

Physics TA Training

Libby Harper-Clark
TATP Science and Engineering Coordinator
Jason Harlow
Senior Lecturer, Department of Physics

Opening Exercise

- Take a moment to reflect on the two major concerns or challenges you have about your teaching appointment.
- Write concerns on the **Needs Assessment Form**.

Think, Pair, Share

Outline

- Policies
- Labs, Practicals and Tutorials
- Teaching techniques
- Communication
- Grading
- Academic Integrity
- General Tips

Relevant policies

- Code of Behaviour on Academic Matters
- Code of Student Conduct
- Freedom of Information and Protection of Privacy
- Appropriate use of Information Technology
- Conflict of Interest

Labs, Practicals, and Tutorials

Before Your Lab or Practical

- Complete the activity/experiment by yourself
- Understand the equipment
- Talk to colleagues/lab manager/instructor
- Train yourself
- Prepare a pre-lab talk

During Lab and Practical Activities

- Ensure safety
- Watch for blindly recording data
- Ask questions make it interactive
- Move around and observe students/groups
- Give feedback to common troubleshooting
- Do not do it for them



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Tutorials

- Answer questions on lecture topics
- Review materials
- Work on specific problems
- Help on assignments/projects
- Distribution of test papers



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

First Contact

- Get to know the room and location
- Arrive early and put up your contact information (email, office hours & location).
- Introduce yourself
- Establish ground rules (emailing, classroom, homework, quizzes)
- Use an icebreaker
- Leave time for student questions



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION



When Speaking to a Group

- Avoid reading out material
- Speak slowly and clearly
- Show enthusiasm
- Move around while talking
- Give pause and summarize concepts
- Ask questions
- If possible use technology and props
- Recommend problems/ideas for practice



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

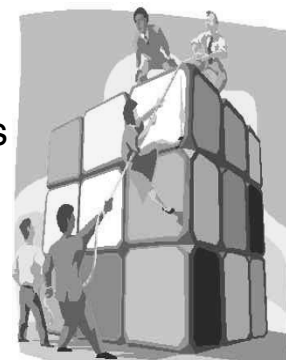
Disruptive Behaviour

- **Examples:**
- Constant questions or interruptions
- Showing inattentiveness
- Disagreeing with everything
- Creating excessive noise
- Entering class late or leaving early
- Use of pagers or cell phones in the classroom
- Disrespecting others' rights to express their viewpoints

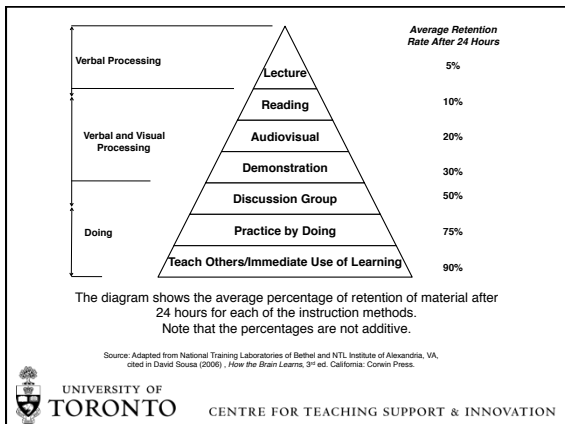


UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Teaching Techniques for Science TAs



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION




Recommended Techniques in Tutorials / Practicals

Jigsaw

In this strategy, students work in teams on a problem then report back to people from other teams on their teams problem.

