**Ways to incorporate Active Learning into your online course**

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| **Activity** | **Description** | **Example** | **Time** |
| Minute Paper | Students write the key points from the day’s lesson. This can be done on paper or digital document. | “Today we discussed conductive heat transfer. In one minute, list as many of the principal features of this process as you can remember.” – Mechanical Engineering | 1 min |
| Muddiest Point | Students write or ask a question about one concept or idea they are still struggling with the most, and submit it to you online (e.g., via Canvas, OLI, Piazza). | “Write the one concept you are having the most trouble understanding.”  “What is one question that still remains for you about this topic/concept/problem/case?” | 1 min |
| Application Card | Students are provided with a task that challenges them to apply a concept or skill to a situation they have not encountered before, or challenged to generate examples that illustrate a concept to demonstrate transfer of knowledge. | [Give students a graph of *y*=*sin*(*x*).] “On top of this graph, plot the graph of *y*=*sin*(2*x*).” *– Mathematics* | 1 min |
| Self-Assessment Quiz | Students take a quiz (typically ungraded), or complete a checklist of ideas to determine understanding of a concept. This can be used at the beginning of the semester, or the beginning of a chapter for students to gauge prior knowledge and identify misconceptions. This can also help the TA target where to spend the most time. | Provide increasingly difficult questions to gauge a student’s knowledge of a particular area:   1. Identify the functional groups present in the Lewis structure shown below [provide these]. 2. Draw the structure of 2,3-dimethyl-3-ethylcyclohexane. 3. Identify the intermolecular forces that would govern the characteristics of the following molecules [provide these]. 4. Predict the products of the reaction between 1-butene and hydronium ion. – *Chemistry* | 5 min |
| Think-Pair-Share | Have students answer a question individually, then compare their answers with a partner and synthesize a joint response to share with the class.  Question can be given via an online poll (e.g., Zoom polling, Piazza polling, Google form) and depending on the tool, you can see an aggregate of responses, and can share those with the class for further discussion). | “From the Barthes piece you read for homework, identify the author’s main point using two supporting reasons from the text.”  *– English*  ----------------------------------------------  Solve the following problem [given]. Turn to a neighbor and compare your answer, come to a consensus and be ready to share your answer with the full group. *– General*  Which concept applies to the above problem?   1. Course concept 1 2. Course concept 2 3. Course concept 3 4. I don’t know | 5 min |
| Brainstorming | Introduce a topic or problem and then ask for student input (individually and/or in pairs/groups). Give students a minute to write down their ideas, and then record them in a shared space (Google document, shared screen/whiteboard, discussion board). | “Write down any relevant results that we know, and questions we might need to answer, in order to prove Fermat’s little theorem.” *– Mathematics*  ----------------------------------------------  “If you were a Catholic in 16th-century England, what factors might influence your decision to convert to Protestantism?”  *– History* | 5 min |
| Set It Up | After providing students with a quantitative problem, ask them to solve it using only variables and units, emphasizing the problem-solving process rather than a specific numerical answer. For example, you could ask students to identify which course concepts are relevant to finding a solution, what assumptions need to be made, or what information is missing and how they might calculate it. | “Using the provided circuit diagram, label the different components (resistors, capacitors, battery, etc.) with variable names. Using Kirchoff’s circuit laws, set up the equations you would use to calculate the current through the circuit at the points identified in the diagram using only variables.” – *Physics* | 5 min |
| Practice Expert Problem-Solving Skills | Have students work in pairs or groups. Provide a worksheet that outlines an **ill-defined problem** and a list of questions that an expert would ask him/herself to approach the problem. | “What is the longest metal pole one can move into a room without bending or breaking it? – *Mathematics*   * Room is 30’ x 20’ rectangle * Room has one entrance at midpoint of 30’ wall * Hallway & doorway leading to room are 5’ wide”   *Some questions to ask students:*   * What is the question asking? What is the deliverable? * What are the important pieces of information given? * How will you get necessary information that is missing? * What are the (reasonable) assumptions you need to make? * What course concepts are relevant? How will you use them to solve this problem? * What is the first step/how would you set up the problem? * Look at your answer. Is it reasonable? | 5-10 min |
| Concept Maps | Direct students to create a concept map in pairs or small groups. Concept maps represent networks of nodes and links. Nodes are labeled boxes representing concepts; nodes are connected by links (lines connecting the nodes that are defined by verbs). Call on pairs/groups to share their concept map using a document projector. | “Create a concept map to connect your understanding of the following terms: natural selection, Hardy-Weinberg equilibrium, Mendelian genetics, allele frequencies, and evolution. Include connecting phrases between map items.” – *Biology* | 5-10 min |
| Role-Playing | Students are asked to act out a part (individually or in groups). In doing so, they get a better idea of the concepts and theories being discussed. Role-playing exercises can range from simple to complex. | “Role 1: You are a traveler who just missed the train to your next vacation destination. Role 2: You are a travel agent assisting a customer. Both: Playing your assigned role, discuss in [language] the situation and determine a solution to the problem.”  *– Modern Languages* | 5-10 min |
| Case Studies | Use real-life stories that describe what happened to a community, family, school, industry, or individual to prompt students to integrate classroom knowledge with real-world situations, actions, and consequences. | “Consider the marketing strategies that P&G used to develop its Pringles line of potato chips [provide a reading/background information]. Would you consider their marketing strategies successful? Why or why not?” *– Business* | 10 min |
| Inquiry-Based Learning | Students use an investigative process to discover disciplinary concepts for themselves. After the instructor identifies an idea or concept for mastery, a question is posed that asks students to make observations, pose hypotheses, and speculate on conclusions. Then students are asked to tie the activity back to the main idea/concept. | Before electroplating zinc onto the surface of a penny, ask students to predict what will happen. After giving students time to reflect and explain their observations, change the scenario – “What will happen when the Zn-plated penny is heated?”  – *Chemistry* | 10 min |
| Peer Review | Students are asked to complete an individual homework assignment, paper, or project. On the day the assignment is due, students submit a copy to one or two classmates. Each student then gives constructive feedback (e.g., corrects mistakes in problem-solving, makes suggestions about improving argumentation, etc.) | Students are assigned a population biology homework problem set. They exchange their work with a peer and are given a rubric and/or answer key. Students grade and/or give constructive feedback on their peer’s work. They submit their peer feedback to the instructor for verification before giving back to the author.  – *Biology* | 20 min |
| Jigsaw | A general topic is divided into smaller, interrelated pieces. Student groups are assigned one of the pieces to review/confirm knowledge. Then the groups “jigsaw” so that there’s a representative from each piece in each new group; students then teach each other about their piece. | Students are assigned to read one of three recent journal articles on neural networks and autism in children. After discussing the study design with their “home groups,” students split into new groups and share the results of their paper, and its strengths and weaknesses with each other. – *Psychology* | 20 min |