

Guide to Creating a Lesson Plan

Thank you for teaching at Splash! Students all across the greater LA area are looking forward to learning from you! To help you plan your class and ensure the best Splash experience possible for both you and your students, we are requesting a lesson plan for each class you are teaching. Don't be intimidated—just think of it as an outline of your class.

You can find in the following pages some helpful tips and resources for building and writing your lesson plan, as well as some sample plans.

If you would like additional support in writing your lesson plan or developing your class, drop by our upcoming [pedagogy workshop](#) on March 29th 5pm PST, or reach out to us at splasheventatucla@gmail.com!

Tips and Resources

- We recommend “[backward designing](#)” your course: First, start by deciding what your course objectives are. What would you like your students to achieve by the end of your class? Then, think about what kind of evidence of student learning (e.g. student performance on assessments) would tell you that your students have achieved those objectives. Then, you can plan your instruction in a way that would help students demonstrate that evidence. This process will help clarify the purpose and intended outcomes of the course and make sure that all components of your class are coherently working towards the same goal.
- So, what are the learning objectives for this class? What kind of learning do you want your students to engage in? Understanding a concept? Analyzing a scenario? Creating a project? Consider other action verbs from this [taxonomy](#). How will you [communicate learning goals](#) to your students? Can you create more structure by having an overarching theme for your class and embedding smaller unit-sized goals within it? How does each lecture, activity, and assessment help achieve the learning objectives?
- How do you intend to allocate and use the time (e.g. 50 minutes, 1 hour 50 minutes, etc.)? Assign group work? Ask your students to write on the board? An experiment or demonstration? Lead a whole-class discussion? How long will you spend on each portion of the class? How will you transition the class from one exercise to another?
- You might want to plan alternative strategies in the event that your activities don't go exactly as you hoped. What will you do if your interesting, open-ended questions fail to elicit productive responses from your class? What will you do if the discussion topic for which you had allotted 25 minutes is thoroughly exhausted after 10 minutes? What if discussion lasts longer or goes in a direction you had not anticipated? If answers to a poll is not as expected?
- Students in your class will be coming from various backgrounds. Are there any diversity-related topics that you should include (e.g. are you teaching a class about public policy but

leaving out the topic of race?)? Examine your own assumptions. Try to cite multiple and diverse examples. Be careful with idioms, slang, and insider jokes that some students may not understand. Read more about inclusive teaching [here](#) and [here](#).

- Make learning fun! We encourage discussions among students and other forms of collaborative learning. Check out this [list of active learning strategies](#). And [this one!](#)
- If you are having trouble choosing your topic, consider the following:
 - What is a central topic in your major?
 - Is there something that can connect readily to what is familiar to students and to other subject matters?
 - Learn more about “generative topics” and teaching for understanding [here](#).
 - Utilize this [worksheet](#) to brainstorm ideas for your class.

See example lesson plans below!

CONVINCE ME

Number of Students: 10-15 ish

Age group: Middle school or early high school

Time: 50 mins

Goals:

- Comfort with spontaneous speaking
- Creative thinking/ drawing connections btw things
- Have fun!

SLIDESHOW:

[Alden's spontaneous speaking game](#)

PLAN: (in 10 min chunks)

0-10

Explain the game!

- Students will be broken into 3 teams
- They will have to present a nonsensical presentation, and they don't get to choose the images on each slide! They must be creative to make it make sense!
- Everyone must talk at least once
- Whichever team is most convincing and logical wins!

Send the link into the chat so that students can see the slides.

Some students will have trouble copy and pasting. Have them send you their email, and manually share it with them. Tell them to check their email and open it that way

Create breakout rooms (3)

10-20

Students have 6-7 mins to prepare. Have them decide what they will say, and decide who will say what

Hop between rooms to make sure kids are talking, help them brainstorm, ask "who's doing ___ slide?"

20-30

Presentations! Each group will take 3 ish minutes.

30-40

TED TALK GAME!

Call on a random student and have them give the ted talk. No planning! Completely off the top of their head

40-50

Continue/finish ted talk game

Lesson Plan for Week 2: The Mind-Body Problem: Philosophical and Cognitive Theories of Mind

Teachers: Zoe Lee, Jone Bacinskaite

Context: Students were posed the problem of consciousness from last week's lecture and given the following readings.

