Introductory Guide for Laboratory Demonstrators

Teaching Commons, York University

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Prepared by:
Dr. Stephanie Pugliese Domenikos
Assistant Professor, Teaching Stream
Department of Science, Technology and Society
Division of Natural Science

Anni Siren
PhD Candidate
Department of Electrical Engineering and Computer Science

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INTRODUCTION

"Demonstrators are the most significant resource applied to the laboratory experience"

Rice, Thomas, O'Toole, 2009 p.71

Research has shown that how students interact with their laboratory demonstrator consistently ranks highly as a contributing factor toward their interest in and attitudes to their science courses (Osborne, Simon, and Collins 2003). You play a vital role in students' learning and you are a very important and valued member of staff. In most cases teaching in a subject is conducted by a team of full-time and casual academic staff, with support from professional staff, including technical staff. You are a valuable member of this teaching team and the success of this team relies on your input, open communication and mutual respect amongst all members.

This Laboratory Guide has been designed for you as a new demonstrator and aims to provide practical ideas and teaching strategies to help you confidently engage and communicate with your students and facilitate effective learning outcomes. We encourage you to take a reflective approach to your teaching and to discuss your practice, and issues that arise, with each other and with the practical coordinator.

TOP TIPS

- Communicate regularly with your course coordinator
- Conduct an engaging demonstration by being prepared
- Be knowledgeable about all emergency, health, and safety procedures
- Be familiar with all equipment, materials, and procedures for experiments
- Enjoy your teaching and remember you play a vital role in the students' learning

1. ROLE OF A LABORATORY DEMONSTRATOR

What do you think makes a good laboratory demonstrator? Below are some of the characteristics that have been identified as making an effective demonstrator in science laboratory classes:

- Be approachable to students.
- Provide clear explanations to student questions.
- Give clear explanations of what is expected of students.
- Mark without bias towards individuals and be consistent with other markers.
- Set a good example for students in their preparation and behaviour in the laboratory.
- Show good knowledge of the theory as well as demonstration techniques and skills.
- Be able to link the material presented in the laboratory with theory presented in lectures, tutorials, clinical sessions, and assessment tasks.
- Provide constructive criticisms and suggestions to students as they work in the laboratory, as well as via student feedback verbally in class and formal written assessment.

Whatever you do as a demonstrator should support learning, so the question, "Is this the most effective way for this student to learn?" should be continually posed.

Teaching involves much more than knowledge in your discipline and running practical classes. Teaching requires careful planning, monitoring of student progress, taking responsibility for Workplace Health & Safety, assessing students' work, providing feedback, and evaluating your own effectiveness.

One of the most important things teachers do is provide feedback. At university students should be taking control of their own learning but they can do this effectively only if they have good feedback. If you see your job as helping students develop their ability to learn, you will give them a different kind and quality of feedback than if you think you are just presenting a topic or determining a mark.

You are also a lifelong learner and as a demonstrator you will experience the satisfaction of facilitating a group of students learning together. Your students bring their own experiences, knowledge, and skills to the learning situation. With your facilitation they will learn from each other and you will learn from them – about your discipline and about learning and teaching.

As a professional you will be further developing your pedagogy through seeking feedback, discussion of ideas with others, reading, reflecting on your teaching and possibly in university staff development workshops or formal teaching courses.

2. INTERACTING WITH STUDENTS

It is important to show respect for students. If you are enthusiastic, helpful, knowledgeable, and fair, you will be creating a learning environment that supports students.

New students may feel uncertain or lack confidence, particularly if they have no recent experience of formal study. You may be a student's least threatening point of contact with the university. Students will come to you to share their joys and successes. Some will also come with their disappointments or complaints. Sometimes students have personal problems that make it difficult for them to study effectively and may seek your advice.

What is not expected of demonstrators?

You are not expected to provide specialist help such as career guidance, academic progress advice or personal counselling. You should avoid this and refer students appropriately. You should consult with your course coordinator to keep them informed and to allow follow up with the student if required. Advice should be confined to matters relating to the subject. Avoid discussing areas for which demonstrators are not qualified. Consultation out of practical times is not expected. Refer students to the course coordinator or lecturer.

What is the role of the student?

Teaching is an interaction between teacher and student, so while the demonstrator has certain responsibilities in helping the student to learn, the student also has responsibilities for their own learning and for the learning environment they share with their peers. An outline of responsibilities of students can be found in the York University Code of Student Rights and Responsibilities.

A note about privacy

It is very important to discuss matters with students and seek advice, inside the teaching team. However, it is not okay to discuss issues outside of this team and it is never okay to talk about students or staff on social media. Remember that you are a representative of York University.

