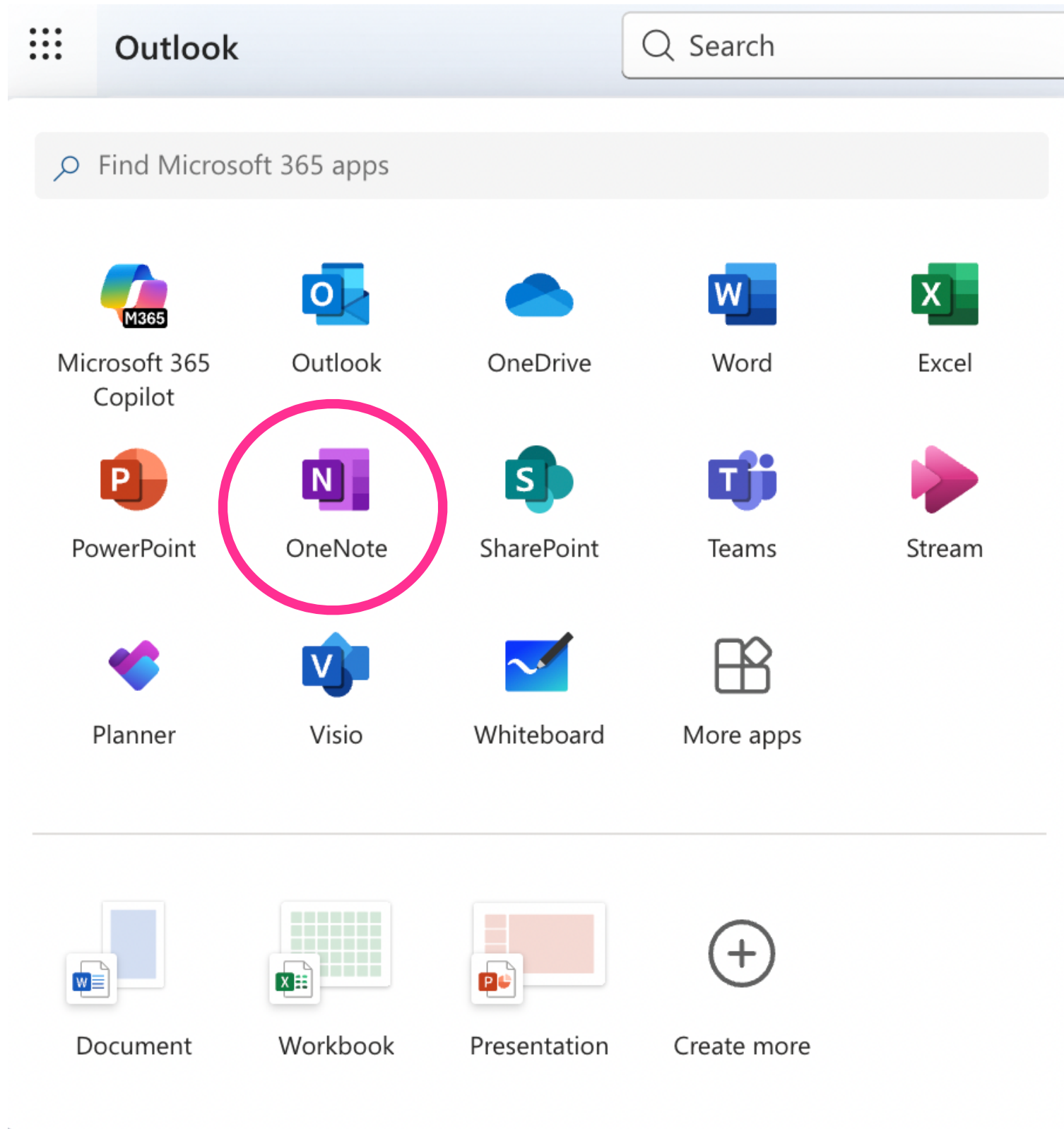
D. Plating on solid medium

- Prepare an appropriate number of tubes with 9 mL saline solution
- Pipette 1 mL of soil slurry into 9 mL of saline solution (use cut-out tip)
- Invert gently the tube
- Repeat the step until it is necessary
- Plate 100 μ L of the soil solution at the estimated correct dilution on to a LB plate twice to get 100 colonies on the plate
- Plate 100 μ L of the higher dilution and lower dilution twice

