

**Interactive lectures:** Classes in which the instructor breaks the lecture at least once per class to have students participate in an activity that lets them work directly with the material.

### Setting the stage

- What is large?
- Do you have teaching assistants?
- Do you have a classroom management system (e.g. Blackboard)?
- Identify your teaching style – Informer, Questioner, Entertainer, etc.
- Play off your style and strengths, but incorporate other deliveries to promote engagement.






- ### How do you prepare for big lectures?
- Identify your main points
  - How do slides advance these points
  - Prepare your visuals
  - Print out notes
  - Practice!
  - Focus on your slide transitions
  - Don't install new software right beforehand!
  - Adapt as needed
  - Take notes on how you would improve for next year
  - Use a lecture preparation checklist

- ### Preparing the teaching team
- Detail your expectations in writing
- Explain TA duties
  - Team work
  - Records policy
  - If co-teaching make sure each professor has clear responsibilities

- ### Goals for the course: Define for yourself and students
- What is the purpose of the course?
  - Develop an informative syllabus (set the expectations early)
    - State goals
    - **Explicitly** express policies and procedures for grading, attendance, late homework, missed tests, office hours, email, etc. - make all expectations clear
    - Publish all important dates at the beginning of the class
    - Identify all resources that will be used and have them ready
    - **Do not make up rules as you go along!**

### Activity

- Identify a large class that you might teach (see worksheet in notebook 2-15)
- What are your top 5 goals for what students will learn in this class? How will you **assess** them?

### Delivering the Lecture

**EXPRESSIVENESS** is the most basic and most direct way to keep students' interest

### Engagement Triggers - examples

- Interpreting Graphs
- Making Calculations
- Demonstration/making predictions
- Brainstorming
- Reading to solve a problem
- Physical prop
- Evocative visual/picture
- Cartoons
- News Clips & Articles
- Video clips
- Think-Pair-Share
- Minute paper
- Muddiest Point
- ConcepTests
- Question of the Day
- Small group discussion
- Clicker
- Google Earth (or other tech)

<https://serc.carleton.edu/NAAGTWorkshops/eol/ycareer/teaching/LargeClasses.html>

### An Example of In-Class Activity

In a 10-20 minute breakout.....

- Break into groups of 5-10 (works even in auditorium seating) and provide a single question, set of questions, or exercise that students need to discuss.
- The question(s) can be used as an introduction or as an assessment of presented material. Each group independently discusses the question and negotiates a group answer.
- Example of hurricane evacuation: stay or go?

You and the TAs monitor and guide groups. Collect each group's answer (a singular assignment with everyone's name listed).

### Kinesthetic Learning Example – P- and S-Waves

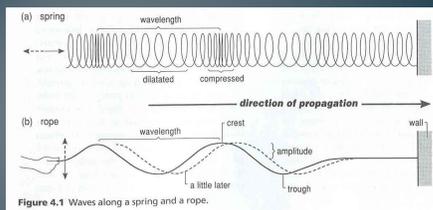


Figure 4.1 Waves along a spring and a rope.

From: Maslett and Khan, Looking into the earth

Differences in particle motion between a P- and S-wave.

### Personal response systems

- Clickers
- Most have smartphones
  - Top Hat
  - Poll Everywhere
  - Others
- Use of these by instructors is highly personal.

## Interactive Lectures Activity

Spend the next few minutes on an activity that you'd like to use in your class (see worksheet, page 2-16).

- What concept do you want students to better understand?
- How will you engage the students?
- How will you know it is working?

## Interactive Lectures Group Brainstorm and Sharing

Now share your idea with a partner and provide each other with feedback.



## Engaging non-majors

Many large lecture classes serve as a core requirement and have many non-majors who are not necessarily engaged in the topic. This is your opportunity to get them interested and excited in geoscience.

- Make it relevant to their lives
- Make pop culture work for you
- Engage different learning styles
- Bring in your personal experiences

## Bring your personal experiences to the classroom

- Where have you done fieldwork?
- What inspires you?
- What environmental issues keep you up at night?
- Where have you traveled?
- What is the societal relevance of your work?
- What career path did you follow and what experiences shaped that?

## Assessment that is consistent with your engagement style...

In "large" classes, you can use a variety of techniques, depending upon the # of students and how much TA support you have:

- Multiple choice/ scantron
- Online quizzes/tests (group or individual)
- Short answer / short essay
- Fill in the blank
- Matching (vocabulary)
- Clickers
- Fill in the blank diagrams
- Peer review



Use Bloom's Taxonomy - aim for students to be working at the "top" of the pyramid in class, and in your exams

Consider collaborative exams!