

LAB NOTEBOOK

Prior to lab each day you will be responsible for reading through your manual thoroughly to understand the experiments you will be performing. Since we do not require you to write a detailed protocol of the experiments you will be doing, we suggest that you do one or more of the following in order to proceed safely, smoothly, and efficiently throughout the day with your partner:

- 1- Highlight in the manual the steps of the procedures.
- 2- Write a “plan of action” that summarizes what you will do and when. (overlapping tasks or labeling tubes/plates in advance can save you a lot of time).
- 3- Make an abbreviated flowchart of what you’ll do during the day.
- 4- Plan with your partner

In order to have a complete notebook (similar to those you’d find in research labs) you will need to have the following items in your notebook (note when each item needs to be completed by: before, during, or after lab):

TITLE AND DATE

Written before lab begins.

At the top of each page, clearly write the date of each of the days, including the half days, you come to lab to carry out your experiment(s). For example: *Experiment I-A: Bacterial Growth in Liquid Media*

AIM (3pts./day)

Written before lab begins.

In complete sentences describe what you set out to accomplish in each experiment, how you will accomplish it, and why? **Do not exceed 4 sentences per one experiment. Be clear, complete, and concise.** Use **specific** scientific terms as much as possible.

The following is an example of an aim for Genetics experiment I-B:

“I will streak 4 bacterial strains on four indicator plates in order to purify each strain and characterize its phenotype. The bacterial strains are: BK3, EJ1, H33, and JET3.”

Note that the aim indicates the **specific** bacterial strains used.

(You will have the chance to rewrite your aim if you want to, but must have written something down before you come to lab. Your grade will be based on your revised version if you choose to do one.)

CHEMICAL SOP (if any, 2pts/day. Points will be recorded once per module, unannounced.) **Written before lab begins.**

This section should include the Chemical name, it's hazards, and how to dispose of it. You need only include the SOP information the *first time* you use a chemical. (You will find this information from a link off the resource page of our website.)

PROTOCOLS QUESTIONS (3pts/day. Points will be recorded once per module, unannounced.) **Written before lab begins.**

In this section you must answer the protocol questions for the lab experiments which are posted on the web.

DATA & OBSERVATIONS (3pts./day) **Written during lab although tables and formulas for calculations should be written in the notebook before lab.**

This section should include separate sections of data obtained from each experiment, documentation of all readings, measurements and calculations done during the lab. You should write your data directly into your notebooks (NOT on scrap paper or paper towels). Observations about how things looked (or smelled!), how long steps took, and what temperatures the heat blocks were at are also appropriate. Graphs and gel pictures belong in this section. They should be clearly labeled (axis, units, gel lanes, size markers). Include sample calculations or formulas, along with units. This section will be evaluated for both content and organization.

An example of data from Expt. I-D organized into a table is as follows:

Table 1: Phenotypes of Control Strains

<u>Strain</u>	<u>Plate</u>	<u>LB Kan</u>	<u>Mac Ara Kan</u>	<u>Mac Lac Kan</u>	<u>LB Cm</u>	<u>LB Ara X-gal Kan</u>
BK3		+ (growth)	White	White	+ (growth)	Blue
EJ1						
H33						
JET3.						

An example of a sample formula is as follows:

For experiment II-D: in the mutagenesis experiment IIA, 0.5 ml of phage was mixed with 0.5 ml of cells, the multiplicity of infection (M.O.I.) can be calculated as follows:

$$(M.O.I.) = \frac{(titer\ of\ phage\ stock)\ (volume\ of\ phage)}{(density\ of\ cell\ suspension)\ (volume\ of\ cells)}$$

$$= \frac{(\# \text{ of pfu/ml}) (ml)}{(\# \text{ of cfu/ml}) (ml)}$$
$$= \text{pfu/cfu}$$

where *pfu* = plaque forming units and *cfu* = colony forming units

INTERPRETATION (4 pts./day)

**Handed in before the next
lab period.**

This section should relate your findings to the specific objectives noted in the aims, and analyze your data. In addition, you may want to describe any problems you encountered, how they were dealt with, and suggestions on how you might do this experiment differently next time. You must also include the answers to the questions posted daily on the web.

One example of interpretation based on your data is the following:

For Expt I-D:

Our data suggests that the phenotype of the BK3 strain is Ara⁻, LacZ⁺, Kan^r, and Cm^s.