

Easy to Use Classroom Assessment Techniques (CATs)					
Type	Description	Purpose	Advantages	Disadvantages	Suggestions for use
Minute Paper	At the end of class students are asked to use index cards or half-sheets of paper to provide written feedback to the following questions: <ul style="list-style-type: none"> o “What was the most important thing you learned during this class?” o “What important question remains unanswered?” 	<ul style="list-style-type: none"> • Assess student understanding of material. • Identify the need for mid-course adjustments. • Helps students identify important points. 	<ul style="list-style-type: none"> • Provides immediate feedback to instructors. • Allow instructors to quickly respond to student questions. • Quick and easy. • Very flexible. 	<ul style="list-style-type: none"> • Overuse may lead students to think of it as perfunctory. • Difficult to develop clear questions that are easy to answer in a short amount of time. • Instructor response may take longer than expected. • Instructor usually cannot respond to all questions asked. 	<ul style="list-style-type: none"> • Lecture/discussion courses. • Large classes. • Courses that regularly present students with large amounts of information. • Manage student expectations by making it clear that you may not be able to respond to all questions.
Muddiest Point	At the end of class students provide written feedback to the question “What was the muddiest [least clear] point in _____?” The question may be applied to lectures, reading assignments, discussion, or a video/film. Instructors then use the student responses to focus the next class meeting. <ul style="list-style-type: none"> o “What was the muddiest point in today’s lecture?” 	<ul style="list-style-type: none"> • Identifies what students find least clear about a particular lesson or topic. • Helps instructor identify which points to emphasize in class. 	<ul style="list-style-type: none"> • Quick and easy to administer. • Requires little instructor preparation. • Identifies student comprehension difficulties • Provides shy students an opportunity to ask questions. • Promotes more careful listening from students. 	<ul style="list-style-type: none"> • Students may focus only on what they do not understand. • Students may raise questions that are difficult to answer. 	<ul style="list-style-type: none"> • Large, lower-division courses. • Manage student expectations by making it clear that you may not be able to respond to all questions.
One-Sentence Summary	Students are asked to summarize a large amount of information into a one-sentence summary that answers the questions “Who does what to whom, when, where, how and why?”	<ul style="list-style-type: none"> • Helps students learn to synthesize and summarize information into “chunks” that can be recalled more easily. • Students learn to express ideas in their own language. 	<ul style="list-style-type: none"> • Quick and easy way to assess students’ ability to organize information and summarize their understanding. • Facilitates meaningful learning through the “chunking” of information and use of non-technical language. 	<ul style="list-style-type: none"> • May oversimplify material. • Cannot be used with material that has multiple answers to the core questions. 	<ul style="list-style-type: none"> • Best for content that has clear parameters or is factual in nature. • The instructor should be able to successfully complete the exercise prior to administering it.

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Application Cards	<p>After presenting a principle, theory or procedure, the instructor gives students index cards and they are asked to develop at least one real-world application of what they learned.</p> <ul style="list-style-type: none"> o “According to Newton, ‘To every action there is always opposed an equal reaction.’ Give an application of Newton’s Third Law from everyday life.” 	<ul style="list-style-type: none"> • Students demonstrate learning by applying the concept. • Forces students to connect past and present knowledge. • Helps demonstrate relevance of the material. 	<ul style="list-style-type: none"> • Quick and easy • Demonstration of real-world relevance may increase student interest in the topic/subject. • Promotes higher-order thinking. • Provides instructors with examples to use in the future. 	<ul style="list-style-type: none"> • Not all concepts have real-world applications. • Shifts focus from the abstract to the concrete. • Students may miss the general concept and remember only the application examples. 	<ul style="list-style-type: none"> • Relevant to all subjects, but is particularly useful in the social sciences, applied disciplines and technical education. • Adaptable to a wide variety of class types and sizes
Pro and Con Lists	<p>Students create a list of pro and con outcomes to a question or situation presented by the instructor.</p> <ul style="list-style-type: none"> o “After reading Shakespeare’s <i>Hamlet</i>, imagine you are Hamlet and list three pros and three cons of murdering your stepfather, Claudius.” 	<ul style="list-style-type: none"> • Students demonstrate depth of knowledge by identifying two sides of an issue. 	<ul style="list-style-type: none"> • Helps to illustrate the complexity of concepts/issues. • Helps students develop analytical skills. • Promotes higher-order thinking. 	<ul style="list-style-type: none"> • Some issues may have more than two sides so it risks oversimplifying more complex issues. • Some students may reject the idea that there are two sides to some moral or ethical issues. • Possibility for controversy. 	<ul style="list-style-type: none"> • Any course where questions of value are an explicit learning objective. • Particularly useful in humanities, social science, and public policy courses or in applied fields where multiple solutions to problems are possible.
Electronic Discussion Boards	<p>Students respond to instructor questions via electronic discussion board.</p> <ul style="list-style-type: none"> o “How could my PowerPoint presentations be improved?” 	<ul style="list-style-type: none"> • To receive simple and immediate feedback from students about instruction or other class issues. 	<ul style="list-style-type: none"> • Allows for quick feedback. • Doesn’t use class time. • Students have the convenience of responding asynchronously as their time allows. • Allows for discussion of issues by multiple individuals and more detailed responses from instructor. 	<ul style="list-style-type: none"> • Response rates may be low unless students are given an incentive to participate. • Responses are not anonymous. • Requires access to an electronic discussion forum (e.g., Blackboard). • All students enrolled will have access to responses. 	<ul style="list-style-type: none"> • Courses where Blackboard or some other electronic discussion forum is already in use. • Possible to adapt other feedback devices for use in this format.

