# Formative Assessment Techniques and Test Item Types

This document was created by the Comprehensive Assessment – New Generation (CANG) Committee to describe techniques that can be used during formative assessment to collect evidence of learning during instruction and the types of items used in benchmark and summative assessments to determine students' progress towards meeting standards and levels of student achievement of standards.

## Formative Assessment Techniques

This table contains techniques that can be used during formative assessment. A link to a web site that provides additional information regarding the technique is followed by a short description and whether or not the technique is student led or teacher led. This table was adapted from information provided by the Council of Chief State School Officer's Formative Assessment for Students and Teachers State Collaborative on Assessment and Student Standards.

| Item Type | Information |
|---|---|
| **Questioning** | **Reciprocal Questioning**<br>http://www.justreadnow.com/strategies/request.htm<br><br>Questioning activities------things like "Reciprocal Questions" or other types of questioning strategies can be used with groups of two or three students or with the whole class. This type of technique can be especially useful with older students. The teacher can circulate around the classroom, listening in to questions asked and the objectives they represent and listening to answers for depth of knowledge. Additional information can be interjected by the teacher into the conversations for greater learning, or specific objectives can be re-taught.<br><br>Teacher Led – Yes Student Led - Yes<br><br>**Think-pair-share**<br>http://olc.spsd.sk.ca/DE/PD/instr/strats/think/index.html<br><br>Students are presented with a difficult question or challenge associated with content being learned. Individual students think about the question/challenge and possible answers; students then pair with another person to discuss the question/challenge and possible answers; students then share their thoughts/responses with the whole class. The teacher can circulate during the partner discussions to listen to student responses/discussion of the topic and then hear the group thoughts on the question. Additional instruction or clarification can be provided based upon the depth/levels of student responses. Partner groups can each be given a different question/challenge to solve----this provides additional content coverage.<br><br>Teacher Led – Yes Student Led - No |

| | |
|---|---|
| | **Focused Listing**<br>http://www.ntlf.com/html/lib/faq/al-ucsb.htm<br><br>Students can be asked either at the beginning (determining prior knowledge), middle (formative---instruction can be adapted or elaborated upon), or end (summative---lets the teacher see what learning has occurred) of a lesson or unit of study to list ideas, concepts, etc. that they have learned about a topic.<br><br>Teacher Led – Yes Student Led – Yes<br><br>**Anticipation Guides**<br>http://www.indiana.edu/~l517/anticipation_guides.htm<br><br>Students complete the first section of this guide prior to reading and/or instruction. Students' responses to the items are discussed in class. Reading and/or instruction follows the discussion. Students complete the second section of the guide after instruction. Responses are checked and changes in response are discussed. This activity provides a great deal of information to the teacher, i.e. depth of student prior knowledge and level of knowledge following reading and instruction.<br><br>Teacher Led – Yes Student Led - No<br><br>**Listening Center – Stories on Tape**<br>http://www.carla.umn.edu/immersion/acie/vol8/bridge_vol8_no1.pdf<br><br>Students tape record their version of what they learned within a specific topic. Students can be assigned small sections of a unit, or volunteer to write about and tape a certain section of what was studied in class. Teachers can select the best tapes on a topic to be placed within the listening center; students who have not mastered those learning objectives can listen to the tape. This activity allows the teacher to know who has learned what information.<br><br>Teacher Led – Yes Student Led -Yes |
| **Demonstrations Presentations** | **Podcasting**<br>http://www.k12handhelds.com/podcasting.php<br>Podcasting is a Web-based broadcast that shares audio content. It provides an avenue for learners to take control of their own learning. Students develop/create a podcast that presents in a unique fashion what has been learned about a specific topic. Teachers, peers, and the general public can listen to these podcasts and teachers can determine what objectives might need additional instruction. See: http://www.mpsomaha.org/willow/radio/index.html. This site is from Willowdale Elementary School in Omaha, Nebraska.<br><br>Teacher Led – Yes Student Led - Yes<br><br>**Classroom Debates**<br>http://olc.spsd.sk.ca/DE/PD/instr/strats/debates/index.html |

