

Academic Rickott

Welcome!

As you get settled in, please form groups of 2 or 3

we're using PollEverywhere for our activities today! Scan the QR code or enter the URL to join in!



Join the poll! https://PollEv.com/ams



Introductions



- Alexis Shuping (she/her//they/them)
- Fifth-year Ph.D. candidate in ECE
- TA'd Digital Logic, Microprocessors, and Operating Systems as an undergrad



- Scott Isaacson (he/him)
- Fourth-year Ph.D. candidate in chemistry department
- TA'd 5 quarters (mostly General Chemistry lecture and lab)



Icebreaker

Think about your answer to the following:

You've been invited to teach a one-quarter class on any topic you want! What topic would you choose, and how would you teach it?

Submit your answer on PollEverywhere! (3 minutes)



Join the poll!

https://PollEv.com/ams



Icebreaker

Now, discuss your answers with your group!

You've been invited to teach a one-quarter class on any topic you want! What topic would you choose, and how would you teach it?

(5 minutes)

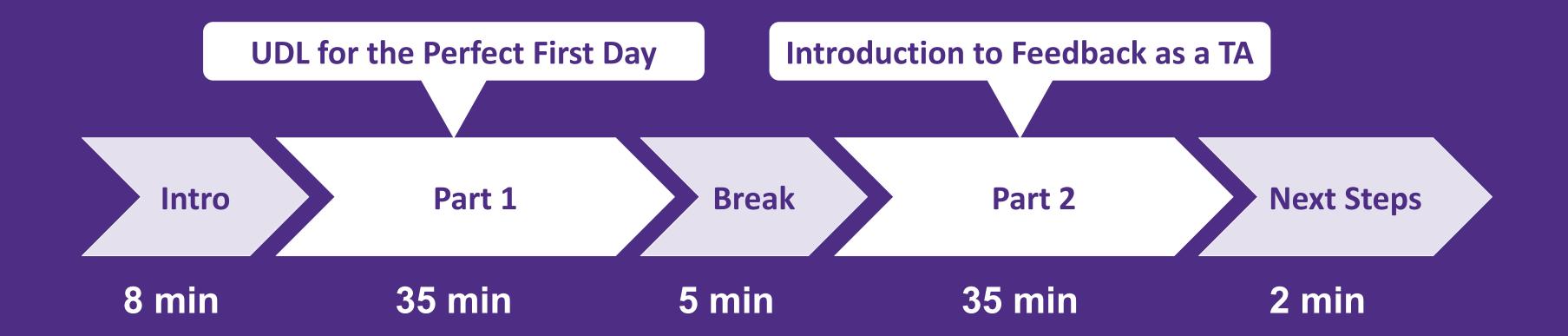


Join the poll!

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Timeline







Part 1: UDL for the Perfect First Day



Objectives

Explain how Universal Design for Learning principles can contribute to an inclusive learning environment

Develop specific strategies for establishing and maintaining a sense of belonging in the classroom using UDL principles.

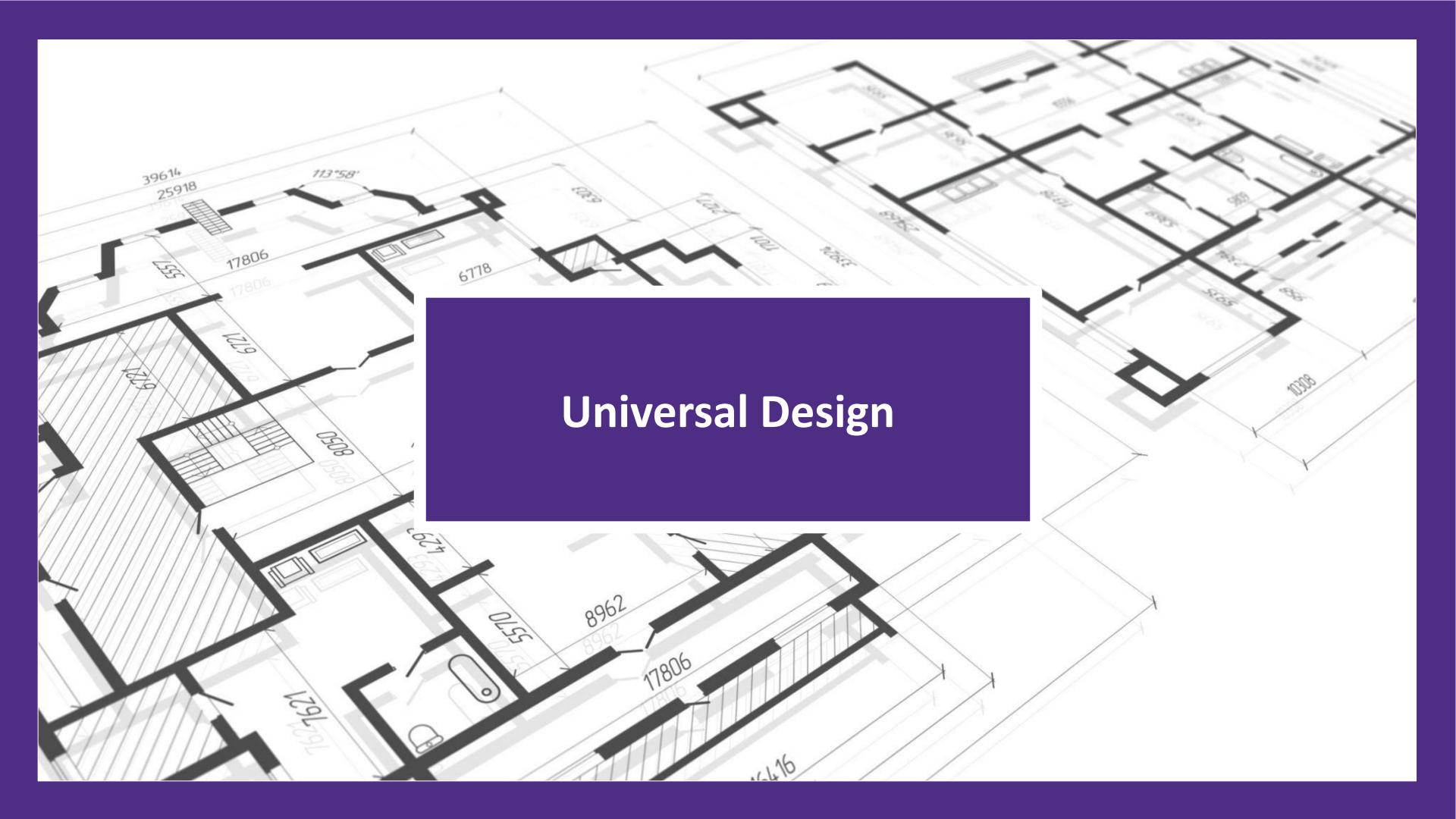
Apply those strategies to your classroom on the first day of the quarter.