3. TIPS FOR INTERNATIONAL STUDENTS

Every new demonstrator faces a great challenge. For the international demonstrator the demands of demonstrating include reaching across different cultural values and assumptions, different educational systems, different native languages, and non-verbal communication systems. Thus, the challenge is greater, but so is the opportunity. As a demonstrator you have the chance to develop a truly sophisticated command of English to which you may have already devoted a great deal of effort. You also have the opportunity to become part of the important Canadian education system and enter into a meaningful, cooperative relationship with your students and the teaching team. Although this section refers to international demonstrators, much of this is relevant when teaching international students.

Language skills

If you have trouble expressing yourself in English, if students have trouble understanding you, or if you have trouble understanding them, openly acknowledge on the first day of class that you and your students may have some difficulty communicating with each other because English is not your native language.

Ensuring your students understand you

Some tips you can follow during your demonstrations:
1. Do not speak quickly; 2. Repeat and paraphrase to emphasise important ideas; 3. Ask your students to raise their hands when they don't understand what you are saying; 4. Check the dictionary for pronunciation of key words, and practice them; 5. Practice your presentation out loud; 6. Watch yourself speak into a mirror or record yourself.

Cultural differences

You may also be surprised at the informal behavior of students in class and in other interactions with their lecturers and demonstrators. For instance, students may wear casual clothes to class, during the practical they may talk with their friends, they may arrive or leave early, they may call their demonstrator by his/her first name and ask questions which seem to challenge the demonstrator. Such behavior may shock or offend you, if you are accustomed to a culture in which students are overtly deferential and respectful toward their lecturers and demonstrators. Recognise that your students are not acting disrespectful of you personally; rather, their behavior is normal for them. Indeed, many students may behave informally with demonstrators they like and respect. However, this does not mean that you must tolerate any behavior that appears disruptive to the class, such as students shouting.

Student expectations

Students expect and appreciate a variety of things from their demonstrators, some of which may be unlike the expectations of students in your country. Here are some examples: 1. Students expect teachers to explain everything fully, particularly the details of what they are expected to do in the course and how grades are assigned; 2. Students values demonstrators who are friendly and open; 3. Students want demonstrators to interact with them in class, encouraging student participation and dealing gently with incorrect responses; 4. Students prefer interesting classes with relevant and intriguing examples; 5. Students respect demonstrators who are knowledgeable, but who are also willing to admit they don't know something when that is the case. Discuss any concerns with your supervisor.

4. STUDENT DIVERSITY

York University is proud to host a diverse group of students and staff. The university values and encourages this diversity, respects differing beliefs and life experiences and strives to create a learning environment in which all students and staff can learn and teach effectively.

Students with a disability

As a demonstrator you will likely teach students who have registered with Student Accessibility Services (SAS) at York University and may have an Accommodation Letter. This letter outlines accommodations that can be made to help the student succeed in their studies. It is the responsibility of the course coordinator to review this document and put appropriate measures in place. The course coordinator will also inform teaching staff of issues pertinent to them fulfilling their roles and responsibilities. All information shared with you remains strictly confidential and may not be shared or discussed outside of the immediate teaching team.

The SAS provides individualized academic accommodation planning to students with learning disabilities/disorders, chronic health and mental health conditions, attention disorders (ADD or ADHD), brain injuries/concussions, physical or mobility disabilities, injuries (e.g. broken arm) and sensory disabilities or impairments (deaf, deafened, hard of hearing, blind, low vision, partially sighted), as well as students who are neuroatypical, neurodivergent and on the autism spectrum.

5. DEALING WITH 'DISRUPTIVE BEHAVIOUR'

It is difficult to provide a set of rules or definitive answers – each case depends on the particular context. Be aware that some of the discipline problems that arise may result from a student's particular mental health situation. When entering the lab space make note of where all the exists in the room are along with the location of the phone.

If a problem arises

Speak to the student privately after the practical class. If the problem is clearly affecting other students, you may need to address this during class. Ask the student what they think the problem is and what they are looking for when they come to the practical class. Clearly describe the behaviour that is disrupting your class and why it is disrupting. Ask the student for a commitment to appropriate behavior. You should alert the lecturer/course coordinator of the problem.

If there is still a problem

With guidance from the lecturer/course coordinator, hold a formal face-to-face meeting with the student and the lecturer/course coordinator, citing the problem behaviour clearly and requesting for it to stop. With guidance from the lecturer/course coordinator you should follow up in writing to the student, noting the time and date of the conversation, the request, and the actions to be taken by the student. This needs to be a true record of what transpired.

It is never wise to publicly instruct a student to leave a teaching space unless it is overwhelmingly clear that they are breaching the Student Conduct Rules and the problem is entirely in their hands. That is, they have not been intimidated or insulted, the teaching has been at least adequate, they really will not listen to reason and are preventing learning from happening or causing danger to themselves or others.

Never use physical force. If you are concerned about threatening behaviour, you should call Security Services (416-736-5333 or from the laboratory phone ext. 33333) and seek support from other staff. The YU Safety app is also a good resource to download on your phone for additional support.

