

## **Summary Report**

### **Setting Student Performance Standards on the Michigan *MI-Access* Participation, Supported Independence, & Functional Independence Grade 11 Science Assessment Instruments**

*Report by:*

*Questar Assessment, Inc.*

The *MI-Access* assessment system is designed for students who are unable to take the regular state assessment, the Michigan Educational Assessment Program (MEAP), even with accommodations. These instruments have been developed over a several-year period by the Michigan Department of Education (MDE). Extensive information concerning the development, characteristics, and statewide implementation of these instruments can be found in various publications of the Department issued by the Office of Educational Assessment and Accountability (OEAA), and is available on request.

Two levels of this three-tiered system – Participation and Supported Independence – became operational statewide in the spring of 2002; student performance standards in English Language Arts (ELA) and Mathematics were established at that time and were applied to results for the past three testing periods. The content of these assessments was changed in 2006 to reflect the state’s Extended Grade-Level Content Expectations for ELA and Mathematics. Performance standards were reestablished in May of 2007. The third level of the system, Functional Independence, became operational statewide for the first time in the fall of 2005.

Development of assessments in the area of Science began in 2005, with field testing of assessment exercises for these assessments taking place in spring, 2007. The Science assessments were developed for Grades 5, 8 and 11 to comply with requirements of the No Child Left Behind requirements that such assessments be established for at least one elementary, middle-school, and high school grade. The new Science assessments in Grades 5 and 8 became operational statewide in the fall of 2007; the Grade 11 assessments became operational for the first time in spring, 2008. OEAA decided, with Technical Advisory Committee (TAC) approval, that it was necessary to establish the performance standards for these new operational assessments. Such standards were established for Grades 5 and 8 using a TAC- and OEAA-approved procedure on April 29 and 30, 2008. It is anticipated that the recommended standards for these grade levels will be approved by the state Board of Education on May 13, 2008. This report summarizes the activities and procedures leading to the establishment of these student performance standards for the Grade 11 Science assessments included in the Participation, Supported Independence and Functional Independence levels of *MI-Access*.

These activities were conducted beginning in late 2007, continuing through the conduct of the actual standards-setting panel sessions in April of 2008, in essentially three stages:

- Develop, revise and finalize an implementation plan
- Collect committee recommendations for the standards
- Review the recommendations and obtain MDE and TAC review and state Board of Education adoption of the standards.

Activities and outcomes of each of these stages are discussed below.

## **Develop an Implementation Plan**

Planning for the standard setting activities began in the winter of 2007-2008 with discussions among professional staff of OEAA and the state's contractor to MDE for *MI-Access* support services, Questar Assessment, Inc. (formerly BETA/TASA). These discussions led to two iterations of written outlines for the process to be followed for establishing the student performance standards. These draft plans were discussed with the OEAA TAC April 2008, during which revisions were proposed and the plans ultimately approved. Based on the draft plans and TAC counsel, the implementation process was finalized. The TAC-approved version of the implementation plan is available from OEAA. The subsequent implementation of the standard-setting process was carried out consistent with the OEAA- and TAC-approved plan. Essentially identical procedures were followed for the sessions summarized in this report as were carried out for the several earlier *MI-Access* standard-setting sessions, including those for the Science assessments in Grades 5 and 8. Conduct of the Science sessions and subsequent data analyses and state standards-adoption processes were parallel for all three levels of the assessments.

## **Collect Committee Recommendations for the Standards**

Prior to the standard-setting sessions, OEAA developed – with input from a range of Michigan stakeholders -- three “achievement labels” and corresponding draft performance-level descriptors (PLDs) to describe student performance on *MI-Access*. The three Performance Categories used for each level of *MI-Access* – *Emerging*, *Attained*, and *Surpassed the Performance Standards* – were used for the Science assessments. These same performance labels are used on all other versions of these assessments in ELA and Mathematics, for the Grades 5 and 8 Science assessments, and for all three levels of the *MI-Access* program. The draft PLDs for each *MI-Access* level guided the standard-setting panels. During and immediately subsequent to the panel sessions, panelists were asked to review, critique, amplify, edit and otherwise revise the performance-level descriptors. The PLDs for all grade levels used to guide the panelists' efforts, shown in Appendix A, will be used by OEAA in presenting the *MI-Access* results to various assessment audiences.

The primary events that led to the recommended standards were three standard-setting committee meetings held in Bloomfield Hills on April 29 and 30, 2008. Each of the three panels recommended performance standards for one level of the *MI-Access* system – Participation, Supported Independence, or Functional Independence.

Each panel met for two full days and followed essentially identical procedures; the agenda for their meetings are presented in Appendix B. Detailed facilitator scripts and common corresponding overhead transparencies were used by facilitators for each of the three sessions. To maximize comparability of sessions and resulting recommendations across the three assessments, identical agendas and overhead transparencies were used for all sessions; the only differences were with regard to the particular assessment addressed in the sessions. Scripts across the several levels of the assessments were also as comparable as possible. All materials used for the April sessions were essentially identical to those used for the earlier *MI-Access* standard setting sessions, including those for the lower grades of Science; these had been reviewed by OEAA staff and the TAC prior to their use.

Standard-setting participants were chosen from nominees made to the OEAA by school districts and various professional organizations and advocacy groups. An attempt was made to include a broad range of stakeholder representation on each panel. Nominations were sought from all *MI-Access* district coordinators, from the state's Special Education Advisory Committee, and from various professional organizations; the call for panelists was also posted on the MDE web site. Participants were selected from the various nominations received. Panel members included classroom teachers (both special and general education), building-level administrators, parents, special education directors, parents, a non-educator business person, and special-education advocacy group representatives. The majority of members of each panel were active, practicing educators. Approximately one-half of the panelists in each session had participated as panelists in one or more previous *MI-Access* standard-setting sessions. A total of **22** panelists participated in the activities. Appendix N contains a list of all participants in the standard-setting activities according to the panel on which they served. Panelists clearly understood that their role was that of an *advisory group* – to recommend a set of standards to MDE and the state board of education. The state Board of Education had the ultimate authority to actually establish or “set” the standards. It was the opinion of all session facilitators that panelists well understood the tasks involved in recommending student performance standards and their role in same. Similarly, all panelists in all sessions attended to session instructions and appeared to conduct their work consistent with the tasks assigned.

All standard-setting sessions were facilitated by a member of the contractor's staff who was experienced in moderating standard-setting and other group decision-making sessions. Facilitators all followed the same agenda and used the same overhead transparency sequence and notes to lead their individual sessions. The three concurrent two-day sessions were all organized identically. Dr. Vince Dean from OEAA provided an overview of the *MI-Access* instruments and their content and scoring. A Questar facilitator presented a general introduction or overview of the standard-setting process and the three performance labels to be used. The panelists then broke into separate panels to begin their work; all subsequent sessions were held in the separate-panel forums outlined above. Multiple MDE/OEAA personnel were present for the sessions, but they served only as resource personnel and observers; they did not participate in the judgment process. In addition, a representative of the OEAA Technical Advisory Committee – Dr. Carol Allman – was present to observe the sessions; Dr. Allman observed portions of each of the three sessions although she did not participate in the discussions of the panelists or the judging activities..

As recommended by the OEAA contractor and BETA and approved by OEAA and the state's TAC, the general methodology used for all sessions was "item mapping." This method, initially proposed by CTB/McGraw-Hill and termed the "Bookmark Procedure™," (c.f., Mitzel, Lewis, Patz, & Green, 2001; Lewis, Green, Mitzel, Baum, & Patz, 1998), was chosen for several reasons. First, it is currently the most widely used method for setting performance standards for high-stakes K-12 educational assessments and is used in the majority of statewide testing programs for which student performance standards are determined by panels. Therefore, it is widely understood and researched by measurement professionals. Second, it is a procedure well-suited for assessments that contain multi-point exercises as are used for the *MI-Access* Participation and Supported Independence Science assessments. Finally and most importantly, the item-mapping procedure was the methodology used for establishing standards for all other *MI-Access* assessments as well as the majority of the state's MEAP (general education) assessments.

For the *MI-Access* Science standard setting, panelists were trained to examine all items/exercises/score points, which were ordered in a review booklet from least- to most-difficult. The three levels of the assessments have differing numbers of score points. Participation is composed of 15 exercises, each with a score-point range of 0 through 6, for a total possible raw score was 90. Supported Independence assessments are composed of 17 selected-response exercises, each scored from 0 through 4 for a total possible score of 68. The Grade 11 Functional Independence assessments are made up of 45 multiple-choice items. For all three levels of the assessments, panelists progressed through the ordered-item booklet until they reached the point at which they believed a *threshold* student who minimally Attained the Standard should just more likely than not be able to answer this item/activity at the particular level of competence. That is, panelists placed a cut point at the activity/score point at which a student who answered correctly was just barely indicating performance that Attained the Standard. A similar process was then followed to establish the recommended cut point for the Surpassed the Standard level.

Each panel made three separate rounds of judgments of the standards. Extensive discussions by the panelists of their interim ratings took place following the first and second rounds. Panelists were urged to explain their judgments and seek clarification of any misunderstandings during these discussions. Panel discussions in all three sessions were animated, engaged, and on-task. To encourage panel interactions and additional consensus among the group, panelists were shown (anonymously) their interim ratings compared with those of their peers. Following the first round of judgments, panelists were given a point-by-point list of the statewide "difficulty" values. For the Functional Independence multiple-choice items, these data were the item *p*-values. For Participation and Supported Independence, these data were the percent of students scoring at or above each score point. These data are presented in Appendix M for each level of the assessments. Panelists were free to consider these data however they wished in making their subsequent recommendations.

Prior to the final round of ratings, panelists were also provided with anticipated statewide "impact" data – that is, the approximate percents of students statewide who would receive *MI-Access* "scores" in each of the three performance categories. These percents were based on frequency distributions of all *MI-Access* assessments available for processing by the contractor as of April 24. Well over 90% of the "complete" statewide data were available as of that date. Statewide summary data for the three assessments are provided in Appendix L;

these data were not provided in this form to the panels, but were the basis for determining the state “impact data” that were shared with the panels prior to Round 3 of their work. Panelists were informed of the limitations of these data (being based on large and representative, but less-than-complete, samples of students statewide), but were informed that they might wish to consider these data during their final round of recommendations. After panelists completed their final judgments, they each filled out a short evaluation questionnaire, asking their opinions of the process and their comfort with both the procedures used and their judgments.

Subsequent to the completion of the sessions, it was discovered that the panelists in the FI session were inadvertently shown incomplete “impact data” prior to their third round of judgments. These data provided the panelists with somewhat inaccurate indications of the percent of students whose FI *MI-Access* performance would fall in each of the three performance categories. This issue was explored thoroughly by the contractor staff with OEAA and the state’s TAC, both of which recommended that the FI panelists be provided with the correct impact data and be given the opportunity to revise their Round 3 judgments if they wished. Each panelist was contacted and provided with their three rounds of judgments and the corrected “impact data.” They were also reminded of the Round 2 recommendations of each of their fellow panelists. The memo and related information that they received concerning this issue is presented in Appendix **P** of this report. They were asked to *reconsider* their Round 3 recommendations and indicate whether or not they wished to revise these based on the final, complete impact data. Each panelist reviewed their recommendations and indicated their wishes. Appendix **Q** presents the *e*-mails received from each of the 7 panelists concerning their wishes. Four of the seven panelists made no change in their earlier recommendations; three panelists changed one or both of their earlier recommendations. The round-by-round recommendations of each panelist in all three panels are tabled in Appendix **C**. The net impact (in terms of median panel recommendation) was to reduce the Attained cut score by 1 raw-score point (and 1 ordered-item position). For purposes of the data summaries and graphs that follow, both the original Round 3 and the final, “Round 4” recommendations of this panel are presented.

Appendix **C** tables the recommendations of each panelist by round of judgments for each of the three panels. Appendices **D** (Participation), **E** (Supported Independence), and **F** (Functional Independence) provide summary data by round by grade of ratings for each of the panels. Also tabled in Appendices **D** through **F** are the means, medians, and standard deviations by round of judgments for both cuts (Attained and Surpassed), along with several measures of error associated with the process. These include the standard errors of the mean and median (the errors associated with the central tendency of the complete set of judges), the standard error of measurement for the assessment ( $SEM_{Test}$ ), and an estimate of the combination of the standard errors of the test and the median of the judges ( $SE_{Composite}$ ). These various estimates of error provide an indication of the likely amount of imprecision in the panelists’ average judgments. As the summary data for the three sessions illustrate, over the course of the sessions, panelists attained some convergence in their judgments concerning the appropriate placement of the standards for the three assessments. However, as is typical in such sessions, members of all panels continued to have somewhat divergent opinions concerning the appropriate cut scores, even at Round 3 of the process.

