Every Teacher's Guide to Assessment

By Amanda Ronan, April 29, 2015
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It's not a stretch to say that assessment is a hot button issue in education; however, you'd be hard pressed to find an educator who doesn't see the value in measuring student progress. Assessments themselves have been vilified, when, in fact, it's why assessments are given and how the data is used that is really the issue. The Glossary of Education Reform gives this great overview of what high-stakes testing is and how it impacts students, teachers, and schools. Basically, high-stakes testing has consequences for the test-takers and givers—sometimes in the form of a high school diploma, grade advancement, and even teachers' salaries. But not all assessment is high-stakes, and when done thoughtfully, the right assessment can provide extremely useful information for all stakeholders—students, teachers, parents, schools, and policy-makers

Let's take a look at what assessment is, why it's important, and how it can be delivered in the classroom in a useful manner. Then we'll dive into some resources available for each type of assessment—diagnostic, formative, and summative.

What is assessment?

Assessment is the measurement of what students are learning. Student achievement is defined as how well they've mastered certain target skills. Assessments provide educators with both objective and subjective data in order to ascertain student progress and skill mastery.

Why do we do it?

The information gleaned from assessments is extremely valuable. Besides a score, which gives quantitative data about how much of the material tested a students has mastered, information about student misconceptions can be determined by analyzing which distractors they chose and why. Information from assessments helps teachers determine which instructional approaches are best for certain students, what their students may already know about a given topic, and what subjects needs to be retaught. Districts distribute money based on needs, as determined by assessment. Policy makers use assessment results to determine the efficacy of programs.

Assessment Basics

Assessments can take many forms and can be designed for many reasons. There's a lot of jargon used to name concepts related to assessments and some of it can be hard to keep track of. Here's a quick breakdown:

Types of Assessment

- **Diagnostic:** Given at the beginning of the school year, or the beginning of a new unit of study, a diagnostic test attempts to quantify what students already know about a topic.
- **Formative:** Given throughout the learning process, formative assessments seek to determine how students are progressing through a certain learning goal.
- **Summative:** Given at the end of the year or unit, summative assessments assess a student's mastery of a topic after instruction.
- **Norm-referenced tests:** These tests measure students against a national "norm" or average in order to rank students against each other. The SAT, ACT, Iowa Basic Skills Test, and other major state standardized tests are norm-referenced.
- **Criterion-referenced tests:** These tests measure student performance against a standard or specific goal. Unit and chapter tests as usually criterion-referenced, as are the newly developed SBAC and PARCC Common Core tests.

Question Types

- **Multiple choice:** These questions provide students with a stem and a set of discrete possible answers from which students must choose the correct one. The possible answers generally include one correct answer and three to four distractors, designed to mimic the common misconceptions students have about the concept being tested.
- **Constructed response:** These questions require a written response. Usually they include a one-part question, and students respond by writing a paragraph or short essay, or building and solving an equation.
- **Extended constructed response:** These questions, like the constructed response, require a written answer. The reason they are "extended" is that they are multi-part questions, requiring students to answer the first part of the question before answering subsequent parts, which may require reflection on or further explanation of an answer given in a previous section.
- **Technology enhanced:** These items are given in computer delivered assessments. Technology enhanced items require students to interact with the material in various ways—through actions like dragging and dropping information, highlighting relevant text, and completing sentences or equations from items in a drop-down menu.
- **Performance task:** These items require students to use multiple stimuli to solve a problem or create something new. Performance tasks are usually scored with a rubric, which includes the criteria students must keep in mind while developing their solution. Performance tasks in ELA may include reading multiple essays and synthesizing the ideas into their own writing. In math, these tasks may ask students to analyze charts and graphs and write out a plan for using the data in a real world application.
- **Informal:** This category covers a wide range of tasks, from checklists to observations. Informal assessment doesn't lead to a score, but it does help teachers gather important insights about students.

Delivery Methods

- **Pencil and paper:** There's no need for a lengthy description with this delivery method. Examples include tests, quizzes, mind maps, and essays.
- **Online:** Modern assessments are moving online, as can be seen with those developed for the Common Core State Standards, which are given strictly in that format. Online tests mean each student needs access to a device on which to take the assessment. Students also need strong digital literacy skills in order to successfully navigate the demands of online testing.
- **Adaptive:** These online tests adapt as the user progresses through the questions. As a student gets answers correct, the program adjusts and gives the student increasingly more difficult questions. The converse is true, and the test will adapt to asking simpler questions to a student who is struggling with grade level topics. Adaptive testing gives educators a much broader picture of students' ability levels. Rather than just labeling students on, above, or below grade level, a student's actual level of knowledge can be assessed. (If this method interests you, check out our recent article on Adaptive Learning as well.