If a student (or yourself) has a mental health crisis

In the case of a mental health crises in a classroom, please contact the appropriate mental health services. To access help, students can book an appointment with the Student Counselling Services. The online booking system opens every morning at 8:45 a.m. EST for same-day booking. Please check back in the system throughout the day, as spots may open due to cancellations. Student preferences regarding counsellor identities (e.g. BIPOC, 2SLGBTQIA+, etc.) will be considered for ongoing counselling/short-term therapy.

For 24/7 support, all York students have access to keep.meSAFE, a free service that offers online resources and phone lines to connect to mental health professionals, in any language. To learn more, visit the MySSP online portal, download the mobile MySSP app or call the toll-free numbers: 1-844-451-9700 (Canada & USA) or 1-416-380-6578 (international). Good2Talk is a free, confidential helpline for Ontario post-secondary students, providing professional counselling and information, and referrals for mental health, addictions, and well-being. It operates 24 hours every day of the year. Phone: 1-866-925-5454 Text: GOOD2TALKON to 686868

6. THE AIMS OF LABORATORY WORK

In order to teach and assess a laboratory class successfully, it is important to understand the aims and anticipated learning outcomes of each topic. In the short term the typical aim of a session spent in the laboratory is to provide a context to explore concepts from lecture material as well as allowing the students to produce an assessable report or worksheet. The long-term goals of laboratory classes include:

- Fostering an ongoing interest in the course.
- Introducing students to future career options.
- Providing students with specialised technical skills.
- Encouraging student interaction, exchange of views and open communication.
- Reinforcing the theory presented in lectures by providing students with hands-on practical experiences.
- Improving students' understanding of the methods of scientific enquiry through experiments and project work.
- Developing general skills such as measurement, observation, recording, reasoning, problem-solving, note-taking, teamwork, and written and oral presentation skills.

7. PREPARATION BEFORE A LABORATORY CLASS

It is important to make time to consider what you are trying to achieve and how you will approach this. Your approach will be partly shaped by the topic being taught. Speaking with the course coordinator, laboratory technicians and other laboratory demonstrators about each of the topics will help you prepare and align your approach. Two helpful questions to ask are:

a. Am I teaching concepts, facts, skills, or a combination of these?
b. How can I enable the students to have an active role in their learning?

Many course coordinators will hold regular planning meetings with demonstrators. Preparing for and attending the planning meetings will help you identify potential problems or difficult questions you may encounter before the session starts. Before you attend these meetings, ensure that you have read all the relevant material in the course manual and that you understand the aims of the next laboratory demonstration. Arrive at the meeting with any specific questions you have about the concepts, methodology or equipment that will be used.

Make sure you know how to use all pieces of equipment and identify the person to contact if there are problems or if equipment malfunctions. It is very important to find out from the course coordinators where the students are in their learning and what material is currently being presented in the lectures. If you have not been given access to the subject eLearning site and other resources, then ask the course coordinator for access. This will help you link the material presented in the practical class with the theory being taught. Make the most of these meetings - the better prepared you are for the class, the more you will get out of your students.

It is equally important that you give some consideration to the motivation of the students you are going to be teaching. For many new students, university is an intimidating experience. Try to remember your first few weeks at university and how you may have felt when you were new and less familiar and experienced with university life. Think about these questions:

- Why are the students studying this topic?
- What can I do to help facilitate their learning?
- What do the students expect of themselves?
- What do the students actually want to learn?
- What do they expect of me to help them be successful?
- How might I encourage students to be active, self-motivated, and independent learners?

8. PREPARATION FOR TEACHING YOUR LABORATORY CLASS

For each lab demonstration session, you need to develop an outline of how you will conduct the class with timelines for each activity. You may be given a laboratory guide by your course coordinator in which case you need to go through each step, or in rare cases you may need to prepare your own lesson plan.

The key point for you to consider is how you can give clear explanations and demonstrations to students so they can successfully complete each particular laboratory task. How can the allotted time best be used to achieve the final learning outcomes? Remember you are familiar with the material, but it is all new for the students. So, to help you give clear explanations to the students remember your:

(A) Communication Skills

Speak clearly, precisely, and confidently, at a steady pace, not too fast or too slow and at a good volume, not too loud or too soft.

(B) Written Instructions

If your topic already has a set of written instructions for a task before your first practical class or laboratory demonstration it is best to work through them. Do they work? If not, why not? Where do changes need to be made? If you find the instructions need amendment or are not operational, first tactfully bring this to the attention of your course coordinator before making any changes. Together you can revise the parts which are unclear and go through them again or ask another demonstrator to go through the re-written format.

(C) Presentation Plan

Organize your information in a logical manner, tell the students how you have organized the laboratory class and describe the purpose for each activity. Where possible make references to the theory and material covered in the lecture. For example, if you want to:

a. Describe a reaction - you can list the individual features and then move from feature to feature.
b. Analyse a problem for causes - list the causes in a logical sequence from simple to complex or from specific to general.
c. Contrast or use pros and cons - demonstrate how to argue a particular position in a process.
d. Demonstrate a process - you need to separate all the steps in the process and present them in the order in which they occur.
e. Summarize - move chronologically from the start to the finish revising the major topics covered.

