



Teaching Assistants Training for the Physics Department

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Questions for new TAs

Give one-get one

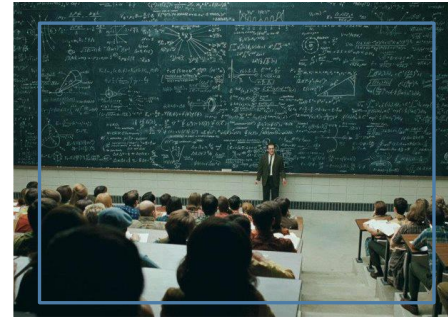
1. Think about your own responses to the **3 questions**. Record at least one idea.
2. Move about the room, interacting one-on-one each time **giving one of your ideas** and **getting one in return**. Record your colleagues' ideas on the sheet, including their name
 - What is my purpose as a TA?
 - What do students want from me?
 - How to meet my students demands?

Added value of TAs

Share
experiences



Demonstrate
high-quality
thinking



Personal insights



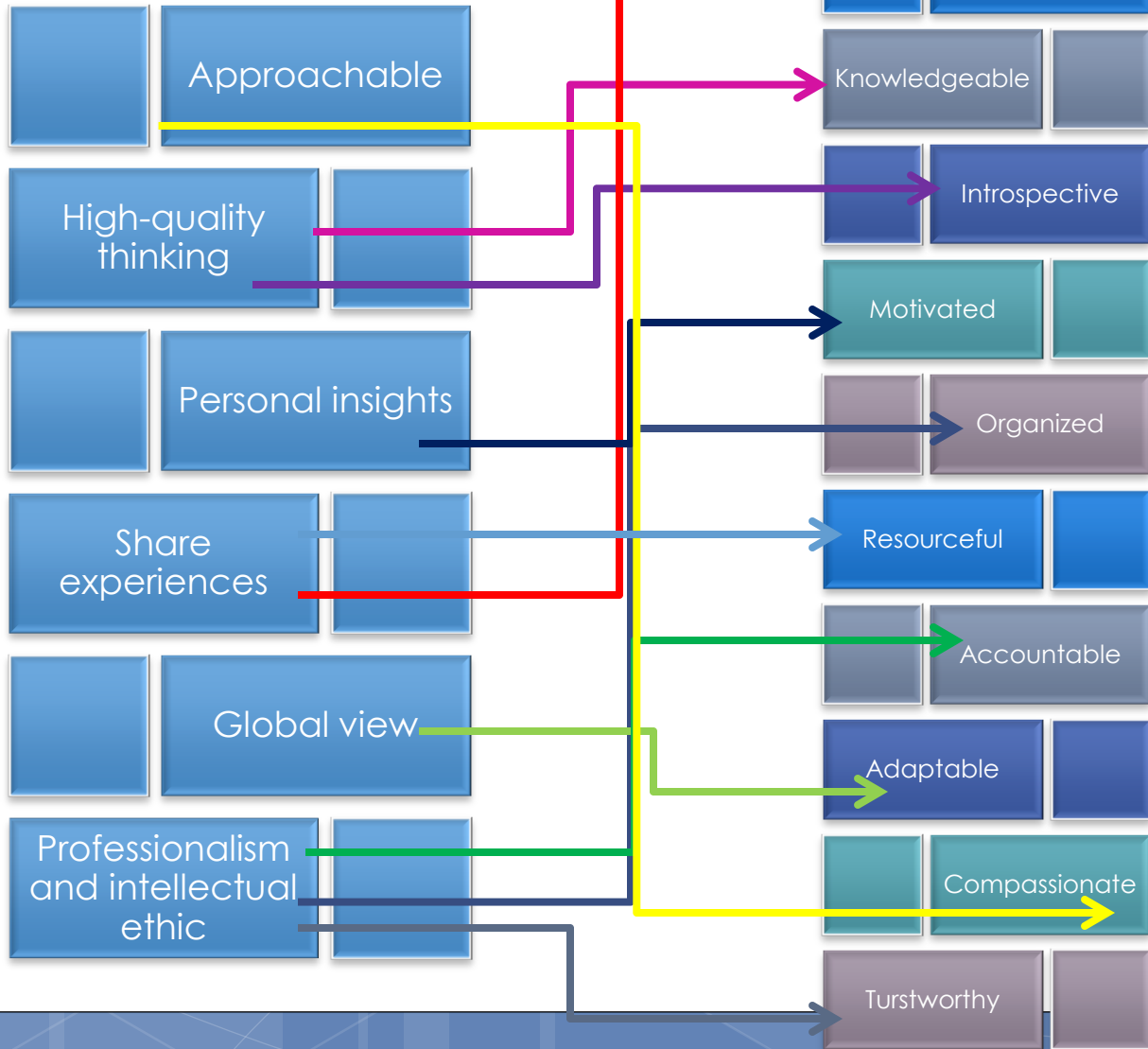
Approachable

Demonstrate
professionalism
and intellectual
ethics



Global
view

Added Value



Personal qualities

Communication with Course Instructor

1. Set

expectations

Determine the course focus/outcomes

Identify your duties and responsibilities

Establish communication methods: email, meetings

2. Mid-term Review

Discuss time/work distribution and job performance

Common student issues

Discuss midterm exam (marking scheme / rubrics)

3. Feedback & improvements

Evaluations from students and CI

Reflection on course outcomes:

- Effective assignments?
- What could be added?
- What can be taken out?

Communication with other TAs

- Can provide help with:
 - Discuss lesson/lab plan, problem solving & marking
 - Discuss classroom management, student issues
 - Share teaching approaches & skills
 - Advice on responding to other TAs or CI
- Ensure clear division of responsibility in multi TA courses

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Getting to know your students

- Why is it important?
 - Students appreciate engaged and approachable TAs
 - Contributes to a stranger class community
- Questions for **the start of the semester**:
 - Who are my students?
 - Why are they taking the class?
 - What are they expecting to learn from it?
 - How do they learn best?

Classroom Presence

- Definition: being aware, receptive and responsive to the mental, emotional, and physical workings of students in their learning environment
- A good relationship between teacher and students facilitates student learning

Presence in teaching, C. R. Rodgers and M. B. Raider-Roth (2006)

Establishing a physical presence

- Personality: enthusiasm, humour
- Body Language
- Proximity: eliminate barriers
- Movement: be dynamic in the class
- Awareness: watch and listen carefully while teaching
- Voice: ensure audibility and variety

Communicating expectations

Communicate expectations on the FIRST DAY

- Be clear about how students should communicate with you: Email, in person, Blackboard
- How long you will take to respond
- Explain your reasons for doing things the way you do:
“I do not respond to emails the night before a mid-term because...”

Approaches to communicating expectations

- Be organized: lead by example
- Be firm, consistent and honest
- Show enthusiasm and engage students
- Overall, strive to build a strong rapport