Scoring

Assessments can be scored by hand, by computer, or by combination of both. Many online assessment programs and apps can score quantitative items, like multiple choice, drag and drops, and fill-in-the-blanks, and other item types that have specific correct answers. Items like performance assessments and essays are still left for teachers or human-scorers to assess.

Reliability and validity of testing are two things that are considered when assessments are adopted. Reliability refers to the likeliness of the scores and outcomes to be repeated in several different populations of test takers. Validity refers to how the assessment outcomes are interpreted and applied. The goal of standardized testing is to be fair and impartial; however, whether or not this goal is actually realized in today's assessments is controversial, as it's nearly impossible for one test to be fair to all student populations.

Assessment Resources

There are tons of great assessment resources and ideas online. Let's take a look at how each type of assessment can be assisted with technology. We'll also explore some more unique ways to monitor your students' understanding and progress.

Diagnostic Assessment

Diagnostic assessments assess strengths, weakness, and prior knowledge. Understanding how much a student already knows about a topic is vital for effective differentiation in the classroom.

Some students may already be experts in a given topic, while others may be missing foundational skills that are key to mastery. Many teachers use the same diagnostic assessment as a formative or summative assessment later into the unit to compare a student's score at the beginning, middle, and end of instruction. Diagnostic assessment lets teachers pinpoint a student's preconceptions of a topic, helping teacher's anchor further instruction on what students have already mastered. Additionally, this kind of assessment helps teachers provide instruction to skills that need more work. The APA has a great article on the importance of diagnostic assessment.

Diagnostic Apps and Software

- **iReady:** This program provides adaptive diagnostic testing and will report on student mastery down to the sub-skill level. The program is adapted by state and district standards, as well as by which Common Core test your state has adopted (if it *has* adopted one). One of the more reasonably priced products out there, the cost is $6 per student, and there are tests for both math and reading diagnostics. For an additional fee ($30 per student for the school year), schools can pay for prescribed personalized lessons based on the student's diagnostic results.
- **Education Galaxy:** Education Galaxy also offers diagnostic testing. There is a free version for teachers that doesn't include all of the bells and whistles as the paid version, but still provides diagnostics by standard and skill and prescribes a learning path for instruction based on test results.

Other Diagnostic Assessment Ideas

- **Observation:** Watching how students solve a problem can lead to further information about misunderstanding.
- **Discussion:** Hearing how students reply to their peers can help a teacher better understand a student's level of understanding.
- **Confidence Indication:** On a traditional pen and paper test, include a way for students to indicate how confident they are in their answers. Letting students self-report can tell teachers a lot about a student's prior knowledge of the material.
- **Categorizing:** Let students sort ideas into self-selected categories. Ask them to explain why such concepts go together. This will give you some insight into how students view topics.
- **Interviews:** Design questions that get to the heart of what you're planning to teach. Interview students to gauge each child's understand of the topic. You'll come away with a great continuum of where each student's prior knowledge is. This may help you pair students to work together later in the unit.

Formative Assessment

Formative assessment monitors student performance and progress during learning. This type of learning is often low-stakes and ungraded. It's used as a way for the teacher to see if the student is making progress toward the end goal of mastering the skill. Teachers use formative assessment

techniques to monitor student learning so that they can provide feedback or help along the way. Both diagnostic and summative assessments can be used as formative assessment.

Formative Apps and Software

- [Socrative](): This free app let's students and teachers collaborate in real-time. Teachers pose questions while students answer instantly on their own device. Teachers can then track student progress and run class reports.
- [iClicker](): This audience response system is engaging and helps teachers gain real-time feedback on the status of their students' learning. Classes can use their own devices with iClick GO, or they can use specialized remotes if personal or one to one devices aren't allowed in class.
- [Padlet](): This app works as a virtual wall or bulletin board where students can collaborate and add ideas in the form of text and multimedia. Padlet can be used as a formative assessment by asking students to answer questions about a topic or to create graphic organizers about what they're learning.

The NWEA blog has a [great list of digital formative assessment tools]().

Other Formative Assessment Ideas

- **Exit slips:** Ask students to solve one problem or answer one question on a small piece of paper. Students hand on the slips as "exit tickets" to pass to their next class, go to lunch, or transition to another activity. The slips give teachers a way to quickly check progress toward skills mastery.
- **Graphic organizers:** When students complete mind maps or graphic organizers that show relationships between concepts, they're engaging in higher level thinking. These organizers will allow teachers to monitor student thinking about topics and lessons in progress.
- **Self-assessments:** One way to check for student understanding is to simply ask students to rate their learning. They can use a numerical scale, a thumbs up or down, or even smiley faces to show how confident they feel about their understanding of a topic.
- **Think-pair-share:** This is an oldie but goodie. Ask a question, give students time to think about it, pair students with a partner, have students share their ideas. By listening into the conversations, teachers can gauge student understanding and assess any misconceptions. Students learn from each other when discussing their ideas on a topic.