(D) Conveying Ideas

You need to alert students to the purpose of the laboratory session and the ideas to be introduced and learned. This information may be presented by the laboratory supervisor/lecturer at the start of the class so be aware of what has been covered. Help prepare your students by using phrases such as:

- "Today we are going to look at the 5 main features of X"
- "What I'm going to do is list the steps of the operation so that you know how it works"
- "The laboratory session today is going to focus on 3 keys concepts covered in lecture, and we are going to explore in greater detail each of these concepts"

Also, you need to connect ideas throughout the laboratory demonstration class and use multiple sources of input. The best way to indicate and connect ideas is by using certain phrases such as:

- "Next, I will review…"
- "Now I'd like to move on to…"
- "What I'd like to do next is focus on…"
- "Let's go back and look at…"

Another helpful strategy is to use multiple approaches when teaching new ideas. Students tend to remember images longer than they remember words. Vivid images or appropriate examples can assist students understanding and comprehension, for example:

- Charts and graphs can easily depict differences, comparisons, and contrasts.
- Showing a photograph or a video rather than just describing a process can be clearer.

(E) Rehearsal

Once you have completed these steps it is always helpful to rehearse in your head or out loud. This will not only help confirm you are prepared but also build your confidence and reduce any nervousness. Make sure you give yourself enough time in case you need to go back and clarify or review a few aspects of the lesson. At this point it is also a good idea to try and pre-empt possible questions students may ask. It is helpful before each class to go through this set of questions and write notes for yourself.

(F) Prepare for Other Student Questions

Students will often have questions not pertaining to the current lab. For example, make sure you know how a student can make up a previous lab. Make sure you're familiar with the procedures they must follow and are able to present that information for any lab or lab component you're in charge of.

Summary Checklist - Teaching Preparation

Questions to Consider	Your Notes
Are you clear what the tasks of the lesson are?	
What concepts do the students need to have mastered before starting the class and what actions will you take if some students have not mastered these concepts? Is there a pre-lab exercise and/or quiz? Have you reviewed this?	
Do the students need any particular skills to be able to complete the task?	
Is there a written set of instructions with examples available for the students?	
Have you got all the necessary equipment available and set-up for the laboratory demonstration?	
Is the task to be completed and assessed during class time?	
Are there any accommodations that need to be made for a student with a disability? Have you reviewed their documentation or discussed this with the course coordinator?	
Are you familiar with all necessary WH & S procedures for this class?	

9. TEACHING STRATEGIES FOR LABORATORY CLASSES

It is absolutely natural to feel nervous before any class and even very experienced teachers can still feel a little anxious before teaching. The following section aims to help you not remove but reduce some of your anxiety and manage any nervousness.

(A) Beginning the Laboratory Class

Always arrive early and if there is no class in the lab before you enter, review as much of the equipment and teaching resources as possible. Make sure you know where all the equipment is stored and where the washrooms are. Welcome students as they arrive and introduce yourself by writing your name on the board, this is a good way to get to know students' names and establish a friendly classroom atmosphere. Also ask students about the previous lecture, often a laboratory class is timetabled straight after a lecture, and this will assist you to be in-sync with the students. It is a good idea to either take attendance or announce clearly what the lab room number is, what section the lab is for and what the lab that day is for before you begin to ensure that students are in the correct lab space.

(B) Introductory Talk

In most demonstrations the lab supervisor/lecturer will introduce the class, however, if this is your responsibility then you need to start the laboratory class with a pre-lab talk or introduction where you may include:

- A demonstration of how the equipment works.
- A rough timetable of how the session will progress.
- An outline of all Workplace, Health, and Safety guidelines.
- Definitions of terms and jargon that may be unfamiliar to students.
- Details of any assessment tasks during the class and what is expected.
- Explanation of concepts fundamental to successfully completing the session.
- The aims of the session and how these relate to the lecture and course materials.
- Details of clean-up procedure, including disposal of any harmful chemicals and sharps.

At the end of this section and before the laboratory commences provide the opportunity for students to ask questions and clarify the purpose and direction of the tasks of the practical.

(C) Pre-lab work

Sometimes a lab has a pre-lab component or a quiz. Make sure you explain the rules as instructed by your course director to ensure coherency and to reduce confusion. Commonly if a student is late, they will either miss the full quiz or will only have the remaining time to complete it.

(D) Main Practical Session

Now it is time to start the session, and this will depend a lot on the type of ideas, demonstrations or experiments that are being conducted. Guide the students through each process, allowing and encouraging them to ask questions throughout the class. It is very important that students are given the opportunity to make their own discoveries and learn to reason and problem-solve. Use your own knowledge of the topic in the laboratory to facilitate them to find their own answers rather than 'just giving them a solution'. This may mean explaining a concept or theory in a number of different ways, helping them to get started, moving them forward when they get stuck, providing anecdotal evidence or practical experience scenarios or re-directing them back to the lecture notes or textbook to clarify and better understand the concepts.