| | |
|---|---|
| | Students choose (or are selected) sides to take on an issue. They must know the topic well in order to defend/argue their position. Teachers can listen to the debate to gauge the depth of student knowledge on a topic.<br><br>Teacher Led – Yes Student Led - No<br><br>**Puppet Show**<br>http://www.blackcat-theatre.co.uk/Classroom.html<br><br>Especially useful with younger students---this method of formative assessment would have students write and present a puppet show that demonstrates in a novel way what was learned about a specific topic. Teachers could view the show or read the scripts to determine which learning objectives had been mastered and which ones needed additional attention.<br><br>Teacher Led – Yes Student Led - No<br><br>**Quiz Game**<br>http://www.glc.k12.ga.us/trc/cluster.asp?mode=browse&intPathID=5128<br><br>Similar format to a game such as Jeopardy. Students develop questions to go along with specified categories. Teams attempt to answer the questions and earn the most points. Teachers can look at the types of questions asked and listen to the students' answers to learn about depth of knowledge and areas that might need additional instruction.<br><br>Teacher Led – Yes Student Led - No<br><br>**Student-Created, Interactive Bulletin Boards**<br>http://faculty.kutztown.edu/schaeffe/BulletinBoards/bbs.html<br><br>Students develop an interactive bulletin board display that showcases what they have learned about a specific topic. Students can work in small groups to create and put together the bulletin board and then each individual can write a brief synopsis of what the activity meant to him or her. Peers can attempt to do the activity as a type of formative assessment for them. The teacher can examine the bulletin board display and activity to gauge depth of learning and to suggest additional learning activities. Also, peer results from the activity and peer feedback would be important.<br><br>Teacher Led – Yes Student Led –Yes<br><br>**Mock Interviews**<br>http://www.learnnc.org/articles/oh-curriculum0406-1<br><br>Students act as news reporters/journalists and interview classmates concerning aspects of topics studied. Students develop varying difficulty level questions and conduct mock interviews which can be tape recorded for later listening or transcribing. Teachers can observe the interview/answer process and/or listen |

| | |
|---|---|
| | to taped interview to see the level of student learning/engagement with the content. Areas needing additional instruction or clarification can be noted and developed.<br><br>Teacher Led – Yes Student Led – No<br>**Role Play**<br>http://teacher.scholastic.com/scholasticnews/indepth/one_world/activities/gameset/index.asp<br><br>Students can be assigned, or volunteer for, roles that allow them to act out information that has been learned about a specific topic. The teacher can view and listen carefully for important concepts, vocabulary, etc. related to what has been learned.<br><br>Teacher Led – Yes Student Led – No<br><br>**Student-Generated Diagrams/Drawings**<br>http://www.allamericareads.org/lessonplan/strategies/after/sts.htm<br><br>Students are asked to draw diagrams related to what they are reading and learning in class. In a study (Gobert & Clement, 1999) with 5th grade students who read articles/textbook information about plate tectonics, the group of students who drew diagrams representing what they were reading/learning outperformed students who only read the text and those who wrote brief summaries of what they had read. Teachers can view the diagrams to see if key concepts are correctly portrayed.<br><br>Teacher Led – Yes Student Led –Yes<br><br>**Student-Generated Venn Diagrams**<br>http://www.2learn.ca/construct/graphicorg/venn/vennindex.html#<br>Students can create Venn Diagrams comparing and contrasting specific concepts or ideas being learned. Teachers can view these diagrams for evidence of student understanding.<br><br>Teacher Led – Yes Student Led – Yes |
| **Writing** | **Journal Entry**<br>http://www.miamisci.org/ph/lpexamine6.html<br><br>Teacher Led – Yes Student Led – Yes<br><br>**Buddy Journals**<br>http://scholar.lib.vt.edu/ejournals/ALAN/winter97/w97-06-Main.html<br><br>Students are assigned a partner for journal writing activities. They can write daily to one another about what is being studied/learned about a specific topic. The teacher can read these buddy journals and then respond to each student about what has been learned, how it has been learned, and areas that need additional instruction or explanation/clarification. |