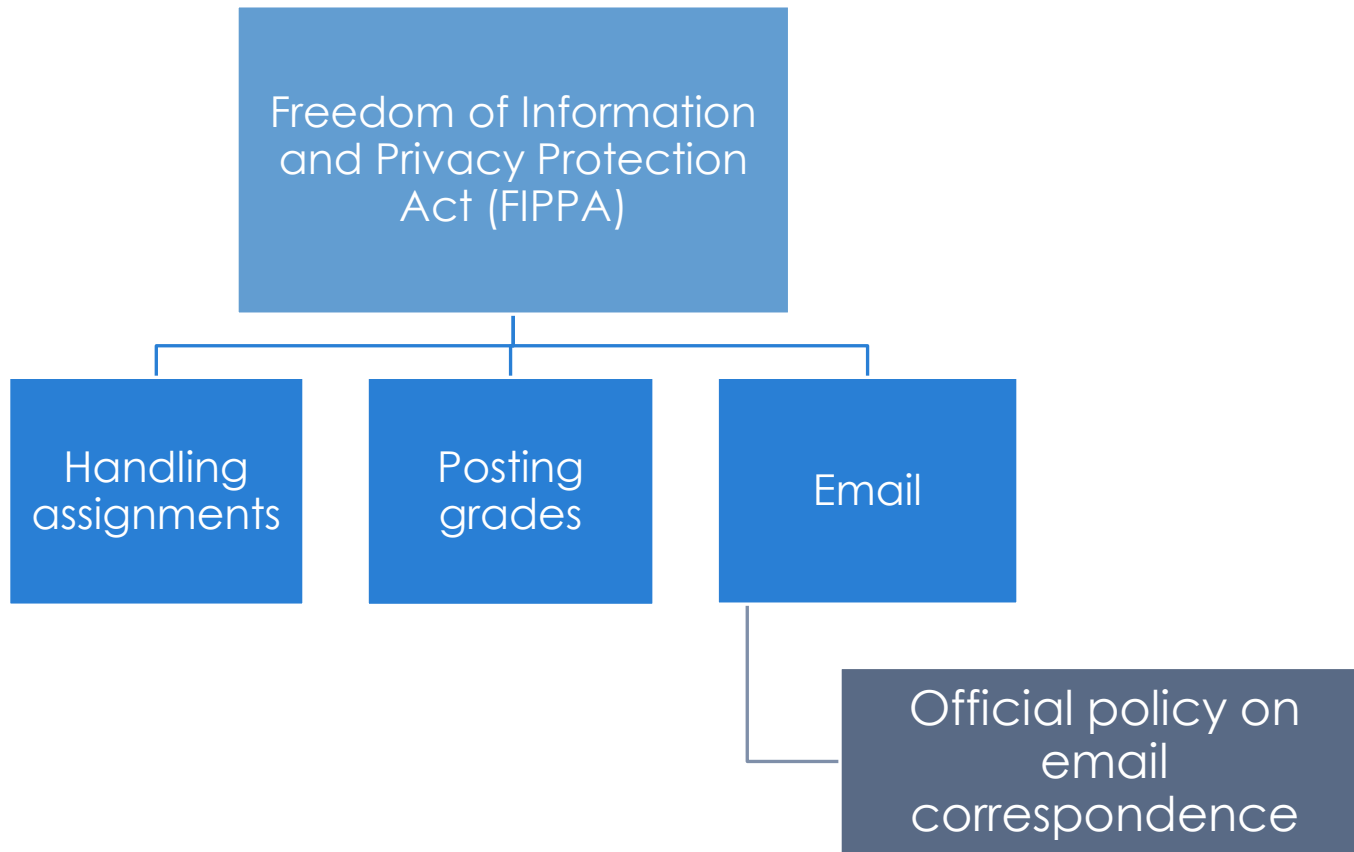
Areas of responsibility

www.teaching.utoronto.ca/gsta/teaching-essentials/ta-toolkit/ta-responsibilities.htm



Respecting confidentiality

www.teaching.utoronto.ca/gsta/teaching-essentials/ta-toolkit/ta-responsibilities.htm

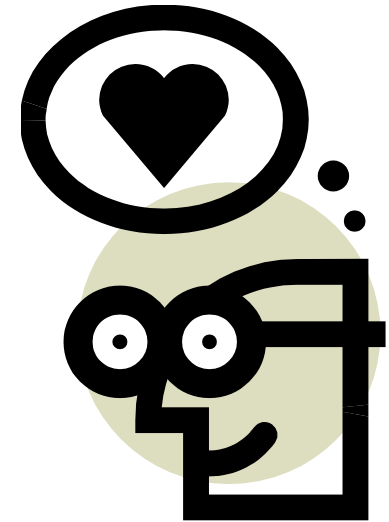


Avoiding conflict of interest

www.teaching.utoronto.ca/gsta/teaching-essentials/ta-toolkit/ta-responsibilities.htm

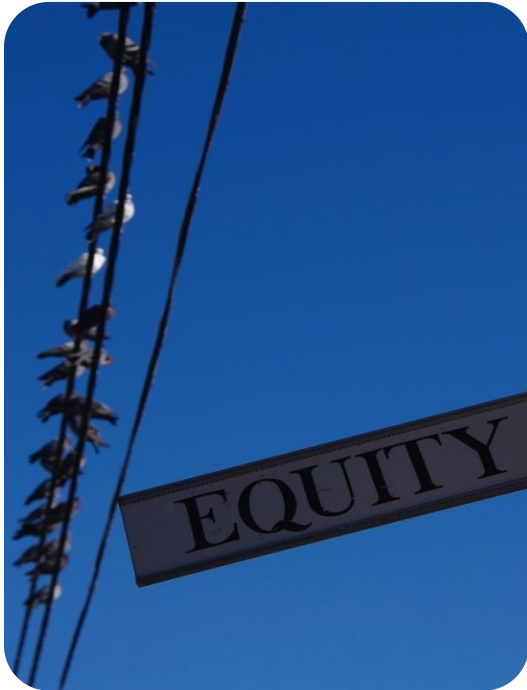
Provost statement on conflict of interest and close personal relationships