Designing an Inclusive Classroom: Where to Start?

- We all want to create classroom environments where students feel like they belong!
- The difficult question is how to do it!
- Let's start with some core principles.





Universal Design

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Universal design is design that is usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

Ron Mace, creator of Universal Design



Universal Design

- The key: accessibility as a core consideration, not as something added later.
- Design a building / product to be accessible to everyone from the start.
- How could we extend this principle to learning?





Universal Design for Learning

- Universal Design for Learning (UDL)
- The pedagogical offshoot of Universal Design
- Focus on designing learning environments that are inclusive to all students, rather than relying entirely on individual accommodations
- Once again: accessibility as a core consideration
- Design a course to be accessible from the start
- Give students agency in the course
 - Agency in how they receive information
 - Agency in how they demonstrate knowledge
 - Agency in how they challenge themselves



Universal Design for Learning

- UDL guidelines can be found at <u>udlguidelines.cast.org</u>
- Includes a very helpful infographic summarizing all the standards, with links to details on each one!
- We're going to talk about a few:
 - 1.2: Support multiple ways to perceive information
 - 2.5: Illustrate through multiple media
 - **5.1:** Use multiple media for communication
 - **6.3:** Organize information and resources
 - 7.1: Optimize choice and autonomy
 - 7.2: Optimize relevance, value and authenticity
 - 8.3: Foster collaboration, interdependence, and collective learning
 - **9.2:** Develop awareness of self and others







Universal Design for Learning

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What we don't want is to be made to feel like we are a burden to you because we have requested accommodations. Many of us already have this feeling that we're burdening you, and it really helps if you can treat us like you want us to be in your course. We're not asking for accommodations to make your life difficult, or because we're trying to get away with something. We want to be in your course. We just need your help learning the best we can.

Anonymous student, quoted by James M. Lang in [2]



Universal Design for Learning – Example

Note-Taking

Traditional Approach

Note-takers only for students with accommodations

- → Requires a "patchwork" approach
- → Depends on students requesting accommodations
- → Can lead to stigma

Student volunteers take notes for the whole class

- → Opportunity for peer learning
- Doesn't require a formal process
- → Destigmatizes note-taking accommodations
- → Gives students leadership opportunities

UDL Approach



[3] C. S. Sanger, "Inclusive Pedagogy and Universal Design Approaches for Diverse Learning Environments," in Diversity and Inclusion in Global Higher Education: Lessons from Across Asia, C. S. Sanger and N. W. Gleason, Eds., Singapore: Springer, 2020, pp. 31–71. doi: 10.1007/978-981-15-1628-3_2.

Universal Design for Learning – Strategies for Classroom Community

In your groups, pick one of your courses from the icebreaker.

Now, imagine you're a professor with full control over that course. In groups, come up with one UDL-based strategy to create a more inclusive classroom community.

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Be sure to include what UDL guidelines your strategy relates to. Go to udlguidelines.cast.org or scan the QR code to the right to see all the guidelines!



(5 minutes)



Join the poll! https://PollEv.com/ams



Universal Design for Learning – Strategies for Classroom Community

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- 1. Learn your students and help them connect with the material 7.2 9.2
- 2. Present information in multiple, accessible ways 1.2 2.5 4.2 5.1 7.1
- 3. Give students choices in how they learn and express their knowledge 2.5 5.1 7.1
- 4. Encourage students to work collaboratively 8.3
- 5. Write down the unwritten rules 6.3 8.2



- Sure, that's great.
- But what if you don't have full control over the course?
- As a TA, you probably won't be able to directly influence course policy.
- So how do we apply our UDL strategies?

