General Zoology
Lab Supplement

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To Accompany the Zoology Lab Manual:

Smith, D. G. & M. P. Schenk
Exploring Zoology: A Laboratory Guide.
Morton Publishing Co.

for

BIOL 1413
General Zoology

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General Zoology
Laboratory Exercises

Lab Reports & Assignments

Biol 1413 Lab Orientation

The laboratory portion of this course is designed to study anatomical details of of animals in general or common examples of specific phyla more thoroughly than it is presented in lecture. This method of 'hands on' learning should also enhance and strengthen the knowledge you gain in lectures. Most of the time you will be working individually or in pairs.

There is sometimes not enough time in lab to go over each and every item that you are assigned. The lab is a designated a time when you have access to materials that you will not have available during home study time. Some of the information assigned in lab you can learn at home, other items, particularly anatomical terms identified on dissected organs, animals and models and microscopic details viewed with a microscope can only be learned adequately in the lab room.

The lab period will begin with a short introduction and orientation to the material to be studied. I will assume that you have read the exercise before you come to lab. I will point out which models, preserved animals and slides we have available for the lesson as well as any changes to the procedures. The rest of the lab time is yours to begin learning the material, view any assigned slides and perform any dissections that are required.

All dissecting tools will be provided for you, you do not need to buy a dissecting kit. We have a small supply of latex gloves available for the dissections.

Lab Reports

Each student will complete a **Lab Report** (see Table of Contents)for the material covered in each of 4 Lab Practicals. Lab reports are at the end of each section of material for each practical (see Table of Contents).

Each **lab report** will include answers to specific questions from individual lab activities as well as general questions about the animal kingdom. You will also be asked to make sketches and observations about the slides and preserved materials that you are studying. You are also free to include any other materials (see below) that you think might be helpful to learn the information presented in the lab exercises and prepare yourself for the practical.

These Lab Reports will be due on the day of the practical covering the same material.

Drawings:

1. If you are sketching material ***without magnifcation*** or if you are switching back and forth between no magnification and slight magnification (eg. hand lens)you should draw a rectangular border around your sketch and indicate the actual size of the object being sketched.

2. if you are sketching material viewed through a **microscope** or a **dissecting scope,** trace a circular border in which to make your drawing (You might cut out a cardboard circle to use each time so they will be neatly done and all the same size). Make sure your drawing fills the circle to the same extent that the object actually appears through the microscope. Be sure to indicate the **magnification** being used for each sketch

3. More detailed information on drawing techniques can be found in the "Collecting and Preserving Methods" binder on the lab counter. If you want to try these more detailed directions, I'll be happy to make you a copy of the article

What else you might want to include:

- Sketches of slide materials, models or preserved materials that will help you to study for the practicals. Any sketches should be labeled appropriately
- You might also want to include comments on the appearance or difficulty in finding and/or identifying the materials for study
- Any personal observations you made while completing the exercise or studying the material
- Special points to be aware of while reviewing the lab

Remember that the function of these reports *should be* to help you organize your lab material and to facilitate learning it for the practical.

General Zoology Animal Collection

You will make a small animal collection consisting of 5 different animals, from 5 different phyla or subphyla. *You will NOT get these items back so please don't include a keepsake or treasure that you want to hold onto*. ACC will provide nets, vials, jars, preservative, insect pins, some labels, etc. The goals for this collection are to:

- Learn to visually recognize some of the animals common to the area
- Learn something about the ecology and behavior of these animals
- Learn how to use identification manuals and keys
- Become acquainted with the taxonomy and classification of animals, and
- Learn how to properly preserve and label museum specimens

You will be given more information on proper preservation and presentation of specimens in lab. You might also want to consult some Identification keys for the kinds of animals that you are interested in collecting. The animal collection will be worth 50 points and is due the Monday of the last week of classes.

Your grade for the collection will be based on the following criteria:

- diversity and originality of your collection
- ability to follow **correct** procedures for preserving and displaying specimensas described in the materials
- quality of the preservation technique
- accuracy of identification (usually to species) & common name

You do not need to kill anything to make this collection. Some examples of the kinds of collections you can make:

soil and leaf litter organisms
aquatic organisms
shells
skeletons and/or skulls
nests, burrows, tunnels, etc
plaster casts of footprints or tracks
photographs
parasites
fossils

The preservation method that you choose depends on the type of collection that you do. For example:

Permanent Slides: are used for small or microscopic animals
70% alcohol/10% formalin: is used for most invertebrates including insect larvae, larger invertebrates and some vertebrates will need to be injected
Study Skins: for birds and mammals
Dried Specimens: for bones, shells, nests, etc
Pinned Specimens: adult insects are generally dried on insect pins and mounted in an insect box

Each and every specimen must be properly labeled. The type and location of the label depends on the kind of collection and preservation that you do. All labels must include the following information:

Collection Locality (including nearest city) **Date of collection**
General Habitat (eg. woods, pond, soil, treebark, grass, etc)
Scientific Name & Common Name
Your Name

When in doubt ASK THE INSTRUCTOR.