Subsequent to the completion of the panel sessions, representative of the contractor and OEAA reviewed all panel recommendation. As has been recommended for all previous *MI-Access* sessions, Questar proposes that OEAA use the *median* panel recommendation for each cut. No revisions in the panel-recommended median cut scores were suggested by the contractor or OEAA. All data and related recommendations of cut scores were reviewed and approved by the TAC prior to submission of the final recommendations to the state Board of Education. As noted previously, the final median cut scores for each assessment level are presented in appendices D-F.

First, panel members converged rather well across rounds in their recommendation. More importantly, the Round 3 median recommendations of all three panels resulted in statewide outcomes that seem consistent both with general expectations of student performance in the area of Science and with previously implemented standards for ELA and Mathematics.

Appendices **G** (Round 1), **H** (Round 2), and **I** (Round 3 and, for FI, Round 4) provide a graphic summary of the round-by-round recommendations by panel for the three assessment levels. Appendix **I** shows the *final* sets of cut scores suggested by the panelists in each committee. The graphs shown in Appendices **G** and **H** were used to provide inter-round feedback to panelists during the sessions.

Appendix **J** displays the statewide percents of students whose *MI-Access* scores fell into the three performance categories by assessment level. Appendix **K** provides statewide results in English Language Arts (ELA), Mathematics, and Science across the three grades levels at which the Science assessment is administered – 5, 8, and 11. All Grades 5 and 8 data and the Grade 11 ELA and Mathematics results are from the most-recent statewide administration of the assessments (Spring or Fall, 2007); plotted Grade 11 Science percents are the Spring, 2008 data described above. The Grade 11 Science results are based on the final panel cut-score recommendations from the standard-setting sessions. Note that the Grade 11 Science recommendations were made one or two years after the ELA and Mathematics standards were established and several months after the Science Grades 5 and 8 standards were set - and were set by separate panels of judges (though using procedures as comparable as possible). As a review of these plotted data indicate, the Grade 11 Science recommendations yield statewide results that are notably consistent with corresponding results for ELA and Mathematics and with Science results in other assessed grade levels.

A summary of the evaluation form completed by every participating panelist at the completion of the standard-setting sessions is presented in Appendix **O**. Across sessions, panelists generally rated all aspects of the sessions highly. They felt that the major activities of the sessions were covered successfully, considered many pertinent elements in making their recommendations, showed increased understanding of the task across rounds of ratings, well understood the data provided to them, and were confident in their judgments by the end of the session.

## **Review of Recommendations & MDE/ SBOE Adoption of the Standards**

All panel recommendations will be shared with the state's national TAC for their counsel on May 2. The final OEAA recommendations, after consideration of TAC input, were

presented to the state Board of Education at their May 13, 2008 meeting. OEAA's recommendation to the Board was that the median panel cut scores for both cuts at all three levels of the assessment be adopted, without revision. The State Board of Education accepted and approved this recommendation. Subsequent to the Board of Education's approval of the final standards, score reports containing the final standards were generated and distributed to all participating Michigan school districts.

Additional questions concerning the assessments, the procedures used for setting performance standards or the data resulting therefrom, or any aspect of the development or interpretation of the *MI-Access* assessments should be addressed to OEAA at the Michigan Department of Education.

## Appendix A – PLD's

### ELEMENTARY SCIENCE – Participation

Grade Span	Emerging	Attained	Surpassed
<b>Elementary General Statement</b>	Based on the <i>Participation EBs</i> , <sup>1</sup> a student who is <b>emerging toward the performance standard</b> should typically, with considerable to moderate assistance, be able to...	Based on the <i>Participation EBs</i> , <sup>1</sup> a student who has <b>attained the performance standard</b> should typically, with considerable to moderate assistance, be able to...	Based on the <i>Participation EBs</i> , <sup>1</sup> a student who has <b>surpassed the performance standard</b> should typically, with moderate to limited assistance, be able to...
<b>Elementary Performance Level Descriptor</b>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>Respond to questions about the world based on observation and/or description</li> </ul>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>Respond to questions about the world based on observation and/or description</li> </ul>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>Respond to questions about the world based on observation and/or description</li> </ul>
	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>Develop an awareness of the natural world</li> </ul>	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>Develop an awareness of the natural world</li> </ul>	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>Develop an awareness of the natural world</li> </ul>
	<b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>Discriminate between living/non-living</li> <li>Identify characteristics of animals</li> <li>Identify animals</li> <li>Match parent/offspring</li> <li>Identify parts of life cycles of familiar organisms</li> </ul>	<b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>Discriminate between living/non-living</li> <li>Identify characteristics of animals</li> <li>Identify animals</li> <li>Match parent/offspring</li> <li>Identify parts of life cycles of familiar organisms</li> </ul>	<b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>Discriminate between living/non-living</li> <li>Identify characteristics of animals</li> <li>Identify animals</li> <li>Match parent/offspring</li> <li>Identify parts of life cycles of familiar organisms</li> </ul>

<b>Elementary</b>  <b>Performance</b> <b>Level Descriptor</b>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify parts of electrical circuits</li> <li>• Recognize movement of objects</li> <li>• Identify characteristics of sounds</li> <li>• Identify how materials are useful</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify parts of electrical circuits</li> <li>• Recognize movement of objects</li> <li>• Identify characteristics of sounds</li> <li>• Identify how materials are useful</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify parts of electrical circuits</li> <li>• Recognize movement of objects</li> <li>• Identify characteristics of sounds</li> <li>• Identify how materials are useful</li> </ul>
	<b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify weather conditions</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify weather conditions</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify weather conditions</li> </ul>

**MIDDLE SCHOOL SCIENCE – Participation**

Grade Span	Emerging	Attained	Surpassed
<p align="center"><b>Middle School General Statement</b></p>	<p>Based on the <i>Participation EBs</i>,<sup>1</sup> a student who is <b>emerging toward the performance standard</b> should typically, with considerable to moderate assistance, be able to...</p>	<p>Based on the <i>Participation EBs</i>,<sup>1</sup> a student who <b>attained the performance standard</b> should typically, with moderate to minimal assistance, be able to...</p>	<p>Based on the <i>Participation EBs</i>,<sup>1</sup> a student who <b>surpassed the performance standard</b> should typically, with minimal to no assistance, be able to...</p>
<p align="center"><b>Middle School Performance Level Descriptor</b></p>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Respond to questions about the world based on observation and/or description</li> </ul> <p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Develop an awareness of the natural world</li> </ul> <p><b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of animals</li> <li>• Identify plants/animals</li> <li>• Identify healthy foods</li> <li>• Associate senses with body parts</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Respond to questions about the world based on observation and/or description</li> </ul> <p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Develop an awareness of the natural world</li> </ul> <p><b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of animals</li> <li>• Identify plants/animals</li> <li>• Identify healthy foods</li> <li>• Associate senses with body parts</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Respond to questions about the world based on observation and/or description</li> </ul> <p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Develop an awareness of the natural world</li> </ul> <p><b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of animals</li> <li>• Identify plants/animals</li> <li>• Identify healthy foods</li> <li>• Associate senses with body parts</li> </ul>

<b>Middle School</b>  <b>Performance Level Descriptor</b>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Recognize movement of objects</li> <li>• Identify sources of sound</li> <li>• Identify light sources</li> <li>• Differentiate between common objects according to length, weight, or temperature</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Recognize movement of objects</li> <li>• Identify sources of sound</li> <li>• Identify light sources</li> <li>• Differentiate between common objects according to length, weight, or temperature</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Recognize movement of objects</li> <li>• Identify sources of sound</li> <li>• Identify light sources</li> <li>• Differentiate between common objects according to length, weight, or temperature</li> </ul>
	<b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify weather conditions</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify weather conditions</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify weather conditions</li> </ul>

## HIGH SCHOOL SCIENCE – Participation

Grade Span	Emerging	Attained	Surpassed
<p style="text-align: center;"><b>High School General Statement</b></p>	<p>Based on the <i>Participation EBs</i>,<sup>1</sup> a student who is <b>emerging toward the performance standard</b> should typically, with considerable to moderate assistance, be able to...</p>	<p>Based on the <i>Participation EBs</i>,<sup>1</sup> a student who <b>attained the performance standard</b> should typically, with moderate to minimal assistance, be able to...</p>	<p>Based on the <i>Participation EBs</i>,<sup>1</sup> a student who <b>surpassed the performance standard</b> should typically, with minimal to no assistance, be able to...</p>
<p style="text-align: center;"><b>High School Performance Level Descriptor</b></p>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Respond to questions about the world based on observation and/or description</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Respond to questions about the world based on observation and/or description</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Respond to questions about the world based on observation and/or description</li> </ul>
	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Develop an awareness of the natural world</li> </ul>	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Develop an awareness of the natural world</li> </ul>	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Develop an awareness of the natural world</li> </ul>
	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify characteristics of living things</li> <li>• Identify characteristics of animals</li> <li>• Identify plants/animals</li> <li>• Identify exercise routines</li> <li>• Identify some common healthy foods</li> </ul>	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify characteristics of living things</li> <li>• Identify characteristics of animals</li> <li>• Identify plants/animals</li> <li>• Identify exercise routines</li> <li>• Identify some common healthy foods</li> </ul>	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify characteristics of living things</li> <li>• Identify characteristics of animals</li> <li>• Identify plants/animals</li> <li>• Identify exercise routines</li> <li>• Identify some common healthy foods</li> </ul>

<b>High School Performance Level Descriptor</b>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify mixtures/components of mixtures</li> <li>• Identify attributes/properties of common objects</li> <li>• Identify electrical circuits</li> <li>• Recognize movement of objects</li> <li>• Identify sources of sound</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify mixtures/components of mixtures</li> <li>• Identify attributes/properties of common objects</li> <li>• Identify electrical circuits</li> <li>• Recognize movement of objects</li> <li>• Identify sources of sound</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify mixtures/components of mixtures</li> <li>• Identify attributes/properties of common objects</li> <li>• Identify electrical circuits</li> <li>• Recognize movement of objects</li> <li>• Identify sources of sound</li> </ul>
	<b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify appropriate clothing for weather conditions</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify appropriate clothing for weather conditions</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines</li> <li>• Identify where water is found/uses of water</li> <li>• Identify appropriate clothing for weather conditions</li> </ul>

**ELEMENTARY SCIENCE – Supported Independence**

Grade Span	Emerging	Attained	Surpassed
<p align="center"><b>Elementary</b> <b>General Statement</b></p>	<p>Based on the <i>Supported Independence EBS</i>,<sup>2</sup> a student who is <b>emerging toward the performance standard</b> should typically, with considerable to moderate assistance, be able to...</p>	<p>Based on the <i>Supported Independence EBS</i>,<sup>2</sup> a student who <b>attained the performance standard</b> should typically, with moderate to minimal assistance, be able to...</p>	<p>Based on the <i>Supported Independence EBS</i>,<sup>2</sup> a student who <b>surpassed the performance standard</b> should typically, with minimal to no assistance, be able to...</p>
<p align="center"><b>Elementary</b> <b>Performance Level Descriptor</b></p>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Answer basic questions about the world based on observation and/or description</li> <li>• Identify simple devices</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Answer basic questions about the world based on observation and/or description</li> <li>• Identify simple devices</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Answer basic questions about the world based on observation and/or description</li> <li>• Identify simple devices</li> </ul>
	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify uses of technology</li> <li>• Develop an awareness of the natural world</li> </ul>	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify uses of technology</li> <li>• Develop an awareness of the natural world</li> </ul>	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify uses of technology</li> <li>• Develop an awareness of the natural world</li> </ul>
	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of animals</li> <li>• Differentiate between plants/animals</li> <li>• Match life cycles</li> <li>• Identify healthy foods</li> <li>• Identify basic requirements for all living things</li> </ul>	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of animals</li> <li>• Differentiate between plants/animals</li> <li>• Match life cycles</li> <li>• Identify healthy foods</li> <li>• Identify basic requirements for all living things</li> </ul>	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of animals</li> <li>• Differentiate between plants/animals</li> <li>• Match life cycles</li> <li>• Identify healthy foods</li> <li>• Identify basic requirements for all living things</li> </ul>