- builds communication and participation



Problem-based learning

In this strategy, small group is given a problem and need to figure out how to solve it

- develops team work in problem resolution


UNIVERSITY OF TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Recommended Techniques in Laboratories / Practicals

Collaborative Report Writing

In this strategy, group works on report writing under TA guidance

- promotes good skill exchange



3-2-1

In this strategy, students share 3 observations, ask 2 questions and generate 1 idea

- develops power of observation and synthesis of ideas

UNIVERSITY OF TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Recommended for one-on-one Consults

Guided Questioning


In this strategy, questions stimulate understanding

- builds independence and critical thinking

Teacher-Student Role reversal

In this strategy, student adopts role of teacher

- builds confidence and knowledge mastery



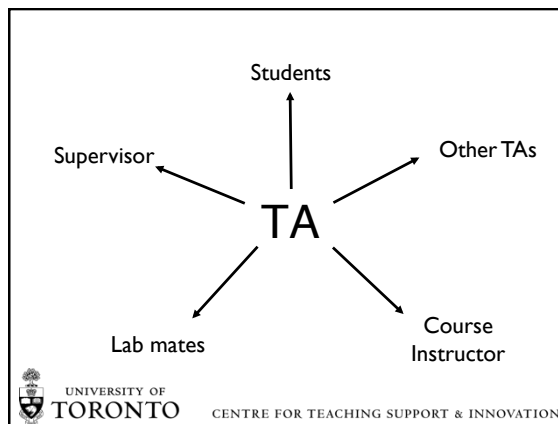
UNIVERSITY OF TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Learning Activities

Walk around survey Debates
Pause and Think Rotating stations Interviewing
Co-operative learning Groups Brainstorming
Jigsaw Role playing Response-cards/Clippers
Problem based learning Guided questioning
Treasure hunt Teacher-student role reversal
Video case study 3-2-1 Poster tour
Think-pair-share
Email/Online discussion

TATP

UNIVERSITY OF TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION



Getting to know you...

- Ice breakers
- Individuals with names, not just a number!
- Backgrounds
- Knowledge
- Reasons for taking the course

Constructive Feedback

- Break up into groups of 3-4
- Instead of the following statements, develop constructive feedback that is both explicit but kind.
- Some of these statements may be spoken accidentally, so remember to think before you speak!

Rephrase (constructive & polite)

1. "Good Idea!"
2. "No, you're wrong"
3. "I don't understand."
4. "Please elaborate."
5. "I don't know."

Answering Questions

- Make sure you understand the question
- Paraphrasing may help with understanding
- Ask them what part they don't understand
- Pause and reflect, then provide clear answers
- Admit if you don't know the answer, but seek out a solution
- There are no dumb questions!

It's OK to ask for help

- Use all the resources available to you
- You are not alone!
- Refer students to the various services U of T has to offer (WIT, Writing Centre & ELWS, A&S, Accessibility and Counselling Services)

Grading

Before Grading

- Know the content of the assignment
- Work through the assignment yourself
- Anticipate difficulties students might encounter
- Read through a few papers
- Set a time limit for each paper or question
- Formulate and/or use a detailed marking scheme



UNIVERSITY OF
TORONTO

CENTRE FOR TEACHING SUPPORT & INNOVATION

During Grading

- Do not have a grading marathon.
- Write clearly on scripts
 - Indicate where and how marks are lost
 - Write marks per section/ question
- Revise rubric if necessary
- Annotate rubric as you progress
- Group scripts in potential breach of academic integrity and check them together
- Make a list of common errors



UNIVERSITY OF
TORONTO

CENTRE FOR TEACHING SUPPORT & INNOVATION

Grading Activity



Designed by
Dr. Jason Harlow



UNIVERSITY OF
TORONTO

CENTRE FOR TEACHING SUPPORT & INNOVATION

Lab Assignment: Diving Eye-dropper

- What is Archimedes' Principle?
- 2 Marks
- Follow the instructions given to build and test the diving eye-dropper. Describe the building process: What the dropper does when you squeeze the bottle and why?
- 8 Marks



UNIVERSITY OF
TORONTO

CENTRE FOR TEACHING SUPPORT & INNOVATION

- What is Archimedes' Principle? 2 Marks
- The buoyancy force on an object immersed in a fluid is equal to the weight of the displaced fluid
- Follow the instructions given to build and test the diving eye-dropper. Describe the building process: What the dropper does when you squeeze the bottle and why? 8 Marks
- Procedure 2 Marks
 - Filled the bottle with water
 - Adjusted size of bubble in dropper until dropper just floats
 - Tightened lid
- Observation 3 Marks
 - When bottle is squeezed, diver sinks
 - When pressure is released, diver floats
- Reason 3 Marks
 - Dropper is held up by buoyancy provided by displaced water by bubble. When bottle is squeezed, bubble shrinks, and buoyancy decreases. Then dropper sinks.