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Directed Paraphrasing	<p>Students are asked to paraphrase part of a lesson for a specific audience and purpose using their own words.</p> <ul style="list-style-type: none"> o “In one or two sentences, paraphrase what you have learned about hospice care to inform a dying, but still lucid patient of its possible advantages over hospital care.” 	<ul style="list-style-type: none"> • Assesses students’ ability to restate important concepts in their own words. • Develops students’ ability to apply course information to real-life situations. 	<ul style="list-style-type: none"> • Demonstration of real-world relevance may increase student interest in the topic/subject. • Promotes higher-order thinking. • Builds students’ communication skills. 	<ul style="list-style-type: none"> • Can take considerable time and effort to assess adequately. • Difficult to set clear criteria for assessment. • Student paraphrasing skills may not improve without focused, individualized feedback. 	<ul style="list-style-type: none"> • Relevant to most subjects, but is particularly useful in the applied disciplines and technical education. • Must be used multiple times during the course to be useful. • Instructors should set strict time limits for completion. 																
Memory Matrix	<p>A simple table with rows and columns representing key concepts and their relationships. When students fill in the blank cells in the table they provide an easily assessable demonstration of their understanding.</p> <ul style="list-style-type: none"> o Example: <table border="1" data-bbox="323 922 636 1003"> <thead> <tr> <th colspan="4">Spanish Verb Endings</th> </tr> <tr> <th></th> <th>-ar</th> <th>-er</th> <th>-ir</th> </tr> </thead> <tbody> <tr> <td>Irregular</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Regular</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Spanish Verb Endings					-ar	-er	-ir	Irregular				Regular				<ul style="list-style-type: none"> • To assess students’ ability to recall factual information and their skill at organizing it into meaningful relational categories 	<ul style="list-style-type: none"> • Quick and easy. • Very helpful for students who are strong visual learners. • Helps students manage and organize large amounts of information. • Can be used by students as a study aid. 	<ul style="list-style-type: none"> • Doesn’t allow students to use their own categorizing schemes. • Can make complex, dynamic systems appear static or overly simplistic. 	<ul style="list-style-type: none"> • Introductory courses that require the recall of a large amount of categorical information. • Particularly well suited for courses in the natural sciences, foreign languages, music, history and law. • Instructors should start with a simple matrix until students are familiar with the technique.
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Exam Evaluations	<p>Students self-evaluate what they learned from the test and assess the quality of the test or exam in terms of difficulty, clarity, appropriateness, or fairness.</p> <ul style="list-style-type: none"> o “The last exam used both multiple choice and essay questions. Which type of question allows you to best demonstrate what you have learned? Please explain.” 	<ul style="list-style-type: none"> • Provide instructors with student reactions to exams to make them more effective learning and assessment tools. 	<ul style="list-style-type: none"> • Focuses on exams as learning exercises. • Demonstrates respect for student perspectives on their own learning. • Provides feedback on an aspect of the course that is central to student satisfaction. 	<ul style="list-style-type: none"> • May raise questions about exams that instructors are uncomfortable addressing. 	<ul style="list-style-type: none"> • Useful in any type of course that requires exams. • Only ask questions about aspects of the exam you are willing to change. • May be incorporated as the last section of an exam. 																

Adapted from *Classroom Assessment Techniques* (1993) by Angelo, T.A., & Cross, K.P.