<b>Elementary Performance Level Descriptor</b>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify how materials are useful</li> <li>• Identify states of matter</li> <li>• Recognize movement of objects including parts of the body</li> <li>• Identify simple machines</li> <li>• Identify sources of light/shadow</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify how materials are useful</li> <li>• Identify states of matter</li> <li>• Recognize movement of objects including parts of the body</li> <li>• Identify simple machines</li> <li>• Identify sources of light/shadow</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify how materials are useful</li> <li>• Identify states of matter</li> <li>• Recognize movement of objects including parts of the body</li> <li>• Identify simple machines</li> <li>• Identify sources of light/shadow</li> </ul>
	<b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines or materials</li> <li>• Recognize states/uses of water</li> <li>• Identify sources of safe vs. unsafe drinking water</li> <li>• Identify weather conditions</li> <li>• Identify the sun, moon, and Earth</li> <li>• Identify differences between day/night</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines or materials</li> <li>• Recognize states/uses of water</li> <li>• Identify sources of safe vs. unsafe drinking water</li> <li>• Identify weather conditions</li> <li>• Identify the sun, moon, and Earth</li> <li>• Identify differences between day/night</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation/recycling routines or materials</li> <li>• Recognize states/uses of water</li> <li>• Identify sources of safe vs. unsafe drinking water</li> <li>• Identify weather conditions</li> <li>• Identify the sun, moon, and Earth</li> <li>• Identify differences between day/night</li> </ul>

**MIDDLE SCHOOL SCIENCE – Supported Independence**

Grade Span	Emerging	Attained	Surpassed
<p align="center"><b>Middle School General Statement</b></p>	<p>Based on the <i>Supported Independence</i> EBs,<sup>2</sup> a student who is <b>emerging toward the performance standard</b> should typically, with considerable to moderate assistance, be able to...</p>	<p>Based on the <i>Supported Independence</i> EBs,<sup>2</sup> a student who <b>attained the performance standard</b> should typically, with minimal to no assistance, be able to...</p>	<p>Based on the <i>Supported Independence</i> EBs,<sup>2</sup> a student who <b>surpassed the performance standard</b> should typically, with minimal to no assistance, be able to...</p>
<p align="center"><b>Middle School Performance Level Descriptor</b></p>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify simple devices</li> <li>• Answer questions about the world based on observation and/or description</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify simple devices</li> <li>• Answer questions about the world based on observation and/or description</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify simple devices</li> <li>• Answer questions about the world based on observation and/or description</li> </ul>
	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify science concepts in common activities</li> <li>• Develop an awareness of the natural world</li> </ul>	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify science concepts in common activities</li> <li>• Develop an awareness of the natural world</li> </ul>	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify science concepts in common activities</li> <li>• Develop an awareness of the natural world</li> </ul>
	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of plants/animals</li> <li>• Sequence life cycles of plants</li> <li>• Sort food into groups</li> <li>• Associate senses with body parts</li> <li>• Match parent/offspring</li> </ul>	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of plants/animals</li> <li>• Sequence life cycles of plants</li> <li>• Sort food into groups</li> <li>• Associate senses with body parts</li> <li>• Match parent/offspring</li> </ul>	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Discriminate between living/non-living</li> <li>• Identify characteristics of plants/animals</li> <li>• Sequence life cycles of plants</li> <li>• Sort food into groups</li> <li>• Associate senses with body parts</li> <li>• Match parent/offspring</li> </ul>

<b>Middle School Performance Level Descriptor</b>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify changes/states in matter</li> <li>• Recognize movement of objects</li> <li>• Identify simple machines</li> <li>• Identify light sources</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify changes/states in matter</li> <li>• Recognize movement of objects</li> <li>• Identify simple machines</li> <li>• Identify light sources</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify attributes of common objects</li> <li>• Identify changes/states in matter</li> <li>• Recognize movement of objects</li> <li>• Identify simple machines</li> <li>• Identify light sources</li> </ul>
	<b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines</li> <li>• Identify safety precautions with water/uses of water</li> <li>• Identify weather conditions/sources of weather information</li> <li>• Identify differences between day/night</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines</li> <li>• Identify safety precautions with water/uses of water</li> <li>• Identify weather conditions/sources of weather information</li> <li>• Identify differences between day/night</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines</li> <li>• Identify safety precautions with water/uses of water</li> <li>• Identify weather conditions/sources of weather information</li> <li>• Identify differences between day/night</li> </ul>

## HIGH SCHOOL SCIENCE – Supported Independence

Grade Span	Emerging	Attained	Surpassed
<b>High School General Statement</b>	Based on the <i>Supported Independence</i> EBs, <sup>2</sup> a student who is <b>emerging toward the performance standard</b> should typically, with considerable to moderate assistance, be able to...	Based on the <i>Supported Independence</i> EBs, <sup>2</sup> a student who <b>attained the performance standard</b> should typically, with minimal or no assistance, be able to...	Based on the <i>Supported Independence</i> EBs, <sup>2</sup> a student who <b>surpassed the performance standard</b> should typically, with minimal to no assistance, be able to...
<b>High School Performance Level Descriptor</b>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify simple devices</li> <li>• Answer questions about the world based on observation and/or description</li> </ul>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify simple devices</li> <li>• Answer questions about the world based on observation and/or description</li> </ul>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify simple devices</li> <li>• Answer questions about the world based on observation and/or description</li> </ul>
	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify advantages/risks of technology</li> <li>• Develop an awareness of the natural world</li> </ul>	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify advantages/risks of technology</li> <li>• Develop an awareness of the natural world</li> </ul>	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify advantages/risks of technology</li> <li>• Develop an awareness of the natural world</li> </ul>
	<b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify characteristics of living things</li> <li>• Identify observable characteristics of animals</li> <li>• Differentiate between characteristics or parts of plants/animals</li> <li>• Sort food into groups</li> <li>• Identify plants/animals found within various ecosystems</li> </ul>	<b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify characteristics of living things</li> <li>• Identify observable characteristics of animals</li> <li>• Differentiate between characteristics or parts of plants/animals</li> <li>• Sort food into groups</li> <li>• Identify plants/animals found within various ecosystems</li> </ul>	<b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify characteristics of living things</li> <li>• Identify observable characteristics of animals</li> <li>• Differentiate between characteristics or parts of plants/animals</li> <li>• Sort food into groups</li> <li>• Identify plants/animals found within various ecosystems</li> </ul>

<b>High School Performance Level Descriptor</b>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify electrical circuits/hazards</li> <li>• Identify simple machines</li> <li>• Identify vibration as a source of sound</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify electrical circuits/hazards</li> <li>• Identify simple machines</li> <li>• Identify vibration as a source of sound</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify electrical circuits/hazards</li> <li>• Identify simple machines</li> <li>• Identify vibration as a source of sound</li> </ul>
	<b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines or materials</li> <li>• Identify safety precautions with water/flow of water/uses of water</li> <li>• Identify weather conditions/weather safety</li> <li>• Identify differences between day/night</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines or materials</li> <li>• Identify safety precautions with water/flow of water/uses of water</li> <li>• Identify weather conditions/weather safety</li> <li>• Identify differences between day/night</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify conservation routines or materials</li> <li>• Identify safety precautions with water/flow of water/uses of water</li> <li>• Identify weather conditions/weather safety</li> <li>• Identify differences between day/night</li> </ul>

**ELEMENTARY SCIENCE – Functional Independence**

<b>Grade Span</b>	<b>Emerging</b>	<b>Attained</b>	<b>Surpassed</b>
<b>Elementary General Statement</b>	Based on the <i>Functional Independence EBs</i> , <sup>3</sup> a student who is <b>emerging toward the performance standard</b> should typically be able to...	Based on the <i>Functional Independence EBs</i> , <sup>2</sup> a student who <b>attained the performance standard</b> should typically be able to...	Based on the <i>Functional Independence EBs</i> , <sup>2</sup> a student who <b>surpassed the performance standard</b> should typically be able to...
<b>Elementary Performance Level Descriptor</b>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>Identify questions based on observation and/or description</li> <li>Identify sources of scientific information</li> </ul>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>Identify questions based on observation and/or description</li> <li>Identify sources of scientific information</li> </ul>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>Identify questions based on observation and/or description</li> <li>Identify sources of scientific information</li> </ul>
	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>Identify ways technology is used in everyday life</li> </ul>	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>Identify ways technology is used in everyday life</li> </ul>	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>Identify ways technology is used in everyday life</li> </ul>
	<b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>Identify observable body parts of animals</li> <li>Identify life cycles of familiar organisms</li> <li>Identify the basic life requirements of plants and animals</li> <li>Identify functions of plant parts</li> <li>Identify how parents and their young look alike</li> <li>Identify animal adaptations</li> <li>Identify the effects of humans on the environment</li> </ul>	<b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>Identify observable body parts of animals</li> <li>Identify life cycles of familiar organisms</li> <li>Identify the basic life requirements of plants and animals</li> <li>Identify functions of plant parts</li> <li>Identify how parents and their young look alike</li> <li>Identify animal adaptations</li> <li>Identify the effects of humans on the environment</li> </ul>	<b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>Identify observable body parts of animals</li> <li>Identify life cycles of familiar organisms</li> <li>Identify the basic life requirements of plants and animals</li> <li>Identify functions of plant parts</li> <li>Identify how parents and their young look alike</li> <li>Identify animal adaptations</li> <li>Identify the effects of humans on the environment</li> </ul>
<b>Elementary Performance Level Descriptor</b>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>Identify useful properties of materials</li> <li>Identify mixtures/components of</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>Identify useful properties of materials</li> <li>Identify mixtures/components of</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>Identify useful properties of materials</li> <li>Identify mixtures/components of</li> </ul>

	<p>mixtures</p> <ul style="list-style-type: none"> <li>• Identify common physical changes in matter</li> <li>• Describe the motion of common objects</li> <li>• Describe the interaction of magnetic/non-magnetic materials</li> <li>• Identify simple machines used to change effort</li> <li>• Identify properties and sources of sounds</li> <li>• Identify sources of light/shadow</li> </ul>	<p>mixtures</p> <ul style="list-style-type: none"> <li>• Identify common physical changes in matter</li> <li>• Describe the motion of common objects</li> <li>• Describe the interaction of magnetic/non-magnetic materials</li> <li>• Identify simple machines used to change effort</li> <li>• Identify properties and sources of sounds</li> <li>• Identify sources of light/shadow</li> </ul>	<p>mixtures</p> <ul style="list-style-type: none"> <li>• Identify common physical changes in matter</li> <li>• Describe the motion of common objects</li> <li>• Describe the interaction of magnetic/non-magnetic materials</li> <li>• Identify simple machines used to change effort</li> <li>• Identify properties and sources of sounds</li> <li>• Identify sources of light/shadow</li> </ul>
	<p><b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface/types of earth materials</li> <li>• Identify routines related to conservation</li> <li>• Identify the states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> </ul>	<p><b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface/types of earth materials</li> <li>• Identify routines related to conservation</li> <li>• Identify the states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> </ul>	<p><b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface/types of earth materials</li> <li>• Identify routines related to conservation</li> <li>• Identify the states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> </ul>