- You **MUST** disclose it immediately to the CI.
- You can't be responsible for grading the student's work.
- You open yourself up to allegations of sexual harassment.



Safeguarding the learning environment

www.teaching.utoronto.ca/gsta/teaching-essentials/ta-toolkit/ta-responsibilities.htm



Policies:

- Code of Student Conduct
- Ontario Human Rights Code
- Policy on Sexual Harassment
- Policy on Appropriate Use of Information Technology
- Accessibility for Ontarians with Disabilities Act

Where to go and what to do:

- Campus police: (416) 978-2222
- Student crisis response: (416) 946-7111
- Equity offices on campus:
Community Safety; Anti-racism and Cultural Diversity; Sexual and Gender Diversity; Sexual Harassment Office
- Guide on online harassment – “Enough!”
- Students for Barrier-free Access
(sba.sa.utoronto.ca)

Tutorials at University of Toronto

- interactive and participatory sessions
- primarily led by Teaching Assistants

During these interactive and participatory tutorial sessions, Teaching Assistants are responsible for gauging student understanding and providing formative feedback, in line with assessment structures and guidelines set by the instructor.

Organizing your teaching

- Be organized: Decide on learning outcomes (try for no more than 2 or 3).
 - **Keep track of learning goals as you go**
- Be concise: Each lecture or activity should hit a learning goal for that day
- Be flexible: Estimate time. Don't *over-plan*. Leave a buffer time.

Why develop learning outcomes?

- To clarify your expectations
- To identify what information is essential
- To identify relevant and innovative means of assessment
- To encourage students to:
 - Monitor their own learning
 - Draw connections between material
 - Infer future questions and considerations

Effective Learning Outcomes



- Articulate what a student should be able to do or know as a result of the learning experience (i.e. tutorial or lab)
- Student-centered

Lab Learning outcome

- Students will demonstrate basic experimental skills by the practice of setting up a Track and Collision cart, and conducting the experiment to enhance their knowledge of measurement error.
- Students will be able to measure the average velocity, and the uncertainty in the velocity of a collision cart and analyze the data obtained using a motion diagram and a position vs. time graph.