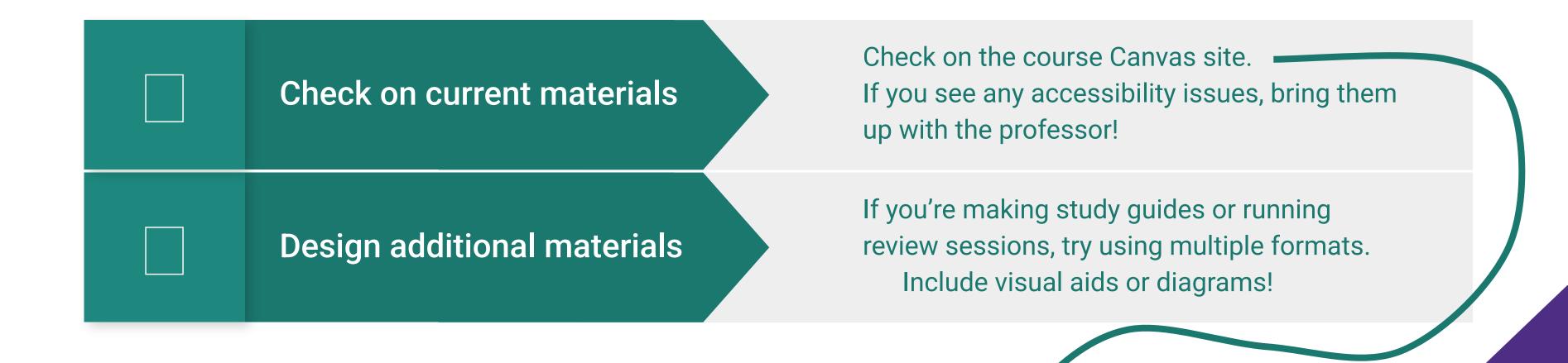


- 1. Learn your students and help them connect with the material
- As a TA, you have an advantage here!
 - Fewer students = more opportunity to get to know them
- Some strategies you can try:

**	Use icebreakers	Especially if you can relate them to the course content
	Poll students	Find out their interests and background! Get feedback on what topics are hardest!
	Learn students' names	Simple steps can make a difference!



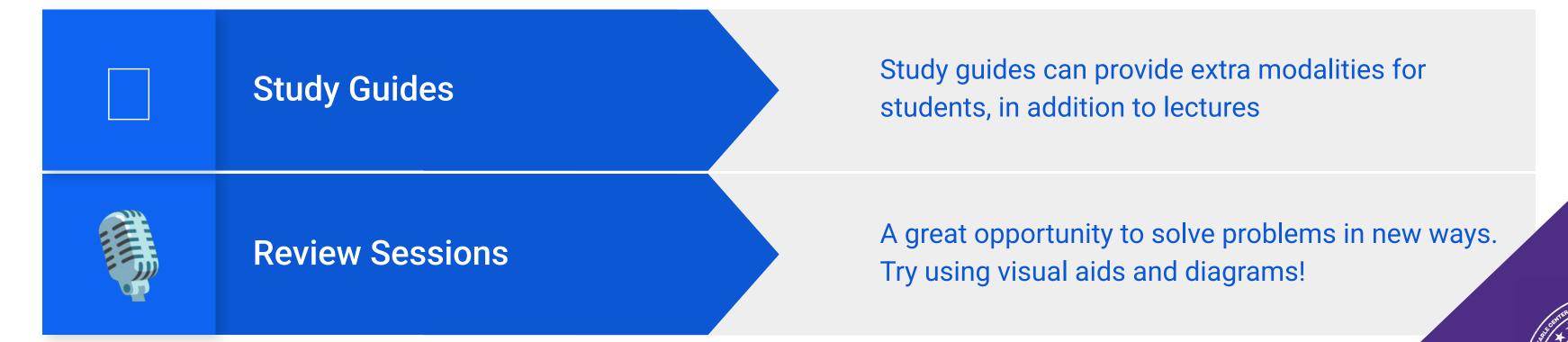
2. Present information in multiple, accessible ways







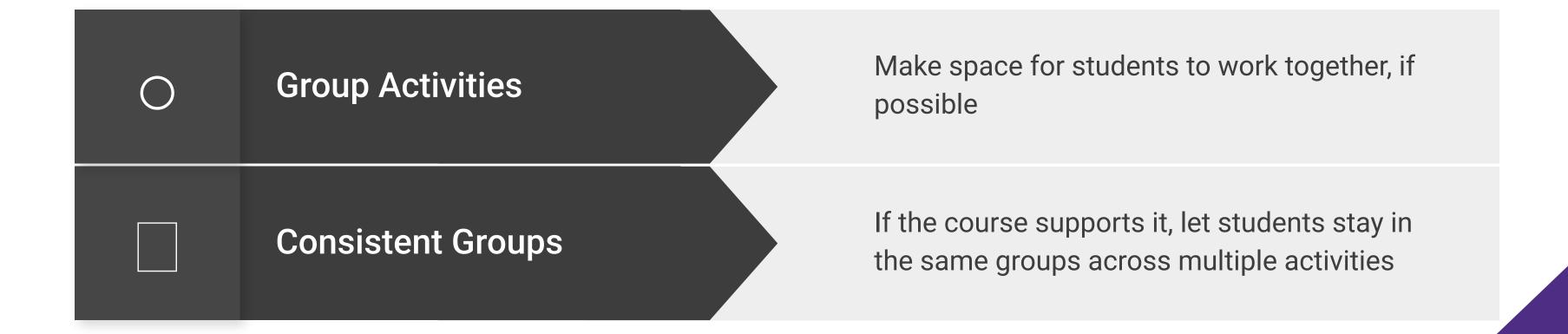
- 3. Give students choices in how they learn and express their knowledge
- This one is particularly hard for TAs
 - You may not have any influence over how assessment is handled
- However, it can be applicable in certain situations:



- 4. Encourage students to work collaboratively
- Students can learn a lot by working together with their peers!
 - Hearing their peers' perspective can assist in learning
 - Teaching other students trains metacognitive skills
 - Helping students connect over course content helps build community
 - Especially important for first-gen / off-campus students!