Animals Preserving Techniques
A Shortened Summary

(More detailed instructions and suggestions can be found in the "ZOOLOGY ANIMAL COLLECTION AND TECHNIQUES" binder in 701)

We can provide **containers, vials or bags** along with **preservatives** for your collection.

We have several dozen **identification guides** for many kinds of central Texas animals. You can also find ID guides at the PIN Library and most public libraries in Austin. You can also find quite a lot of information by searching the web

More information on proper collecting and preserving techniques are in a binder in the labroom

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More detailed Information on preserving various kinds of specimens:

A. Animals collected live:

Most invertebrates except those listed below:

Kill and preserve in jars of 10% formalin solution or 70% alcohol (ethyl or isopropyl; make label with India ink and place **inside** jar

Most insects except butterflies, moths and dragonflies:

Kill in killing jar or freezer; pin properly; allow to dry; label should be no larger than 1"x1/2" and placed on pin below insect

Butterflies, moths and dragonflies:

Kill in killing jar or freezer; pin and arrange wings on spreading board or piece of styrofoam; allow to dry; label should be no larger than 1"x1/2" and placed on pin below insect

Vertebrates except for birds and mammals (e.g.: fish, frogs, salamanders, lizards, snakes, turtles)

kill in freezer; fix and preserve in jar of 10% formalin solution; use syringe to inject formalin solution into the body cavity in several places; make label with India ink and place **inside** jar

Birds and Mammals:

Hunt following all applicable state and federal laws; prepare a "study skin" using the techniques outlined in the 'ZACT' manual mentioned above; a label no larger than 1"x3" is attached by string to rear leg

B. Animals collected dead but in good condition:

Most invertebrates and lower vertebrates:

Preserve in jars of 10% formalin solution or 70% alcohol; label as above

Insects:

If they are freshly dead, use above procedures; if they are long dead and dried out you will need to place them in a "relaxing chamber" to soften them up so they can be pinned and arranged; label as above

Birds and Mammals:

"roadkills" in good condition can be skinned and study skins prepared as above

Skull or Skeletal mounts:

Flesh can be removed by several means such as boiling, staking near fireant hill or using dermested beetles; once bones are defleshed they can be placed in a bleach or hydrogen peroxide solution to whiten; allow to dry; place in bag or box with complete label tied to skull if possible

C. Nests, Feathers, Eggs, Racks, shells, feathers:

Clean up as much as possible and place in bag or box with complete label

D. Footprints and Burrows:

Use plaster of Paris to pour into print, allow to set then remove and clean off; place in bag or box with label

E. Photographs:

Should be original photographs; most 'good' photographs will need a telephoto lens for vertebrates or close-up lenses for small invertebrates and insects - the specimen should take up a substantial part of the frame and be easily recognizable

Biology Lab Safety Procedures and Information

Health and safety are paramount values in science classrooms, laboratories and field activities. You are expected to learn, understand and comply with ACC environmental, health and safety procedures and agree to follow the ACC science safety policy. You are expected to conduct yourself professionally with respect and courtesy to all. You can read the complete ACC science safety policy at: *http://www.austincc.edu/sci_safe/*

All safety policies and procedures apply to scheduled lab classes as well as open labs.

Consequences for not complying with safety procedures:

1. You will not be able to participate in a lab activity if:
    a. you are late for class and have missed safety training specific for that day's lab or field activity;
    b. you have forgotten your personal protective equipment;
    c. you refuse to wear personal protective equipment;
    d. you have not followed safety policies and procedures for that lab or field activity.
2. You may be withdrawn from the class and not reinstated if:
    a. you missed required safety training at the beginning of the semester;
    b. you repeatedly fail to follow lab safety policies and procedures.
3. You may be expelled from ACC if you thoughtlessly or intentionally jeopardize the health or safety or another individual.

Emergencies

If there is a life-threatening emergency (fire, major chemical spill, explosion, injury):

1. Report the situation and your specific location (campus, room) by
    using the safety phone in a lab classroom; it will automatically connect you to ACC Police Dispatch (location of safety phone_____
    calling 222 from any ACC phone to reach ACC Police Dispatch
    calling 512-223-7999 from a cell phone or non-ACC phone to reach ACC Police Dispatch

2. Evacuate if necessary:
    a. take your personal belongings with you if possible;
    b. on your way out, close but do not lock the classroom door;
    c. go to the designated rally point for your campus and building.
        Directions to nearest exit: _____
        Location of rally point:_____

In the event of an extreme emergency or impending threat, ACC Emergency Alert can send critical voice and text messages to your cellphone. Verify and update your ACC Emergency Alert information. For non-emergency calls, dial 512-223-1231.

Safety Equipment and How to Use It:

→ Information about chemicals used in this laboratory can be found in Material Safety Data Sheets (MSDSs) and in a chemical inventory located _____.

