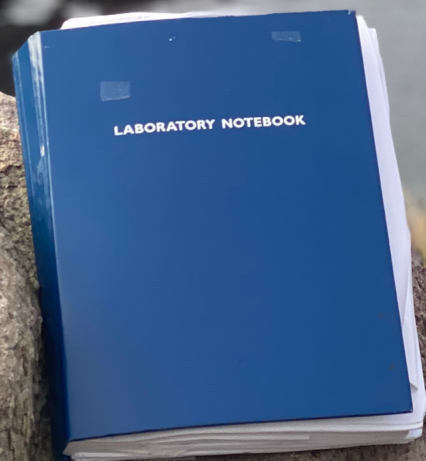


The logo for Memorial University, featuring a red rectangular shape with a white outline above the text "MEMORIAL UNIVERSITY" in white, uppercase letters.

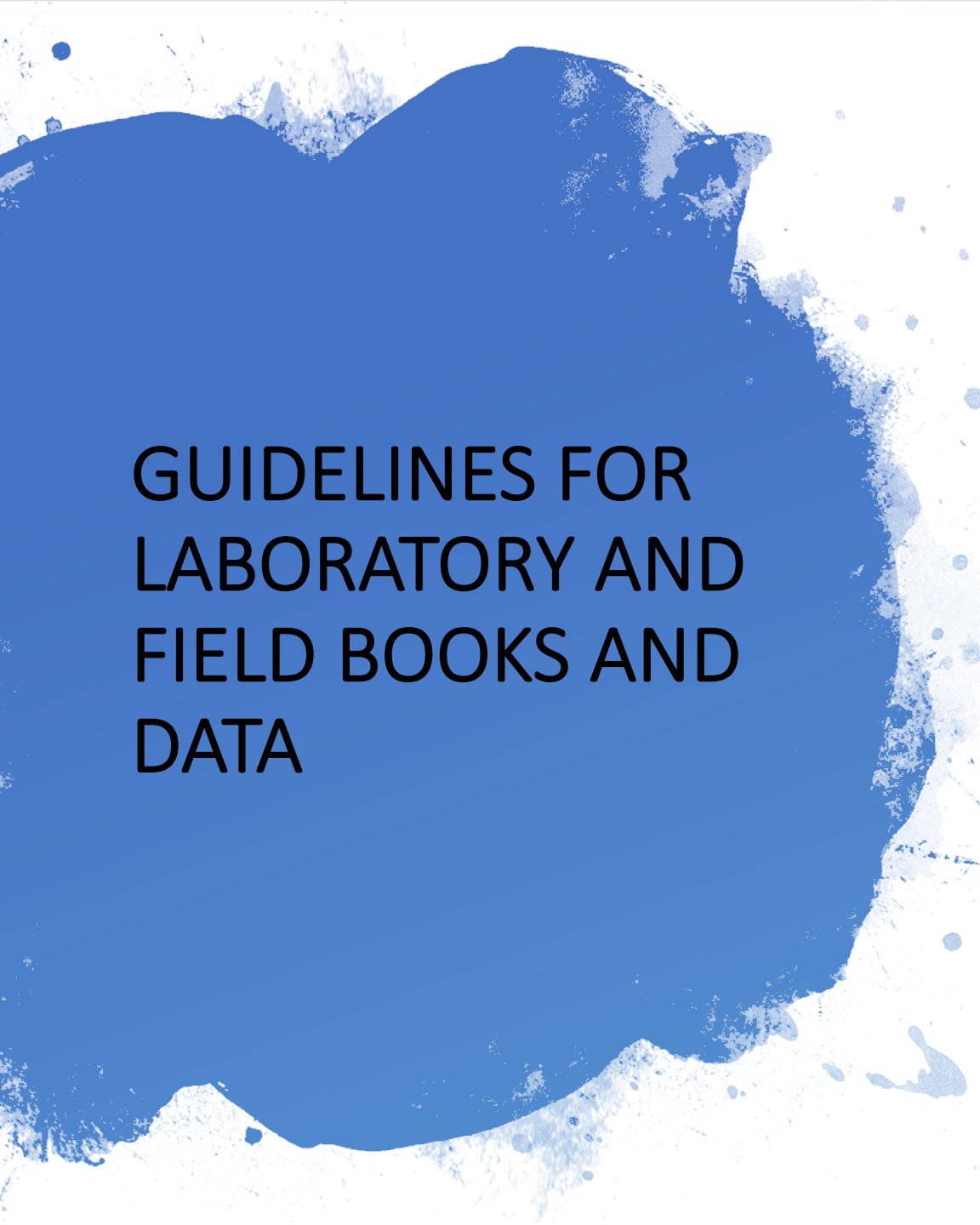
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GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA



