

# Computer Adaptive Testing (CAT)

Since 2016, the M-STEP online assessments in English language arts (ELA) and mathematics have used a technology called [computer adaptive testing](#), or [CAT](#). CAT tests are customized for each student for a more accurate measurement of what students know.

Here's how it works. The computer-based test adjusts the difficulty of questions throughout the assessment based on the student's responses. If a student answers a question correctly, the next question will be harder; if a student answers incorrectly, the next question will be easier. Computer adaptive testing significantly improves on the old fashioned, fill-in-the-bubble, paper-and-pencil assessments used since parents and grandparents were in school.

## How does CAT make the M-STEP better?

Michigan's assessments provide estimates of student achievement. Since adaptive tests are customized to each student, the results have smaller margins of error, meaning CAT offers teachers and schools more accuracy in evaluating student achievement, readiness for college and careers, and growth over time.

### ■ BENEFITS for STUDENTS

**Customized** — CAT assessments adapt to each student during test time. This means that students experience a set of questions that is tailored to each individual.

**Appropriate** — Adaptive testing is accurate across the range of student ability—from those who are most advanced to those who are struggling. Online adaptive testing also allows students to show what they know in an environment that feels comfortable for them, since many of today's students use computers daily in learning and in life.

**Precise** — CAT assessments more quickly identify which skills students have mastered, and provide more accurate student scores.

### ■ BENEFITS for TEACHERS and SCHOOLS

**More reliable** — CAT allows schools to more reliably measure student growth over time. As students advance from one grade to the next, teachers and parents can be confident that higher scores reflect real learning gains.

**More Secure** — The assessments draw from a large bank of questions. Because students receive different questions based on their responses, test questions are more secure and can be used for a longer period of time.

**Aligned** — The M-STEP CAT is fully aligned with Michigan's academic standards in ELA and mathematics, which were adopted in 2010. This means M-STEP serves as a great measure of how well schools are matching their teaching to the kinds of information students will need for success.

### ■ ADDED BENEFITS of ONLINE, COMPUTER-BASED ASSESSMENT in GENERAL

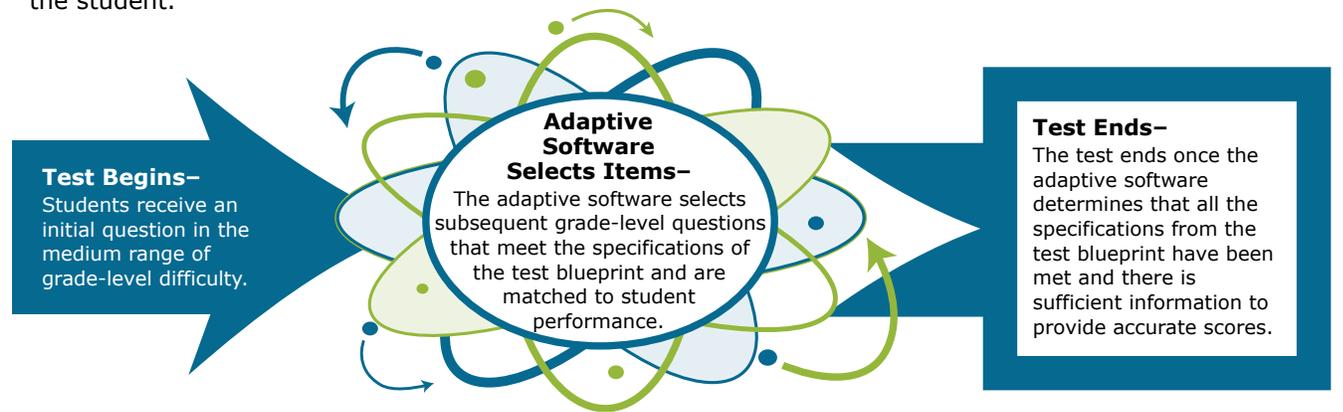
**Faster Results** — Computerized assessments allow educators and parents to receive preliminary results in weeks, not months. Faster results mean schools and districts can use the information from M-STEP assessments earlier to inform future curriculum and instructional strategies.

**Flexibility** — Computer-based assessment allows administrators to administer testing on a more flexible schedule. Test sessions may be scheduled on a single day or on multiple days during the 4-week grade-level online testing window. Schools can use their best judgment to set the appropriate amount of time for students to be in test sessions. This flexibility also makes it easier to more smoothly integrate assessment into the school day with fewer interruptions to classroom learning.

## ■ HOW COMPUTER ADAPTIVE TESTING (CAT) WORKS

The M-STEP computer adaptive software draws from a large pool of **on-grade-level** test questions.

The adaptive software runs in the background while students take the assessment. After each response, it selects the next question based on a number of criteria, including: the test **blueprint\***; the number of times a question is likely to be used (to prevent overexposure of questions); and previous responses from the student.



\*The blueprint specifies the content areas and types of questions that will appear on the test.

## ■ COMMON QUESTIONS about COMPUTER ADAPTIVE TESTING

**If students are asked different questions, how can we compare their results?**

Each student's test must meet the requirements of the test blueprint. The blueprint specifies the content areas and types of questions that will appear on the test. For example, if the test blueprint requires that each student receive two questions about adding fractions, the adaptive software will select two questions from a group of perhaps a dozen that assess the ability to add fractions.

**If an advanced student correctly answers many challenging questions, will he or she receive the same score as a struggling student who correctly answers the same number of easier questions?**

No. Each question is placed on a scale of difficulty. Students who answer many challenging questions correctly will receive higher scores, which will correspond to higher achievement levels.

**What about students with special needs who are advanced in some areas and much weaker in others?**

The ELA and math assessments each include four claims in which students will be assessed. In ELA, for example, questions will focus on the following

claims: reading, writing, listening, and research. A student with strong skills in one area will be able to demonstrate them because the adaptive software will allow the student to respond to each claim.

**Can students review and change their answers?**

Yes and no. Students must answer each test question before moving on to the next question. In most sections, they cannot go back and change their answers. The only time students may go back and modify their responses is within an ELA passage set. To learn more, review the videos on "M-STEP ELA Navigating the Computer Adaptive Test" and "M-STEP Math Navigating the Computer Adaptive Test." Both videos are available at the [M-STEP web page](http://www.michigan.gov/mstep) ([www.michigan.gov/mstep](http://www.michigan.gov/mstep)).

**How does the adaptive software handle questions that cannot be automatically scored?**

The adaptive portions of the ELA assessments in some grades include some constructed response questions that must be scored by human readers. Student responses to these constructed responses and to questions in the ELA and math performance tasks will be combined with the machine-scored questions into a single final score report.

Visit the [M-STEP web page](http://www.michigan.gov/mstep) ([www.michigan.gov/mstep](http://www.michigan.gov/mstep)) for helpful M-STEP resources.