Get More From a Score
Using a Single Test to Deliver Multiple Measurements

One of the biggest complaints that parents, teachers, and administrators have today is "too much testing!" These stakeholders express strong concern that as new standards are adopted, testing will increase even further.

Combine Spring high-stakes testing and the prep for that with the testing often required for grade or program placement, growth measurement, universal screening, and other measurement needs, and you can understand the concern. Administrators are addressing these concerns directly, including an announcement by the Council of Chief State School Officers:

> "Assessments should complement each other in a way that defines a coherent system of measures. Assessments should be administered in only the numbers and duration that will give us the information that is needed and nothing more. Multiple assessments of the same students for similar purposes should be minimized or eliminated."[1]

So what if there were a single test you could administer two to four times a year that took less than an hour to provide a coherent system of measures?

It turns out that there is: Scantron's computer-adaptive assessment solution.

Increase Assessment Flexibility

So what is computer-adaptive testing (CAT)? Simply put, computer-adaptive testing adjusts to the ability level of the student. As a student answers correctly, he or she is presented with a harder question on the same topic. If a student answers incorrectly, he or she is presented with an easier question. The test continues in this way through the units or topics being tested until the system identifies a consistent pattern in responses.


Sample Path for a Student

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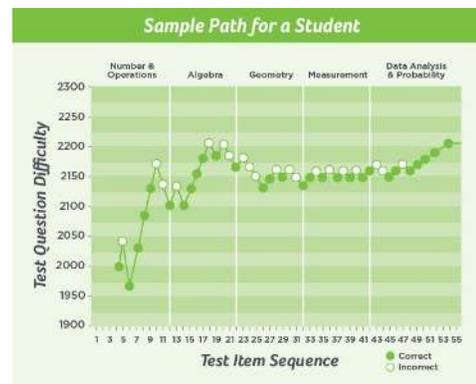
[1] "Commitments from CCSSO and CGCS on High-Quality Assessments." *Http://www.ccsso.org/*. Council of Chief State School Officers, 15 Oct. 2014. Web. 29 Oct. 2014.
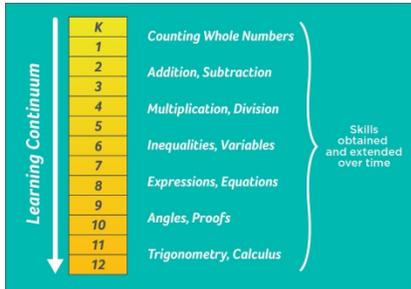
From there, the test analyzes the complete pattern of responses to determine an estimate of the student's ability.

The student's ability estimate is presented as a scaled score, which is simply a translation of the ability estimate and represents that student's relative position on a common vertical scale for that subject.[2] The vertical scale ranges across the continuum of learning in that subject for all grade levels (as shown to the left).

A CAT is more flexible than fixed-form testing, especially for core subjects. Struggling students never feel overwhelmed, and high achievers feel challenged, while students who perform more in the center of the testing bell curve are also presented with the correct level of the material, allowing everyone to be evaluated as accurately as possible.
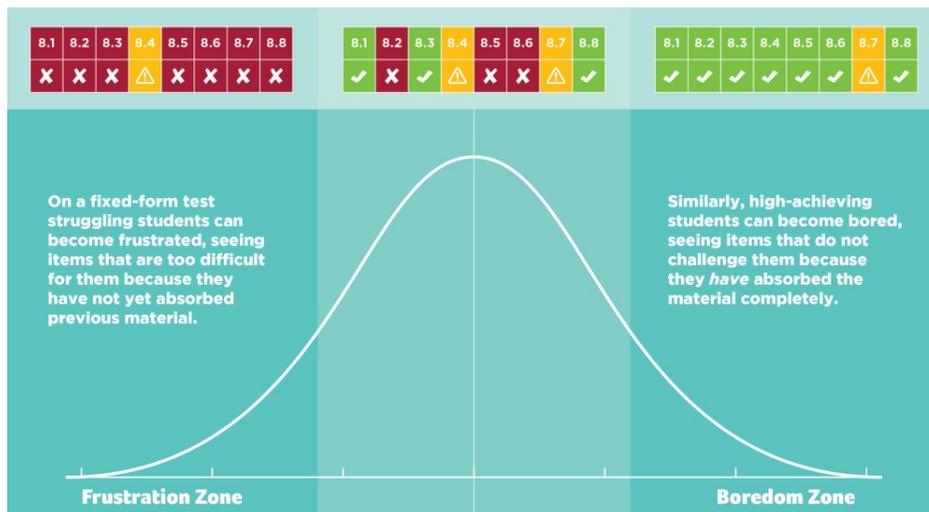
As shown above, the amount of measurement information you get from a fixed-form test can be limited for the struggling student (left-hand side) or the high achiever (right-hand side). Because a CAT adjusts to the student, you can efficiently assess a broader range of knowledge in less time, giving you a strong educational foundation to build on.

