

# Understanding a Computer Adaptive Test



Computer adaptive testing provides precise information about student achievement in less time than a fixed-form test.

The Smarter Balanced System includes computer adaptive testing (CAT) customized for each student. During a test, the difficulty of questions changes based on student responses—providing more precise information about student achievement in less time than a fixed-form test in which all students see the same set of questions.

An effective computer adaptive test requires two components:

## Test Blueprint

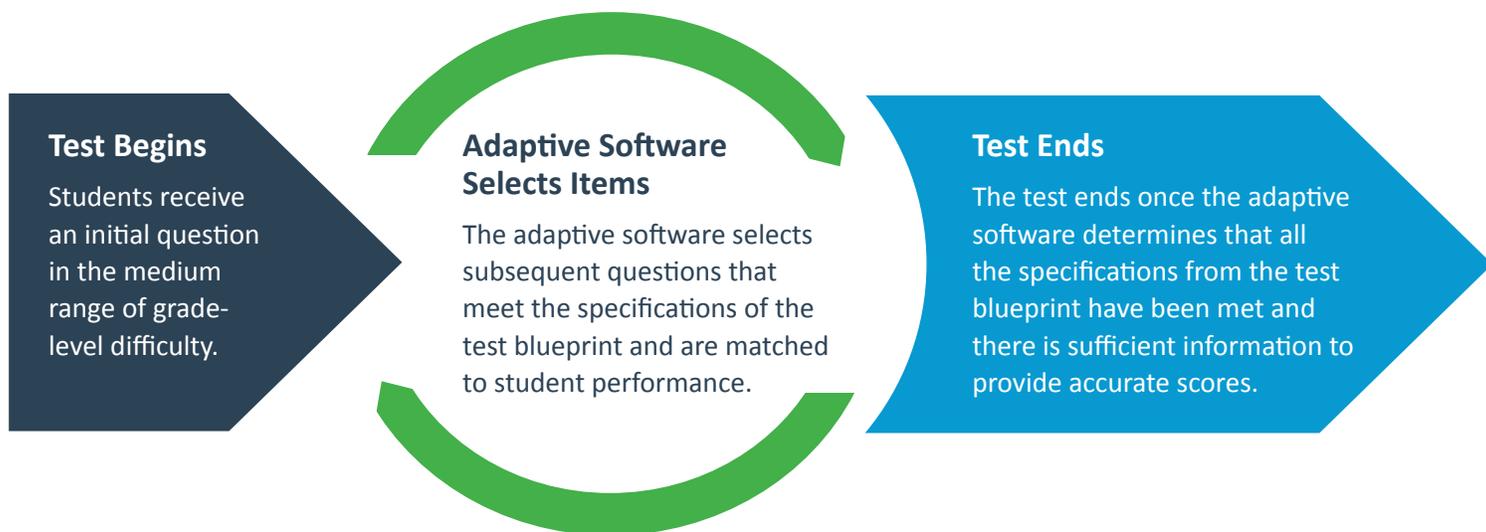
- Ensures the full range of knowledge and skills in English and math standards is assessed
- Specifies the number of questions, score points, and depth of knowledge associated with each section of the assessment
- Available online at: [contentexplorer.smarterbalanced.org/test-development#blueprints](https://contentexplorer.smarterbalanced.org/test-development#blueprints)

## Adaptive Software

- Includes a set of rules that determine which questions a student will be given during the assessment
- Builds the best test for each student by selecting questions that satisfy the test blueprint and match student performance
- More information available online at: [smarterbalanced.org/our-system/assessments/testing-technology/](https://smarterbalanced.org/our-system/assessments/testing-technology/)

## How the Smarter Balanced Adaptive Software Works

The adaptive software runs in the background while students complete the assessment. After each response, it selects the next question based on a number of criteria, including the specifications from 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.



## A Better Picture of Student Achievement

All assessments provide estimates of student achievement. Since adaptive testing is customizable to each student, the results have smaller margins of error. This allows schools a more precise determination of student growth over time. It also means as students advance from one grade to the next, educators and families have access to more accurate information about student performance.

Adaptive testing is also more accurate across the range of students' learning skills and abilities. The Smarter Balanced adaptive software is configured to select only from grade-level questions for approximately the first two-thirds of the test. At that point, if the estimate of the student's achievement level is clearly at the lowest (or highest) level, the question pool is expanded to include (as needed) questions either from below (or above) the student's grade level. Before being used, out-of-grade questions are screened to make sure they are instructionally and developmentally appropriate. Expanding the question pool to include out-of-grade questions can help create a more complete picture of each student's knowledge and skills.

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## Questions

### → 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 a student answers questions above their grade-level correctly, will they receive the same score as a student who correctly answers the same number of grade-level 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 who are advanced in some areas and need to advance in others?

The English language arts/literacy and math assessments each include several content areas in which students will be assessed. In English, students will be assessed on reading, writing, listening, and research. In math, questions will focus on concepts and procedures, problem solving and modeling/data analysis, and communicating reasoning. A student with strong skills in one area will be able to demonstrate them because the adaptive software will give the student the opportunity to respond to each content area.

### → Can students review and change their answers?

Yes. Students may go back and modify their responses within a test segment. The adaptive software continually works to tailor the test to each student, so a modified response will simply generate a new question that satisfies the test blueprint and matches student performance.

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

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