Student support

Providing assistance to all students means:

- Making sure you get around to all students and not missing anybody.
- Ensuring no one student or group of students takes up all of your time.
- Being sensitive to students who are struggling – offer guidance and encouragement.
- Remembering to be inclusive of all students, acknowledging each student will be coming from their own level of understanding.
- Be aware of adjustments required for disability students or students with other special needs.

Here are some ideas to help you manage the class while students are working on their task:

- Walk around the class rather than only standing at the front.
- Create a checklist-system to make sure you get to see each student or group.
- Always be visible so you can observe all students and they can get your attention.

Managing time

Managing time when teaching can be challenging, particularly when you have a diverse group of students. Sometimes you may feel you have too much time or too little time. Being prepared will help minimize this feeling as well as help you find the balance between teaching students who understand new ideas quickly and those who need more practice. If for example you feel you don't have enough time for lots of question during the lab, you could offer to answer questions via email or answer questions on an eClass discussion forum/blog. If you feel you have too much time, always have extra questions prepared or start to introduce next week's topic.

Active learning and questioning

Students learn best when they are actively engaged, and the laboratory is a perfect place to foster active learning. Reward questions as much or more than answers, and remind students there are no silly questions. Encourage students to question and reflect on their own thoughts, processes and conclusions, other student's findings, as well as the steps outlined in any given text. You can share one student's questions with the class and discuss them as a group, as they may be questions of common interest to the entire class.

In addition, consider the following techniques:

- Pausing - allows students time to think about a question before responding.
- Re-phrasing - students genuinely may not understand the original question.
- Probing - helps stimulate thinking skills. You can probe for clarification or examples.
- Reacting - always react positively to student contributions. If an answer is clearly wrong or inadequate, try re-phrasing and clarifying the question.

Keeping records

In most cases you will be required to maintain accurate records including attendance roles and marks. Your record keeping system will need to be one that others on the team can readily access, understand and use. Keep a record of student names, contact details, student numbers, attendance, assessments, and consultations. Please consult with the course coordinator on their record keeping requirements. It is recommended that your record attendance at the end of each laboratory class as students show you adequate completion of all required work. It is most important that these records are kept up-to-date throughout the session. Be aware of the limits of your authority, e.g. medical certificates should always be cited by the supervisor or coordinator and your subject may require students to submit an application for a Petition in relation to missed classes and/or assessments.

(E) Summarizing the Laboratory Lesson and Cleaning-up

When planning your laboratory demonstration, it is important to always leave enough time for summarizing the day's lesson and cleaning-up the laboratory. When you have the students' attention briefly summarize/review the key concepts covered in the lesson. When summing-up you need to:

- Remind students of any assessments, due dates, and submission format.
- Summarise the key concepts of a task or experiment and suggest further readings.
- Emphasise the links between the lectures, course materials and laboratory exercises.
- Reinforce the clean-up procedure, including the disposal of any harmful or hazardous chemicals/sharps.

10. GUIDE TO STUDENT ASSESSMENT

The assessment of laboratory tasks serves two important purposes:

- To assess students learning and grade students on set tasks.
- To provide immediate feedback to specific problems so students become aware of gaps in their understanding.

In general you will be expected to mark in accordance with a specific set of assessment criteria, marking scheme or rubric. Subject outlines provide information to students about assessment requirements and how assignments will be marked. If you are unsure about any aspect of marking, always check with your course coordinator, your fellow laboratory demonstrators and ask yourself the following questions:

Summary Checklist – Assessment

Questions to Consider	Your Notes
Am I clear about what the students are being assessed on in each task?	
Do I have a copy of and understand the marking criteria and marking scale?	
Do I take marks-off for poor grammar, spelling and English and what do I do with poor referencing methods?	
What are the guidelines for granting students extensions? Are there penalties for late submissions?	
Do I know what to do if students argue or want to appeal the marks they have been given?	
Do I know what to do if I suspect students have submitted work other than their own?	

Academic Integrity
York University regards academic dishonesty as a very serious matter. Remind students that every subject outline clearly shows links to the university's academic integrity policy and the role and responsibility of each student to adhere to this. If you suspect students of plagiarism, then you need to contact your course coordinator immediately. You can also provide students with the following links:

- Senate Policy on Academic Integrity
  http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/

- SPARK Academic Honesty Tutorial
  https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/

- Code of Student Rights and Responsibilities
  https://oscr.students.yorku.ca/student-conduct

As a laboratory demonstrator you might detect plagiarism in laboratory reports or academic misconduct during in class exam supervision. You may also need to be aware of students inappropriately 'sharing' experiment results. If you notice what you think may be academic misconduct you need to **consult and be guided** by your course coordinator in how to respond and manage this. Some tips that may help you notice plagiarism include:

- Generally poor referencing techniques.
- Lack of quotation marks or correct referencing.
- Noticeable repetition from one student paper to another.
- Language that seems inconsistent with the student's other work.
- Inconsistencies in writing style or fonts within a piece of written work.