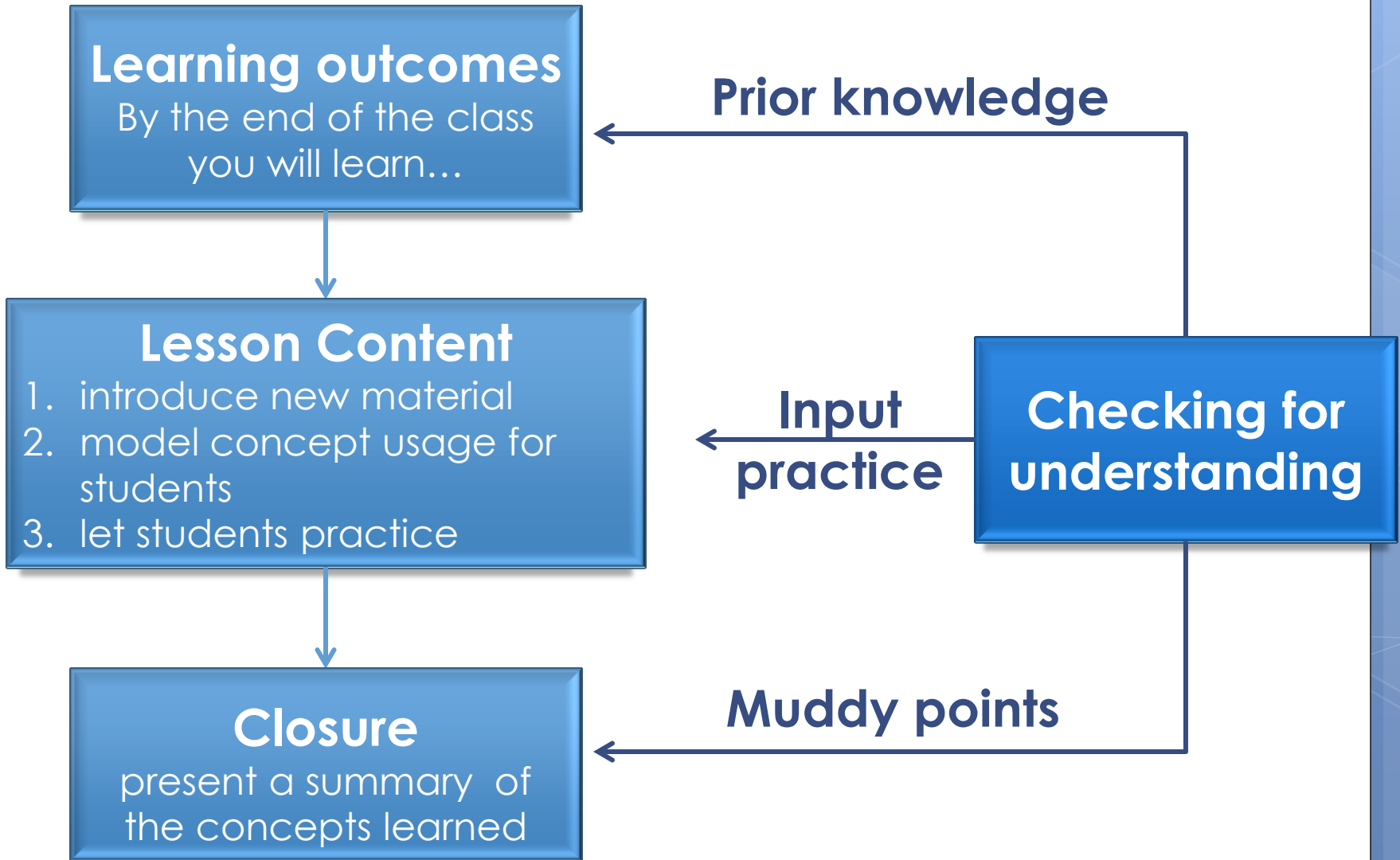


Lab Learning outcome

- Students will demonstrate **basic** experimental skills by the practice of setting up a Track and Collision cart, and conducting the experiment to **enhance their knowledge of measurement error**. 
- Students will be able **to measure** the average velocity, and the uncertainty in the velocity of a collision cart and **analyze the data obtained using** a motion diagram and a position vs. time graph. 



The structured tutorial: Lesson planning



Plan for Physics Tutorial

TOPIC: Conservation of momentum

LEARNING OUTCOME(S): At the end of the class students will understand what momentum is and what conservation of momentum means, and apply it to common examples in classical mechanics

<p>Timing 10 min</p>	<p>Grouping* W S L W</p>	<p>ACTIVATING PRIOR KNOWLEDGE: -check their understanding of Newton's laws, velocity and vectors using a short multiple-choice quiz</p>	<p>Materials /Resources -quiz handout</p>
<p>Timing 5 min</p>	<p>W</p>	<p>SHARING THE PURPOSE/OBJECTIVES/OUTCOMES: -write down the learning outcome on the board and an outline for the tutorial</p>	<p>Materials /Resources</p>
<p>Timing 25 min</p>	<p>W S</p>	<p>LESSON CONTENT (input, modelling, check for understanding, practice): -deliver lecturette: derive $p=mv$; explain conservation; -illustrate the concepts with physical examples: pool balls and particle accelerators collisions (show videos) -problem based learning: work through one examples of momentum conservation forth students; ask them to work in pairs to solve a second example -check for understanding by monitoring their group work</p>	<p>Materials /Resources -AV equipment</p>
<p>Timing 5 min</p>	<p>W</p>	<p>CLOSURE (summary, muddy points) -offer a summary of the concepts presented and leave the floor for students to ask questions</p>	<p>Materials /Resources</p>

*Grouping: whole class(W), small groups (S), large groups (L)

At the end: Reflection

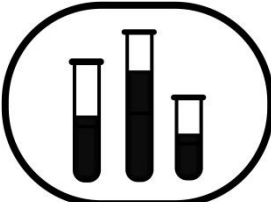
- Evaluate the experience.
- How did it go?
- What worked and what didn't?
- Was the preparation enough?
- It may be helpful to consult your fellow TAs to discuss your experience.
- What can you do to improve for the next class?



