



## CPM's Position Paper on Assessment

Assessing what students know and learning where their ideas come from provide the foundation for productive teaching. During instruction, effective teachers are constantly collecting data about the mathematics students have made sense of and adjusting lessons to provide the content students are ready to learn next. With this view of teaching, assessment has to be continuously interwoven with an educator's instructional practices.

Authentic assessment begins with teachers actively circulating the classroom while students work on mathematics in small teams. As they move strategically around the room, teachers are carefully listening to conversations and asking deliberate questions that require students to describe, analyze, make inferences, or generalize. Teachers engage in such behaviors with three intentions in mind: building relationships, sparking new mathematical learning, and determining the next instructional decision.

In addition to data gathered from student conversations and questions, teachers assess by reviewing written records of thinking in the form of daily classwork, homework, projects, and by periodically giving quizzes or tests. In the past, paper/pencil problem solutions and the number of right answers served as sufficient evidence of either a student's mathematical competence or failure to learn. Raw scores run through an algorithm and translated into a single course grade provided the only proof of learning for both students and parents.

Today, expectations of mathematical competence go beyond these limited measures of achievement. Students learn to develop meaningful procedures and make sense of mathematical tools as they engage with challenging, problem-based tasks. Students offer conjectures, explain their ideas and justify their reasoning through active discourse; then students capture evidence of their thinking by creating a written record. Such records, in various forms, make visible student progress toward agreed upon learning goals, confirm that success criteria have been met, and offer insight into any misconceptions. And for accountability purposes this recorded evidence must be available to stakeholders beyond the classroom.

When the written records take the form of summative assessments (end-of-unit or chapter tests, final projects, portfolios, etc), best practices require instruments that afford students a fair and balanced opportunity to showcase their knowledge in a manner that is similar to the methods that were used in class as the students participated in constructing their understanding. Robust summative assessments not only prompt justification and reasoning, but they provide space for students to tackle the mathematics with varying approaches, ask students to critique the reasoning of others and offer a chance to explore new ideas. Providing descriptive, effective feedback on assessments requires extra effort and thoughtful consideration. The practice of providing feedback is beneficial and well worth the time invested. Indeed, assessment data

gained through this process is the cornerstone of all future instruction and an integral piece of every student's mathematics education.

Given the time constraints that consume a typical day of instruction, it is easy to understand the appeal of an automated assessment platform that will create, evaluate, and score student work with minimal teacher involvement. Electronic tests and quizzes with questions that are essentially multiple choice, fill in the blank, or make a match reside at the lowest levels of every depth of knowledge chart. On such tests, students are tasked with items that prompt basic recall, routine calculations, rote procedures, and straightforward applications of a concept. The output, typically a raw score or series of checked boxes indicating which "standards" have been met and which require remediation, is made immediately available to various stakeholders with little or no chance for teacher commentary.

Such a robotic generation of data tells us only what students do not know and eliminates the critical dialogue between student and teacher, as well as several other previously discussed professional practices that allow teachers to build on what students do know. The complete picture of what a student has and has not learned is only made visible by carefully reading their responses and thinking deeply about what has been shared. Skilled teachers use their expertise to make an informed decision as to what the student understands, guided by a clearly defined rubric of what learning should look like. Their focus is not on a deficit model, but on what progress the student has made and what knowledge they possess, whether partial or full. This is the challenge of providing a superior assessment experience for students. Anything less is a reversion to earlier, simplistic measures of achievement framed by the current level of technological sophistication and motivated by expediency.

To engage in authentic assessment, teachers need to work together, crafting their instruments and developing rubrics for scoring. The administration needs to offer support by providing time for teachers to work collaboratively and recognize their control of this process. Since teachers know their students best, their knowledge should guide the construction of all assessments, both formative and summative. Formative and summative assessments serve different purposes, and teachers need to be clear when and why they are giving each. Formative assessment happens daily, and should not solely take the form of an Exit Ticket. As mentioned above, listening to student discussions during circulation and asking questions are effective and powerful formative assessment tools.

Summative assessment has its place when students have had ample opportunities to engage in content through exploration, investigation, representation, practice, and repeated application. Through daily formative assessment, the teacher knows the progress students are making toward the learning goals, and when they are ready for a more summative assessment. It makes no sense (and is not a useful experience for anybody) to give a summative assessment knowing most students are not ready and will most likely fail. The learning process is easier for everyone and more enjoyable, when every student achieves some level of success!

When students have been meaningfully engaged with the content, have had ample time to make sense of it, and have developed procedural fluency, then they may be ready for a summative (evaluative) assessment. That may not be at the immediate end of a chapter or unit. More time to use and practice what has been learned may be needed. Summative assessments should reflect what students have had opportunities to learn in class and will continue to use and build on. There is not enough time for an assessment to address everything that happened in class, but the teacher does need to provide opportunities for students to demonstrate their understanding and to show what they know, to show that they are adequately prepared for what comes next. Therefore, a summative assessment should focus on a few key big ideas that will be a foundation for future learning and application.

CPM is in complete agreement with and supports NCTM’s beliefs about mathematics assessment as explained in Principles to Actions (NCTM, p. 91-92).

Beliefs about mathematics assessment	
Unproductive beliefs	Productive beliefs
The primary purpose of assessment is accountability for students through report card marks or grades.	The primary purpose of assessment is to inform and improve the teaching and learning of mathematics.
Assessment in the classroom is an interruption of the instructional process.	Assessment is an ongoing process that is embedded in instruction to support student learning and make adjustments to instruction.
Only multiple choice and other “objective” paper-and-pencil tests can measure mathematical knowledge reliably and accurately.	Mathematical understanding and processes can be measured through the use of a variety of assessment strategies and tasks.
A single assessment can be used to make important decisions about students and teachers.	Multiple data sources are needed to provide an accurate picture of teacher and student performance.
Assessment is something that is done to students.	Assessment is a process that should help students become better judges of their own work, assist them in recognizing high-quality work when they produce it, and support them in using evidence to advance their own learning.
Stopping teaching to review and take practice tests improves students’ performance on high-stakes tests.	Ongoing review and distributed practice within effective instruction are productive test preparation strategies.

In addition, CPM would add the following:

Unproductive beliefs	Productive beliefs
Authentic assessment means asking students “real world” problems to solve.	Authentic assessment means assessing in a manner that mirrors the way the students have learned, and focusing on what the students know, rather than what the students do not know.
It is important to assess students multiple times on a single skill or concept, asking every variation of the skill.	Assessment, as with the learning, should focus on the big ideas and the connections to assess for understanding, and not on the fine grain-sized skills.
There is not enough time to develop good assessments and good lessons, so the little time there is should be spent on developing lessons.	Assessment and teaching should be seamlessly interwoven, and time should be spent on both. Because of the lack of time most teachers have, it is important to assess wisely, and use the supports that are in place.
Assessment and grading are one and the same, so to assess students, a teacher must spend time grading student papers.	Assessment is the process of understanding student learning, and grading is evaluating that understanding. The bulk of the teacher’s time should be spent on assessing rather than grading.

CPM supports teachers in this task of educating students. In every chapter of the books, CPM outlines where the lessons are going, and what knowledge the students should be mastering. CPM provides support for the teacher with a comprehensive Teacher Edition and professional development, and also provides support for assessing students with the third phase of professional development dedicated to assessment, assessment guidance in the Teacher Edition, and an online assessment site with sample tests and over 17,000 problems. While CPM will not offer computer graded assessments, CPM does offer support, guidance, and a large selection of problems to choose from.