So far, so good. Any computer-adaptive measure offers similar flexibility. But what does Scantron deliver to take it to the next level?

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2 Our adaptive test uses the Item Response Theory (IRT) Rasch model to estimate student ability; the standard error of measure (SEM) associated with each ability estimate is also provided.

Intelligent (Re)Start

Intelligent Start configures our adaptive test to remember the ability level that student attained on a particular subject and starts that student with an appropriate item difficulty level the next time that student takes a test in the same subject.[3] Even if the student transfers to another school in the district, our adaptive test starts his or her next test at the correct level as long as that student has the same student ID.

Why do you care? Intelligent Start ensures that a student begins subsequent assessments at the ability estimate where he or she left off on a prior (same subject) test. This allows subsequent test administrations to be of shorter duration since the student does not have to again demonstrate prior knowledge. Intelligent Start also remembers the student ID: as long as a student has the same ID at a new school or program within the district their score history and ability level is available. This allows the student to avoid having to start all over again, making it easier to assimilate the student instructionally into the new class.

Intelligent Start ensures you don't waste valuable testing and instructional time covering and re-covering material where the student is already proficient. Students can pick up where they left off, and teachers get a current and accurate picture of student achievement.

Testing Accommodations: Grade Level Modification

You can use Grade Level Modification to set a student's initial adaptive test to begin at a different point than their currently assigned grade level. This means that if you already know the student is performing significantly above or below grade level, you can adjust the test starting point to make the test easier or more challenging for the student as needed.

Why do you care? Grade Level Modification allows students to begin a test closer to their actual ability level when a student is significantly lower- or higher-performing.

Grade Level Modification reduces testing time by presenting initial questions appropriate to the student's level of knowledge as identified by the modification you set. Students known to be struggling are not presented with initial material above their capabilities, thus reducing their overall frustration. Students known to be high performing start a level closer to their proficiency, reducing their boredom and ensuring they remain engaged with the test. In addition, students at both ends of the spectrum get a shorter, more focused assessment that provides a score with enhanced accuracy.

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[3] Intelligent Start is different for each specific subject (e.g., Mathematics is a different subject and test from Algebra, which is different from Geometry, etc.).

Testing Irregularities

Our adaptive test automatically spoils a test if the student appears to be randomly selecting answers or if the system detects other testing irregularities. If, for example, a student answers five consecutive questions within 15 seconds and gets three or more of them wrong, our adaptive engine ends, then spoils that test for irregularities.

Why do you care? Automatically checking for testing irregularities provides an additional level of control over the trustworthiness of your scores. When a test is automatically spoiled, the original results are removed from the system and the student starts the test fresh, providing an opportunity for closer proctoring, some other accommodation, or both.

Test Spoiling

You can also manually spoil a test. Sometimes students are simply not ready to be tested that day. They may be very young and experiencing attention-span issues. They may be feeling ill and are thus not at their best. They may be behaviorally challenged and having an agitated day or difficulty focusing on *any* task. Regardless of the reason, manually spoiling a test enables you to clear the slate so they can retake the test anew on a better day without negatively impacting their academic record.