UNIVERSITY OF
TORONTO

CENTRE FOR TEACHING SUPPORT & INNOVATION

Marking Activity results

Team	Alice	Bob	Cho	Darius	Eva	average
1	3	10	4	6	2	5
2	4	5.5	5	3	3	4.1
3	5.5	10	5	2	4	5.3
4	5.5	10	4	5.5	2	5.4
5	4	10	5	2	2	4.6
6	4.5	8.5	4.5	3.5	1	4.4
7	5.5	10	3.5	2.5	2	4.7
8	6	10	5	3	2	5.2
9	3	8	5	3	2	4.2
average	46%	91%	46%	34%	22%	
std dev	11%	16%	6%	14%	8%	
min	3	5.5	3.5	2	1	
max	6	10	5	6	4	
mark range	F to C	D to A	F or D	F to C	F	

Lesson learned: No matter how carefully you mark, there will be an uncertainty.



UNIVERSITY OF
TORONTO

CENTRE FOR TEACHING SUPPORT & INNOVATION

Feedback

- Be detailed, specific, and constructive
 - encouraging and affirming of good ideas
 - constructively critical of problem areas
- When grading series of assignments give detailed comments on the first few assignments.

After Grading

- Ensure assigned grades correspond to a fair ranking
- Record raw scores
- Set policy for re-grading
- Return assignments to the students individually and when it is least disruptive
- Set up a time to address grading disputes

Academic Integrity

What is Academic Integrity (AI)?

- Intellectual honesty
- Appropriate use of information
- Accurate citation and referencing
- Awareness of and adherence to strict academic principles and values

Examples of AI violations

- Plagiarism
- Impersonation
- Copying
- Cheating
- Purchased essays
- Reusing materials from other courses
- Misuse of computerized sources

How to prevent

- Talk to all students about academic integrity.
- Teach students correct citation.
- Have links to university policy / guidelines available on course website.
- Make clear all work must be “in own words”.

How to detect

- Know students' level of performance.
- Pay attention and notice repeated sentences / sudden changes in style.
- Paid resources: TurnItIn, MyDropBox.
- Free software for detection plagiarism in physics by Professor Lou Bloomfield, University of Virginia:
www.plagiarism.phys.virginia.edu/home.html



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

What to do when found

- **Do not take action independently.**
- Do not indicate to the student that you suspect plagiarism (even if asked).
- Do not return any papers.
- Refer the problem to the instructor, who should follow proper protocols.
- Assist the instructor by investigating if asked.
- **It is an academic offence to not report.**



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Resources available

- **For more information go to:**
www.utoronto.ca/academicintegrity
- **How not to plagiarize:**
www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

General Tips



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Personal time management

- When/how do you work best?
- Plan and track your hours
- Time/Mind Intensive activities
- Create “protected time”
 - Teaching-related activities
 - Research/thesis, social, etc.



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Further Resources

- Writing Centres
- English Language and Writing Support (ELWS)
- Academic Success Centre
- Accessibility Services
- Counselling and Psychological Services (CAPS)
- Walksafer Program



UNIVERSITY OF
TORONTO CENTRE FOR TEACHING SUPPORT & INNOVATION

Teaching Assistants' Training Program

- The TATP is here to help you Free-of-charge peer-training program
- Workshop series
- A certificate program
- Awards in recognition of outstanding teaching by TAs
- A resource library (print, Dvd and web) and individual consultations
- Peer-based support network
- Robarts Library, 4th floor



Closing Exercise

- Look at the list of teaching concerns you wrote down at the beginning of this session.
- Do you have any questions that have not been covered by today's workshop?



Teaching Assistants' Training Program
<http://www.teaching.utoronto.ca/gsta.htm>