Experiment 1 E F G H

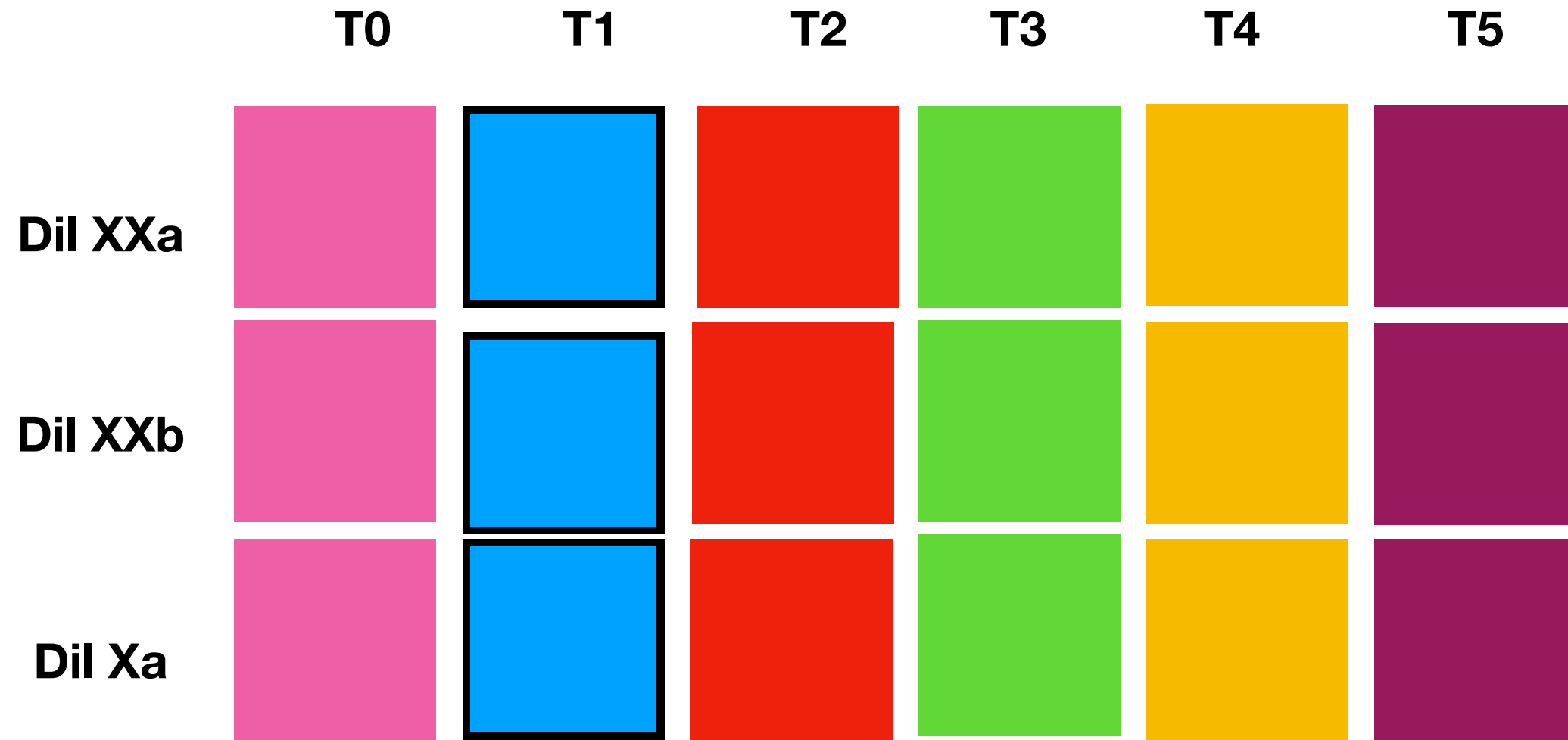
- Package the plates (plastic bag with wet paper)
- Incubating plates in the box for 1 week **under constant light**
- **Take pictures every day for 5 days of the plates** and change the wet paper
- Bring the plates back to class after one week
- **On the e-book plot growth dynamic of colonies**
- **Writing final RESULT report on e-book (pictures and number) and answer picture**