Why do you care? When you spoil a test, the original results are removed from the system and the student starts the test fresh. Our adaptive solution does not retain the earlier effort, which means you get a result you can count on to truly reflect the student's ability.

Test Length

The express version of our adaptive test provides a shorter, 25-question version of the standard test. Using the same subjects and item pools as the standard test, this express version provides flexibility with an eye on the clock. You can view the same reports as you receive for the standard test, including reports at the student, class, and district levels.

Please note: Since any short-form test relies on fewer questions to determine the ability level, the standard error of measure (SEM) is higher, resulting in a slightly less precise ability estimate. Consider your requirements around the balance of higher precision versus faster testing when you decide whether to use a shorter-form test.

Why do you care? Because the express test is shorter, it reduces the burden on overbooked computer labs and school network bandwidth, something that is especially important during Spring when testing time is at a premium because of summative testing. It can also be beneficial for students who have difficulty paying attention and/or maintaining focus. A shorter assessment enables these students to better demonstrate their true ability without experiencing testing fatigue.

Although Scantron recommends using the standard test two to four times a year to establish baselines and provide growth measurement, some of our clients use the express version more often throughout the year to gather results more frequently, so they can adjust instruction accordingly.

National Norms

Scantron regularly gathers national norm data for each subject area, providing a national peer group to serve as a basis for score comparison. This norm group includes more than 70,000 students tested in the Spring and Fall. Each group is representative of the gender/ethnicity composition of the nation as a whole.

Why do you care? Comparing student scores against a national norm group provides further insight into your students that you can use for reporting and additional analysis—including easy and immediate comparative reporting on annual measureable objectives (AMO). Knowing where students rank against a national peer group can help you focus on college and career readiness more easily. Consider the availability of recent, regular, and comprehensive norming studies when you are choosing a CAT provider. Scantron's lengthy experience in the market and early adoption of this crucial research means our adaptive test already includes the results of multiple years of norming data and analysis.

Solve more needs with a single measurement vehicle

> "Too often, students take tests that are designed to be used for a single purpose. Better assessments and more coordination among educators, from the classroom to the central office to the state education department, would allow students to take fewer formal assessments during the course of the year without sacrificing our ability to have crucial feedback about how students are learning."[4]
> *David Hespe, New Jersey Acting Commissioner of Education*

For more than a decade, Scantron has rigorously developed and frequently refreshed our adaptive item pools. Items are pre-aligned to state and college-and-career-readiness standards—in many cases written *expressly* to support these standards—so they can be used to reflect AMO and other state or national measurement requirements.

A single adaptive test returns a variety of scores, including:
- Scaled Score
- National Percentile Ranking (NPR)
- Lexile® measures (Reading tests only)
- Performance Rating (with custom research study)

That's nice, you say, but how can I use these scores to understand my students and improve their achievement? Let's explore.

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4 "Chief State School Officers, Urban School Leaders Offer Statements of Support for Commitments on High-Quality Assessments." Http://www.ccsso.org/. Council of Chief State School Officers, 15 Oct. 2014. Web. 29 Oct. 2014.

Detailed Reports

Our adaptive test offers extensive reporting so you can get the most out of your scores, such as:

- Student or Parent data
  - Profile Templates, containing information to share with students and parents, with different layouts covering growth trends, specific scores, and skills to focus on. Available in English and Spanish.
  - Suggested Learning Objective (SLO) Reports (see *Personalized Learning/Individualized Instruction*, below, for details)
- Teacher or Instructional data
  - Class Profile, containing information regarding current scores with grouping options on either scores or instructional level by skill.
  - Student Detail Report, showing groups of students who have demonstrated success or are experiencing challenges, by skill.
  - Suggested Learning Objective (SLO) Reports (see *Personalized Learning/Individualized Instruction*, below, for details)
  - Class Standard Student Detail Reports, which shows whether students achieved specific selected education standards. This helps you know what areas in which to support the student and to provide his or her additional learning resources.
  - Gains Analysis Reports, providing yearly gain targets to maintain progress with national peers and evaluation of that progress as the year continues.
  - Performance Band Reports, containing information that enables placement based on norm comparison or custom, predictive research categories
- Administrative or Evaluation Data
  - Summary Reports, providing a quick view of all student subject scores with average and score distribution.
  - Gains Reports, so you can review test gains by group, location or grade across summer or within a school year.
  - Gains Analysis Report that demonstrate/evaluate gains against norms and growth categories.
  - Performance Bands that evaluate recent test scores for grouping and resource allocation, or for predictive categories (with custom research).
  - Predictive Validity Reports (available with a custom predictive validity study); see *High Stakes Test Prediction* later in this article.