Easy to Use Classroom Assessment Techniques (CATs)

Type	Description	Analyzing the Data and Making Conclusions
Minute Paper	At the end of class, students use index cards or half-sheets of paper to provide written feedback to the questions: <ul style="list-style-type: none"> o “What was the most important thing you learned during this class?” o “What important question remains unanswered?” 	Categorize and count responses and note useful comments. Compare minute papers over the semester to see changes in the clarity and thoughtfulness of student writing.
Muddiest Point	<ul style="list-style-type: none"> o At the end of class students provide written feedback to the question, “What was the muddiest [least clear] point in _____?” 	Skim approximately half of the answers, noting common types of muddy points. Then read all responses and sort them into piles of related muddy points with a separate pile for unique responses that don’t fit into a category. Count the number of responses in each pile, noting the most frequently mentioned points. Alternatively, group together muddy points about facts and principles, points about concepts, and points about skills.
One-Sentence Summary	Students summarize a large amount of information in one sentence that answers the questions, “ <i>Who</i> does <i>what</i> to <i>whom</i> , <i>when</i> , <i>where</i> , <i>how</i> , and <i>why</i> ?”	Draw slash marks with a pencil between key elements of the sentence, separating answers to the various questions (<i>Who? Does What?</i> etc.). You can also have students draw slash marks themselves after completing sentences. Evaluate each sentence component by writing a zero (incorrect or inadequate), a check mark (adequate), or a plus (more than adequate) above that element. Make a response table for the entire class with the questions as column headings and the marks—zero, check, and plus—as row headings. Write totals in the cells and note overall strengths and weaknesses. For example, are students better at answering <i>who</i> and <i>what</i> than <i>how</i> and <i>why</i> questions?
Application Cards	After hearing a principle, theory, or procedure, students write at least one real-world application of what they learned on an index card. <ul style="list-style-type: none"> o “According to Newton, ‘To every action there is always opposed an equal reaction.’ Give an application of Newton’s Third Law to everyday life.” 	Quickly read through the index cards, marking each example of a real-world application with an abbreviation such as G, A, M, or U, for “great,” “acceptable,” “marginal,” or “unacceptable.” Choose three to five of the best examples and one or two marginal or unacceptable examples to share with the class, altering poor ones enough to hide the identity of the people who wrote them.
Pro and Con Lists	Students list advantages and disadvantages of a decision or situation the instructor proposes. <ul style="list-style-type: none"> o “After reading Shakespeare’s <i>Hamlet</i>, imagine you are Hamlet and list three pros and three cons of murdering your stepfather, Claudius.” 	Count how frequently a specific advantage or disadvantage was listed by students, noting the ones most often mentioned. Compare student answers with your own to see if they have left out points you expected them to mention or included points you considered unessential. Notice the balance of pros to cons to determine if you need to focus more on one or the other.

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Electronic Discussion Boards	Using their own words, students respond to instructor questions via electronic discussion board. <ul style="list-style-type: none"> o “How could my PowerPoint presentations be improved?” 	Summarize answers and group them by theme. Notice concerns that are not directly relevant to your questions, because they may represent important or strong reactions to your teaching.																
Directed Paraphrasing	Students paraphrase part of a lesson for a specific audience and purpose. <ul style="list-style-type: none"> o “In one or two sentences, paraphrase what you have learned about hospice care to inform a dying, but still lucid patient of its possible advantages over hospital care.” 	One approach is to separate responses into four piles: “confused,” “minimal,” “adequate,” and “excellent,” based on 1) how accurate the paraphrase is, 2) how well it has been geared for the intended audience, and 3) how well it has accomplished the assigned purpose. A different approach is to circle the clearest and most confusing points in each paraphrase, using different-colored pens, and then identify patterns of clarity and confusion for the class.																
Memory Matrix	Students fill in the blank cells of a table to demonstrate their understanding of key concepts. <ul style="list-style-type: none"> o Example: <table border="1" data-bbox="323 740 634 824"> <thead> <tr> <th colspan="4">Spanish Verb Endings</th> </tr> <tr> <th></th> <th>-ar</th> <th>-er</th> <th>-ir</th> </tr> </thead> <tbody> <tr> <th>Irregular</th> <td></td> <td></td> <td></td> </tr> <tr> <th>Regular</th> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Spanish Verb Endings					-ar	-er	-ir	Irregular				Regular				To discover what students know well, tabulate correct responses for each cell for the class and compare that with totals for other cells, noting large differences. Focus on incorrect or marginal items and look for patterns in the kinds of errors. Results may indicate that you need to better organize some information you present or spend more time teaching some categories of information.
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Exam Evaluations	Students self-evaluate what they learned from the test and assess the test’s difficulty, clarity, appropriateness, or fairness. <ul style="list-style-type: none"> o “The last exam used both multiple choice and essay questions. Which type of question allows you to best demonstrate what you have learned? Please explain.” 	Pay close attention to the content of student comments describing what they are learning from the test. Try to separate comments that address the fairness of your grading from those that concern the effectiveness of the test as a learning instrument. If you ask students what type of test they prefer, tally their preferences, but consider the reasons students provide for their preferences when determining the merit of making a change.																

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