

## Active Learning Strategies Cheatsheet

Technique	Description	Preparation required
Brainstorming	The instructor introduces a topic and then asks students to brainstorm ideas and write them down on a sheet of paper.	Minimal
Concept maps	The instructor has students individually or has a group draw a diagram that shows the connections between various concepts from content covered. The instructor starts the activity by posing a focused question such as “What is the role of dopamine in the body?” The students then brainstorm a list of relevant concepts and organize them into a map.	Minimal
Entrance ticket	At the start of class, the instructor gives a prompt and has the class response on a sheet of paper or through audience response system.	Minimal
Exit ticket	At the end of class, the instructor poses a question to students that they must complete before leaving class. Responses can be made on a sheet of paper or through an audience response system. Example: “Name one thing you learned from the class today” or “What questions do you still have about today’s material?”	Minimal
Group discussions	Either as a large group or divided into small groups, the instructor facilitates a discussion around a topic.	Minimal
Minute paper	The instructor poses a question to the class related to content presented and asks them to write down their response on a sheet of paper or electronically.  Example: “What was the most important thing you learned today?” or “What questions do you still have?”	Minimal
Mnemonics	The instructor has the class come up with mnemonics to assist with the learning of material.  Example: Students think of an acronym to identify the drugs that interact with warfarin.	Minimal
Muddiest point	The instructor has the class reflect on areas of confusion following the end of lecture, discussion, or activity. Instructor can have students respond on a sheet of paper or use an audience response system  Example: “What was the muddiest point in this unit on _____?”	Minimal
Think-Pair-Share	The instructor asks a question of the class, gives students time to think of a response individually, and then asks students to share their thoughts with a partner or with the entire class.	Minimal

Audience response systems	The instructor uses either a free or paid technology to poll the class or complete an interactive set of questions. Answers are collected automatically and provide immediate feedback to the instructor or the entire class. Student responses can be exported and used to assign points for participation.	Moderate
Case studies	The instructor provide the class with a real or hypothetical patient case to facilitate either a small group or large group discussion.	Moderate
Debates	The instructor stages a debate and divides class into groups that represents different views on a certain topic. The students are given time to prepare an argument for their assigned viewpoint.	Moderate
Games	The instructor creates a game to engage students and appeal to their competitive nature. Examples: Jeopardy, Kahoot	Moderate
Guided notes	An alternative to traditional notes where the entire lecture is provided to the students. With guided notes, strategic information is removed from the provided note outline, which requires students to fill in information as they listen to a lecture.	Moderate
Just-In-Time-Teaching	The instructor posts conceptual questions using the online learning management system or other technology. Students must respond by a set deadline prior to class. The instructor reviews the student responses and addresses the correct and incorrect reasoning during class.	Moderate
Role play	The instructor breaks the class into groups where each group member can assume a different role. A scenario is presented and the group given time to discuss. Individual students then role play their assigned part.	Moderate
Jigsaw	The instructor divides the class into small groups and has each group learn about a topic where they become an “expert.” The groups are then reorganized so that each group now contains one “expert” student from each topic. Each expert student must then teach their group members about their topic.	Extensive
Process Oriented Guided Inquiry Learning (POGIL)	An instructional strategy where students work in small groups on specifically designed guided inquiry materials. The materials provide students with data or information following by a set of questions that guide them through formulating their own conclusions.	Extensive
Problem-based Learning (PBL)	An instructional strategy where students work in small groups to solve complex problems.	Extensive
Team-based learning (TBL)	An instructional strategy that focuses on teamwork and communication. TBL consists of three phases: 1) Preparation phase where individual team members complete pre-class materials, 2) Application phase where teams work together to solve a set of problems, and 3) Assessment phase where teams work together to answer graded assessment questions.	Extensive
References: Active Classroom Model Cheatsheet. Washington State University College of Pharmacy. International Teaching Learning Cooperative, Pocket Guide for Evidence-based Instruction. <a href="https://www.itlcnetwork.org/edtools">https://www.itlcnetwork.org/edtools</a> How can you incorporate active learning into your classroom? Center for Research on Learning and Teaching, University of Michigan. <a href="http://www.crlt.umich.edu/sites/default/files/resource_files/02_Active%20Learning%20Continuum.pdf">http://www.crlt.umich.edu/sites/default/files/resource_files/02_Active%20Learning%20Continuum.pdf</a> Wolff M et al 2014. Not another boring lecture. Engaging learners with active learning techniques. The Journal of Emergency Medicine. POGIL. <a href="https://pogil.org/about">https://pogil.org/about</a>		

### Active learning references:

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- Chickering AW and Gamson ZF. 1987. Seven Principles for Good Practice in Undergraduate Education. AAHE Bulletin.
- Deslauriers et al. 2011. Improved Learning in a Large-Enrollment Physics Class. Science.
- Freeman et al. 2014. Active learning increases student performance in science, engineering, and mathematics. PNAS.
- Gleason BL et al. 2011. An Active-Learning Strategies Primer for Achieving Ability-Based Educational Outcomes. AJPE 75 (9) Article 186.
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- Prince M. 2004. Does Active Learning Work? A Review of the Research. Journal of Engineering Education.
- Schneider M, Preckel F. 2017. Variables associated with achievement in higher education: A systematic review of meta-analyses. Psychol Bull. Jun;143(6):565-600.

### Web resources for general teaching strategies:

- 5 Minute University (5MU). Available by emailing [5minuteu@gmail.com](mailto:5minuteu@gmail.com)
- IDEA (<http://www.ideaedu.org/research-and-papers/pod-idea-center-notes-instruction>)
- Magna Publications (<https://www.magnapubs.com/index.html>)
- Carnegies Mellon University Eberly Center: Solve a Teaching Problem (<https://www.cmu.edu/teaching/solveproblem/index.html>)
- Penn State Schreyer Institute for Teaching Excellence (<http://www.schreyerinstitution.psu.edu/>)
- Vanderbilt University Center for Teaching: Teaching Guides (<https://cft.vanderbilt.edu/teaching-guides/>)
- Western Washington University Teaching Handbook (<http://www.wvu.edu/teachinghandbook/index.shtml>)