As you view each type of report listed above, you can drill deeper into the information, narrowing your focus until you get exactly the data you need (e.g., school, class, or individual student). These reports can be filtered by time frame, customizable student groups, and a variety of demographics to aggregate and disaggregate results.

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Personalized Learning/Individualized Instruction

In addition to the aggregate reports, one of the tools our clients cite as a key reason they chose our adaptive test over other CAT solutions is the student profile. In fact, customers are enthusiastic about the entire reporting experience in our adaptive test.

The student profile breaks down performance scores by subject into a visual report you can use to explore specific needs. Needs are further specified via the SLO report, which details the specific *standards*—not just strands—where additional instruction or guidance may be necessary. This report is also available at the class level. The class-level report helps you determine whether the entire class needs additional instruction as well as identifying specific groups of students who may be struggling with the material, so you can form study groups or other classroom-level interventions.

SLO down—there's more! The SLO report doesn't stop with this identification, however. One of the strongest benefits Scantron has to offer is tight relationships with *multiple* instructional resource partners. Other CATs may offer a similar connection, but it's usually into their own curricula, limiting the resources available to you. Because Scantron is your assessment and analysis partner, we focus on best assessment practices, balanced cognitive complexity coverage, and deep understanding of and alignment to your chosen standards. To this end, we've established partnerships to provide integrated connections to a variety of instructional resources:

- **netTrekker® by Knovation®** supplies access to targeted instructional resources. All netTrekker's resources are curated by education experts to ensure high quality. By accessing these materials through the SLO, the netTrekker search is pre-completed, sending you directly to more than 300,000 resources relating to the skills and standards you need to target.
- **Various Edgenuity® solutions**, such as MyPath®, Hybridge®, or Pathblazer®, which can automatically import our adaptive test scores and guide you in creating a personalized learning path for each student.
- **Classworks® by Curriculum Advantage**, which assists teacher in creating individual learning exercises and targeted classroom instruction based on adaptive test results.

Scantron continually seeks out and adds new resource partners to help you get the most out of your results, so you can bridge the gap between assessment and instruction.

Growth Measurement

Growth measurement is simply comparing two scores on a similar (or identical) test on the same subject, given at a minimum of two different times in the school year (typically in the Fall and Spring). The difference between these two scores can be considered to represent the student's academic growth in that subject during that time.

How districts use growth measures varies widely. Some use it strictly to monitor student growth within a domain (e.g., Math or Reading) at specified intervals (we recommend two to four times a year) across the school year. Some use smaller

measures to monitor student progress more frequently. Some districts use growth measurement as one of the elements in their educator effectiveness programs.

Regardless of how your district uses the results, our adaptive test can provide effective growth measures. Because scores are reported against a common vertical scale, a significant increase in score beyond the SEM truly reflects an increase in proficiency of the skill being measured. Instead of devising additional measures, simply administer our adaptive test at appropriate intervals, and then use the results (from either the standard or the express form) as a yardstick.

Universal Screening

Universal screening is part of a Response to Intervention (RTI) framework. You need a baseline measure of where all students are within foundational skills (such as Math and Reading), and to repeat that measure at least two more times during the year to identify growth. So far, that sounds a lot like the basic growth measurement we discussed previously. However, universal screening applies an additional layer: determining which students may fall into an instructional tier where they need additional intervention with a progressive plan of increasing intensity to return them to grade-level (or whatever growth goal you set).