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GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA

- This presentation's intent is to provide guidelines on best practices for laboratory and field notebook records and accompanying data storage.
- These guidelines are not meant to restrict how you record your notes and data – they are meant to provide suggestions to help you maintain a complete and accurate record of your experiments and field research that you or anyone can refer to at a future date.
- You are not going to necessarily remember all the details of an experiment or field research that you did a year ago (or even a week ago), yet you or another individual may need to repeat that experiment in the future or write up the results.
- If your data cannot be verified from your lab/field book and where your electronic records are stored for future analyses, then you are negatively affecting the integrity of your work and the ability to publish it.

GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA

- **WHEN YOU START A NEW LAB/FIELD BOOK**

- At the beginning of the new lab/field book, write your name, your role in the lab (Marine Biology, Honours Program), and the date you started the new lab/field book. Include the lab name (e.g. Santander Lab), its location (0 Marine Lab Rd, Department of Ocean Sciences, A1C 5S7) and phone number (e.g. 709-864-3245) in case the lab book is left outside the lab.
- Your lab/field book should enable anyone in the lab to identify **why you did an experiment/field research, how you did it, where the materials are/were ordered from (if is possible), what happened (or did not happen), your interpretation of the results, and your planned next steps.**

GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA

- **EACH EXPERIMENT RECORD SHOULD CONTAIN THE FOLLOWING:**

- **1. Experiment/Field Research Date** – Record the date in the lab/field book by writing out the entire date rather than using one or two-digit numbers, as this could cause confusion as to when an experiment/field research was carried out. For example, 05/04/03 could be interpreted as May 4, 2003; April 5, 2003; April 3, 2005, or March 3 2005.
- **2. Experiment/Field Research Title** – This title should be sufficiently descriptive to identify what method/approaches was used and why the experiment/field research was done. For example: ‘RNA extraction from male *Salmo salar* head kidney infected with *Aeromonas salmonicida* J223 at 3, 7, 14, and 21 days post infection’. “Release experiment to quantify the growth, survival, habitat use and diet of farm, wild and hybrid Atlantic salmon in nature”
- **3. Objective/Purpose** – For a new study, write a brief description of why you are starting the study, list the objectives, and state any specific hypotheses of the experiment/field research. You may also want to indicate how this experiment relates to previous experiments or indicate which step it is within a project.
- **4. Material and Methods** – The first time that you do an experiment/field research, record a very detailed account. Include in the material and methods: *i*) Where your samples were obtained from / field research was conducted; *ii*) How the experiment/field research was done *iii*) If any issues were encountered, *iv*) If you would do anything differently in the future; *v*) What equipment was used and where it is located; *v*) Who showed you how to calibrate equipment or certain technique or where the technique came from (Reference)

GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA

FIGURE 1: EXAMPLE OF A GEL PHOTOGRAPH PASTED INTO A LABORATORY NOTEBOOK

1 MAY 1999 Exp 31 Contd

0.8% Agarose Gel in TAE

Lanes - 100 bp ladder
 2-5 - Samples from PCR Reaction (+ 2µl GeneAmp) Purified
 7 - 1 kb plus ladder
 - 10XU for 60 min.

100 bp ladder
 2.1 kb
 2.15 kb

- Procy Good - 6 bands
 - no. bands strong - a few bands from other lanes
 - Sizes 4, 89, 1817 for Sequencing.
 - Also 100µm LB + amp to the colony in the EMBE-emb tube.