11. PROVIDING STUDENT FEEDBACK

In order for students to learn and to make the most of the learning and assessment process it is essential to provide students with feedback. Often students are unsure of what constitutes feedback and only see marks and written feedback on individual reports as feedback. It is helpful to explain that in addition to comments on individual assignments, answering questions in class, on email or in forums is also feedback. Effective feedback:

- Is specific and timely and given as close to task completion as possible.
- Allows students to adapt and adjust their learning strategies.
- Leads students to being capable of assessing their own work.
- Gives students a clear indication of how work can be improved.
- Focus students on fulfilling the task rather than effort or time spent.
- Addresses students' misconceptions and gaps in their understanding.

If students are to learn from written comments on individual/group assignments they must read, understand, and act upon what you have written and respond accordingly in their next piece of work. All students need to receive feedback, not only those who did not do so well. Students who do well need to know why they achieved a high mark and what is needed to progress further.

Remember to:

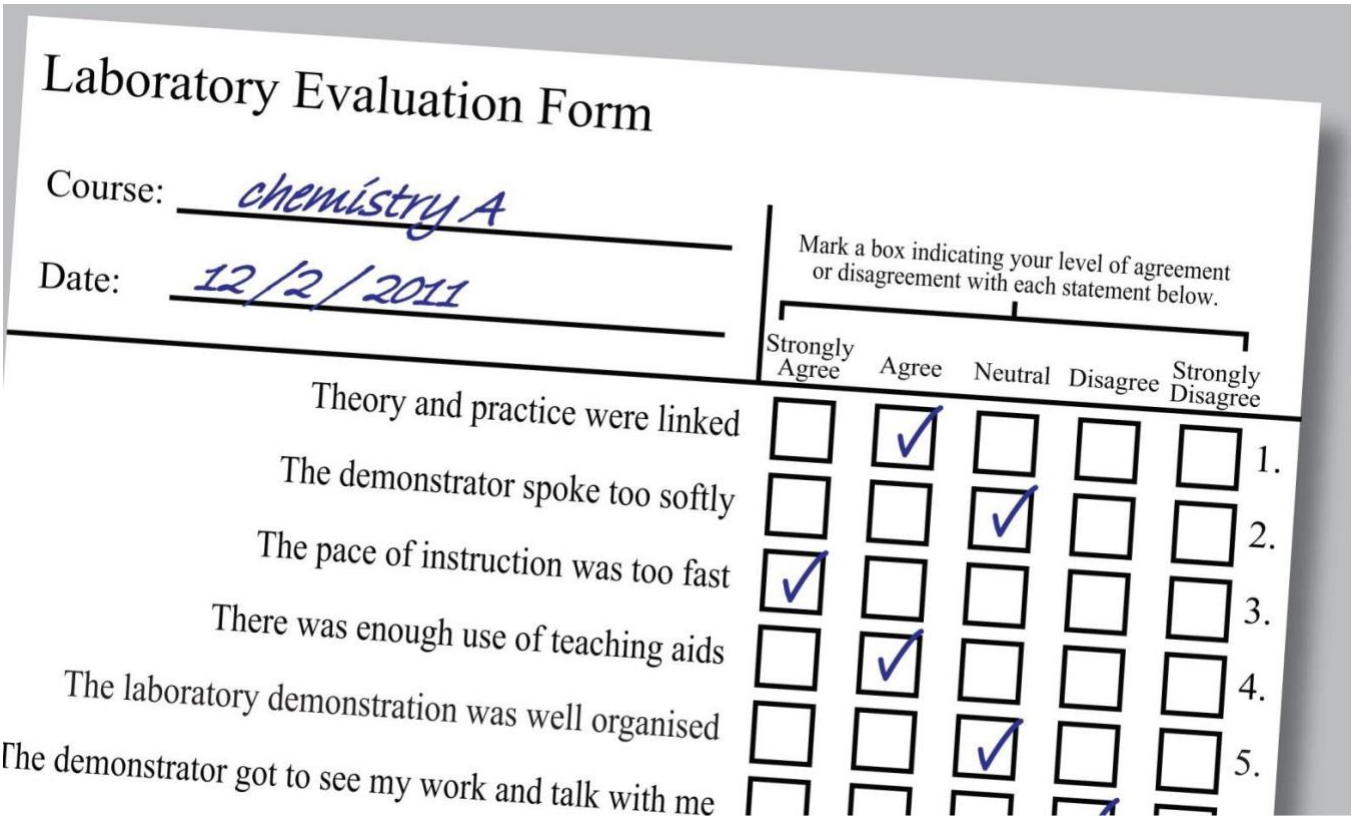
- Try to sign off on a positive and encouraging note.
- Make constructive criticisms on potential improvements.
- Clearly explain why you have awarded a particular mark.
- Where applicable, encourage students to come and discuss the report with you.
- Use positive reinforcement and congratulate students on what they have done well.