Using a computer-adaptive assessment for screening provides the baseline view you need for all students. If you are using such an assessment anyway, our adaptive test helps you continue that measure over time within an RTI framework and identify individual growth and gains. You can identify specifically how a student has improved from *their* baseline, not just that they still "do not meet standards," where some CATs stop.

Our support for customized performance bands, combined with customizable student groups, even helps you see, easily and graphically, how identified students are improving. Using our adaptive test as a screener helps you reduce your testing footprint, freeing up instructional time and precious school network bandwidth.

Program Placement

Identifying students for program placement can be tricky. Many of the factors to be considered are subjective: Is this student ready academically *and socially* to move up a grade? Does he or she have the study skills and drive to be a good candidate for a particular track such as GATE, Advanced Placement, or International Baccalaureate? Would a program like AVID help this student succeed?

Our adaptive test adds an academically based, objective measure to the discussion, supplementing the subjective analysis. Its vertical scaling, national norming, and grade level estimates provide objective test scores and comparative ranking to specify overall subject readiness. SLOs identify which specific skills students have attained, so you can be sure the placement doesn't overextend their identified abilities and put them in a potentially negative "catch-up" loop.

High-Stakes Test Prediction (with predictive validity study)

Scantron doesn't stop with simply providing a test mechanism. Our assessment experts and psychometricians conduct a variety of research studies for our clients, including predictive validity studies to determine how closely adaptive test scores map to scores students can be predicted to achieve on one or more selected high-stakes state summative or college entrance exams.

Once a study is completed, you can then administer our adaptive test as you would anyway—but you can use the *same* scores for an additional purpose: identifying how a student is predicted to perform on state grade-level tests or college-readiness exams. You can use the student profile and Suggested Learning Objectives that you receive as a matter of course to help fill any gaps before the student takes that all-important test to help them succeed.

Prediction is a moveable feast, however. State summative tests change every few years. As we've all seen over the years, educational standards themselves are adapted and adjusted to better match the world in which our students must function and succeed.

When considering predictive validity studies, look for a partner who is in this for the long haul, with significant experience and expertise in prediction studies. Make sure your research partner has the stamina and know-how to not only conduct the study, but maintain it in the face of the only constant there is: change.

Scantron doesn't just conduct the study, turn in a white paper, and dust our hands off after a job well done. Teachers, parents, and students don't need yet another thing to read—they need actionable information and concrete, specific recommendations. Scantron delivers.

When you commission a predictive validity study, you receive a research report documenting the results of the study, and we integrate results directly into your adaptive test solution subscription via predictive

validity reports you can access from our reports area. For each study, you can access a report that shows the likelihood (expressed as a confidence percentage) for each student's predicted performance category on the summative test.
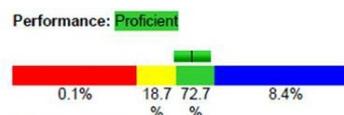
Date	Performance	U	PP	P	A
9/13/12	Partially Proficient	14%	63.3%	22.3%	0.4%
12/14/12	Proficient	0.1%	18.7%	72.7%	8.4%

A cautionary note: Predictions are valid and reliable, *with the understanding that the student continues to receive the same amount and quality of instruction*. What this means for educators is that interventions should be examined and planned carefully to avoid the risk of sacrificing a predicted high performance by one student for the sake of improving a predicted low performance for another. In addition, high-performing students need continual challenge—use predictive data to add to instruction as appropriate for all students, not just the students experiencing difficulties.

For example, based on his or her adaptive test scores, Student A is predicted to have a high score on the state summative exam. Student B is predicted to have a low score. If you make an instructional change to support improving Student B's score, and this change *reduces* the support Student A was getting, Student A may not score as well as predicted. Plan to use prediction reports to determine who needs *extra* help, not to *shift* help from one student to another.