4. Encourage students to work collaboratively

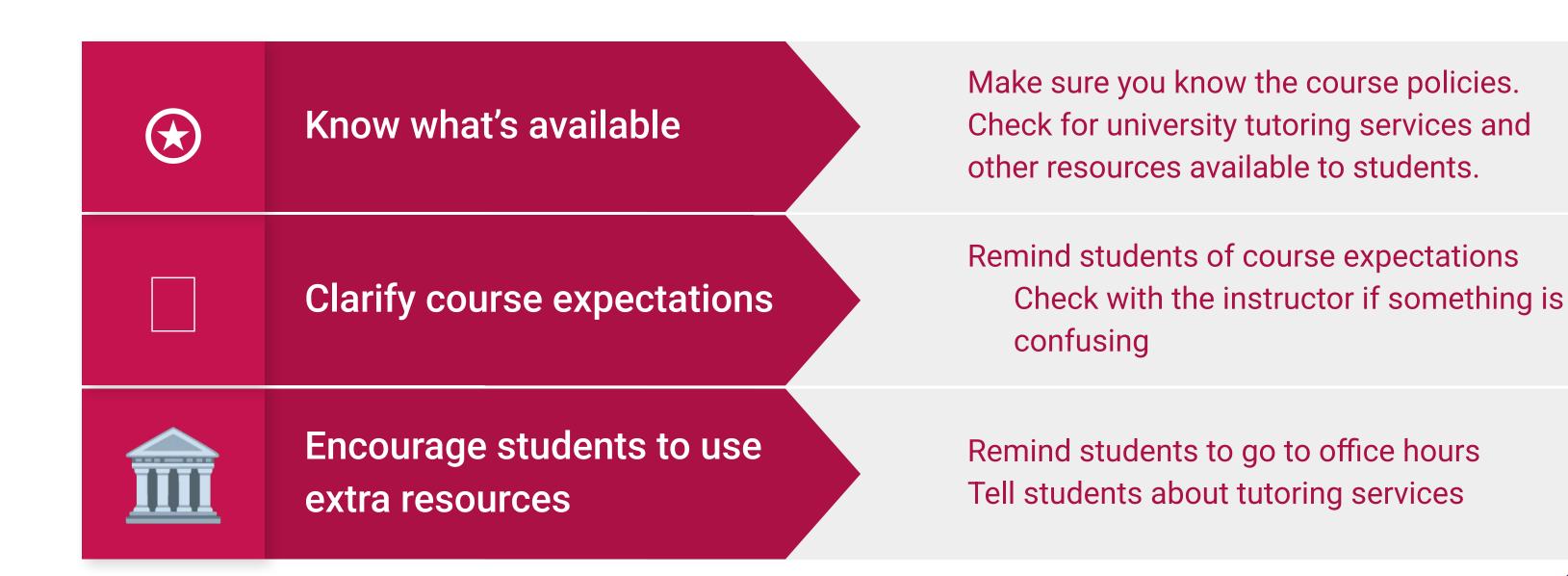




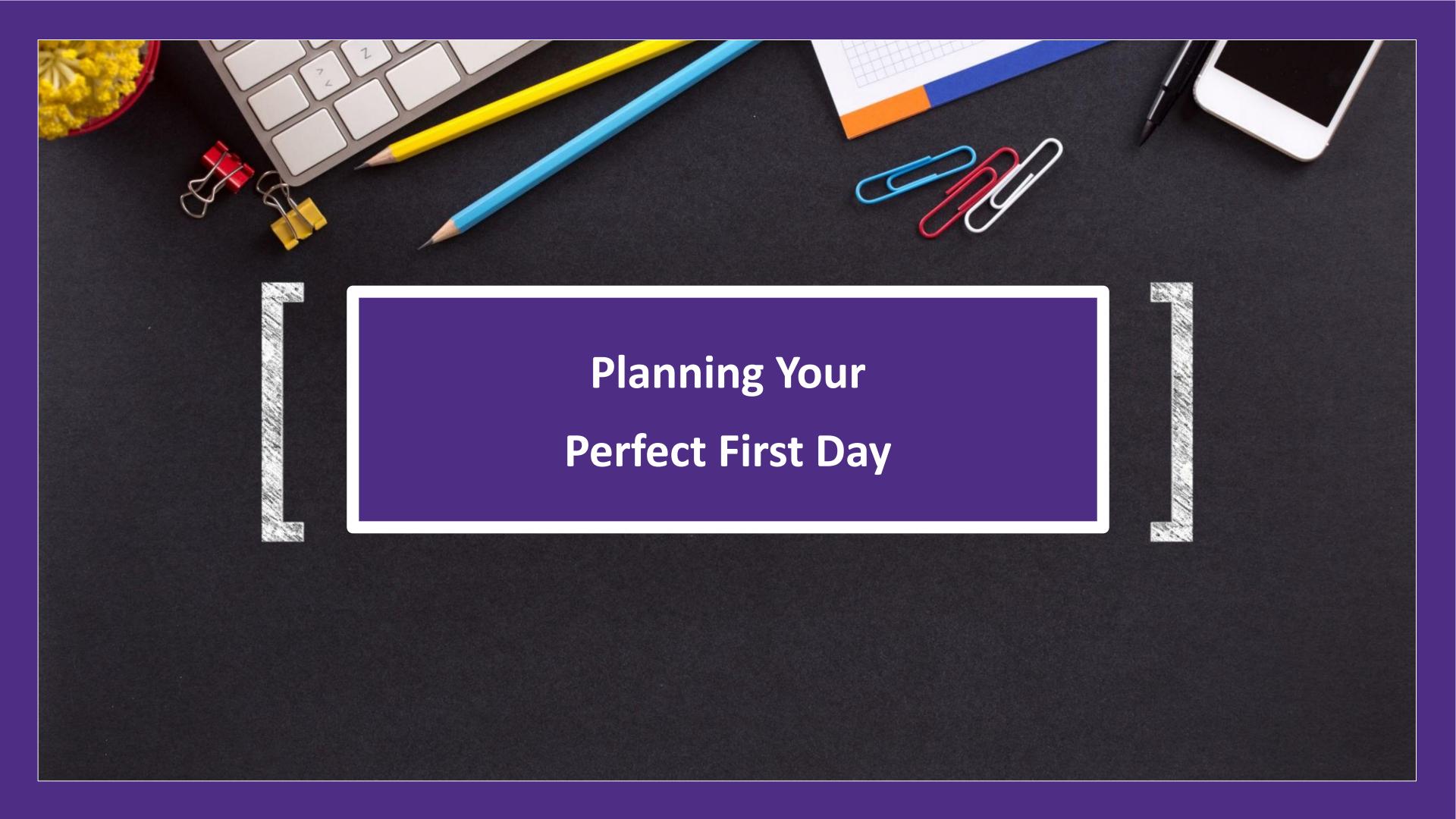
- 5. Write down the unwritten rules
- Our classrooms all have 'unwritten' rules
 - O What does 'participation' look like?
 - Owhen is it acceptable to ask for an extension?
 - O What are office hours for?
 - Some students might not have the same understanding of these unwritten rules
 - Particularly first-generation, international, and neurodivergent students