| | |
|---|---|
| | Teacher Led – Yes Student Led –Yes<br><br>**Poems**<br>http://www.gigglepoetry.com/<br><br>Students can create a unique poem that demonstrates what was learned about a specific topic/area. The teacher can read the poem and ask the student to explain how s/he wrote the poem and what it means to him/her. Poems can take a variety of forms/styles.<br><br>Teacher Led – Yes Student Led – Yes<br><br>**Quick-writes**<br>http://www.bertiekingore.com/Quick_Writes.pdf<br><br>Students write, or draw, ideas, thoughts, feelings, etc. on information that has been taught (5-10 minutes). This short, impromptu activity can enable the teacher to see what information might need to be re-taught or elaborated upon.<br><br>Teacher Led – Yes Student Led – No<br><br>**Focused Listing**<br>http://www.isothermal.edu/talc/assessment/FocusedListing.pdf<br><br>Students can be asked either at the beginning (determining prior knowledge), middle (formative---instruction can be adapted or elaborated upon), or end (summative---lets the teacher see what learning has occurred) of a lesson or unit of study to list ideas, concepts, etc. that they have learned about a topic.<br><br>Teacher Led – Yes Student Led – No<br><br>**Two-Minute Paper**<br>http://www1.umn.edu/ohr/teachlearn/tutorials/powerpoint/assessment.html<br><br>Usually used at the end of a lesson. The teacher can ask the students to write for two minutes about what they have learned that day, or they can be asked to summarize the lesson.<br><br>Teacher Led – Yes Student Led – No<br><br>**Muddiest Point**<br>http://cty.jhu.edu/teaching/strategies/assessment/muddiestpt.htm<br><br>Students are asked at the end of a lesson or before moving to a new topic to write down the one thing that they least understood from what was taught. This activity gives the teacher tremendous information on what might need to be re-taught or elaborated upon.<br><br>Teacher Led – Yes Student Led – No |

| | |
|---|---|
| | **Application Cards**<br>http://www.ntlf.com/html/lib/bib/assess.htm<br><br>After teaching a topic, idea, or concept ask students to write down one real-world application for that topic or idea.<br><br>Teacher Led – Yes Student Led – No<br><br>**One-Sentence Summary**<br>http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/assess-2.htm<br>After instruction, ask students to write about what they have learned in one complete sentence.<br><br>Teacher Led – Yes Student Led – Yes<br>**RSQC2**<br>http://www.dean.usma.edu/math/people/Lin/CATs/RSQC2.html<br><br>Within a two-minute time period, students must recall and list in rank order the most important points from the previous day's lesson. Then in two additional minutes students write one sentence summarizing those important points. Next, they write one major question that they would like to have answered, and then identify two threads/components to connect what they listed to the overall unit/course goal.<br><br>Teacher Led – Yes Student Led – No |
| **Learning Converstions** | **Classroom Debates**<br>http://www.education-world.com/a_curr/strategy/strategy012.shtml<br><br>Students choose (or are selected) sides to take on an issue. They must know the topic well in order to defend/argue their position. Teachers can listen to the debate to gauge the depth of student knowledge on a topic.<br><br>Teacher Led – Yes Student Led – No<br><br>**Mock Interviews**<br>http://www.usnewsclassroom.com/resources/activities/act011105.html<br><br>Students act as news reporters/journalists and interview classmates concerning aspects of topics studied. Students develop varying difficulty level questions and conduct mock interviews which can be tape recorded for later listening or transcribing. Teachers can observe the interview/answer process and/or listen to taped interview to see the level of student learning/engagement with the content. Areas needing additional instruction or clarification can be noted and developed.<br><br>Teacher Led – Yes Student Led – No<br><br>**Jigsaw Groups**<br>http://www.jigsaw.org/overview.htm |