**MIDDLE SCHOOL SCIENCE – Functional Independence**

Grade Span	Emerging	Attained	Surpassed
<p align="center"><b>Middle School General Statement</b></p>	<p>Based on the <i>Functional Independence EBs</i>,<sup>2</sup> a student who is <b>emerging toward the performance standard</b> should typically be able to...</p>	<p>Based on the <i>Functional Independence EBs</i>, a student who <b>attained the performance standard</b> should typically be able to...</p>	<p>Based on the <i>Functional Independence EBs</i>,<sup>2</sup> a student who <b>surpassed the performance standard</b> should typically be able to...</p>
<p align="center"><b>Middle School Performance Level Descriptor</b></p>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify questions based on observation and/or description</li> <li>• Identify tools that aid in scientific investigation/measurement</li> <li>• Identify sources of scientific information</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify questions based on observation and/or description</li> <li>• Identify tools that aid in scientific investigation/measurement</li> <li>• Identify sources of scientific information</li> </ul>	<p><b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify questions based on observation and/or description</li> <li>• Identify tools that aid in scientific investigation/measurement</li> <li>• Identify sources of scientific information</li> </ul>
	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify how science relates to the world around them</li> <li>• Identify ways technology is used in everyday life</li> </ul>	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify how science relates to the world around them</li> <li>• Identify ways technology is used in everyday life</li> </ul>	<p><b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify how science relates to the world around them</li> <li>• Identify ways technology is used in everyday life</li> </ul>
	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Recognize that living things are made of cells</li> <li>• Identify observable body parts and/or systems of animals</li> <li>• Classify organisms</li> <li>• Identify life cycles of flowering plants</li> <li>• Identify functions of plant parts</li> <li>• Identify how species may become extinct</li> <li>• Describe relationships among populations in ecosystems</li> <li>• Identify that organisms acquire energy from sunlight</li> <li>• Identify how humans benefit from plant/animal materials</li> </ul>	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Recognize that living things are made of cells</li> <li>• Identify observable body parts and/or systems of animals</li> <li>• Classify organisms</li> <li>• Identify life cycles of flowering plants</li> <li>• Identify functions of plant parts</li> <li>• Identify how species may become extinct</li> <li>• Describe relationships among populations in ecosystems</li> <li>• Identify that organisms acquire energy from sunlight</li> <li>• Identify how humans benefit from plant/animal materials</li> </ul>	<p><b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Recognize that living things are made of cells</li> <li>• Identify observable body parts and/or systems of animals</li> <li>• Classify organisms</li> <li>• Identify life cycles of flowering plants</li> <li>• Identify functions of plant parts</li> <li>• Identify how species may become extinct</li> <li>• Describe relationships among populations in ecosystems</li> <li>• Identify that organisms acquire energy from sunlight</li> <li>• Identify how humans benefit from plant/animal materials</li> </ul>

<b>Middle School Performance Level Descriptor</b>	<p><b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Describe properties of objects/substances</li> <li>• Recognize that items consist of smaller particles</li> <li>• Identify simple electrical circuits</li> <li>• Describe common physical/chemical changes in matter</li> <li>• Identify common energy transformations</li> <li>• Describe the motion of common objects</li> <li>• Describe the interaction of magnetic/non-magnetic materials</li> <li>• Identify simple machines used to change effort</li> <li>• Recognize how sound travels through different media</li> <li>• Identify sources of light/shadow</li> </ul>	<p><b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Describe properties of objects/substances</li> <li>• Recognize that items consist of smaller particles</li> <li>• Identify simple electrical circuits</li> <li>• Describe common physical/chemical changes in matter</li> <li>• Identify common energy transformations</li> <li>• Describe the motion of common objects</li> <li>• Describe the interaction of magnetic/non-magnetic materials</li> <li>• Identify simple machines used to change effort</li> <li>• Recognize how sound travels through different media</li> <li>• Identify sources of light/shadow</li> </ul>	<p><b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Describe properties of objects/substances</li> <li>• Recognize that items consist of smaller particles</li> <li>• Identify simple electrical circuits</li> <li>• Describe common physical/chemical changes in matter</li> <li>• Identify common energy transformations</li> <li>• Describe the motion of common objects</li> <li>• Describe the interaction of magnetic/non-magnetic materials</li> <li>• Identify simple machines used to change effort</li> <li>• Recognize how sound travels through different media</li> <li>• Identify sources of light/shadow</li> </ul>
	<p><b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface using maps</li> <li>• Identify routines related to conservation</li> <li>• Identify states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> <li>• Identify effects of pollution</li> <li>• Demonstrate awareness of the motion of the earth/moon</li> </ul>	<p><b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface using maps</li> <li>• Identify routines related to conservation</li> <li>• Identify states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> <li>• Identify effects of pollution</li> <li>• Demonstrate awareness of the motion of the earth/moon</li> </ul>	<p><b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to:</p> <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface using maps</li> <li>• Identify routines related to conservation</li> <li>• Identify states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> <li>• Identify effects of pollution</li> <li>• Demonstrate awareness of the motion of the earth/moon</li> </ul>

### HIGH SCHOOL SCIENCE – Functional Independence

Grade Span	Emerging	Attained	Surpassed
<b>High School General Statement</b>	Based on the <i>Functional Independence EBs</i> , <sup>2</sup> a student who is <b>emerging toward the performance standard</b> should typically be able to...	Based on the <i>Functional Independence EBs</i> , <sup>2</sup> a student who <b>attained the performance standard</b> should typically be able to...	Based on the <i>Functional Independence EBs</i> , a student who <b>surpassed the performance standard</b> should typically be able to...
<b>High School Performance Level Descriptor</b>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify questions based on observation and/or description</li> <li>• Identify tools that aid in scientific investigation/measurement</li> </ul>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify questions based on observation and/or description</li> <li>• Identify tools that aid in scientific investigation/measurement</li> </ul>	<b>Constructing New Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify questions based on observation and/or description</li> <li>• Identify tools that aid in scientific investigation/measurement</li> </ul>
	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify how science relates to the world around them</li> </ul>	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify how science relates to the world around them</li> </ul>	<b>Reflecting on Scientific Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify how science relates to the world around them</li> </ul>
	<b>Using Life Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Recognize that living things are made of cells</li> <li>• Identify observable body parts of animals</li> <li>• Classify organisms</li> <li>• Identify the basic life requirements of plants and animals</li> <li>• Identify how living things maintain a healthy balance</li> <li>• Identify how characteristics are passed on through generations</li> <li>• Describe relationships among populations in ecosystems</li> <li>• Identify how organisms acquire energy</li> <li>• Identify the effects of human activity on ecosystems</li> </ul>	<b>Using Life Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Recognize that living things are made of cells</li> <li>• Identify observable body parts of animals</li> <li>• Classify organisms</li> <li>• Identify the basic life requirements of plants and animals</li> <li>• Identify how living things maintain a healthy balance</li> <li>• Identify how characteristics are passed on through generations</li> <li>• Describe relationships among populations in ecosystems</li> <li>• Identify how organisms acquire energy</li> <li>• Identify the effects of human activity on ecosystems</li> </ul>	<b>Using Life Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Recognize that living things are made of cells</li> <li>• Identify observable body parts of animals</li> <li>• Classify organisms</li> <li>• Identify the basic life requirements of plants and animals</li> <li>• Identify how living things maintain a healthy balance</li> <li>• Identify how characteristics are passed on through generations</li> <li>• Describe relationships among populations in ecosystems</li> <li>• Identify how organisms acquire energy</li> <li>• Identify the effects of human activity on ecosystems</li> </ul>

<b>High School Performance Level Descriptor</b>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Classify common objects according to observable attributes</li> <li>• Identify useful properties of materials</li> <li>• Identify mixtures/components of mixtures</li> <li>• Recognize that items consist of smaller particles</li> <li>• Identify simple electrical circuits</li> <li>• Identify electrical hazards/how current is controlled in simple electrical circuits</li> <li>• Identify common energy transformations</li> <li>• Describe the forces exerted by magnets, electrically charged objects, or gravity</li> <li>• Identify machines used to change effort</li> <li>• Identify properties and sources of sounds</li> <li>• Identify how light interacts with matter</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Classify common objects according to observable attributes</li> <li>• Identify useful properties of materials</li> <li>• Identify mixtures/components of mixtures</li> <li>• Recognize that items consist of smaller particles</li> <li>• Identify simple electrical circuits</li> <li>• Identify electrical hazards/how current is controlled in simple electrical circuits</li> <li>• Identify common energy transformations</li> <li>• Describe the forces exerted by magnets, electrically charged objects, or gravity</li> <li>• Identify machines used to change effort</li> <li>• Identify properties and sources of sounds</li> <li>• Identify how light interacts with matter</li> </ul>	<b>Using Physical Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Classify common objects according to observable attributes</li> <li>• Identify useful properties of materials</li> <li>• Identify mixtures/components of mixtures</li> <li>• Recognize that items consist of smaller particles</li> <li>• Identify simple electrical circuits</li> <li>• Identify electrical hazards/how current is controlled in simple electrical circuits</li> <li>• Identify common energy transformations</li> <li>• Describe the forces exerted by magnets, electrically charged objects, or gravity</li> <li>• Identify machines used to change effort</li> <li>• Identify properties and sources of sounds</li> <li>• Identify how light interacts with matter</li> </ul>
	<b>Using Earth Science Knowledge</b> Demonstrate a <i>limited</i> ability to: <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface/types of earth materials</li> <li>• Identify routines related to conservation/recycling</li> <li>• Identify the impact of human activity on the environment</li> <li>• Identify the states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>basic</i> ability to: <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface/types of earth materials</li> <li>• Identify routines related to conservation/recycling</li> <li>• Identify the impact of human activity on the environment</li> <li>• Identify the states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> </ul>	<b>Using Earth Science Knowledge</b> Demonstrate a <i>consistent</i> ability to: <ul style="list-style-type: none"> <li>• Identify features of and changes in the earth's surface/types of earth materials</li> <li>• Identify routines related to conservation/recycling</li> <li>• Identify the impact of human activity on the environment</li> <li>• Identify the states/sources/uses of water</li> <li>• Identify weather conditions/seasonal changes/safety precautions</li> </ul>

# Appendix B – Agenda for Sessions



## AGENDA

### MI-ACCESS STANDARD SETTING

### Grade 11 Participation, Supported Independence, & Functional Independence Science Assessments

#### DAY 1

April 29 – MORNING

8:30 – 9:30

#### **Welcome, Introductions, Logistics** (Vince Dean)

*Large-Group session – all panels together*

- Place of this activity in the overall *MI-Access* schedule
- Logistics – expenses/honoraria, schedule, problem-solving

#### **Overview of *MI-Access* Assessment System** (Vince Dean)

- *Current* Participation, Supported Independence, and Functional Independence Assessments
- Next steps for *MI-Access* Program

#### **Current Status of *MI-Access* P/SI/FI Assessments & Standards** (Vince Dean)

- Alignment of P/SI/FI with EGLCEs, EHSCE, and EB
- Performance Standards set for *MI-Access* P/SI/FI ELA and Math, and statewide impact data for these
- Overview of *MI-Access* Science assessments
- How the *MI-Access* Science assessments are scored

9:30 – 10:45

### **Setting Performance Standards – General Process**

(Mike Beck)

- Agenda for the two days
- Delimit the panels' activities – "Ground rules"
- What does it mean to set "performance standards"?
- Overview of the general process of setting standards
- Process of placing cut scores to segment a continuum of performance
  1. Drawing a discrete cutoff (threshold students)
  2. Errors of classification in any measurement process
  3. Why multiple rounds are required
  4. Keys to making good judgments
  5. What happens *next* – panels as advisory, not decision-makers

11:00 – 12:00

### **Definitions and Description of Performance Standards**

*panelists break into 3 individual groups, separately facilitated*

- Performance Level Descriptors developed by the state and the Science PLD Committee and their import/use
- What does *mean* for a Grade 11 student to be described this way – What can these students *do*? What do they *know*?
- Generate comments for each panel

April 29– AFTERNOON

1:00 – 2:00

### **"Experience" the Assessments**

*continued after lunch as necessary*

- "Take" the actual assessment on which performance standards will be set – answer questions, take notes
- Discuss the test – content, concerns, difficulty, "construct" issues

2:00 – 2:45

### **Orientation to the Specific Standard-Setting Methodology**

- "Mechanics" of setting standards
- Judges' task
- Features of the procedure

2:45 – 3:30

### **Preparation for Round 1 of Judgments**

- Reminders of key issues – threshold, PLDs, all *MI-Access* students
- Distribute materials and orient panelists to use
- What to do – mechanics of making judgments for all cuts

- Rules for judgments – anonymity, independence, security of materials
- Day 2 preview

**3:45 – 5:00** (or until completion) **First Round of Judges' Work**

Panelists work independently, turning in their rating sheets and leaving for the day when completed.