5. Write down the unwritten rules







Planning for the First Day – Why Plan?

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It's normal, even useful, to feel a bit nervous on the first day of the semester. When we get too nervous, however, we often become overly focused on our own behavior rather than paying attention to our students.

- Haynie and Spong [4]
- Your first interaction with students is a crucial time
 - It's an opportunity to start defining your classroom culture
 - It's students' first impressions of you and the course
- Having a plan lets you manage those first impressions!
 - It helps you cover everything you want to cover
 - It gives you support if you feel nervous
 - It keeps you focused on your goals



Planning for the First Day – What to Plan?

- We don't need too much detail
- It's best to have an outline with:
 - Topics
 - Activities
 - An estimated timeline
- The timeline is especially important!
 - It helps you know how much to fit into your plan
 - It lets you keep track of how fast you're going during the class session



Course: Microcontroller System Design

Topics: Microcontrollers, their peripherals, and the systems built with them

Key Features:

- Weekly labs, where students have to program their microcontrollers
 - Students can work in teams for these!
- A group capstone project at the end of the course
- Lab sections are 90 minutes

First-Day Requirements:

- Introduce yourself
- Pass out lab kits to students
- Help students install the lab software

Let's make a first-day plan for this course!



Remember our strategies!

- 1. Learn your students and help them connect with the material
- 2. Present information in multiple, accessible ways
- 3. Give students choices in how they learn and express their knowledge
- 4. Encourage students to work collaboratively
- 5. Write down the unwritten rules

Where to start?

- Let's get students working in teams!
- Icebreaker activity?
 - Connect it to students' lives and the content!
 - Microcontrollers are ubiquitous in the modern built environment.
 - Talk about the unlikely places you can find them.
 - Have student groups try and list all the microcontrollers in the classroom!
 - Get student responses digitally (PollEverywhere or a similar service)
- Give 10 minutes for students to settle in and complete the icebreaker

FIRST DAY PLAN

10m – Icebreaker



Remember our strategies!

- 1. Learn your students and help them connect with the material
- 2. Present information in multiple, accessible ways
- 3. Give students choices in how they learn and express their knowledge
- 4. Encourage students to work collaboratively
- 5. Write down the unwritten rules

What next?

- Now that students have settled in, it's a good time to introduce yourself!
- Talk about how you relate to the course content
 - What made you want to become an expert in this subject?
- Shouldn't take more than 10 minutes

FIRST DAY PLAN

10m – Icebreaker

10m – Introductions



Remember our strategies!

- 1. Learn your students and help them connect with the material
- 2. Present information in multiple, accessible ways
- 3. Give students choices in how they learn and express their knowledge
- 4. Encourage students to work collaboratively
- 5. Write down the unwritten rules

What next?

 We need to pass out lab kits and get students set up! Let's budget in plenty of time to do that.

FIRST DAY PLAN

10m – Icebreaker

10m – Introductions

40m – Lab kits and setup



Remember our strategies!

- 1. Learn your students and help them connect with the material
- 2. Present information in multiple, accessible ways
- 3. Give students choices in how they learn and express their knowledge
- 4. Encourage students to work collaboratively
- 5. Write down the unwritten rules

What next?

- We need to pass out lab kits and get students set up! Let's budget in plenty of time to do that.
 - Make sure to point students toward the setup instructions
 - You can also walk through the process yourself, to provide multiple ways of learning
 - Uninstall the software on your computer and then reinstall it and set everything up on the board
 - Since software installation can cause lots of problems, let's make sure to budget in extra time to walk around and help students who need help.

FIRST DAY PLAN

10m – Icebreaker

10m – Introductions

40m – Lab kits and setup

5m – Pass out lab kits

10m – Demonstrate install

25m – Help students with any tech problems



Remember our strategies!

- 1. Learn your students and help them connect with the material
- 2. Present information in multiple, accessible ways
- 3. Give students choices in how they learn and express their knowledge
- 4. Encourage students to work collaboratively
- 5. Write down the unwritten rules

What next?

- We've already covered our core requirements for this session, and we still have some time left!
 - This could be a good time to write down some unwritten rules!

FIRST DAY PLAN

10m – Icebreaker

10m – Introductions

40m – Lab kits and setup

5m – Pass out lab kits

10m – Demonstrate install

25m – Help students with any tech problems



Planning for the First Day – Example

Remember our strategies!

- 1. Learn your students and help them connect with the material
- 2. Present information in multiple, accessible ways
- 3. Give students choices in how they learn and express their knowledge
- 4. Encourage students to work collaboratively
- 5. Write down the unwritten rules

What next?