As well as individual written feedback, it is also useful to provide some general feedback to the whole class. This can be done either during a class or at the start of the next week's class by drawing attention to common problems and questions asked during the week or from assignments that have been recently assessed. Discuss this with the lab supervisor/lecturer.

12. EVALUATING YOUR LABORATORY CLASS

As a laboratory demonstrator you may not be formally evaluated on your teaching. However, your teaching contributes to the overall student experience in any subject and each subject is formally evaluated on an ongoing basis. During the laboratory demonstration or towards the end, you may wish to get some immediate feedback on how the laboratory was perceived by the students. You could ask for a show of hands or request that students complete anonymously a simple 5 scale-checklist, which you can prepare before class and students drop into a box on their way out. The statements could be written to match the topic or be more general.

You may also choose to have a formal Teacher Evaluation conducted at the end of the teaching semester. You will need to consult with the course coordinator.



Laboratory Evaluation Form

Course: chemistry A

Date: 12/2/2011

Mark a box indicating your level of agreement or disagreement with each statement below.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	
Theory and practice were linked		✓				1.
The demonstrator spoke too softly			✓			2.
The pace of instruction was too fast	✓					3.
There was enough use of teaching aids		✓				4.
The laboratory demonstration was well organised			✓			5.
The demonstrator got to see my work and talk with me						

Sample laboratory evaluation sheet © RMIT University 2011

13. HEALTH AND SAFETY

As a laboratory demonstrator you are responsible for supervising your students at all times and for ensuring that the students are aware of the health and safety policies of your discipline, school and the university.

The rules governing behaviour in laboratories may differ depending on the type of session but there are a few standard rules that should be pointed out to all students.

- Long-hair must be tied back.
- No eating, drinking, or smoking in the laboratory.
- Naked flames should not be left unattended
- Close-toed shoes and full-length pants should be worn at all times.
- Personal protective equipment such as lab coats, gloves and protective eye wear (i.e. goggles) must be worn at all times (contact lenses are not recommended in the laboratory)
- Hands should be washed at the end of the session.
- Sharps should be disposed of only in marked containers
- Hazardous chemicals should be disposed of in marked containers and not into the sewage system (i.e. down the sink)
- Do not carry hazards outside the lab and remove your gloves when leaving the lab

At all times lead by example and model exceptional WH&S practices. Depending on the nature of the laboratory you're assigned to, there may be additional requirements or special training including but not limited to WHMIS and biohazard training. Any special training should be confirmed with your course director at the start of term.

You need to talk to students about general health and safety issues, as well as those specific to each laboratory session. If you are in **any doubt** about any health and safety issues within the laboratory, you should approach the laboratory technician or your course coordinator for advice.

To ensure that you and your fellow TAs are safe in a lab environment the following are a few standard rules to adhere to:

- Find out where all the safety equipment is located in the lab (e.g. eyewash station, fire extinguishers) and the emergency exists.
- Each lab that hosts dangerous chemicals has a binder on how to treat various

chemical injuries. Please note where this binder is located in your lab.

- When moving heavy equipment, please ensure there is a correct trolley or moving equipment available. Do not attempt to move large equipment alone, always have at least two people present.
- Ensure students clean their stations before they leave, and store and dispose of equipment as instructed. Ensure that all stations are left clean, if they are not, you will need to finish cleaning up.
- Ensure all students exit and the door is secured after you leave.
- In case of rigorous exercise in lab, ensure that you go over exercise safety regulations provided to you by your course director. If these are not provided, please inquire proper instructions from your course director.

Note that the lab technician should always be available to you to ask questions if you're unsure about lab safety or equipment. Also, please talk to your fellow TAs. More experienced TAs are a great asset for more information.

Workplace Hazardous Materials Information System (WHMIS)

WHMIS is a comprehensive system that provides health and safety information on hazardous products that may be used in your laboratory. Furthermore, WHMIS is aligned with the worldwide hazard communication system known as GHS – the Globally Harmonized System of Classification and Labelling of Chemicals. You should be familiar with the pictograms that can be found on chemical labels that show their hazard:

	**Exploding bomb** (for explosion or reactivity hazards)		**Flame** (for fire hazards)		**Flame over circle** (for oxidizing hazards)
	**Gas cylinder** (for gases under pressure)		**Corrosion** (for corrosive damage to metals, as well as skin, eyes)		**Skull and Crossbones** (can cause death or toxicity with short exposure to small amounts)
	**Health hazard** (may cause or suspected of causing serious health effects)		**Exclamation mark** (may cause less serious health effects or damage the ozone layer*)		**Environment*** (may cause damage to the aquatic environment)
	**Biohazardous Infectious Materials** (for organisms or toxins that can cause diseases in people or animals)				

* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

For more information on WHMIS, visit:
https://www.ccohs.ca/oshanswers/chemicals/whmis_ghs/

Safety Data Sheet (SDS) database
SDSs are summary documents that provide information about the hazards of a product and advice about safety procedures. They provide more detailed hazard information about the product than the label and are an important resource to help you learn about the product(s) used in the laboratory.