e-BOOK



- **OneNote**
- **Create and share a notebook**

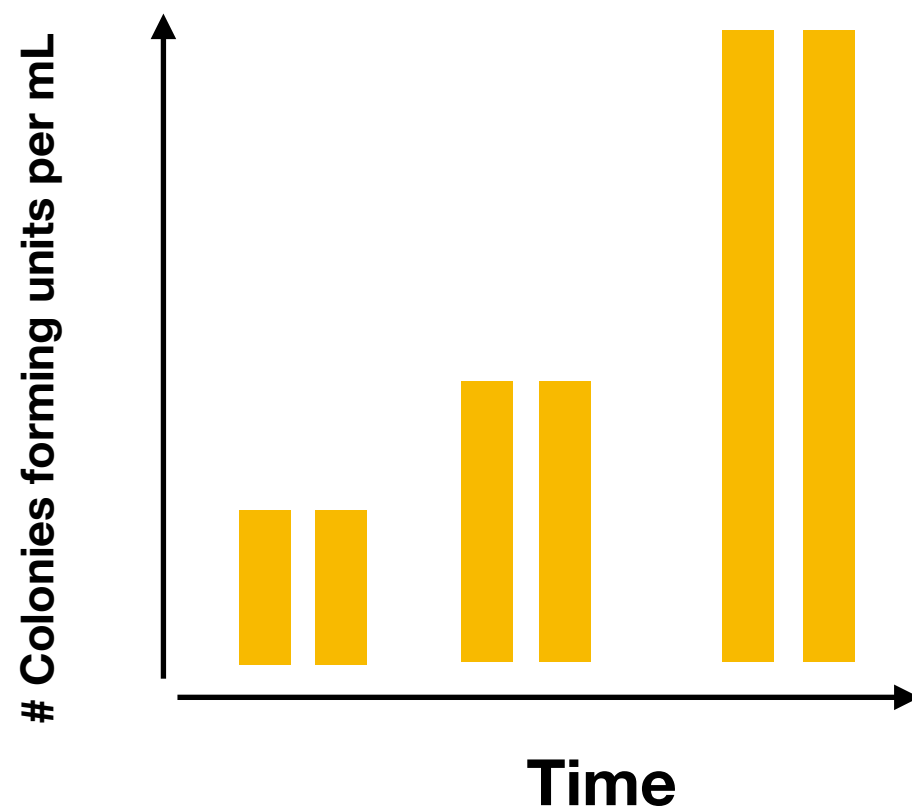
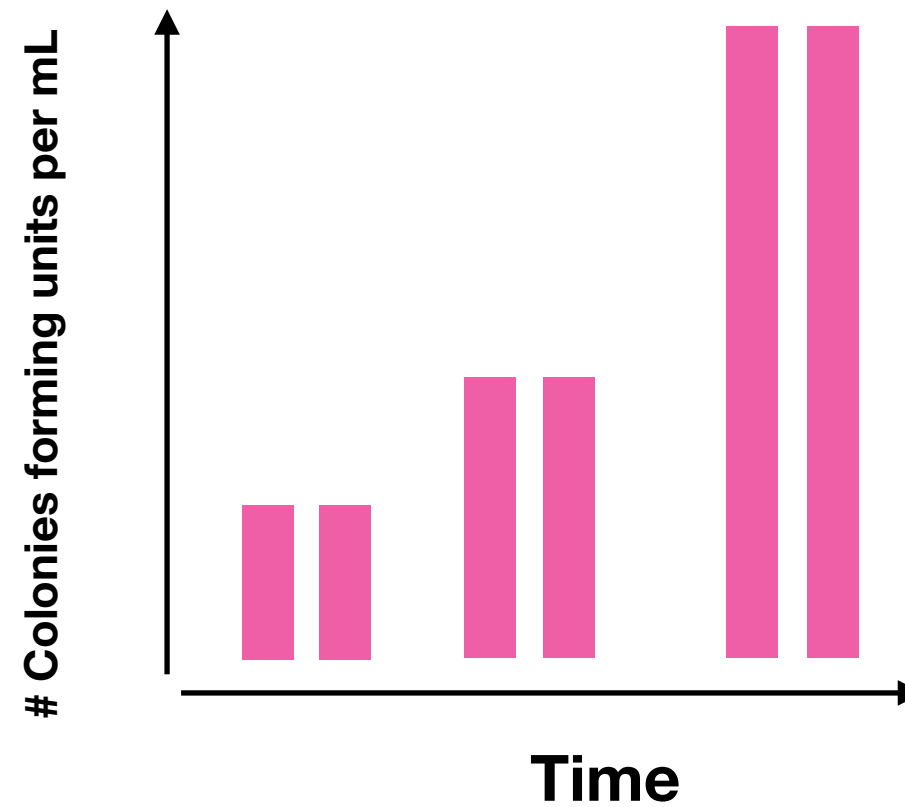
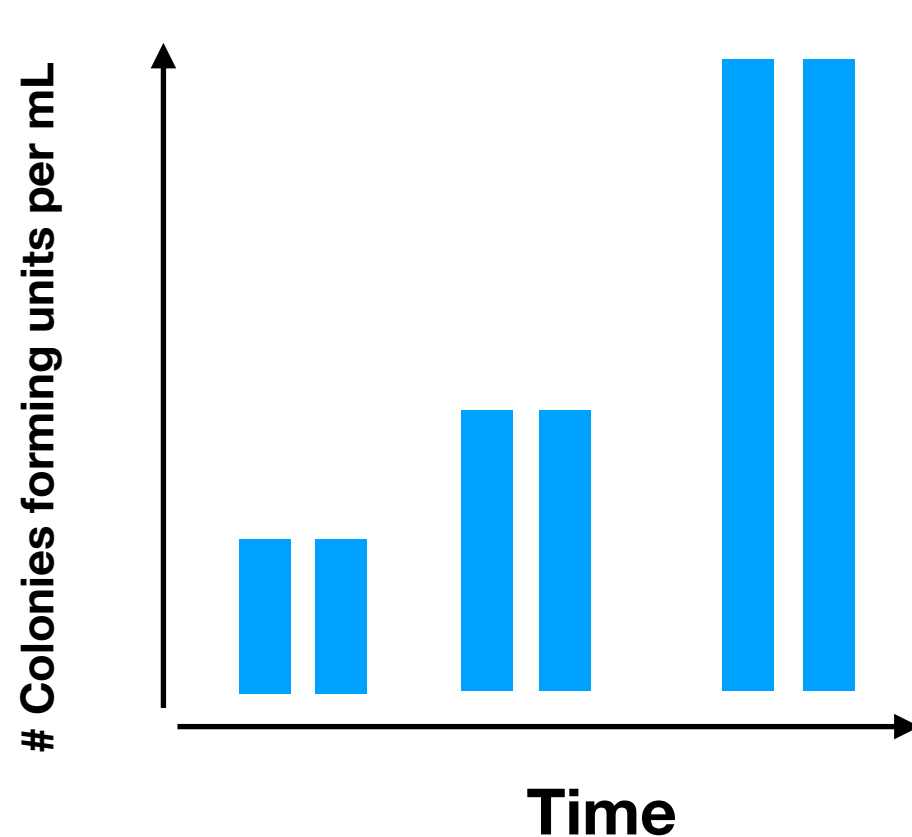
e-BOOK example: time series pictures



etc.....

- Soil plate pictures over time
- Water picture over time

e-BOOK example: time series CFU/mL



- Plot bar graph for soil and water
- Compute average of CFUs over time
- Compute standard deviation of CFUs

e-BOOK example: answer questions based on your data

- 1. How many culturable soil/freshwater-microbes there are under constant light?**
- 2. Are there more culturable microbes in the soil or in the freshwater sample per unit of volume under constant light?**

Goal

- Assessing number of cultivable microbes via CFU (colony forming unit) plating method
- Assumption: 1 g of sediment has 1 billion microbes
- Colonies on the plates need to be countable —> how much to dilute?
- Importance of replicate
- Count the colonies over time and compute CFU/mL (number of colonies x dilution x plated microliters)