Summative Assessment

Summative assessments are design to measure student achievement at end of instruction. These types of assessments evaluate student learning at the end of a project, unit, course, or school year. Summative assessment scores are usually recorded and factored into student academic record in the form of letter grades and scores from tests like SAT or ACT.

Summative Assessment Apps and Software

- **Quizlet:** Build flashcards, quizzes, games, and tests in the app. It's free and simple to get started and you have access to the sets created by other users. For $25 per year you can add data tracking, like class progress on the study sets you've created or assigned. You can also add images and voice recording. But even without the bells and whistles, the Quizlet experience makes testing more enjoyable.
- **tv:** Bubblr allows users to create trivia quizzes based on YouTube videos. You can play challenges created by other users, or create your own trivia challenges for students. This site helps students get used to being tested on multi-media stimuli, something that is popular in the Common Core tests.

Other Summative Assessment Ideas

- **Portfolios:** Portfolios allow students to collect evidence of their learning throughout the unit, quarter, semester, or year, rather than being judged on a number from a test taken one time. Education World put together this great article on the use of portfolios as assessment tools, and our own Kristen Hicks hunted down tools that can be used to create digital portfolios back in February of 2015.
- **Projects:** Projects allow students to synthesize many concepts into one product or process. They require students to address real world issues and put their learning to use to solve or demonstrate multiple related skills. For the best information on projects as assessments, check out the Buck Institute for Education's (BIE) Project Based Learning resource list.
- **Performance Tasks:** Performance tasks are like mini-projects. They can be completed in a few hours, yet still require students to show mastery of a broad topic. Inside mathematics put together a fantastic, free set of math performance assessment tasks.

In Short

Until more reform happens, high-stakes assessments and the sheer numbers of tests students are expected to take will continue to be issues of prominent debate in the education world. The future of assessment is online and adaptive. In fact, as we move towards this future, tests will become increasingly precise, meeting students where they are, and pinpointing exactly what they need to learn. With this kind of data-rich precision, assessments should become less frequent in number and in intensity. After all, in the end, the problem is less the idea of testing itself, but how we design them, apply them, and make use of their data. Done the right way, assessments are a great way for educators to better understand their students' progress, because helping students learn is the primary objective of education.

Common Formative Assessment Development Process (Module 2 is Yellow) (Module 3 is Pink)

1. Topic or unit: Historical Arguments: Understanding "We the People…"	2. Identify the standards to be addressed in this topic or unit. RI.6.2 Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. W.6.1 Write arguments to support claims with clear reasons and relevant evidence. a. Introduce claim(s) and organize the reasons and evidence clearly. b.Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.
3. Select a standard(s) to be commonly assessed and write it in this box. To gain a better understanding, underline the nouns and circle the verbs. RI.6.2 Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. W.6.1 Write arguments to support claims with clear reasons and relevant evidence. a.Introduce claim(s) and organize the reasons and evidence clearly. b.Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.	Describe what a student would know, understand and be able to do if he/she mastered the standard. The student should be able to determine the central idea of a given text and provide a summary of the text without using personal opinion or judgment. The student should also be able to write an argument to support his/her claims with clear reasons and relevant evidence.
	Create learning targets using student friendly language. "I can statements." I can summarize a text identifying the main idea in a nonjudgmental way and write an argument to support my claims. This means I can give clear reasons and relevant evidence to back up my claims.
4. List your BIG ideas. a. An effective summary demonstrates the reader's understanding of a topic or text by communicating the text's central idea in a way that is free of personal opinions and judgments. b. Strong arguments present claims that are backed up with clear reasons and relevant evidence from credible sources.	5. Write an essential question/s with the corresponding BIG idea (BIG ideas answer the essential questions) a. What makes a summary of informational text effective? b. How does a writer craft a strong argument?

6. Learning Target/Test Item Match: Based on the Learning Targets and Definition of Mastery (See #3), choose the types of test items that will work best to measure mastery. Place checkmarks in the appropriate boxes below.