SDSs inform the user:

- What the hazard(s) of the product is/are
- How to use the product safely
- What to expect if the recommendations are not followed
- How to recognize symptoms of exposure
- What to do if emergencies occur

You should consult the Safety Data Sheet (SDS) Database prior to a demonstrating an experiment to ensure you are familiar with all the hazards of all the products used: https://chemicalsafety.com/sds-search/

If an accident occurs

1. Notify the Lab Technician and/or the Course Director immediately
2. Refer to the YorkU Emergency Response Guide for protocols
3. If you require medical attention, the nearest emergency room is Humber River Hospital
4. Complete a Workplace Incident Report with your Course Director. Submit the form to Health, Safety & Employee Well-Being (HSEWB) (wir@yorku.ca) within 24 hours of the incident

14. CONCLUSION

The following checklist is a summary of points to consider when teaching a laboratory demonstrator class.

Summary Checklist – Ready to Start

Key Questions to Answer	Y/N Follow-up
Do I know who my course coordinator is and have I met with him/her?	
Have I completed a School Induction for Workplace, Health & Safety?	
Have I attended a welcome & orientation to the course/school?	
Am I sure of what my role is as a laboratory demonstrator?	
Do I feel prepared for the laboratory class I am about to teach?	
Have I prepared 'how' I will teach the class?	
Do I know if any of the tasks are to be assessed?	
What strategies have I got in place to reflect on and evaluate the session?	
Do I know where to get extra support to develop my teaching skills?	

Enjoy your time as a Laboratory Demonstrator at York University

15. REFERENCES

Biak, C. (2008). Melbourne University Sessional Teachers' Manual. Victoria, Australia: University of Melbourne.

Houston, D. (2010). Flinders University Centre for University Teaching, Science Demonstrators Handbook. South Australia, Australia: Flinders University.

Osborne, J., Simon, S. & Collins, S. (2003) Attitudes towards science: a view of the literature and its implications. International Journal of Science Education, 25(9), 1049 – 1079.

Rice, J. W., Thomas, S. M., O'Toole, P.(2009) Tertiary Science Education in the 21st Century.
Australian Learning and Teaching Council.

Rix, C., (2009) Hints for Laboratory Demonstrators. Victoria, Australia: School of Applied Science, RMIT University.

16. RESOURCES

Important Contact Information

- Medical emergency: 911
- Campus Security Services: ext. 33333 (or 416-736-5333)
- Custodial services: ext. 22401
- Hazardous spill: ext. 55491 (or 416-736-5491)

YU Heath and Safety

- https://www.yorku.ca/bettertogether/
- https://www.yorku.ca/well-being/
- https://counselling.students.yorku.ca/
- https://www.yorku.ca/safety/gosafe/
- https://www.yorku.ca/safety/app/
- https://tinyurl.com/y2cbctfv (YU Ergonomic brochure)

YU Health and Safety Training

- https://hr.info.yorku.ca/health-safety-training/

YU Emergency Response Guide

- https://www.yorku.ca/safety/resilience/erg/

Faculty of Science Health and Safety

- https://www.yorku.ca/science/governance-services/health-safety/

Safety Data Sheet (SDS) Database

- https://chemicalsafety.com/sds-search/

YU goSAFE Services

- https://www.yorku.ca/safety/gosafe/
- On-campus safe-escort, during late hours
- Shuttle pick-ups to parking lots, bus stops or residences
- Contact: 416-736-2100 ext. 55454 OR 416-736-5454
- Contact via any campus payphone (for free)
- Contact via Blue Light emergency phones
- Contact via safety phone buttons; red for Security and black for goSAFE

Student Accessibility Services

- https://accessibility.students.yorku.ca/
- Questions and Concerns: sasreg@yorku.ca

The Teaching Commons

- Teaching resources for TAs, TA/ITA orientation, Certifications and Accredited courses

- https://www.yorku.ca/teachingcommons/
- https://www.yorku.ca/teachingcommons/graduate-students/
- For inquiries email: maynat@yorku.ca

Technical Support

- https://wiki.eecs.yorku.ca/dept/tdb/covid19:start
- https://wiki.eecs.yorku.ca/dept/tdb/services:remotelab

Bio-Physics Labs

- Transmitted Light Microscopy
- Contrast Modes in Microscopy
- Lysozyme Crystallization
- Optical Tweezers of Onion Cells
- Light Induced Chloroplast Translocation
- Lysozyme Crystallization
- In-Vivo Spectroscopy
- The Electrical Properties of Chara
- Mapping a binding site using NMR spectroscopy

NOTES