***NEW* Training for TAS**



Discussion-Based Sessions



Laboratories/Practicals



Skill Development Sessions



Review Sessions



**Adapting Teaching Techniques-
Scaling Learning Activities**



Laboratories or “Practicals” in ROSI

- Provide opportunities to run experiments or tests
- Problem-solving/ Practice sets are common in Engineering, Math, & Science
- Provide opportunities for students & TAs to practice & review problems related to course content.

Training In:

- Delivering effective pre-lab talks
- Delivering demonstrations and presentations
- Effectively monitoring student work
- General lab safety and protocols
- Tutorial planning
- Classroom management
- Providing effective feedback

What did you come up with?

**What aspects
make an effective
lab introduction?**

Introduction Design Components:

- a) **Assessed prior knowledge & experience**
- b) **Get audience on topic**
- c) **Provide baseline definitions and link to the bigger picture**
- d) **Set expectations for students**
- e) **(Learning Objectives)**
- f) **Divide groups efficiently**

To engage
Critical
thinking

Increase
responsibility
of the
reader

To lay out
various
perspectives

To create
interest

Why question?

Promotes
Thinking

To become
More student
centered

To change
the flow of
instruction

Summary
Or
Conclude

Preparation of Questions

- Thoughtfully plan your questions
- Give your students your questions in advance

Encourage Creativity & Flexibility Through Questioning

- Break the mold of the “right” answer
- Balance & diversify the questions you use
- Ask questions that call for intuition, hunches, & use logic
- Ask questions that call for students to show their understanding

Evaluating Questions

Which question is better for **checking in with students** while they are carrying out an experiment?

- a) How are you guys doing?
- b) Are you having any troubles with any of the steps so far?
- c) What has worked well in the experiment? What has not worked well and why?

How do we answer questions?

- Listen to your students
- Provide positively reinforcing comments – even to incorrect or erroneous answers.
- Ask for clarification whenever needed
- Encourage students to answer their own questions
- Thank students for asking questions
- Be honest when you don't know

**What do I do when I don't
know the answer?**

I don't know!?!\$@?!?



**I don't know
I don't remember
I hadn't thought about that
Let me think about that
Wow. That's a good question
Does anyone know the answer?**

I don't know!?!\$@?!?

**I don't know
I don't remember
I hadn't thought about that
Let me think about that
Wow. That's a good question
Does anyone know the answer?**



**I will find out for you!
I will email you the answer!
I will post the answer on
blackboard!
Try checking this book!
Let's ask the Professor**



Note: It's better to be a good facilitator than to know the answer to every question!

Effective
Feedback

During
Formal
Assess-
ment

Informally
During
Lab

Why Grade?

For Instructors:

- Assess student understanding
- Assess effective teaching

For Students:

- Stimulates improvement
- Tangible evaluation of progress
- Identify student strengths and weaknesses
- Encourages and motivates student learning

Grading Activity

- You will be given:
 - a handout with 3 students answers (blue, green, yellow), a solution & a rubric
 - 3 sticky notes
- **Tasks:**
 - 1) Read the answers and solutions (5-6 min)
 - 2) Use the rubric to assign marks for the 3 answers (2-3 mins)
 - 3) Write down the final mark on the sticky note corresponding to each answer