**DAY 2**

**April 30 – MORNING**

**8:30 – 8:45                      Review of Round 1 Issues and Problems**

- Questions/Observations of judges to the process in Round 1
- Clarification of general issues and “mechanics” of the process

**8:45 – 10:45                      Feedback & Discussion of Round 1 Judgments**

- Round 1 feedback – Graphic portrayal of panelists' judgments (anonymous)
- Meaning of Round 1 judgments - distribution of cuts, median/mean cut
- Discussion of *WHY's* for Round 1 (i.e., what led panelists to set their standards as they did? Problems, issues, confusions, rationales for preliminary standards)
- Discussion of selected items or score points on extremes and near the middle of the Round 1 distribution of cuts
- “Shaping” of panelists' considerations, focusing on critical considerations (threshold performance, “should vs. will,” PLDs, item rating procedural confusions, construct issues)
- Purpose of Rounds 2 & 3 – reflection, reconsideration, and comfort, not consensus
- Present statewide student performance data by activity (*task difficulty* values)
- What the data *mean* and why they are only minimally useful in setting standards
- Reminder of key considerations

**11:00 – 12:00** (or completion)      **Round 2 of Judges' Work**

Opportunity to reconsider and adjust Round 1 judgments for both tests

April 30 – AFTERNOON

**1:00 – 2:30      Review of Round 2 Judgments**

- Questions/Observations of judges on the process
- Feedback and discussions much like that for Round 1
- Projected “impact data” – implications of the Round 2 recommendations
- Discussion of impact data from the ELA and Mathematics assessments, and the desirability of maintaining some consistency
- Discussion of selected items or score points

**2:30 – 3:00      Preparation for Final Judgments**

- Evaluation forms
- Questions, reminders, wrap-up/thanks

**3:15 – 4:15      Final Round of Judgments & Evaluation**  
*(or until completion)*

*Panelists depart as they finish work and turn in all materials and their evaluation forms.*

## Appendix C – Results By Round by Assessment Level

### Judge Recommendations by Round Participation - Science

Grade 11						
Judge	Attained			Surpassed		
	1	2	3	1	2	3
1	34	49	49	61	79	79
2	45	47	49	74	79	79
3	28	45	45	73	86	79
4	57	48	48	73	74	81
5	53	53	53	74	79	81
6	47	53	53	73	79	81
7	33	46	48	76	83	81

### Judge Recommendations by Round Supported Independence - Science

Grade 11						
Judge	Attained			Surpassed		
	1	2	3	1	2	3
1	18	24	31	47	60	61
2	15	23	35	47	55	61
3	21	31	31	55	63	63
4	23	23	36	56	56	62
5	32	24	29	44	55	55
6	30	34	34	52	57	59
7	36	31	36	55	55	59
8	20	34	34	60	60	62

## Judge Recommendations by Round Functional Independence - Science

### Grade 11

Judge	Attained				Surpassed			
	1	2	3	4	1	2	3	4
1	10	20	20	20	32	38	38	38
2	19	20	20	19	37	38	37	39
3	21	19	19	19	37	40	39	38
4	17	19	20	17	40	40	40	40
5	7	17	19	19	26	41	37	37
6	27	28	26	26	35	35	39	39
7	28	28	26	26	43	36	37	37

## Appendix D – Summary Statistics – Participation

MI-Access Participation - Science Grade 11

### Item Difficulty Sequence Cuts (Maximum Activity Score = 90)

	Attained			Surpassed		
	Median	Mean	SD	Median	Mean	SD
Round 1	45	42.4	11.0	73	72.0	5.0
Round 2	48	48.7	3.2	79	79.9	3.8
Round 3	<b>49</b>	49.3	2.9	<b>81</b>	80.1	1.1
Recommended	<b>49</b>			<b>81</b>		

### Percent of Students by Performance Category

	Emerging	Attained	Surpassed
Round 1	50	26	24
Round 2	52	33	15
Round 3	<b>54</b>	<b>34</b>	<b>13</b>

### Round 3 Summary Statistics

	Attained	Surpassed
Number of Judges	7	7
SEMean	1.1	0.4
SEMedian	1.4	0.5
SEM (Test)	7.1	7.1
SEMedian + SEM	8.5	7.6

## Appendix E – Summary Statistics – Supported Independence

MI-Access Supported Independence - Science Grade 11

### Item Difficulty Sequence Cuts (Maximum Activity Score = 68)

	Attained			Surpassed		
	Median	Mean	SD	Median	Mean	SD
Round 1	22	24.4	7.4	54	52.0	5.5
Round 2	28	28.0	5.0	57	57.6	3.0
Round 3	<b>34</b>	33.3	2.6	<b>61</b>	60.3	2.5
Recommended	<b>34</b>			<b>61</b>		

### Percent of Students by Performance Category

	Emerging	Attained	Surpassed
Round 1	11	50	39
Round 2	15	57	28
Round 3	<b>23</b>	<b>61</b>	<b>16</b>

### Round 3 Summary Statistics

	Attained	Surpassed
Number of Judges	8	8
SEMean	0.9	0.9
SEMedian	1.2	1.1
SEM (Test)	5.9	5.9
SEMedian + SEM	7.1	7.0

# Appendix F – Summary Statistics - Functional Independence

## MI-Access Functional Independence Science Grade 11

### Item Difficulty Booklet Sequence Cuts (Maximum Score = 45)

	Attained			Surpassed		
	Median	Mean	SD	Median	Mean	SD
Round 1	19	18.4	7.9	37	35.7	5.5
Round 2	20	21.6	4.5	38	38.3	2.2
Round 3	20	21.4	3.2	38	38.1	1.2
Round 4 (final) & <b>Recommended</b>	<b>19</b>	20.9	3.6	<b>38</b>	38.3	1.1

### Percent of Students by Performance Category

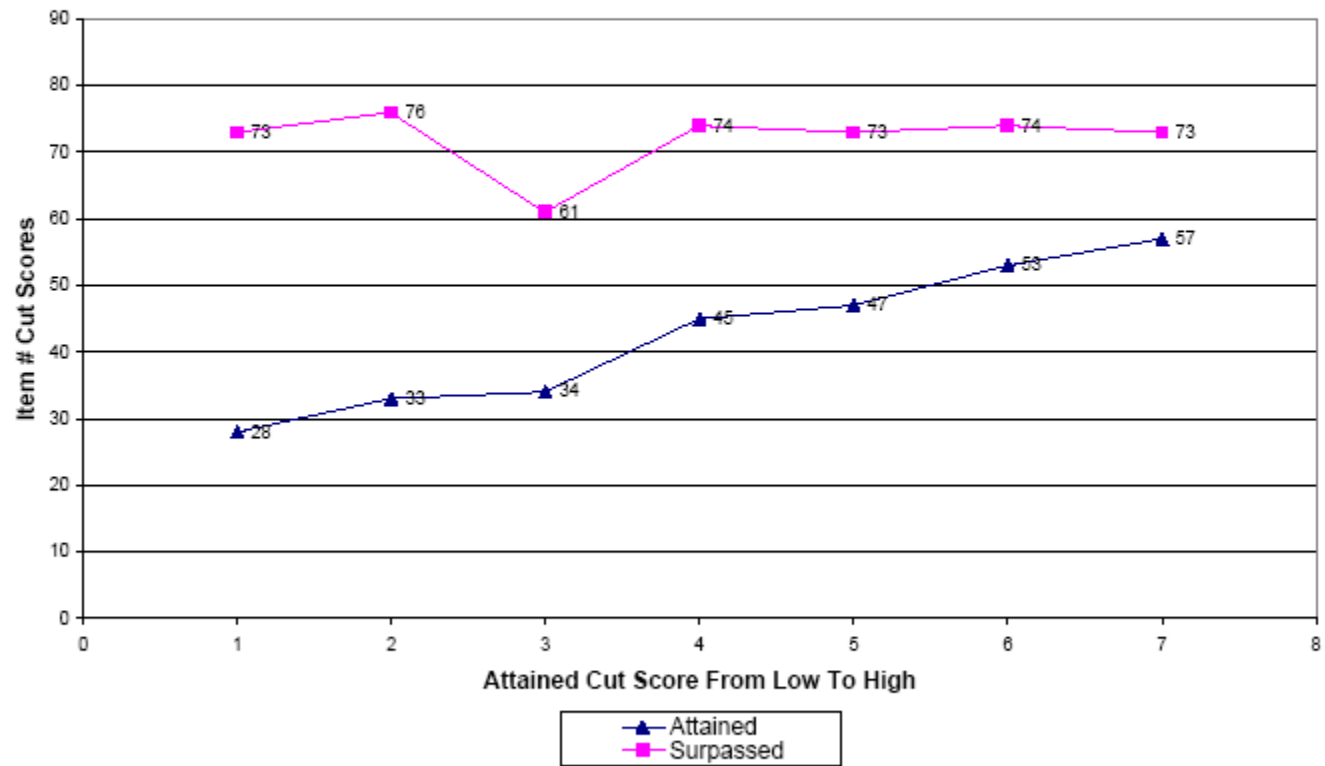
	Emerging	Attained	Surpassed
Round 1	37	34	29
Round 2	43	32	26
Round 3	43	32	26
Round 4	37	37	26

### Round 4 Summary Statistics

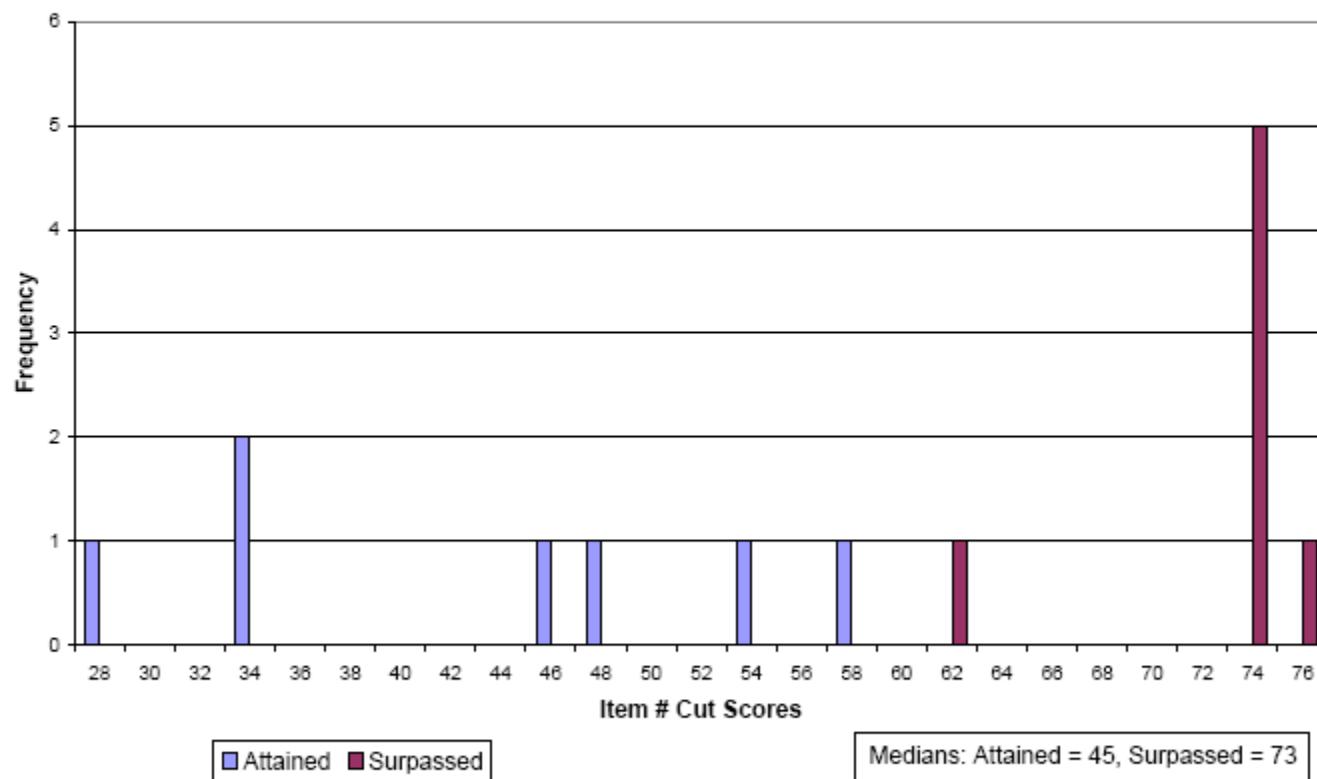
	Attained	Surpassed
Number of Judges	7	7
SE <sub>Mean</sub>	1.4	0.4
SE <sub>Median</sub>	1.7	0.5
SEM (Test)	3.1	3.1
SE <sub>Composite(Median + SEM)</sub>	4.8	3.6

