

Active Learning Activities

THINK-PAIR- SHARE

Brain science: retrieval (activate prior knowledge), self-assessment, collaboration, elaboration

Bloom's taxonomy: understand

Low stakes formative assessment allows teacher to adjust instruction as needed.

- Explain to students that think-pair-share helps activate prior knowledge and share ideas about content or beliefs with peers.
- Provide **prompts** about a concept or topic
 - Give students 1-2 minutes to think about the prompt on their own.
 - Then discuss with a partner for another few minutes.
 - Facilitate whole group discussion.
 - Ask students to elaborate on their thinking with explanations, evidence, or clarifications.
 - What makes you think that?
 - Please give an example from your experience.
 - What do you mean? Can you talk a little more about that?
- Remain neutral with your responses
- Invite others to respond with alternative viewpoints, agreements or disagreements.
- Invite additional comments
 - Who would like to share an alternative opinion?

TURN AND TALK

Brain science: retrieval, self-assessment, elaboration, collaboration

Bloom's taxonomy: understand, apply, analyze, evaluate

Low stakes formative assessment

- Teacher poses a question to the class and students simply turn to the person next to them to discuss for 2 minutes. A comfortable way for students to share ideas and set the stage to share sharing with larger group.
- Teacher strolls around the room but does not interrupt. Most important is process of retrieval and elaboration, which serve as a self-test.
 - During share out, if misperceptions surface, teacher can invite students to clarify

Example prompt:

Part of the challenge of communicating climate change with the public is that there is disparity between what scientists and the non-scientist public think and know about climate change.

- Why do you think there is such a disparity?

QUICK WRITE

Brain science: retrieval, self-assessment, elaboration

Bloom's taxonomy: understand, analyze, apply

Low stakes formative assessment

- At the beginning or end of class, give students 5 minutes to respond to a prompt about homework assignment or the current or previous session.
 - Value: motivate students to prepare for course discussion or introduction to new material; use as attendance check. Students will realize the reward through more dynamic discussions and deeper learning.

POLLING

Brain science: retrieval, self-assessment, elaboration

Bloom's taxonomy: remember, understand, analyze, evaluate

Low stakes formative assessment

- Students vote anonymously on what they perceive as the best explanation/answer to a question, followed by opportunities to discuss their ideas with peers. A follow-up vote leads to greater learning of the material.
Important: have students discuss
why they think their explanation is the most accurate
why the other explanations proposed are not accurate.

As a formative assessment, the instructor determines what further explanations or clarification students need before moving forward. **Various polling tools** include Clickers, Socrative.com and Poll.Everywhere.com, white boards, and strips of different colors of paper.

INDIVIDUAL PLUS GROUP QUIZZES

Brain science: retrieval, self-assessment, elaboration, collaboration

Bloom's taxonomy: remember, understand, apply, analyze evaluate

Low stakes formative assessment or summative/high stakes

Students complete quiz individually and turn in to be graded.

Immediately following the individual quiz, put students in small groups to quiz again, but this time they discuss the answers in their group and submit for a group score.

- Grade both quizzes; if the group score is higher, average the two grades. A low group score does not penalize students with a higher individual score.

Value: Encourages individual accountability; helps students better understand the material through peer discussion. In self-assessing, students can understand their learning gaps.

TESTS/QUIZZES WITH COMMON MIS/PRECONCEPTIONS AS DISTRACTORS

Brain science: retrieval, self-assessment, collaboration, elaboration

Low stake, formative assessment

Design assessments to include common preconceptions/misconceptions that students often hold. Use upon introducing a unit or scaffolding up to more difficult content/skills.

- Students answer the question on their own
Discuss their answer and rationale with partner.
Students answer the question again after the peer discussion.
Then whole group discussion
Why the correct answer is correct?
Why the others are not?

JIGSAWS

Brain science: retrieve, elaborate, collaborate, self-assess, feedback

Bloom's taxonomy: understand, apply, analyze, create

Low stakes or high stakes; formative assessment

- Put students in groups of 4-6.
- Provide each group member a particular aspect/part of the topic or learning objective.
- Allow 3-5 minutes for students to read and study the material
- Put students in new groups. Each group will consist of students who have read the same segment to create an "expert group."
 - Group member shares, elaborates, clarifies, and corrects misperceptions, enough so that each student is comfortable returning to their original group to "teach" the other students.
- Then, students return to original groups. Experts, in turn, share knowledge with their cooperative group, building on learning through elaboration and collaboration.