Student:		Evaluator	
Experiment:			
Date:			
Objective			Partial score
Methods & Materials: Describe materials and methods used	– Methods are incompletely described	– Methods and Materials are described in most experiments	– One could repeat the experiment from the Methods described
	– Observations are not recorded	– Observations are noted	– Observations are carefully recorded
Content Mark (20/50)	Needs improvement (0-7)	Satisfactory (8-15)	Excellent (15-20)
Analysis: Describe data analysis	– Data analysis is not described or included	– Data is analyzed, but the methods used may not be fully described	– Data analysis is complete with sample calculations written out in full
	– No error analysis	– Error analysis is qualitative	– Final results are accompanied by error estimates
Analysis Mark (20/50)	Needs improvement (0-7)	Satisfactory (8-15)	Excellent (15-20)
Interpretation: Reach a conclusion	– Conclusions are not documented	– Immediate thoughts are recorded for most experiments	– Results are interpreted in the context of the hypothesis being tested
Interpretation Mark (10/50)	Needs improvement(0-4)	Satisfactory (4-7)	Excellent (7-10)
			TOTAL SCORE (_/50)

The Rubric

- Why use it?
 - Efficient use of time
 - Justify grades → helps fairness / avoids disputes
 - Students aware of expectations → learn to evaluate their own work
- How to design it?
 - Identify evaluation criteria
 - Break the assignment into sections
 - Assign a mark for each section
 - Get approval from instructor

Annotating the rubric

What is fair marking?



- Be consistent, mark all the students in the same way
- Marking consensus in multi-TA courses
- Mark at the class level:
“temperature check” on 5-10 papers
- Avoid bias:
 - Shuffle papers
 - Cover names
 - Mark one question at a time

Marking to stimulate students' improvement

- How to achieve that?

Marking to stimulate students' improvement

- How to achieve that?

EFFECTIVE FEEDBACK

What is feedback?

- What is feedback?
 - information about how we are doing in our efforts to reach a goal.
- Why is feedback important?
 - **Offering** feedback helps students learn more and improve faster

The Feedback Loop

- Which one is more effective and why?





Is this feedback?

You might want to use a more direct approach for solving the problem.

Good work!

Is this feedback?

You might want to use a more direct approach for solving the problem.

Good work!

Feedback vs. advice

- Prescriptive: telling the learner what to do
- Balance advice with feedback
 - Ask student for ways to improve
 - Increase students' confidence & autonomy

Feedback vs. evaluation

- This comment makes a value judgement

Giving meaningful feedback

You might want to use a more direct approach for solving the problem.

It would be useful to draw a force diagrams in order to make the problem solving process clearer. Also, your second assumption is not correct.

Good work!

Your arguments were more precise in this paper than in the last one. I think that the supportive evidence you provide in the 3rd paragraph requires more research.

Giving meaningful feedback

You might want to use a more direct approach for solving the

It would
make
second

Give students tips on where things to improve
directly where they made a mistake!

Good
You
the
prov

Give students feedback on HOW to improve!

in

Feedback component of marking activity

- Write down a brief feedback (3 sentences) for the blue answer in the marking activity by focusing on the following:
 - indicate a strength in their work
 - suggest an area of improvement
 - mention a strategy on how to improve
- Spend 2 min on writing the feedback and share it with the TA sitting next to you

Effective feedback main points

- **Constructive feedback**

- encourage & reinforce good ideas
- constructively critical of problem areas

- **Efficient feedback**

- Give detailed comments on the first few assignments
- Focus on a few key criteria
- Later, be specific, focus on a few things each time

Time saving strategies for feedback

- **Summary list:**

- Note frequent mistakes
- Present them in class

- **Set of written responses:**

- Create comments database for essay marking and recycle them

Time Management or “Dealing with Stacks”

- Set small goals
- Allow a “buffer” of time
- Enter grades as you go
- Ensure everything you need is at hand (text, rubric)
- Ensure deadlines are reasonable



Upholding Academic Integrity

Code of Behaviour on Academic Matters



Upholding academic integrity

www.teaching.utoronto.ca/gsta/teaching-essentials/ta-toolkit/ta-responsibilities.htm

What to do when you suspect an offense?

Report it to
the CI

- NOT reporting is an offense of the Code!
- You may be asked to compile evidence.
- LOG YOUR HOURS.