| | |
|---|---|
| | Students are arranged in groups to learn about, read, and discuss a learning topic. This activity follows basic set-up rules and can be adapted for various content areas. The teacher listens in to various group discussions to determine what has been learned and what areas need to be elaborated upon.<br><br>Teacher Led – Yes Student Led – No<br><br>**Discussion Questions/Prompts**<br>http://www.utexas.edu/academic/diia/gsi/seminars/materials/new04/moreno2.doc<br>The teacher can initiate class discussion to aid comprehension of written materials by modeling how to ask and answer questions such as: (1) clarifying questions; (2) verifying questions; (3) refocusing questions; (4) redirecting questions; and (5) narrowing the focus questions. This activity could be especially helpful with older students and with struggling readers. The teacher could see if additional instruction, or elaboration, was needed.<br><br>Teacher Led – Yes Student Led – No<br><br>**Anticipation Guides**<br>http://forpd.ucf.edu/strategies/stratAnt.html<br><br>Students complete the first section of this guide prior to reading and/or instruction. Students' responses to the items are discussed in class. Reading and/or instruction follows the discussion. Students complete the second section of the guide after instruction. Responses are checked and changes in response are discussed. This activity provides a great deal of information to the teacher, i.e. depth of student prior knowledge and level of knowledge following reading and instruction.<br><br>Teacher Led – Yes Student Led – No<br><br>**Concept Tests or Maps**<br>http://serc.carleton.edu/introgeo/interactive/conctest.html<br><br>The teacher poses one or more questions during class that cover key concepts to be covered within the lesson. Several possible answers are provided to the students. The students are asked to vote with a show of hands on the correct answer to a specific question posed. If the majority of the students get the answer correct, then the instructor provides a brief explanation of the correct answer and moves on. If most of the students do not get the answer correct, then the teacher gives a few minutes to the class so that "neighbors" can discuss and try to convince the other person to vote for their answer choice. Students are then asked to vote on their answer choices a second time. If most students answered correctly, a brief explanation is given and then the teacher moves on. If students still do not seem to be getting the answer, then the teacher provides detailed information on the concept.<br><br>Teacher Led – Yes Student Led – No |

| | |
|---|---|
| | **Gallery Walk**<br>http://serc.carleton.edu/introgeo/gallerywalk/index.html<br><br>This is a discussion technique that gets students out of their chairs and moving around the classroom. The teacher poses four or five questions related to key concepts that the students should learn and these questions are written on either poster paper or large sheets of writing paper and placed at stations around the classroom. Small groups of students sit at tables or stand at a station, read the question, discuss possible answers to the question, and then write down key ideas or thoughts that they have discussed. After a designated amount of time, that group of students move to the next station in the room, read the question at that station and the written comments of the previous group, discuss those ideas and jot down their thoughts related to that question for the next group to read and respond to. For instructors, it's a chance to gauge the depth of student understanding of particular concepts and to challenge misconceptions. When the group returns to the station where it started, the group synthesizes comments and makes an oral report, the "reports out" phase of Gallery Walk," to the class. This stage of the Gallery Walk is a great chance for involving the entire class in discussion and to address misconceptions. Group or individual written reports can be completed in lieu of oral reports.<br><br>Teacher Led – Yes Student Led – No<br><br>**Assessment Conversations**<br>http://www.reading.org/downloads/publications/books/bk572-3.1-Johnston.pdf<br><br>Classroom conversations between students and the teacher that have the characteristics of eliciting, recognizing, and using information. Eliciting allows students to share as much as possible (through a variety of means and ways) of what they know or have learned about a topic. Recognizing requires the teacher to make judgments about the differences among student responses so that changes can be made in instruction to maximize student learning. Using this information is mainly meant to help students achieve consensus on the information about a topic.<br><br>Teacher Led – Yes Student Led – No |
| **Student-Led Assessment** | **Self-Assessment and/or Peer Assessment**<br>http://www3.telus.net/linguisticsissues/selfassess2.html<br><br>Teachers can guide students in how to effectively self assess their own learning and effectively use peer assessment in grading group activities and projects.<br>Teacher Led – No Student Led – Yes<br><br>**Rubrics**<br>http://pareonline.net/getvn.asp?v=7&n=25 |