- We've already covered our core requirements for this session, and we still have some time left!
 - This could be a good time to write down some unwritten rules!
 - Let's make sure students are familiar with the syllabus using a "scavenger hunt!"
 - In teams, students work together to find the answer to course policy questions
 - If there are any particularly confusing or non-standard policies, make sure to include them in the scavenger hunt!
 - (Be sure to check with the instructor before doing something like this)

FIRST DAY PLAN

10m – Icebreaker

10m – Introductions

40m – Lab kits and setup

5m – Pass out lab kits

10m – Demonstrate install

25m – Help students with any tech problems

30m – Syllabus Scavenger Hunt



Planning for the First Day – Example

Our First Day Plan:

Time	Activity
10 minutes	Icebreaker: how many microcontrollers are in this classroom?
10 minutes	Introductions What about this course is interesting to me as a TA?
5 minutes	Pass out lab kits
10 minutes	Demo installing the software (Make sure to uninstall everything the night before!)
25 minutes	Let students go through the install process. Walk around and help anyone who has problems!
30 minutes	Syllabus Scavenger Hunt (Set up the questions on PollEverywhere beforehand!)

FIRST DAY PLAN

10m – Icebreaker

10m – Introductions

40m – Lab kits and setup

5m – Pass out lab kits

10m – Demonstrate install

25m – Help students with any tech problems

30m – Syllabus Scavenger Hunt



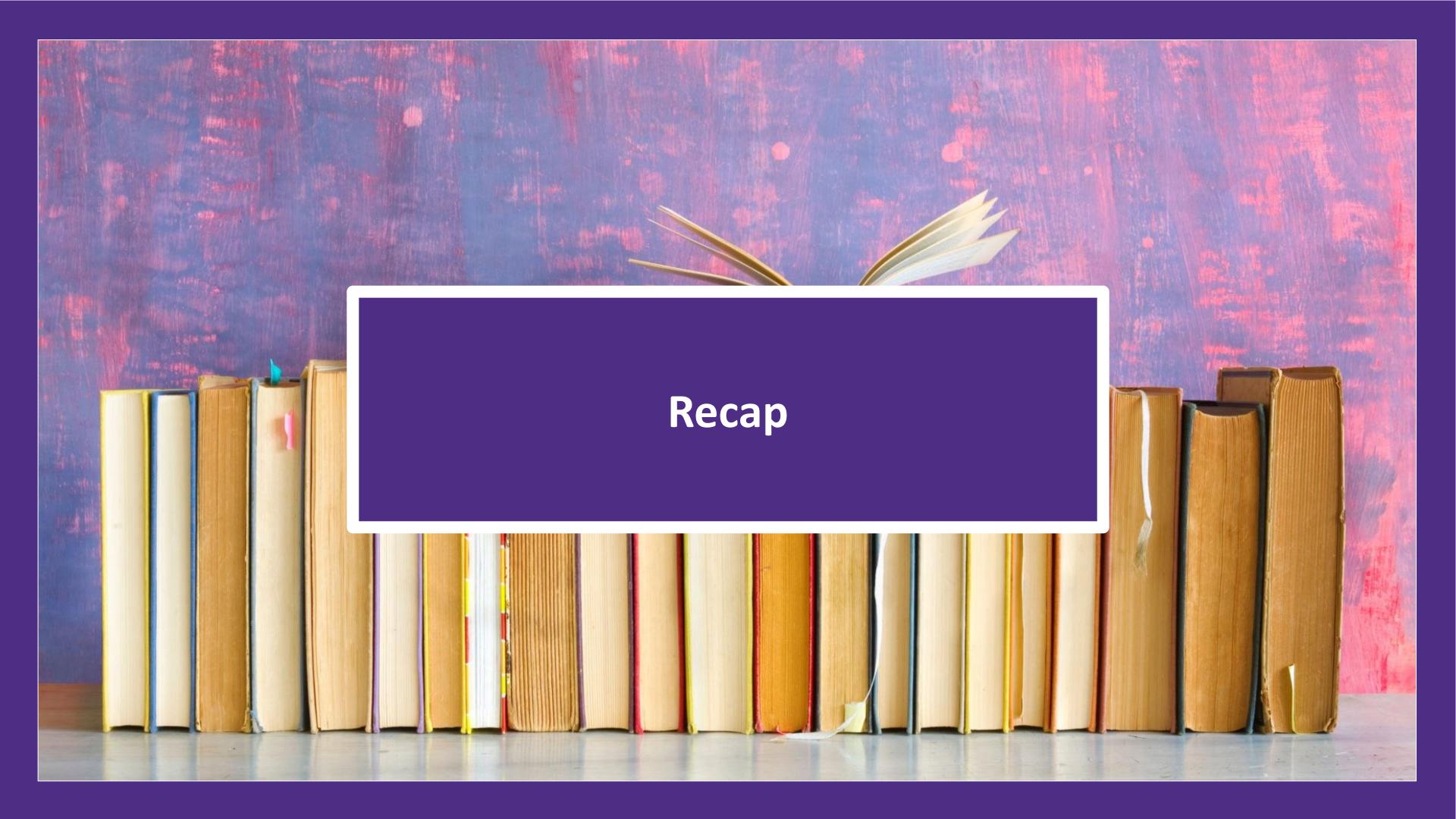
Activity: Making Your Plan

Think about the course you're going to be TA-ing for this year.

Individually, take 10 minutes to fill out the First Day Plan worksheet for your course. Feel free to talk things through with your group or raise your hand if you're unsure of something!

You can find the list of strategies and a link to the UDL Guidelines on the worksheet.





