

Before we begin

- Think about the best lab course you've taken:
 - What made it successful?
 - What was the most memorable moment?
 - How can this success be emulated in virtual lab experiences?

Life as a (Remote and/or In-Person!) Lab TA

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Caltech

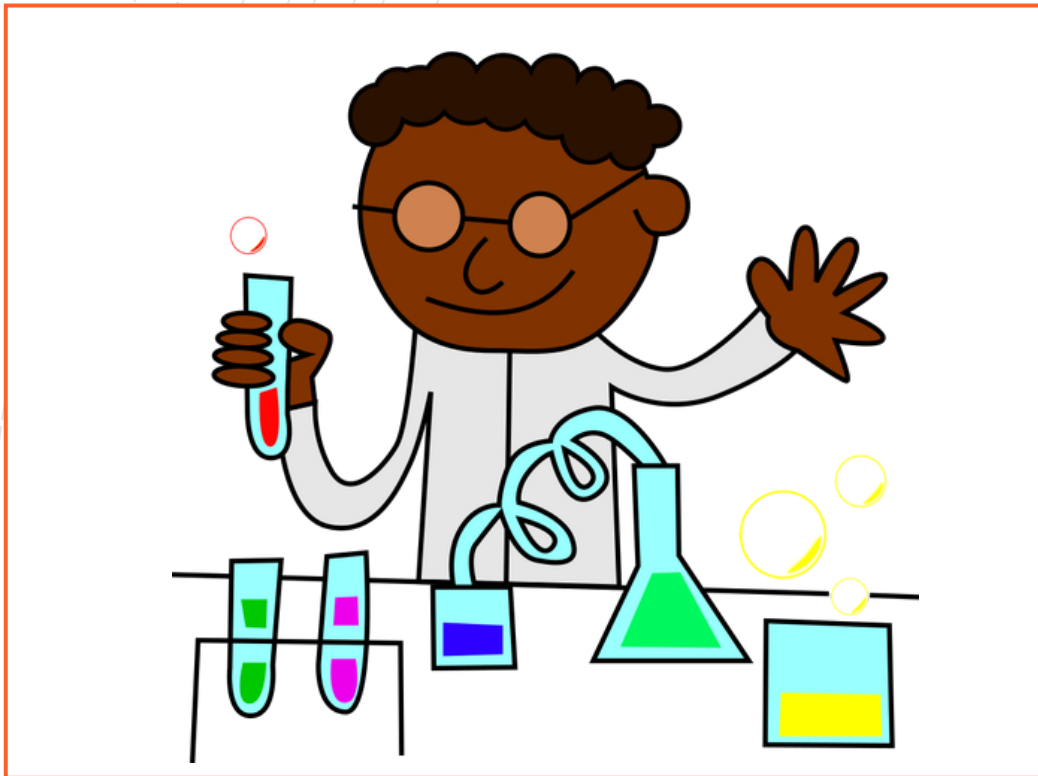
Outline

- Responsibilities (and benefits) of being a lab TA
- Crafting the environment
- Running a successful lab
 - And doing so remotely!