Standards Tracking

Our adaptive solution is criterion-based. This means that over the years, items have evolved to be aligned to and even written expressly to support a wide variety of standards documents, including college-and-career-ready standards and the Next Generation Science Standards (NGSS), as well as the most recent educational standards developed by your state.

To view adaptive test scores in light of these standards, all you have to do is select the standards document to be referenced. We can even create standards connections to more than one standards document so you can still use the scores even if you're transitioning between standards systems. The appropriate discrete standards (not just strands) appear in a variety of reports—without having to administer multiple tests or deconstruct the strands into specific standards or skills yourself!

Further, this standard-level connection informs the SLO's recommendations of additional instructional resources provided by our partners. As previously noted, the SLO uses whatever standard or combination of standards you select to support your efforts to improve student growth and achievement.

This deep, standard-level connection between test results and standards means you automatically receive the detailed information you require to tailor your next instructional steps to specific student needs and achievements. Create study groups. Design lesson plans to support specific standards where you've identified a gap. You can even create individual additional homework assignments for specific students to help them get back on track. The data you need to adjust instruction is right at your fingertips.

Transform result data into actionable knowledge

We've already discussed the wide variety of reports available directly in our adaptive solution. Scantron believes that there is another step in the data-driven instructional transformation: true, multi-dimensional analytics.

To that end, we've partnered with Qlik® , a leading provider of advanced analytics technology, to combine their data analysis platform with our decades-long experience in educational data. The result is Scantron Analytics, a powerful tool you can use to truly explore your student data, making connections and gaining insights never before possible.

Spreadsheets are a common way of analyzing data, but looking at a spreadsheet of test scores can only help you answer the question "How did the students do on *this*

test?" To know how that compares to other tests, for example: how benchmark assessments relate to state summative scores, you need another spreadsheet. Then you have to combine them into a single view and add a chart to visualize the data. Then, if you want to know whether attendance played a role in the scores, you have to overlay yet another spreadsheet using advanced functions and formulae. This process is sometimes manageable for confirming relationships that you already suspect to be true. It does not, however, help you identify relationships between seemingly unrelated variables.

To avoid a spreadsheet maze and bias associated with data familiarity, some districts opt to build a data warehouse to pull together all the pieces of information needed to build a complete picture of the student. However, this can be expensive, time-consuming, and resource-intensive. And that's just to set it up, without analyzing the data it contains. The analytics component can add yet more time and cost, and often results in a rigid set of query paths written to answer a limited number of questions.

Fortunately, there's a powerful, yet simple, solution that helps you explore your data and answer your own questions as you think of them (and even those that you don't). Scantron Analytics automatically and securely consumes data from a variety of sources: your student information system, ACT® , SAT® , state-determined high-stakes tests, interim assessment measures (including our adaptive growth and fixed-form, on-grade tests), and much more.

Dynamic, interactive dashboards provide a starting point to explore your data. From a district-wide view, one click gets you down to a school, a class, or even an individual

student record. Another click can instantly disaggregate results, grouping them by demographics such as gender, ethnicity, Special Ed status, Free and Reduced Lunch, or student groups that you define—whatever data grouping helps you answer your questions. Scantron Analytics also includes an ability to define a cohort of students based on any criteria you choose, such as a specific Performance Band in our adaptive test, and then analyze related information for that cohort, such as their attendance or grades. Access to longitudinal data makes cohort analysis even more powerful—a single click can take you back to prior years' results.

A world-class analytics solution breaks the barrier between information and knowledge. You can immediately see the connections and patterns (both expected and unexpected) that enable you to make decisions based on information instead of guesswork. You can see the relationships between disparate data and use that knowledge to make decisions that help your students succeed—easier and faster than ever before.

How can Scantron help?

Scantron has an extensive track record providing digital assessment solutions for computer-adaptive and fixed-form approaches as well as world-class item banks, to help thousands of customers succeed in developing assessments that measure and accelerate student growth.