## Appendix G – Round 1 Recommendations by Assessment Level

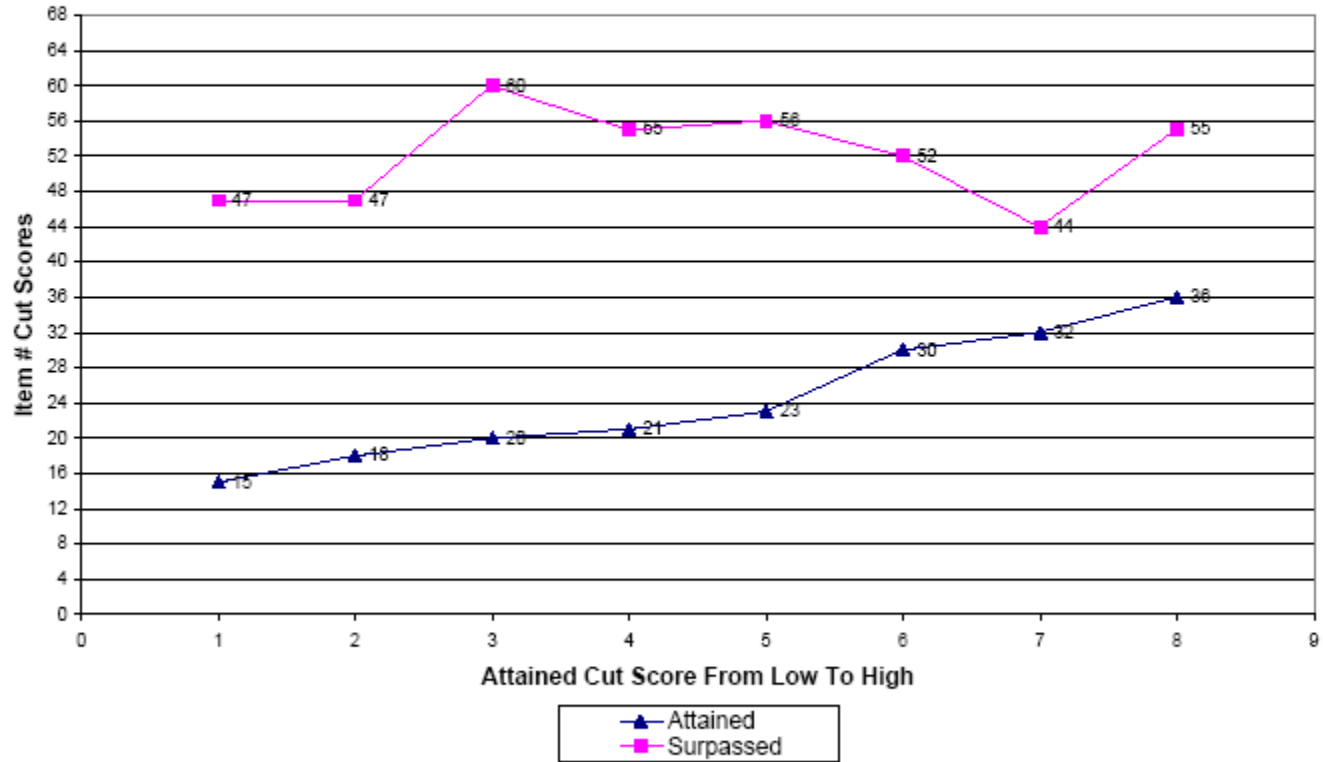
MI-Access Participation  
Science Grade 11 -- Round 1  
Standard Setting - April 29-30, 2008



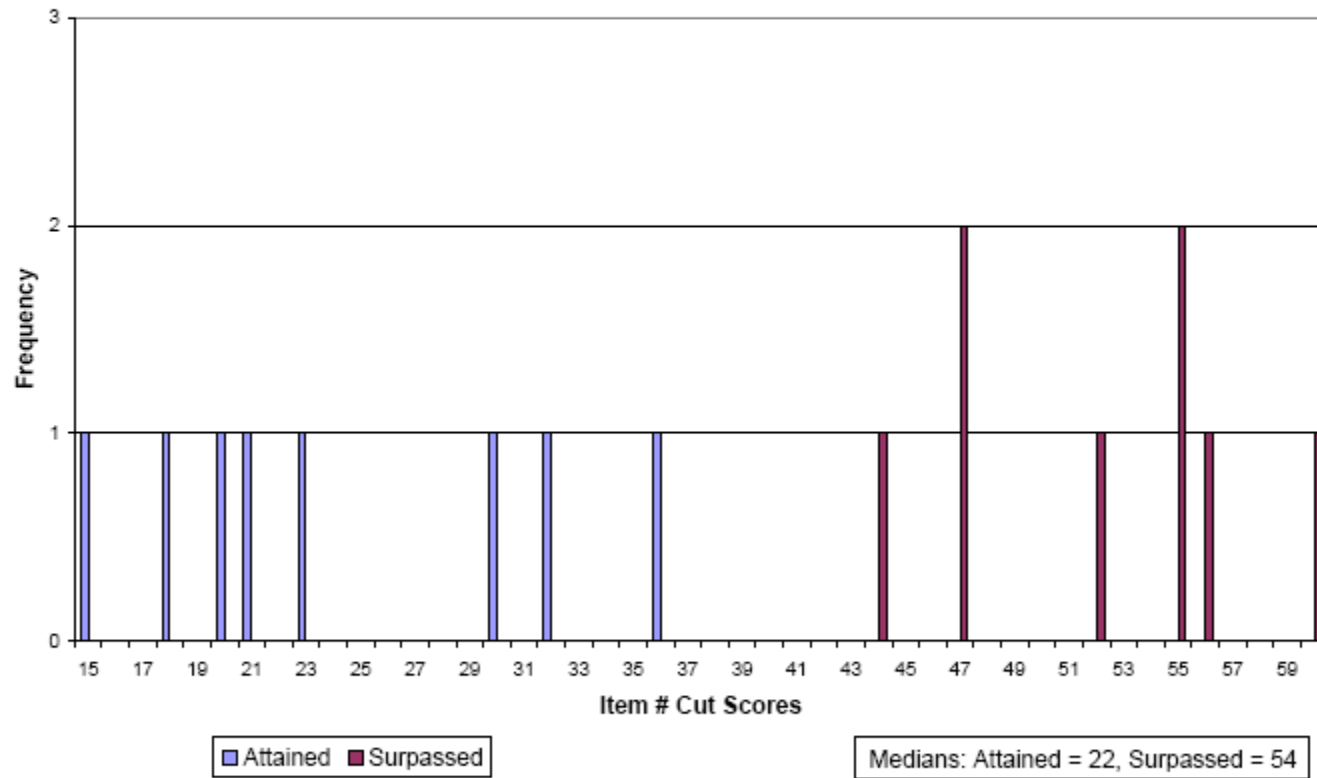
MI-Access - Participation  
Science Grade 11 -- Round 1  
Standard Setting - April 29-30, 2008



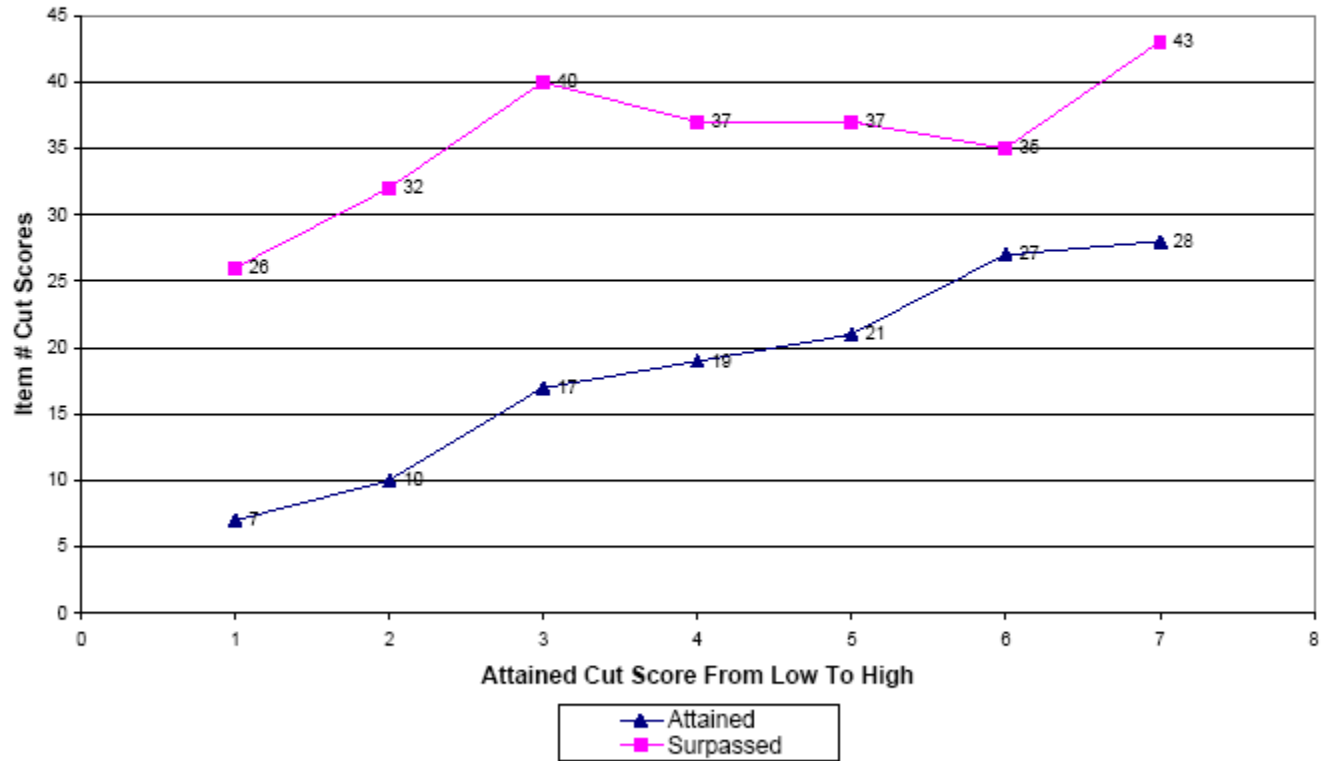
MI-Access Supported Independence  
Science Grade 11 -- Round 1  
Standard Setting - April 29-30, 2008



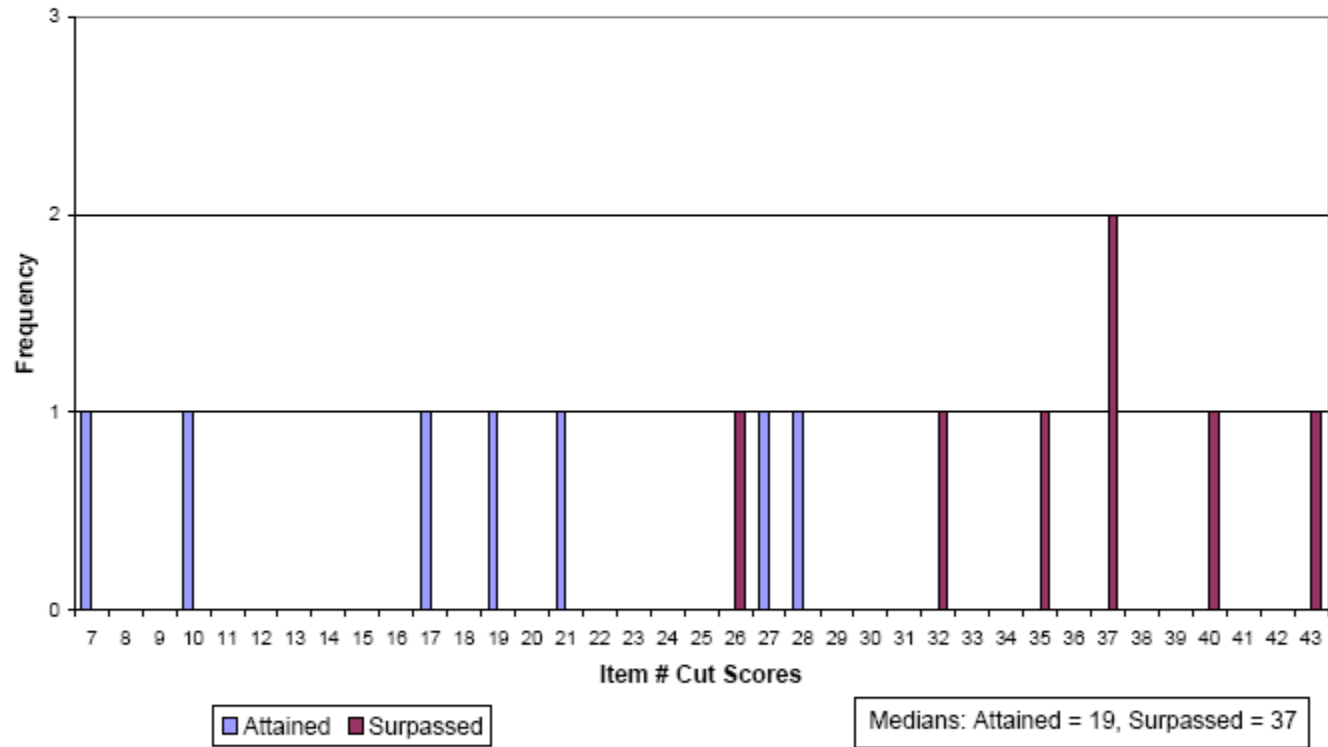
MI-Access - Supported Independence  
Science Grade 11 -- Round 1  
Standard Setting - April 29-30, 2008