[Handwritten signature]
 5 May 1999

FIGURE 2: USING A PREPRINTED FORM FOR STANDARD REACTIONS SAVES TIME

111
 1 MAY 1999 Exp 31

PCR of colonies from Exp 30 - 10x Recombinant Clones

- To see when clones are recombined, will do PCR using primers to MCS outside insert - will get a 150bp fragment if no insert - and a 1.1 kb fragment if 900 bp insert is present.

- Spins colonies in wire loop - Transfer to 20µl water in 50µl Eppendorf (only in 18 clones).

PCR Reaction setup	Exp. No. - 51	Date - 1-11-99	No. Reactions - 18
Builer	5x - 20µl	2	36
dNTPs	25µl - 10mM	1	18
MgCl ₂	25µl - 10mM	1	18
Primer 1	25µl - 10mM	1	18
Primer 2	25µl - 10mM	1	18
Taq	25µl - 10mM	1	18
Water	25µl - 10mM	0.2	3.6
TOTAL VOLUME		4.8	90
		10	180

- 2.1 kb

Reactions set up in 9µl of water etc (above) and 1 µl of cell lysis.

PCR Conditions

92°C	- 5 minutes
92°C	- 10 Sec.
58°C	- 20 Sec.
72°C	- 60 Sec.
72°C	- 10 minutes
15°C	- 1600

35 Cycles

Reactions started @ 10:53 - Estimated end @ 12:47

[Handwritten signature]
 5 May 1999

GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA

- **This level of detail will allow you to refer to this protocol in the future if you repeat the experiment/field research, perform a similar experiment/field research, or if you need to troubleshoot the research results.**
- If there is an established protocol (e.g. on the lab website or Molecular Cloning or sampling methodology), you may reference that protocol instead of completely rewriting it in your lab/field book.
- You can also paste a print-out of the established protocol in your lab/field book. If you make modifications to an established protocol, those must be recorded in your lab book.
- Similarly, if you follow the protocol of a published paper, or use it to develop your own protocol, include the reference for the paper or a copy of the protocol with any changes, in your lab/field book.

GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA

- Regardless of the number of times you have done an experiment/field sampling, always record all calculations and summarize formulas for future reference – if you make a mistake you will later be able to determine why your experiment/field research may not have worked. In addition, always record where you obtained your samples and any information about their handling and storage that may later be pertinent (e.g. who provided your samples, how they obtained them, if the samples were at room temperature or on ice, the time between collection and processing, etc..).

GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA

Digital Laboratory notebooks

- To accommodate the increase of digital data collected, some labs are using electronic lab notebooks (ELN)..
- An ELN (electronic lab notebook) is a software tool that in its most basic form replicates an interface much like a page in a paper lab notebook. In this electronic notebook you can enter protocols, observations, notes, and other data using your computer or mobile device. Always be sure to backup such ELNs to ensure the information is not lost due to, for example, a computer crash.
- Here are few free options if you wish to take this route in consultation with your supervisor.
- <https://seqome.com/electronic-lab-notebook/>
- <https://cerf-notebook.com/>
- <http://lab-ally.com/products/rSPACE-ELN/>
- <https://www.labguru.com/>
- <https://www.perkinelmer.com/product/e-notebook-enotebook>



GUIDELINES FOR LABORATORY AND FIELD BOOKS AND DATA

Recourses and References

- <http://www.iphandbook.org/handbook/ch08/p02/>
- <http://www.ruf.rice.edu/~bioslabs/tools/notebook/notebook.html>
- <http://nsmn1.uh.edu/rforrest/Notebook.pdf>
- <http://guides.lib.purdue.edu/content.php?pid=232776&sid=1925915>
- <https://www.sciencemag.org/careers/2019/09/how-keep-lab-notebook> (comments from the community; addressing the possibility of a digital lab books)
- A paper about maintaining a digital lab book: <https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1006918>
- ELN
 - <https://datamanagement.hms.harvard.edu/electronic-lab-notebooks>
 - https://en.wikipedia.org/wiki/Electronic_lab_notebook