TEACHING STRATEGIES TO ASSESS STUDENTS’ IDEAS IN UNDERGRADUATE SCIENCE CLASSROOMS

To give all students opportunities to think about what they know, what they are confused about, and what questions they have about the science they are learning:

Some Novel Types of Assessments

Challenge Statement: Students given a statement that could be true or untrue and students charged to take a stance whether they agree or disagree, then explain their reasoning. Challenge statements are particularly effective at uncovering student misconceptions.

Multiple-Response Question: Allows students multiple opportunities to respond to a prompt. 1) On their own, 2) After talking with a neighbor, and 3) After teacher or student-led discussion on topic.

Concept Map: Students charged to brainstorm list of concepts related to a particular topic and then diagrammatically show how the concepts are related, using connect words on arrows and lines that connect terms. Also called as a mind-map or flow-chart.

Retrospective Post-Assessment: Students given a template to fill in their what their previous ideas were about a particular topic and then elaborate on what their ideas are now. Retrospective Post-Assessments are particularly effective at prompting students to be meta-cognitive about they’ve learned.

Drawing: Can be used to encourage an alternative way for students to express their ideas.

Comics: Using comics from newspapers and web, students charged to explain the biological ideas addressed in the comic. Comics are a nice way to engage students at the start of a class or unit.

Some Modes of Assessing

During Class
- Write-Pair-Share: Similar to a think-pair-share, students charged to write on their own for 1-5 minutes before talking through their ideas with a neighbor.
- Index Cards: Quick and easy ways to ask assessment questions on the fly and collect writing from all your students. Good to use at beginning of write-pair-share.
- Clickers: Allows instructor to get a quick, real-time read of what all their students are thinking and allows students to see what their peers are thinking.

Homework
- Reflective Journals: Typically submitted electronically, these journals can be a venue for students to discuss their ideas in more detail without the time constraints of the classroom.

Exams and Quizzes