SORTING STRIPS

Brain science: retrieve, self-assessment, elaboration, collaboration

Bloom's taxonomy: understand, apply, analyze, create

Low stakes, formative assessment

- PREP: Type up small pieces/chunks of information and cut into strips.
 - Form student groups to sort strips into categories or organize them into a sequence, depending on the topic.
 - Strategy encourages discussion of competing ideas or alternative organization schemes within a process. Often the discussion process and idea-sharing holds the most learning value/outcome.
- Added value: Movement and tactile manipulation strengthens learning

PARTIAL OUTLINES/POWER POINTS PROVIDED FOR LECTURE

Brain science: retrieve, elaborate, collaborate, self-assess

Bloom's taxonomy: understand, analyze

Low stakes, formative assessment

- Create a partial outline or graphic organizer for students. Fill in **some** but not all main points or lesser points.
- Students work individually during or after lecture, and then with partner or group to clarify.
- Or students work individually; turn in their work; then groups collaborate to complete the same together for a group score. If group score is higher than individual, average the score. If individual score is higher, student earns that score, so they are not penalized by group score.
- **Research shows** that students have a better understanding, do better on exams, and remain more engaged with the content during lecture when they are provided with partial, rather than complete lecture outline/notes or PowerPoints.
- Optional format: use a low stakes quiz

PAUSING IN LECTURE OR PUNCTUATED LECTURES

Brain science: retrieval, elaboration, collaboration, self-assessment, reflection

Bloom's taxonomy: remember, understand

Formative assessment, low stakes

- When teachers insert wait time in lectures, students have time **to reflect** on, discuss, clarify, and apply ideas just presented. They engage actively in the lecture rather than passively taking notes. These strategies also help students clarify what they do and don't understand.
- Ask students *to not take notes* as you work through a problem on the board with the class
- Afterwards, give students 5 minutes to copy and discuss the problem/process with peers.
- **OPTIONS:**
 - 1) **Group discussion:** Pose a question; allow 6-10 secs for students to respond
 - 2) **Quick write** and reflect about a concept just covered in lecture
 - Optional,** collect the quick write for a formative assessment and to further the discussion based on their "muddiest point" or thinking errors.
 - 3) **Turn and talks:** Pair students and have them share what they do and don't understand about a concept just covered in lecture. Encourage students to add to their notes from the discussion.
 - 4) **Huddle board:** Students in small groups apply their understanding of a concept and post on a mobile white board (a huddle board). A few groups share their work to generate discussion, summarize findings, scientific normative of explanations, etc.

POSTERS & GALLERY WALK

Brain science: retrieve, self-assess, elaborate, collaborate

Bloom's taxonomy: understand, apply, analyze

Low stakes, formative assessment

- In small groups, students collaborate to answer a question or solve a problem.
 - They present their ideas on a sheet of chart paper. They can use smaller post-it notes to adhere to the chart paper or colored sharpies to elaborate or add comments.
 - Once complete students display it on the wall, much like at a scientific poster session.
 - Group members take turns standing at the poster and explaining it to other students as they circulate throughout the room.
- An alternative format:
 - Post different questions or problems on whiteboards or large sheets of paper at different stations around the room.
 - Groups start at a single station, reading the question or prompts and responding by writing on the board/paper or adding their comments with sticky notes.
 - Groups then rotate, reading the question/prompt *and* responses placed there by previous groups. After discussion, they add their own responses.
 - Rotation continues until every group has visited every station.

ADDED VALUE: movement strengthens learning

FISH BOWL

Brain science: retrieve, elaborate, self-assess, collaborate, generate

Bloom's taxonomy: understand, apply, analyze, evaluate

Low stakes, formative assessment

A fish bowl allows a small group of students to engage in a discussion about ideas or concepts that have alternative explanations while the rest of the class observes and takes notes.