Recap

- Universal Design for Learning (UDL) provides a framework for course design that centers accessibility and belonging for all students
- Using the UDL Guidelines, we developed strategies for helping students succeed starting from the first day of class
 - 1. Learn your students and help them connect with the material
 - 2. Present information in multiple, accessible ways
 - 3. Give students choices in how they learn and express their knowledge
 - 4. Encourage students to work collaboratively
 - 5. Write down the unwritten rules
- By keeping UDL Guidelines in mind and making a concrete plan, you can start creating an inclusive classroom environment from the very first day!





Break





Part 2: Introduction to Feedback as a TA



Transition

 Incredibly important to apply what we learned in the first part about student inclusion and belonging in your approach to student feedback

 You will interface directly with students more than they will with their professors

 You play an active role in their education and can considerably impact how they approach the material, their mindset, etc.



Workshop Objectives

Introduction to common TA responsibilities

Learn background and strategies for providing effective feedback (eg Rubrics)

 Talk about how you might actually implement these concepts in your interactions with students

Apply what we learn to a super fun activity



TAing at Northwestern

- Quarter system takes some getting used to: it is fast-paced
- Classes are rigorous and challenging (at least the chemistry curriculum is a step up from what I received in undergrad)
- These students are talented, demanding, and often used to succeeding
- You will probably have a variety of roles here: recitation leader, office hours, Lab TA, proctoring and grading exams, etc.
- This means you will be responsible for a variety of different assignments: lab reports, problem sets, short answer questions, presentations, papers, etc.



Grading and Providing Feedback

- Depending on your TA assignment/professor you may or may not have ownership when it comes to the actual assessments
- You will all have the responsibility of providing feedback
- What does this mean and what does this look like:
 - Does anyone have an examples of assessments or feedback that were particularly effective for your learning?

How can I be a "good" TA?



Feedback

- Feedback is essential for learning, grades are not
- Grades generate high emotions in students, so understanding how to deliver feedback is critical for their future learning
- Often times, we get too obsessed with the number on the top of the paper rather than the feedback itself
- Separation of the grade and the feedback (posting grade later) allows for students to digest and actually listen to the feedback that you spent time and effort on
- Grades attempt to quantify the relative achievement of student on an assessment, but students learn best when they have a clear understanding of the learning goals for each assessment and feedback can help contextualize and bridge any gaps
- Grades can still be a useful tool for communication or it at least alters how feedback is experienced and received



Feedback Continued

- Feedback should be: Frequent, Immediate, Specific, Loving
- **Frequent**: The more often you provide feedback the better, can even be just encouragement
- Immediate: Try and return feedback on assessments as quickly as possible to be the most effective
- Specific: The more focused and clear the feedback is the more likely students will understand the learning objectives
- Loving: The way you provide feedback matters. Students need to know that you are genuinely interested in their learning and success



Tips for Grading

Don't overwhelm students with lots of feedback (even if they got a lot of things wrong). Focus
on the few major important things. You may not be able to fix every mistake

- If you have many questions to grade, focus on one question at a time.
 - Constantly remind yourself of the different quality of answers
 - There will likely be common errors made: note these to discuss

 Be willing to meet and talk to students about mistakes made and to answer questions they have on your feedback



Tips for Grading Continued

- While we try and be as objective as possible, subjectivity and bias are present: grade with equity in mind
- Do not factor things like handwriting into grading or who the student is (blind yourself grading)
- Recognize that people respond differently to grades and feedback
 - For some people bad grades are motivating
 - For some people bad grades are a reinforcement that they are not good enough
- With this in mind, focus on providing constructive feedback while praising good work as you can and be cognizant of framing



Extra Tips

- You may be TAing for introductory courses with material you haven't reviewed in years, or maybe there is something you haven't actually learned, so spend time beforehand reviewing the material.
- On that same note, it is okay if you don't know the answer to the question, but follow up with students
- Communicate constantly with the professor so you have a clear understanding of the expectations



Rubrics

- The idea of rubrics might bring up mixed feelings
- Depending on the assignment type, providing rubrics ahead of time clarifies expectations
- Can make grading easier for you and fairer for students as you have clear guidelines for providing feedback
- Can help save you time
- Canvas/Crowdmark have tools to help with rubrics on assignments



Rubrics Continued

a) When the valve is opened and the two gasses are mixed between containers, describe how, if at all, the partial pressure of the oxygen gas will change compared to its initial pressure and why (assume there is no chemical reaction between the two gasses). (3 points)

The partial pressure of the oxygen gas will decrease (1 point) after mixing compared to its initial pressure, because according to the relationship $P_1V_1 = P_2V_2$, (1 point) when the gas has access to a larger volume (1 point) the pressure of the gas will decrease.

b) Before mixing, there are 365 mL of oxygen gas at an unknown pressure in vessel A, and 548 mL of neon at 1.65 atm in vessel B. After the valve is open and the gasses are allowed to mix, the pressure throughout the whole system is measured to be 2.34 atm, and the temperature was constant throughout the whole process. What was the initial pressure of the oxygen gas in vessel A prior to mixing? (again assume there is no reaction between the two gasses) (3 points)

```
PV = nRT

Moles and temp constant, so

P_1V_1 = P_2V_2

P_{tot} = P_{02} + P_{tot}

V_{tot} = 365 \text{ mL} + 548 \text{ mL} = 913 \text{ mL}

P_{1.Ne}V_{1.Ne} = P_{2.Ne}V_{2.Ne}

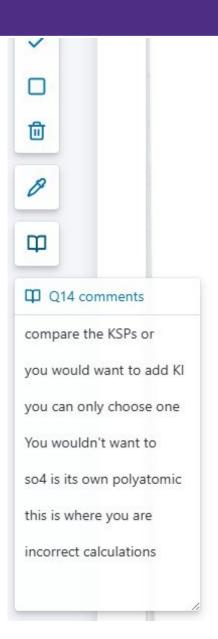
(1.65 \text{ atm})(548 \text{ mL}) = P_{2.Ne}(913 \text{ mL})

P_{2.Ne} = 0.990 \text{ atm} (1 point)

Now, P_{02} = P_{tot} - P_{Ne}

P_{02} = 2.340 \text{ atm} - 0.990 \text{ atm} = 1.35 \text{ atm} (1 point)
```