| | |
|---|---|
| | Students can use teacher-created rubrics covering the grading of learning products/assessments to help them: (1) know what they should learn from a particular lesson/unit of study; (2) plan how they will approach an assignment, and (3) how they will assess their completion of a specific learning activity and overall content learning.<br><br>Teacher Led – No Student Led – Yes<br><br>**Click—Clunk Response Cards/Sticks**<br>http://www.interventioncentral.org/htmdocs/interventions/rdngcompr/clickclunk.php<br><br>Works especially well with younger students. Students are given two index cards or two small colored stock cards attached to popsicle sticks. One card reads "Click" and is raised when the student completely understands what is being taught or read. The other card reads "Clunk" and is raised when the child is confused, or doesn't understand what is being presented. The teacher immediately knows which children are understanding concepts and which ones might need additional instruction, or explanation.<br><br>Teacher Led – No Student Led – Yes<br><br>**Mini-Lessons**<br>http://ocw.mit.edu/NR/rdonlyres/Urban-Studies-and-Planning/11-124Fall-2004/3311ACA8-8F60-49B2-85E7-23C7E36D6E31/0/minilessons.pdf<br><br>Students prepare sections of topic lessons to teach to peers, or to younger grade-level students. The students must read, question, prepare activities and learning materials associated with specific content in order to learn the concepts themselves and to teach the information to others. The teacher can observe this process, interact with students to gauge level of learning, offer suggestions and provide small snippets of instruction to help the students learn. Also, the teaching of the lesson can be observed. This process can be completed individually or in small groups.<br><br>Teacher Led – No Student Led – Yes<br><br>**Case-Based Instruction**<br>http://www.actionbioscience.org/education/herreid.html<br>Students structure their own learning using the "story" of the case. They generate questions based both on their interests and prior knowledge that relates to the topic of study. Investigative cases are useful for lifelong learning because they are open-ended and draw from a broad range of situations in which various thinking skill levels can be applied.<br>Teacher Led – No Student Led - Yes |

**Benchmark and Summative Assessment Item Types**

This table contains item types that typically appear on benchmark or summative assessments. A short description of each is provided followed by the pros and cons of using each.

| | |
|---|---|
| **Multiple Choice** | Multiple choice items consist of a stem and a set of options from which the student selects a response. Typically, there are four response options (one correct and three distractors). Some research indicates that the use of three response options (one correct and two distractors) is optimal for multiple-choice questions (Rodriguez, 2005).<br><br>Pros:<br>• Easy to score<br>• Often more dependable/reliable<br>• Free from problems of interrater consistency of scoring and bias<br>• Cost-effective<br>o When test length is indexed by total testing time, 16-item MC test is equivalent to one CR test-item (Hambleton & Swaminathan, 1985 as cited in Pearson & Garavaglia, 1997). The 16 MC items provide more information, and cost much less to score<br><br>Cons:<br>• typically assess lower-level thinking skills (though items can be written to<br>• evidence of knowledge is indirect (requires recognition of correct response rather than creation of a correct response)<br>guessing/use of logical reasoning to rule out answers |
| **Gridded Response** | Gridded response questions require students to solve a problem and bubble their numerical answer into an answer grid on the scantron sheet. Typically used for mathematics and science assessments on items requiring a numerical response. Gridded response questions are worth one point each.<br><br>Pros:<br>• Easy to score – use of scantron, computer scoring<br>• Free from problems of interrater consistency of scoring and bias<br>• Test recall rather than recognition, control for guessing<br>• Allow students to solve the problem using their preferred method (i.e., express probability in fraction or percent; computer can score more than one answer as correct)<br>• Ranges of answers can be scored as correct (i.e., estimation questions) |

| | |
|---|---|
| | Cons:<br>• Typically assess lower-level thinking skills<br>• Typically only used for items requiring a numerical response<br>• Would require new format of scantron sheets, which may be confusing to students |
| **Constructed Response – Fill-in-the-Blank/Short Answer** | Fill-in-the-blank questions are the simplest forms of constructed response questions. They require the student to fill in a blank or provide a short answer response to a question.<br><br>Pros:<br>• easy to construct<br>• test recall rather than recognition, control for guessing<br>• demand higher levels of thinking<br><br>Cons:<br>• More difficult to score than MC<br>• Cost<br>• Retesting issues<br>• Turnaround time for scoring |
| **Constructed Response – Short Response** | Short answer items require a brief written response. Short response questions are more focused and constrained than extended response questions. For example, a short response might ask a student to "write an example," "list three reasons," or "compare and contrast two techniques." The short response items on the Florida assessment (FCAT) are designed to take about 5 minutes to complete and the student is allowed up to 8 lines for each answer. The short responses are scored using a 2-point scoring rubric. A complete and correct answer is worth 2 points. A partial answer is worth 1 point.<br><br>Pros:<br>• Item construction – less test questions, less time to write items<br>• Can be better suited to measure fluid abilities<br>• demand higher levels of thinking<br>• direct evidence of learning<br><br>Cons:<br>• Highly involved and laborious scoring<br>• Scoring is more subjective<br>• Biases in scoring threaten validity (handwriting, sentence length)<br>• Lower reliability than comparable multiple choice format<br>• More difficulty in equating alternate forms, technical process is very immature<br>• Studies indicate that MR has higher predictive validity than CR<br>• Writing ability influences students' test scores – contaminant in measuring what they've learned (Haladyna, 1997) |