- An inner circle of students engages in the discussion, while the rest of the class either sits in an outer circle, or remains in their regular seats and observes.
- If class organized into small groups, members of each group can tap their respective teammate and replace them in the inner circle to expand on or provide additional evidence to support an explanation. Optional: the entire class needs to take part in the inner circle conversation by the end of the class period.

IDEA LINE UP

Brain science: retrieve, generate, elaborate, collaborate, reflect

Bloom's taxonomy: understand, apply, analyze, evaluate

Low stakes, formative assessment

Idea Line Up uses the diverse perspectives to generate heterogeneous student discussion groups. Diverse thinking helps students connect with peers who have opposing perspectives.

- Pose a question about which students have enough prior knowledge/experience to have some evidence to bring to bear in the discussions which ensue. The ideal question will generate a continuum of responses, especially when asked prior to collecting significant evidence or before students have the opportunity to synthesize the evidence they have already collected.
 - Students position themselves on a line to indicate their level of agreement in response to the question. After students line up, have students talk to the person next to them, so they can clarify their own thinking on why they positioned themselves on the line in a particular spot.
 - Students' positions on the line typically indicate a diversity of thinking. Teacher then forms student groups with differing ideas about the question. Students discuss their reasoning for their responses.
 - Students write group claims and evidence small whiteboards or chart paper.

Optional: Prior to investigation, students use initial ideas as “benchmark” to weigh evidence they gather from their investigations.

FOUR CORNERS

Brain science: elaborate, self-assess, collaborate, reflect

Bloom's taxonomy: understand

Low stakes, formative assessment

Students consider several claims (responses to a question). For example, a teacher might ask, "Where does most of the mass in a plant come from?" Claims for consideration might include, "soil," "air," "water," and "sunlight."

- **How it works:** Teacher displays the question prominently for all to consider.
 - **Teacher assigns** each corner of the classroom one claim or possible answer, also prominently displayed on screen or whiteboard.
- Students go to the corner of the classroom that has the claim **they agree with most**.
 - If they don't agree with any claims, they should go to the middle of the room.
- In their corners, students discuss why they chose their answer and clarify misperceptions.
 - Students share and record evidence that supports that claim and why the other claims lack evidence
- Students move into new groups of diverse answers for more discussion and clarification of understanding.

GAMES A variety of games can be used in your classes. This could include professionally made educational board games, games you yourself have created, or a variety of free digital quiz game programs like !Kahoot (<http://kahoot.com>), Quizlet Live (<http://quizlet.com>), and Quizizz (<http://quizizz.com>). With Quizizz, for example, faculty use an already created quiz or make their own by uploading multiple choice questions, saving their quiz, and giving the individualized quiz code to students. Students then play the quiz--in class or at home as homework--and are scored based on speed and accuracy. Results can be downloaded and used to help you assess student learning.

TURN YOUR ASSESSMENTS INTO AN AWESOME GAME

BYOD	Live Results
<p>Works on all devices! No need for a projector.</p>	<p>Realtime class-level and student-level insights.</p>
<p>Choose from millions of shared questions.</p>	<p>Questions on student devices. Students set their own pace</p>
Question Library	Student Response
www.quizizz.com	
FREE	

PEER REVIEW. Students are asked to complete an individual homework assignment or short paper. On the day the assignment is due, students submit one copy to the instructor to be graded and one copy to their partner. Each student then takes their partner's work and depending on the nature of the assignment gives critical feedback, corrects mistakes in problem-solving or grammar, and so forth.

CASE STUDIES. Use real-life stories that describe what happened to a community, family, school, industry or individual to prompt students to integrate their classroom knowledge with their knowledge of real-world situations, actions, and consequences.

ROLE PLAYING. Here students are asked to "act out" a part. In doing so, they get a better idea of the concepts and theories being discussed. Role-playing exercises can range from the simple (e.g., "What would you do if a client rejects your engineering design concept based on the cost and usability of the product?") to the complex.

EXPERIENTIAL LEARNING. Plan site visits that allow students to see and experience applications to the theory/concepts discussed in the class.

*Active Learning Strategies modified from <https://teaching.berkeley.edu/active-learning-strategies>

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