MI-Access Functional Independence  
Science Grade 11 -- Round 1  
Standard Setting - April 29-30, 2008

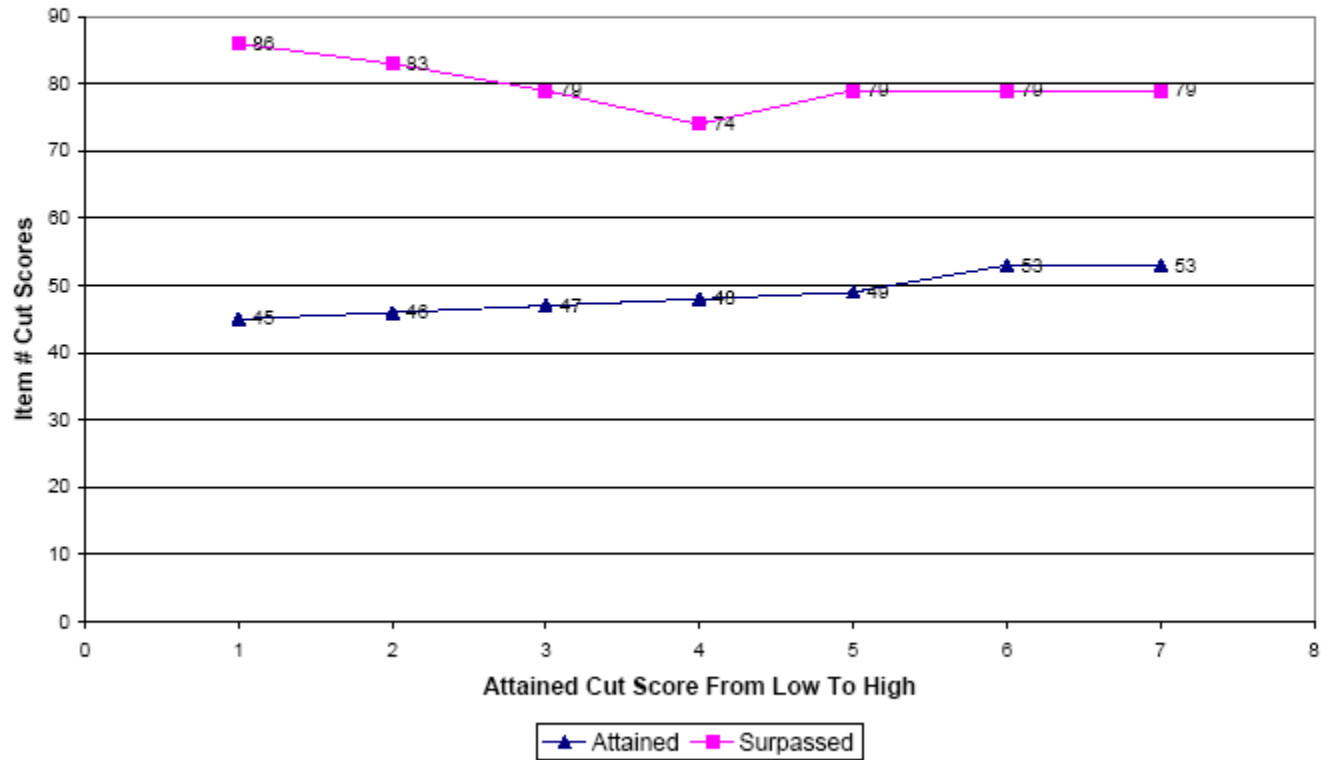


MI-Access - Functional Independence  
Science Grade 11 -- Round 1  
Standard Setting - April 29-30, 2008

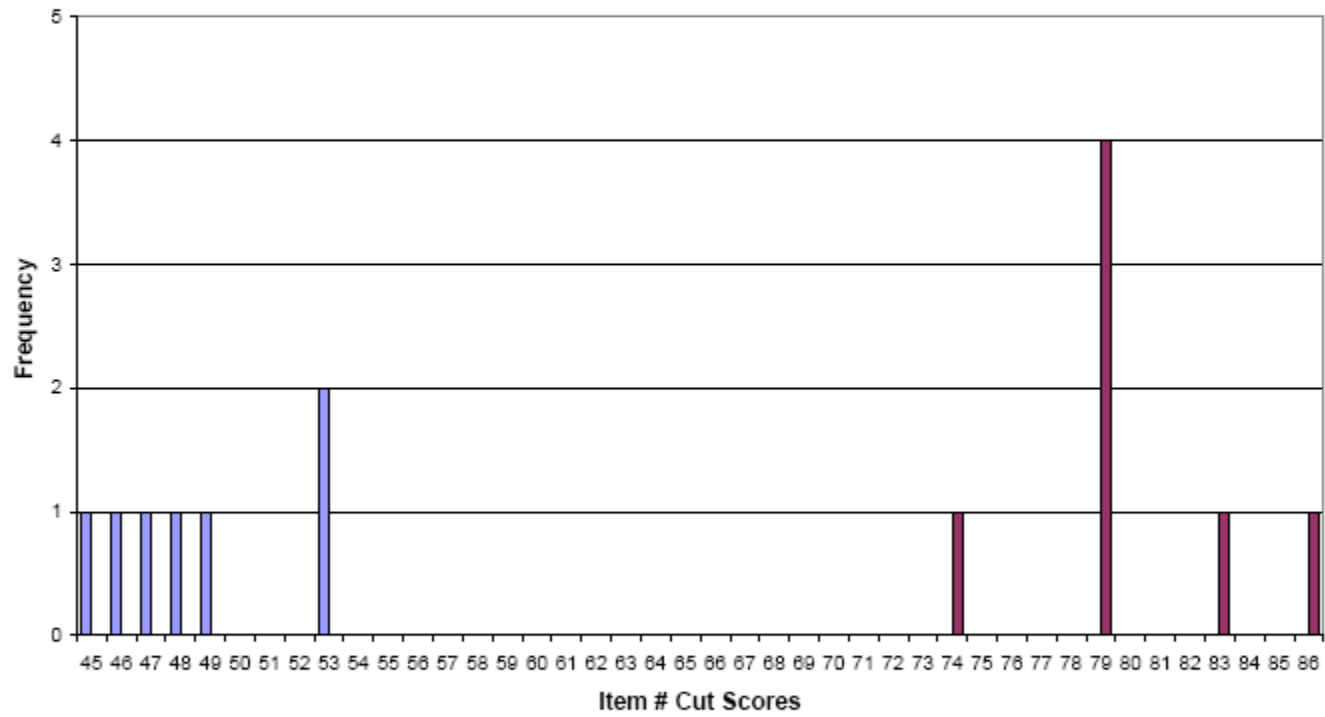


## Appendix H – Round 2 Recommendations by Assessment Level

MI-Access - Participation  
Science Grade 11 -- Round 2  
Standard Setting - April 29-30, 2008



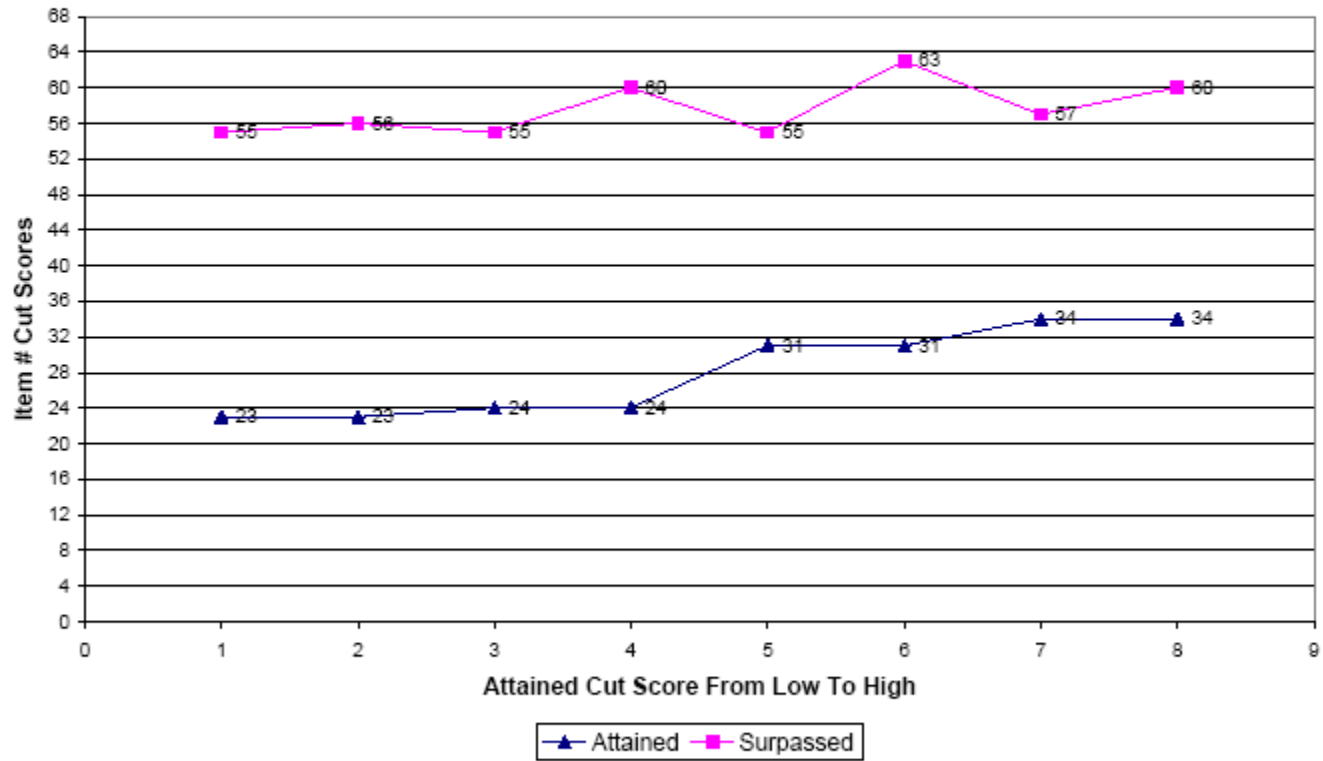
MI-Access - Participation  
Science Grade 11 -- Round 2  
Standard Setting - April 29-30, 2008