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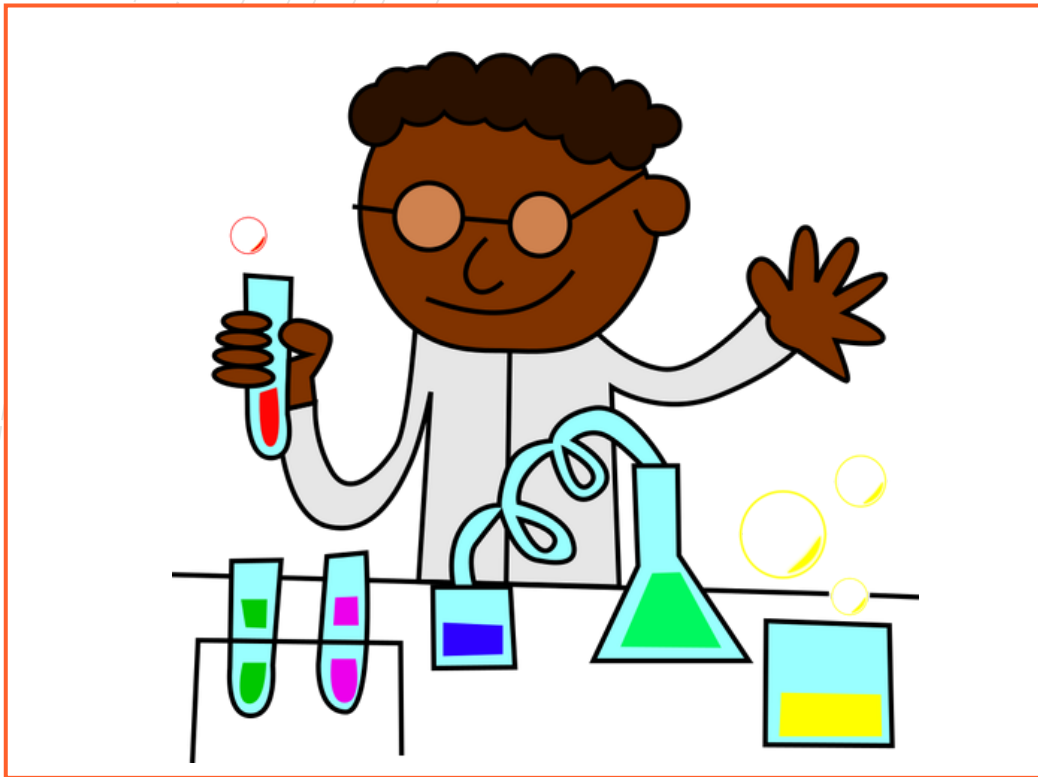
- **Responsibilities (and benefits) of being a lab TA**
- **Crafting the environment**
- **Running a successful lab**
 - **And doing so remotely!**

Responsibilities of a Lab TA



- **Prepare** the experiments and equipment.
- **Oversee** the lab period and assist students during this time.
- **Grade** lab reports, notebooks, pre-lab exercises.
- Hold **Office Hours** for students to come with questions.
- Lead a **Recitation Section** on the relevant material for an experiment.

Responsibilities of a Remote Lab TA



- **Prepare** the experiments and equipment.
- **Record or Live stream** the lab period and assist students during this time.
- **Grade** lab reports, notebooks, pre-lab exercises.
- Hold REMOTE **Office Hours** for students to come with questions.
- Lead a REMOTE **Recitation Section** on the relevant material for an experiment.

Benefits of Being a Lab TA



- Helping students identify as scientists.
- Teaching practicable skills.
- Good practice for yourself too!
- A chance to both teach and mentor.
- A built in active learning environment!

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Reflect

- Have you ever had a 'bad lab day'? What made it difficult? What could have made it better?

Some answers

- Nothing worked!
- Didn't know what to do.
- Something broke.
- Really frustrated with lab partner.
- Didn't understand the results.



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The right lab environment encourages students to be open with you when these things happen (and they will!)

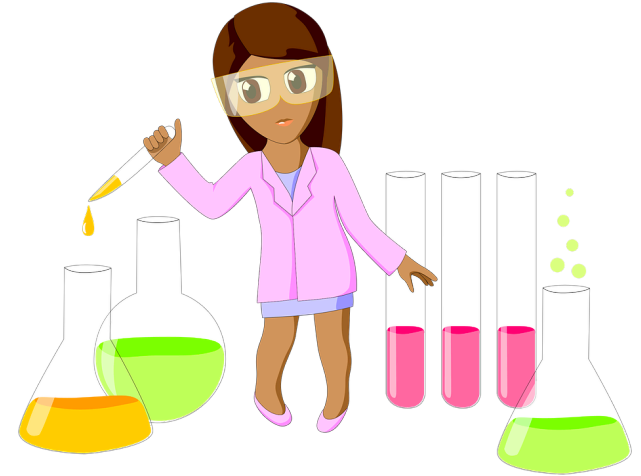


Expert Amnesia

- This can be a common barrier to communication with your students. You can easily forget you are an expert in:
 - Vocabulary
 - 'Basic' techniques
 - Equipment
- Don't assume your students know something unless you are sure they were taught it recently!