"Scantron's computer-adaptive diagnostic test delivers a single score you can use for a variety of measures," says Mike Ruby, Director of Product Management. "Being able to measure so many different elements with a single assessment saves our clients time and effort, reducing test overload while improving the information you get about each student's attainment of crucial skills and standards."

Scantron introduced our first computer-adaptive measure more than a decade ago, and added our fixed-form digital assessment platform not long after. We've been evolving our platform and content ever since, increasing our understanding of the instructional shifts in educational standards and balanced cognitive rigor, and reflecting that understanding in our item banks and tests.

We've helped districts with workshops and consulting for content development processes as well as working with customers to provide high-quality, aligned content. We've validated educator assessment efforts and demonstrated positive impact to student learning with research studies ranging from determining growth targets to predictive validity studies.

Beyond assessment vehicles, Scantron offers Scantron Analytics, powered by the leading "big data" analytics engine: QlikView. Scantron Analytics presents up-to-date information through highly visual, easy-to-understand dashboards. By storing all information in memory, Scantron Analytics delivers powerful analytics without the need for a separate data warehouse. Using information you're already collecting, sourced from a wide variety of educational systems, Scantron Analytics displays easy-to-read graphical dashboards and data visualizations. Important trends and previously

hidden connections jump out, so you can spend your time developing creative solutions instead of trying to make sense of rows and columns of numbers.

Whatever the assessment assistance you need, Scantron has the products, tools, services, and expertise to help you ensure that you have the right program for your students. Our award-winning web-based software, combined with our comprehensive suite of assessment services, help you get the most out of your assessments and results. Use the following checklist to identify considerations important to your assessment requirement and see how Scantron can meet you where you are and help you get to where you want to be.

Contact Us:
1.800.722.6876
www.scantron.com
Scantron Corporation. 1313 Lone Oak Road, Eagan, MN 55121

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CHECKLIST

Are You Getting Enough from One Score?
Questions to Ask Yourself About Your Computer-Adaptive Test (CAT)

Is your CAT flexible?	☐ Does your CAT remember the ability level the student last attained on the test? If it does, will it automatically restart the student's next test at that level?
	☐ Can you configure your CAT to let you adjust a student's starting grade level to account for known accommodation needs (above or below current grade level)?
	☐ Does your CAT identify testing irregularities and automatically spoil the test if it detects them? If the system spoils a test, is the spoiled test cleared from the student's record so he or she starts over fresh?
	☐ Can you manually spoil a test if a student is having a bad experience that day? If you spoil a test, is the spoiled test cleared from the student's record so he or she starts over fresh?
	☐ Does your CAT provide a long form and a short form to accommodate a variety of testing needs or free up computer lab time?
	☐ Does your CAT include national norms so you can compare your students to a national peer group? Does your CAT partner perform their own norm studies directly or merely link to norming done through connected resources? How often is it refreshed?
How many needs does your CAT score serve?	☐ Do you get a vertically scaled score? A grade level estimate? A national percentile ranking/normal curve equivalent? Does your score include Lexiles®?
	☐ Can you define performance bands to suit your needs?
	☐ Does your CAT partner also provide research services so your scores can include a performance rating?
	☐ Can you access a wide variety of student, parent, teacher, and administrative reports? Can reports be aggregated and disaggregated by different student populations? Does your CAT include a student or class profile you can use to access additional linked instructional materials?
	☐ Can you use your scores to demonstrate growth? Do reports include gains and gains analysis data as well as score summaries?
	☐ Can you easily use your results for universal screening, measuring students against their *own* results, rather than just "does not meet standards"?
	☐ Can you use the scores as part of program placement? Can you track results to specific standards, or merely to high-level strands?
	☐ Can your CAT partner perform research for a predictive validity rating against a selected high-stakes test?
Can you connect to deeper analytics?	☐ Does your CAT provider link to an analytics engine that lets you explore your data visually, rather than wading through spreadsheets?

INFORM INSTRUCTION TO IMPACT STUDENT ACHIEVEMENT TODAY!

For a free consultation to evaluate your assessment needs, call **800.722.6876** or visit us at **www.scantron.com/k12**.