- Many different types of rubrics: Holistic, Analytic, Single Point, and each have their own benefits (more details are found in handout)
- Clear in what is awarded points, allows for partial credit
- Downside can be not having general criteria





Activity: Grading a Test Question

Ammonium carbamate decomposes by the following reaction:

$$NH_4(NH_2CO_2)(s) \rightleftharpoons 2NH_3(g) + CO_2(g)$$

For this reaction, K_c is measured to be 5.51 x 10⁻⁷ at 300 °C. A 10.0 L glass bulb, containing enough ammonium carbamate so that some will still remain when the system reaches equilibrium, is evacuated, sealed and then heated to 300 °C.

Based off of this
 answer key allocate 10
 points



7:300C-> 573.15K a) want P: PV=nRT total make: 3 P = NRT = 3(.08314) (573.15) K



Answer 2

(a) We know
$$K_e$$
, need K_p :

 $T=300^{\circ}C=573.1SK$
 $K_p=K_e(RT)^n$
 $=5.5\times10^{\circ}[0.083145)(573.15)]^3$
 $=0.05963$

NHy (NH2CO2) $\Longrightarrow 2NH_3+CO_2$

T

 C
 E
 $V_p=4x^3$
 $V_p=4x^3$
 $V_p=4x^3$
 $V_p=4x^3$
 $V_p=4x^3$
 $V_p=4x^3$



Answer 3

a)
$$K_P = K_c (RT)^{\Delta n}$$
 $\Delta n = 3 - 0 = 3$
 $= (5.51 \times 10^{-7}) ((0.083145)(573.15))^3$
 $= 0.5963$
 $NH_4 (NH_2CO_2) \rightleftharpoons 2NH_3 + CO_2$
 $0 \quad 0$
 $+ 2x + x$
 $-2x - x$
 $K_P = (P_{NH_3})^2 P_{co_2}$ $P_{NH_3} = 2x = 1.06$
 $= (2x)^2 x \longrightarrow P_{co_2} = x = 0.530$
 $= 0.530 \text{ bar}$



Activity Questions

Discuss in your groups:

- How did these answers score?
- What are the positives that can be taken from each answer?
- What are helpful comments that can be made?

Discuss together:

- How did this go?
- What made this difficult?
- How will your feedback be effective?



Closing Thoughts

- Being a TA can be a lot of fun and very rewarding
- Know that if you are anxious, apprehensive, etc. these feelings are not uncommon. I encourage you all to talk to each other for support
 - https://www.northwestern.edu/studentaffairs/sass/
- Students learn best if you are excited and interested in their success, so approach your feedback from this lens



References

- Isis Artze-Vega, Flower Darby, Bryan Dewsbury, and Mays Imad, "<u>Transparency: Create an Equity-Minded</u> Assessment and Grading Strategy," *The Norton Guide to Equity-Minded Teaching*, pp. 31-53, (2023).
- Jose Bowen and C. Edward Watson, "Grading and Feedback," Teaching Naked Techniques (2017)
- Provided meaningful feedback on students' academic performance, IDEA Notes on Instruction. [Website]
- Allison Boye and Collin College, "Guiding Learning and Assessment through Rubrics," IDEA Paper 84 (2021).
- Ambrose et. al, "What Kinds of Practice and Feedback Enhance Learning?," How Learning Works (2010).

Supported Principles of Inclusive Teaching

- Principle 1: Consider your and your students' social identities and their implications for learning
- Principle 2: Establish and communicate clear course standards and expectations
- Principle 4: Communicate sources of support for learning





Next Steps



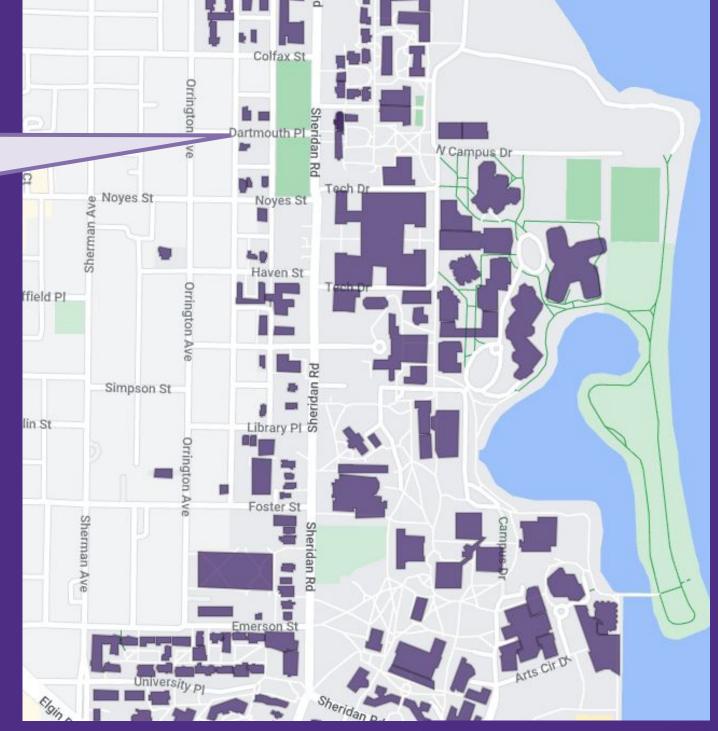
Come on over!



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Stay Engaged!

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We'd love to hear your feedback!