Selected Response Items	Constructed Response Items	Performance or Personal Communication
_____ True false _____ Multiple Choice _____ Matching _____ Multiple-Response* _____ Fill-in the Blank * * List of choices provided. Note: If constructed properly, a multiple-choice item has the capability of measuring higher-levels of cognitive processes.	_____ Closed Constructed Response: Lend themselves to a right or wrong answer. Usually support two levels of performance. (0 and 1). Fill-in the blank or short answer. _____ Minimal to Medium Open-Ended Constructed Response Items: Usually support three or four levels of performance. (0,1,2) or (0,1,2, 3) _____ Extended Constructed Response: Very close to being a performance event. Usually support four to five levels of performance.	_____ Personal Communication: Oral response from students with teacher observation and the recording of performance on a grid, checklist, or rubric. _____ Performance event (task) using a written prompt with a scoring guide. _____ Student demonstration coupled with teacher observation and the recording of performance on a grid, checklist or rubric.

7. Selected Response: Write Test Items:	8. Constructed Response: Write Test Items:	9. Performance or Personal Communication Write Test Items:
Give correct answers.	Create Scoring Rubrics	Create Scoring Rubrics.

10. Define Achievement Levels: Describe how information from the scoring guides can be used collectively to determine achievement levels for students. These levels will be used in the Data Team Process. **(In example below, students complete a 7 question formative assessment. Questions 1-5 are selected response, and questions #6 and #7 are constructed response items with either 3 pt or 4 pt rubrics for scoring)**

Proficient & Higher	Correct answers on all 5 SR items, at least 2 out of 3 on CR item #6, and at least 3 out of 4 on CR item #7
Close to Proficient	Correct answers on at least 3-4 SR items, at least 2 out of 3 on CR item #6, and at least 2-3 out of 4 on CR item #7
Far to Go	Correct answers on 1-2 of 5 SR items, at least 1 out of 3 on CR item #6, at least 1 out of 4 on CR item #7
Intervention	Correct answers on 0-1 SR items, OR 0-1 out of 3 on CR item #6, OR 0-1 on CR item #7

Proficient & Higher	
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11. Review and Revise……Exchange tests with another group. Use a critique form to evaluate the overall quality of the assessment as well as the individual items within the test. Make suggestions and return test to writers for them to make suggested revisions.

NEXT STEPS:

12. Give the Pre-Assessment to students and collaboratively score—begin the DT process by charting the results for each teacher and for sub-populations.

13. Evaluate the students understanding of the BIG ideas as you go along with the unit of study by using the Essential questions…an indicator of what's happening as you continue with the unit of study.

14. Give the Post-Assessment to students and collaboratively score----chart post test results. Compare Pre-Test Results with Post-Test Results. Determine next steps.

Adapted from Ainsworth, L. & Viegut, D. (2006). *Common formative assessment: How to connect standards-based instruction and assessment.*

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Definitions/Benefits/Considerations of Assessments

Pair up with another participant and using your current level of understanding, create a working definition of each type of assessment below, along with the benefits and drawbacks for each type of assessment.

Selected-Response Assessment	Constructed-Response Assessment	Performance Assessment
Definition: Benefit: Considerations:	Definition: Benefit: Considerations:	Definition: Benefit: Considerations:

Evaluate Your Test

1. Collectively, do the assessment items produce the necessary evidence to determine whether or not the student has mastered the standard(s) targeted for assessment?

2. Are the assessment items the most appropriate type to use to measure the targeted standard?

3. Do the assessment items require students to demonstrate the same level of rigor as specified by the targeted standard?

4. Are the items worded clearly and concisely?

5. Are the directions written so students clearly understand what they are to do?

6. Are the items free of any type of bias?

Possible Causes for Faulty Items/Low Scores on Items

1. Basic content or skills have not been addressed or taught.

2. Students are unfamiliar with the process needed to solve the problem/answer the question (i.e. problem solving, deductive/inductive thinking, making an inference, etc.)

3. Students are unfamiliar with the format needed to answer the question. (i.e. political cartoon, letter, graph, etc.)

4. Students are unfamiliar with the meaning of the language used in the test item. (i.e. compare and contrast, paraphrase, illustrate, evaluate, etc.)

5. Lack of reading ability. Vocabulary used in item stem or stimulus is too difficult.

6. Wording of the item is unclear or confusing.

7. The rubric does not align with the test item. The rubric holds students accountable for something that was not cued in the item stem.

8. The rubric holds students to a standard that is not grade-level appropriate.

9. The item is asking the impossible or improbable (i.e. Asking for two similarities and two differences when there are not that many. Asking for three details when there are not that many.)

10. The stimulus material used as a basis for item development is at fault.

Adapted from:
Haladyna, Thomas. (1997). *Writing test items to evaluate higher order thinking.* Boston, MA: Allyn and Bacon
Popham, W. J. (2003). *Test better, teach better: The instructional role of assessment.* Alexandria, VA: Association for Supervision and Curriculum Development.