Student learning objectives for this session: *By the end of this class, students should be able to...*

1. Recognize and follow different theories on the mind-body problem
2. Define the Hard Problem of consciousness
3. Provide evidence to support different theories of mind

Supplies needed: Projector, whiteboard

Class Outline:

1. The mind-body problem (Discussion: "Think-Pair-Share" style) ← **10 minutes**
 1. What is the relationship between the mind and the body? Consider the relationships between mental properties (mental representations, computations, emotions etc.) and physical properties: size, weight, motion, etc.)
 2. Can mental states influence physical states and vice versa?
 3. Are mental states and physical states entirely distinct, or is one a subset of the other?
 4. The body is a physical thing; what is the mind (ontologically)? What constitutes a mind?
2. The mind-body problem: evidence and relation to AI (lecture) ← **10 minutes**
 1. Show existing evidence for mind-body relations (eg. the effects of your physical state on emotions and perception, patients in vegetative states, etc.)
 2. What this means for conscious AI: if we determine that the mind arises from the body, then conscious AI are a possibility in a future where we replicate the human mind; if the mind and body are entirely distinct, this implies that conscious AI cannot occur unless someone can manufacture a "mind"
 3. Use this to segue into theories of mind
3. Theories of Mind (Activity: Pinwheel discussion) ← **15 minutes**
 1. Since students have already read the fundamental arguments for and against Dualism and Materialism, split them into random groups each assigned to argue in favor of a particular theory
 2. Support students by circling through groups and providing guidance/corrections where necessary
 3. Write down main points on board to address in the next section
4. Theories of Mind (lecture with questions for students) ← **10 minutes**
 - Address main points brought up by students during discussion with existing evidence (or lack thereof)
 1. Materialism: mental states are just physical states (reductionist)

1. Identity theory: the states and processes of the mind are just the states and processes of the brain → so if we replicate the brain, do we replicate the mind? When we replicate the mind, do we replicate the brain?
 2. Behaviorism: all human behavior is a product of reflexes to changes in the physical world → current AI machines can respond to the physical world and be “conditioned” (ie. through ML), does this argue for machine consciousness?
 3. Functionalism: mental states are constituted solely by their functional role in, i.e. causal relations with, other mental states, sensory inputs and behavioral outputs → so if AI functions like a human, does it thus have a mental state, or a mind?
 4. Segway into Dualism as a counterargument to materialism
- b. Dualism: mind and body are two distinct things and cannot be reduced to one another
1. Idealism: our physical experience is entirely a result of mental processes (ie. reality is but a “figment of our imagination”)
 2. This implies that conscious AI are impossible unless we create an artificial “mind” but we cannot even define what that is
- c. Ask class what is the point of learning and thinking about all these different theoretical standpoints? Confirm that it is because we need to have frameworks for evaluate AI to determine whether or not they could be considered conscious.
5. The hard-problem of consciousness (lecture) ← **5 minutes**
 - a. Define the hard-problem of consciousness in reference to what we’ve covered that day
 - b. Clarify that moving forward we are going to take a specific theoretical approach to the mind-body problem (CTM) and that we will provide evidence for our choice through readings and future lectures

Sample Lesson Plan

80-minute Biology discussion on “prokaryote gene regulation”²

Goal for student learning:

To identify the structure and regulation mechanism of the lac operon and trp operon by using a role-play activity.

Materials:

Lecture and discussion notes.

1. In-class quiz on previous three lectures (5 min).

2. Review and role-play set-up (20 min).

2.1 Review the *structure* of the lac and trp operon (7 min). Draw the structure on the board for reference and review the biological process and regulation of lac operon.

2.2 Ask the students to come to the board *in pairs* to complete the figure with important component molecules (5 min).

- If the students can successfully draw the pathway, ask another student to talk through the pathway again.
- If the students have difficulty drawing the pathway, the other students or the GSI could help them to figure out the pathway.

2.3 Review the trp operon mechanism (8 min).

- Ask students to work in groups of 3-4 people each for 5 min to talk through how this operon is being regulated while referring to the structure on the board. (Instructions: discuss how the trp operon responds to environment with/without tryptophan, what proteins are involved, and how they interact with each other).
- To debrief, ask someone to talk through the trp operon mechanism (3 min).

3. Check for Understanding: Play the “Lac Operon” role-play (45 min).

3.1 Introduce the lac operon and trp operon role-play activity and explain the process (5 min).

Assign the roles of different molecules to volunteer students who will be the “actors,” while all the other students will be the “directors” of the play.

3.2 Role-play (15 min): The “actors” play the dynamic regulation of the lac operon, and the “directors” judge whether they play a functional lac operon or not. Change the environmental conditions, play the responses of the lac operon again (10 min). If time permits, repeat for the trp operon. (5min)

3.3 Group Discussion (10 min): As a large group, discuss the following questions:

- What are the ways to improve the play by better representing the regulation of the pathway?
- How would one exhibit specific versus non-specific interactions?
- What other responses will be stimulated under other conditions, such as mutations?

3.4 Students discuss remaining exercise questions in small groups (15 min).

- Sample exercise question: *What do you think would happen in each of the following?*
- An E.coli missing a functional lacZ gene.
- An E.coli missing a functional lacI gene.
- An E.coli in which the repressor molecule no longer can bind lactose.

4. Summarize the discussion and any remaining questions (10 min).

²Submitted by Yaxuan Yang, Molecular, Cellular & Developmental Biology as a sample lesson from Bio 172 (under the direction of Dr. Kenneth Cadigan)