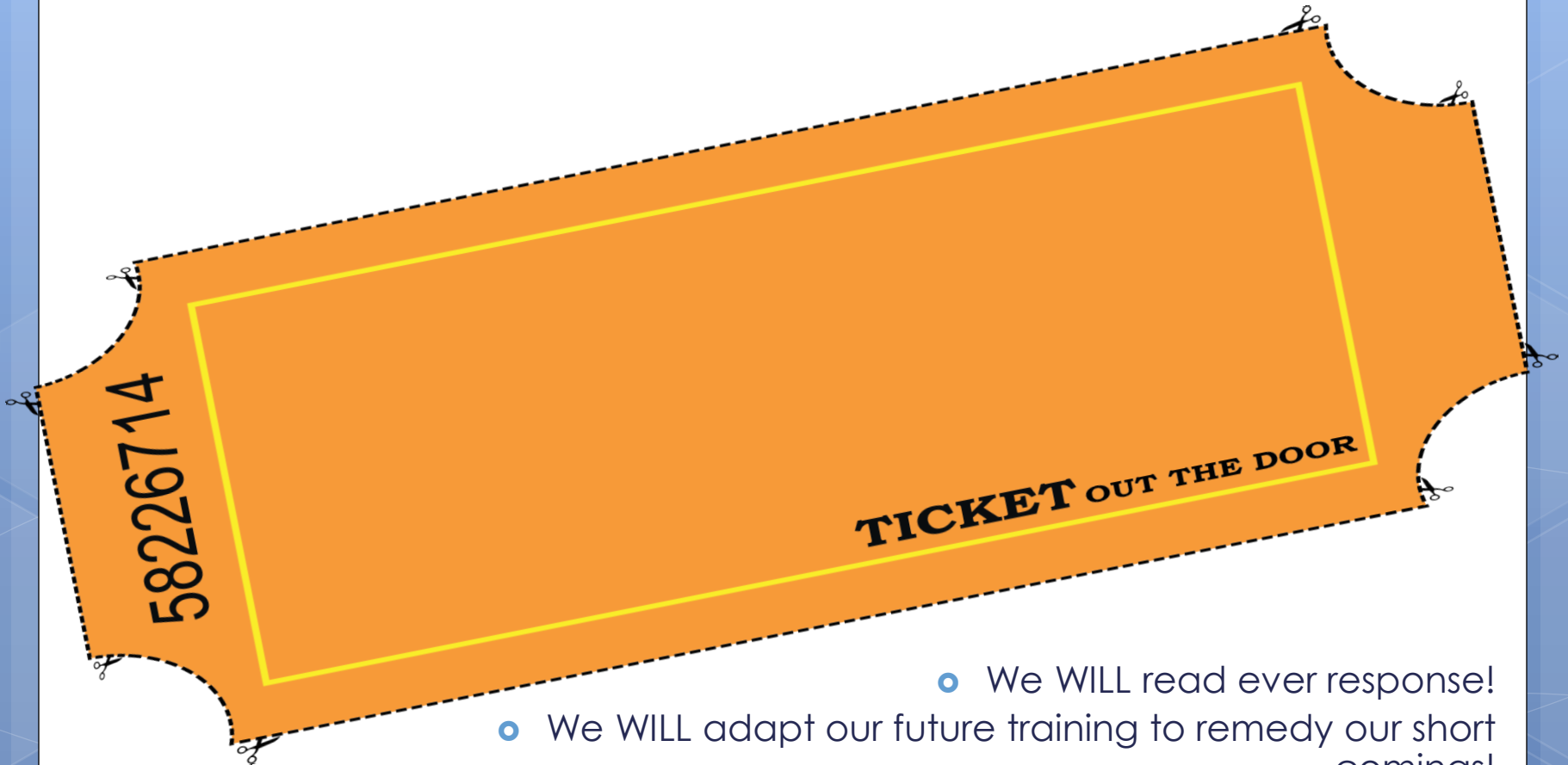
Retain the
assignment

- Don't assign a grade.
- Don't return the assignment(s).

Exercise
caution with
the student

- Don't accuse the student of plagiarism.
- Don't impose penalties.
- Don't advise the student to withdraw.

Ticket out the door...



- We WILL read ever response!
 - We WILL adapt our future training to remedy our short comings!
- Thank-you

TATP

Teaching Assistants' Training Program

Thanks!

url

<http://www.teaching.utoro>

email

services.ta@utoront
o.ca



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