| | |
|---|---|
| | • Cost<br>• Retesting issues<br>• Turnaround time for scoring<br>• Testing windows |
| **Constructed Response – Extended Response** | Extended response items require students to demonstrate understanding in depth. These written responses may include explanations, appropriate charts, tables, graphs or other graphic organizers. On the Florida assessment (FCAT), students have 14 lines for each answer to an extended response item, and they are advised to allow approximately 10-15 minutes to complete each item. The FCAT extended responses are scored using a 4-point scoring rubric. A complete and correct answer is worth 4 points. A partial answer is worth 1, 2, or 3 points.<br><br>Pros:<br>• Item construction – less test questions, less time to write items<br>• Can be better suited to measure fluid abilities<br>• demand higher levels of thinking<br>• direct evidence of learning<br><br>Cons:<br>• Highly involved and laborious scoring (even more so than short-response)<br>• Scoring is more subjective<br>• Biases in scoring threaten validity (handwriting, sentence length)<br>• Lower reliability than comparable multiple choice format<br>• More difficulty in equating alternate forms, technical process is very immature<br>• Studies indicate that MR has higher predictive validity than CR<br>• Writing ability influences students' test scores – contaminant in measuring what they've learned (Haladyna, 1997)<br>• Cost<br>• Retesting issues<br>• Turnaround time for scoring<br>• Testing windows |
| **Performance** | Performance assessment is the direct, systematic observation of an actual student performance and the rating of that performance according to previously established performance criteria. In this type of assessment, students are asked to perform a complex performance task or to create a product. They are assessed on both the process and the end result of their work.<br><br>Pros:<br>• Hands-on participation from the student, active engagement<br>• Process can be assessed in addition to the end result/answer<br>• Direct evidence of learning |

| | |
|---|---|
| | • Use of real-life scenarios<br><br>Cons:<br>• Cost – 100x more expensive than multiple choice testing, 5-6x more expensive than constructed response (Stecher, 1995)<br>• Issues for students with disabilities<br>• Retesting issues<br>• Turnaround time for scoring |
| **Simulation** | Simulations are computer-administered items that mimic a specific process or behavior. The student performs a task on the computer to achieve the end state as described in the item stem.<br><br>Pros:<br>• Emphasis on testing a learner's task performance and mastery of a skill, rather than knowledge level<br>• Hands-on participation from the student, active engagement<br>• Process can be assessed in addition to the end result/answer<br>• Direct evidence of learning<br>• Use of real-life scenarios without the cost of the materials required for performance items<br><br>Cons:<br>• Cost of test construction/technology for administration<br>• Test construction is much more complex and time-consuming<br>• Complex issues with scoring methods and procedures<br>• Availability of required level of technology in all schools<br>• Issues for students with disabilities<br>• Research is in the very early stages |

## References


Gadalla, T.M (1999). *Multiple-Choice versus Constructed-Response Tests in the Assessment of Mathematics Computation Skills.* Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Canada.

Haladyna, T.M. (1997). *Writing Test Items to Evaluate Higher Order Thinking.* Boston, MA: Allyn and Bacon.

Haladyna, T.M. (1999). *Developing and Validating Multiple-Choice Test Items.* Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Pearson, P.D. & Garavaglia, D.R. (2003). *Improving the Information Value of Performance Items in Large Scale Assessments: NAEP Validity Studies.* Working Paper Series. National Center for Education Statistics (ED), Washington, DC

Rodriguez, M.C. (2005). Three Options Are Optimal for Multiple-Choice Items: A Meta-Analysis of 80 Years of Research. *Educational Measurement: Issues and Practice, 24*(2), 3-14.

Stecher, B. (1995). *The Cost of Performance Assessment in Science: The RAND Perspective.* Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Francisco, CA.