Your students will be a mixed group!

- First years up through seniors.
- Majors and non-majors.
- Pre-meds.
- People who have to and people who want to.
- People who've spent years in a lab and people who've never stepped foot in a lab.



There will be no set common knowledge and students will have a wide variety of experiences

Tips for a Welcoming Lab

- **On the first day:**
 - Tell them exactly what your role will be, and how they should use you as a resource.
 - Make expectations for yourself and your students clear.
- **Consistently throughout the term:**
 - Call students by name.
 - Be accessible and reach out/circulate amongst students.
 - Give thoughtful responses and answer questions thoroughly.
 - Be professional and have fun.
 - Stay positive and supportive!



Staying calm and positive can be hard, but understanding who your students are and where they are coming from can help.

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 - **And doing so remotely!**

Prepare

Do the lab! As well as the prelab questions, analysis, and report.

Design a rubric and share with students ahead of time.

Set up the physical space for smooth lab time.

Prelab

Encourage students to ask questions.

Give feedback on their prelab assignment before their report is due.

Return to prelab questions during lab to remind students of the subject material.

In Lab

Serve as a resource during lab time to help students through their own exploration.

Ask guiding questions.

Keep students on time and on task.

Ask deeper questions during quiet moments in lab.

Office Hours

Keep yourself available for students and be prepared to answer questions.

Anticipate common issues and questions.

Guide students towards the answer rather than tell them outright.

Grading

Have a preset rubric that has been designed to emphasize the learning goals of the lab.

Grade early and return assignments in a timely manner.

Give constructive and detailed comments.

Adjust

Ask for feedback, and change elements of the course based on those responses.

Help students improve with each assignment.

Tips for When Things Go Wrong

- In lab:

- Step in before things go too far awry but allow students to self correct.
- Guide towards solutions, but answer questions when students are too far outside their stress zone.
- Explain why something is wrong, or what went wrong, rather than reprimand.
- Praise when things go well!
- Stay curious and flexible— things will go wrong that are outside of anyone's control; try to use it as a moment to teach why and how things went awry.

- Outside of lab:

- Give detailed feedback for incorrect analyses to help students improve.
- Follow up with students if you see they are struggling.

Stay level-headed and light-hearted. Learn from sticky situations so as not to repeat them!

Tips for Remote Labs



- **Communicate!**
 - With your fellow TAs, the professor, and your students. You will need to meet often and coordinate with all involved to smoothly run a virtual lab.
 - Set expectations early and clearly.
- Keep students actively learning as much as possible. Lab should feel like discovery.
- Try to connect with students:
 - Encourage everyone to have their camera on in video lectures or sections.
 - Find time to small talk and get to know your students before or after sections.
 - Hold regular office hours, and add extra if possible as due dates approach.

Reflect

- What is a problem you expect to face?
How do you plan to manage this situation?
How would this change if you must
manage it virtually?

Example Scenario #1

The lab seems to be going well for a group, but when it comes time to analyze their final results, the expected outcome is nowhere to be found. How can you handle such a situation, both in lab and in grading?

Example Scenario #2

A student emails you and asks a series of very specific questions about how to do the lab report write up. In addition, they attach a pdf of their current work and ask you if they are performing the analysis correctly. How should you respond?

Example Scenario #3

A lab group is stuck on a part of the lab and isn't sure how to progress. They seem acquainted with the material but are frustrated by their progress. How can you help them through the experiment and make sure they are still learning?

Example Scenario #4

To teach your lab remotely, you are video chatting students as you act as their hands in the lab. Some of your students are barely paying attention and are not directing any of the experimentation. How do you respond to this situation and adjust for the rest of the lab?

Next Steps

- Please visit <https://teach.caltech.edu> for more resources on teaching remotely
- Visit <https://learn.caltech.edu> for more resources on learning remotely

Resources

- **Course Specific Problems or Guidance:**
 - Professors, Head TAs, previous TAs, and your co-TAs for the class
- **Teaching Questions and Advice:**
 - Center for Teaching, Learning, and Outreach:
ctlo@caltech.edu
- **General Concerns:**
 - Undergraduate Dean's office



Thank you!