→ The emergency gas shut-off for this lab is located: _____. Shut off the gas immediately if gas nozzles or valves are damaged or if there is a fire.

→ Fire extinguishers are located: (1) _____.
(2) _____.

To use a fire extinguisher:
1) twist the pin and then pull it out of the handle
2) hold the end of the hose and point it at the base of the fire

3) squeeze the handle

→ Fire blankets are located: (1) _____.
(2) _____.

If you are on fire, stop, drop and roll. Let someone else to get the fire blanket.

→ A safety shower is located _____. If you spill a significant quantity of chemical, especially an acid or base on yourself immediately stand under the shower and pull the handle. Disrobe. The instructor will evacuate the room and close the doors for your privacy. Someone of your gender will stay to help you. Stand under the shower for at least 20 minutes. You will be given clothing after the shower.

→ An eyewash is located _____. If a chemical is splashed or rubbed into your eyes you must use an eyewash for at least 20 minutes with your eyes held open. Someone will help you with this.

→ If a person is experiencing electrical shock from touching wires or equipment, use a belt or other non-conducting material to pull them away from the electrical source.

→ First aid kits are located: (1) _____.
(2) _____.

a. Only minor cuts and burns will be treated in the lab. Serious injuries must be treated in a medical facility. Emergency Medical Services (EMS) will be called if you are injured and are unable to take yourself to a medical facility.

b. The instructor must fill out a report describing your injury.

Personal Protective Equipment (PPE)

1. Required when biological, chemical or physical hazards are present on the lab benches, open shelves or counters:

a. Safety Eyewear

*You must wear non-tinted safety eyewear (safety glasses or goggles) marked Z87 when directed to do so by the lab instructor or lab safety instructions.

*You must bring your protective eyewear with you to every lab class. If you forget your eyewear and the lab room does not have a pair to loan to you, you will not be able to participate in the lab and may forfeit your lab grade for that day. ACC cannot guarantee that loaned safety glasses or safety goggles are uncontaminated by microbes or chemicals.

*People who wear contact lenses must wear goggles and may not wear safety glasses.

b. Gloves – You will be provided with nitrile gloves for handling biohazards and hazardous chemicals. Please notify the instructor if your skin is irritated by these gloves.

c. Shoes – Shoes must cover the top, front and sides of your feet. They must be impervious to liquids.

d. More specific requirements may exist for labs in which unique hazards are present (for example: BSL2 organisms or physical hazards such as sharps, open flame, UV light, pressurized gases, or liquid nitrogen.

2. Recommended when biological, chemical or physical hazards are present on the lab benches, open shelves or counters:

a. Apron or Lab Coat – You may be instructed to wear an apron or lab coat over your clothes when handling biohazards or hazardous chemicals.

b. Wear natural fiber clothing for any lab activity involving open flame (synthetic material

melts onto skin in a fire).
c. Before putting on gloves remove watches, rings, and bracelets that could either puncture the glove from the inside or interfere with rapid removal of the gloves.
d. Tie back long hair. e. Do not wear clothing with long, loose sleeves.

Waste Disposal

You must precisely follow the waste disposal procedures. Never dispose of anything in lab without prior direction from the instructor.

→ Hazardous chemical waste containers are located:
solids _____
liquids _____

→ Biohazard bags are located: _____ → Sharps containers are located: _____ → Glass (rinsed test tubes and broken glass) disposal boxes are located:
_____

→ Regular trash containers are located: _____

Lab Conduct

1) At the beginning of any class held in a lab room, do not enter the room until your instructor is present. Wait in the hall, even if the door is open.

2) Do these things:
*follow all procedures in manuals, in handouts, and as given by the instructor;
*store backpacks, coats, and other personal items as directed;
*report broken glass and chemical spills to your instructor immediately.

3) Do NOT do these things:
*come to class while intoxicated or while under the influence of drugs that impair your ability to safely perform the lab or field activity;
*horse around or perform unauthorized experiments;
*eat, drink, or chew (tobacco or gum);
*bring drinks or food (even in closed containers) into the lab;
*pipet by mouth; taste chemicals or directly smell chemical fumes.

Lab Hygiene

→ Clean up your individual work area/equipment and community work areas/equipment (e.g., sinks, balances).
→ Put lids back on bottles and containers immediately after use.
→Do not put excess chemicals back into original containers.
→ Dispose of chemicals and waste only as directed by the instructor.
→ Turn off equipment as instructed.
→ Wash your hands prior to leaving lab.
→ Assume that chemicals used in lab are corrosive or irritating. If at any time chemicals come into contact with your skin wash the affected area immediately.

Standard / Universal Precautions

Diseases such as HIV and hepatitis can be transmitted from person to person through contact with human blood or other body fluids. Follow the Standard or Universal Precautions whenever exposure to human body fluids is possible:

→ Consider all body fluids (saliva, blood, urine, feces, vomit) to be potentially infected with a harmful pathogen.