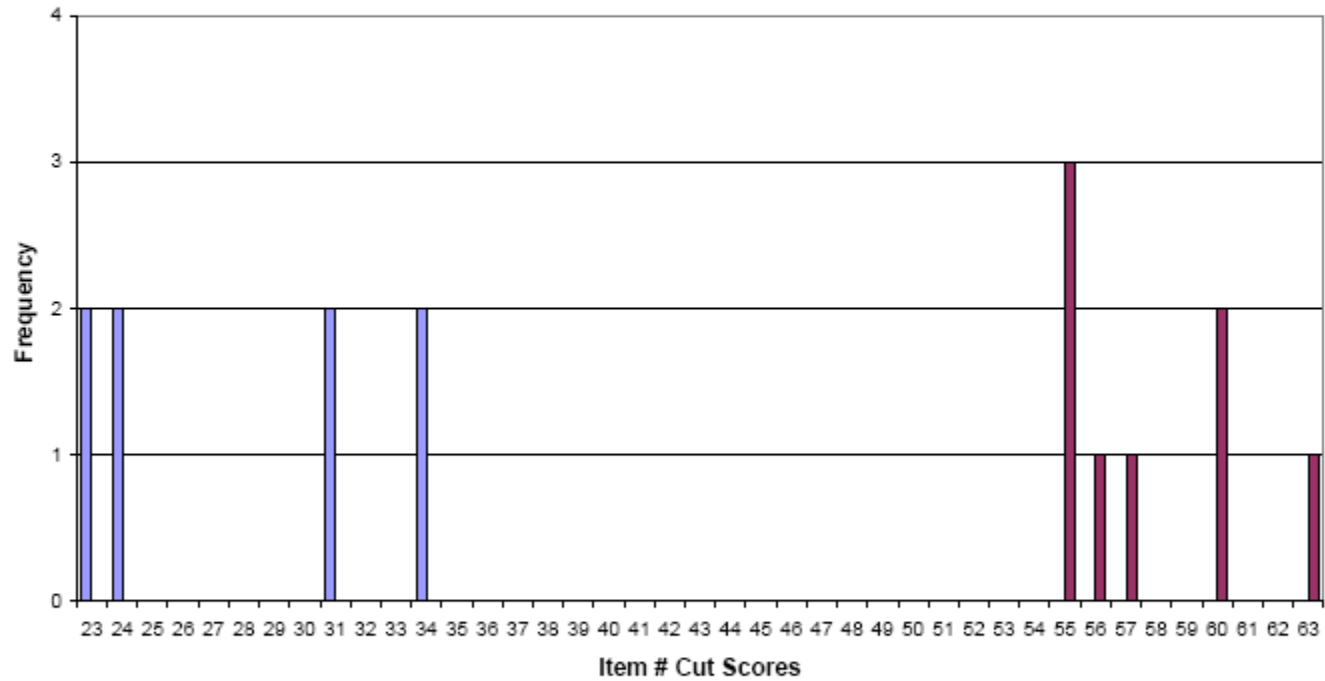
Attained Surpassed

Medians: Attained = 48, Surpassed = 79

MI-Access - Supported Independence  
Science Grade 11 -- Round 2  
Standard Setting - April 29-30, 2008



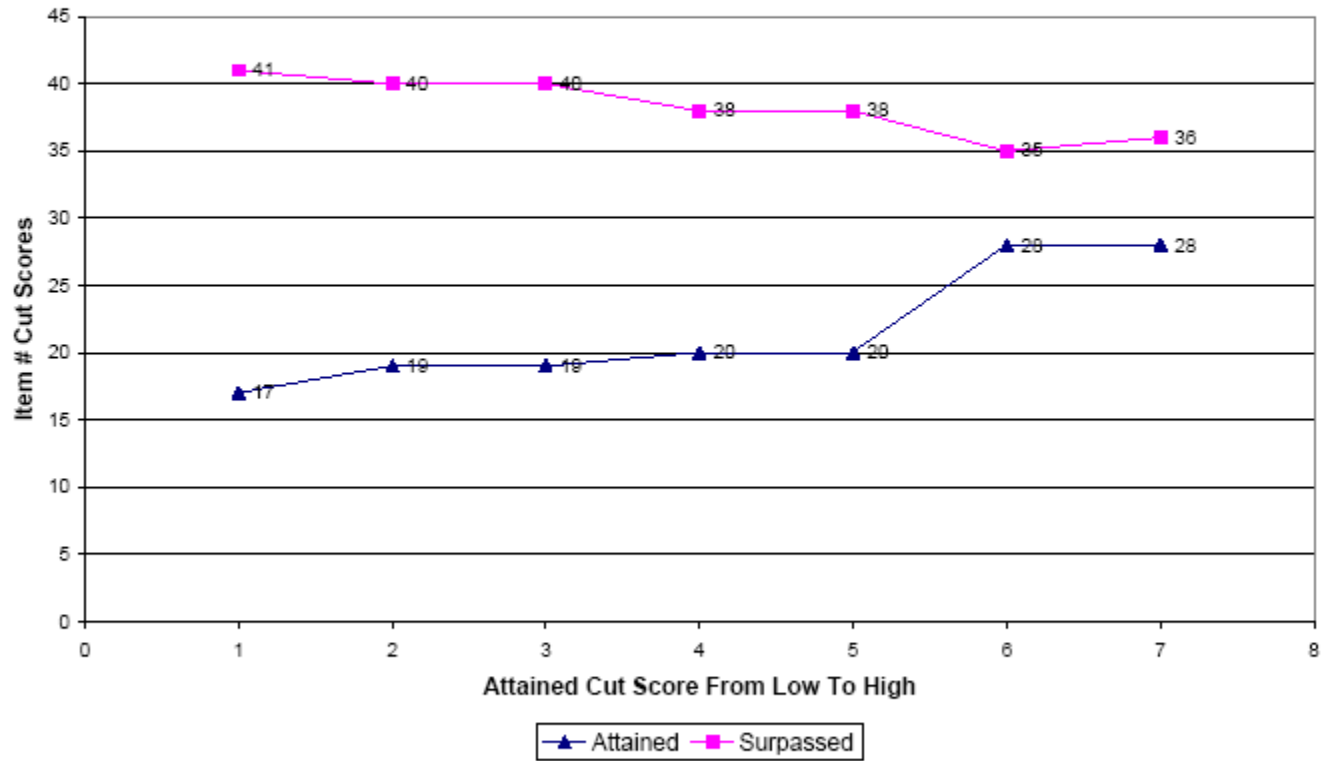
MI-Access - Supported Independence  
Science Grade 11 -- Round 2  
Standard Setting - April 29-30, 2008



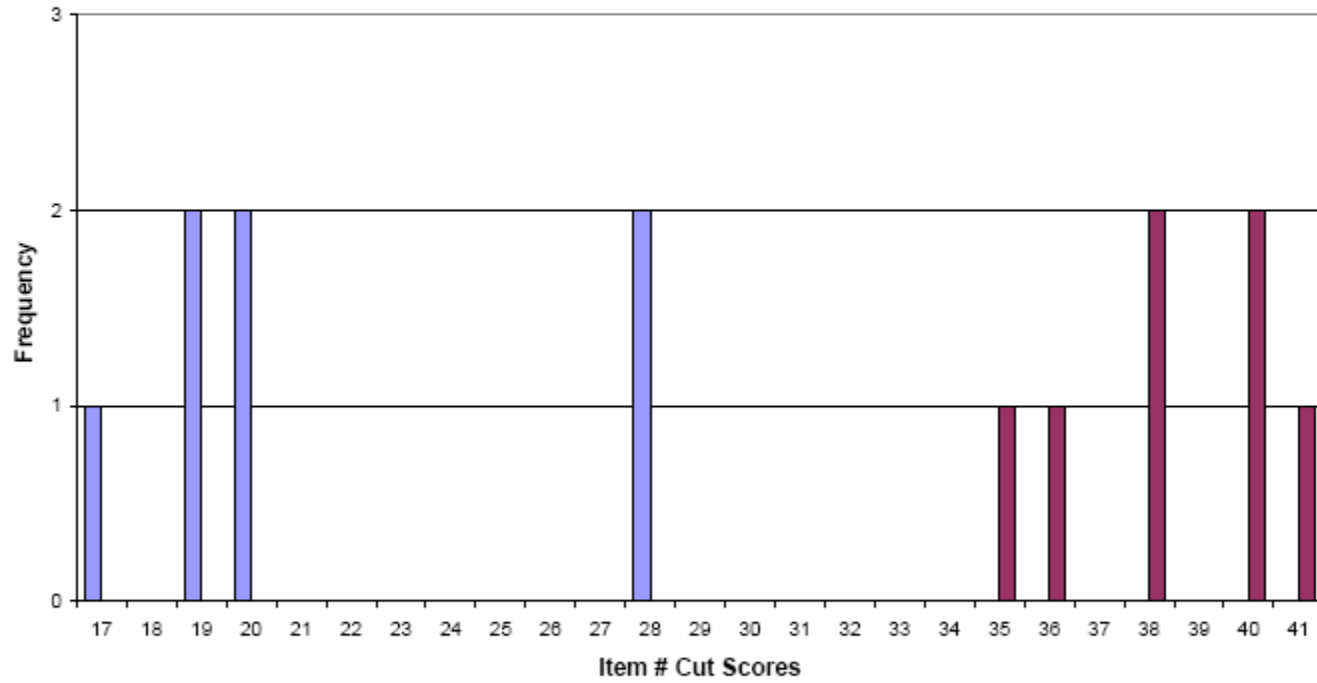
Attained Surpassed

Medians: Attained = 28, Surpassed = 57

MI-Access - Functional Independence  
Science Grade 11 -- Round 2  
Standard Setting - April 29-30, 2008



MI-Access - Functional Independence  
Science Grade 11 -- Round 2  
Standard Setting - April 29-30, 2008

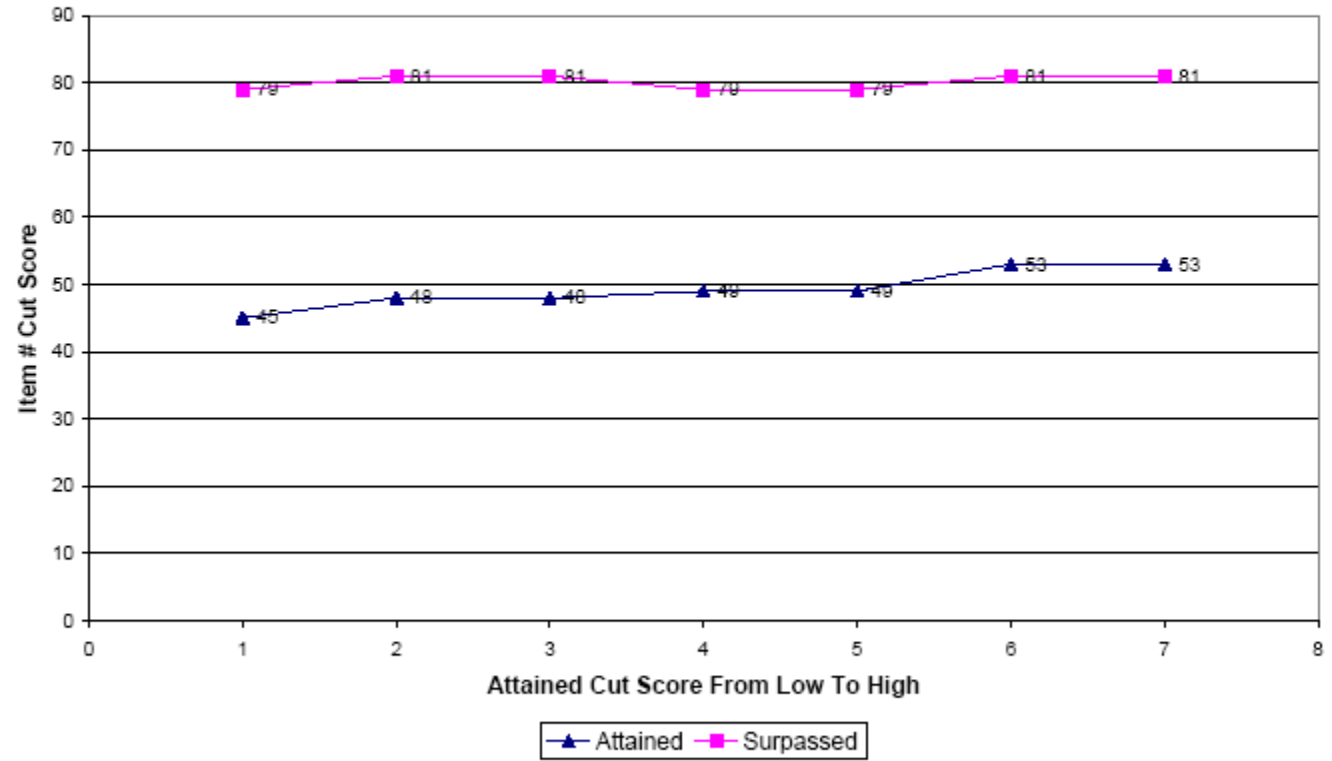


Attained Surpassed

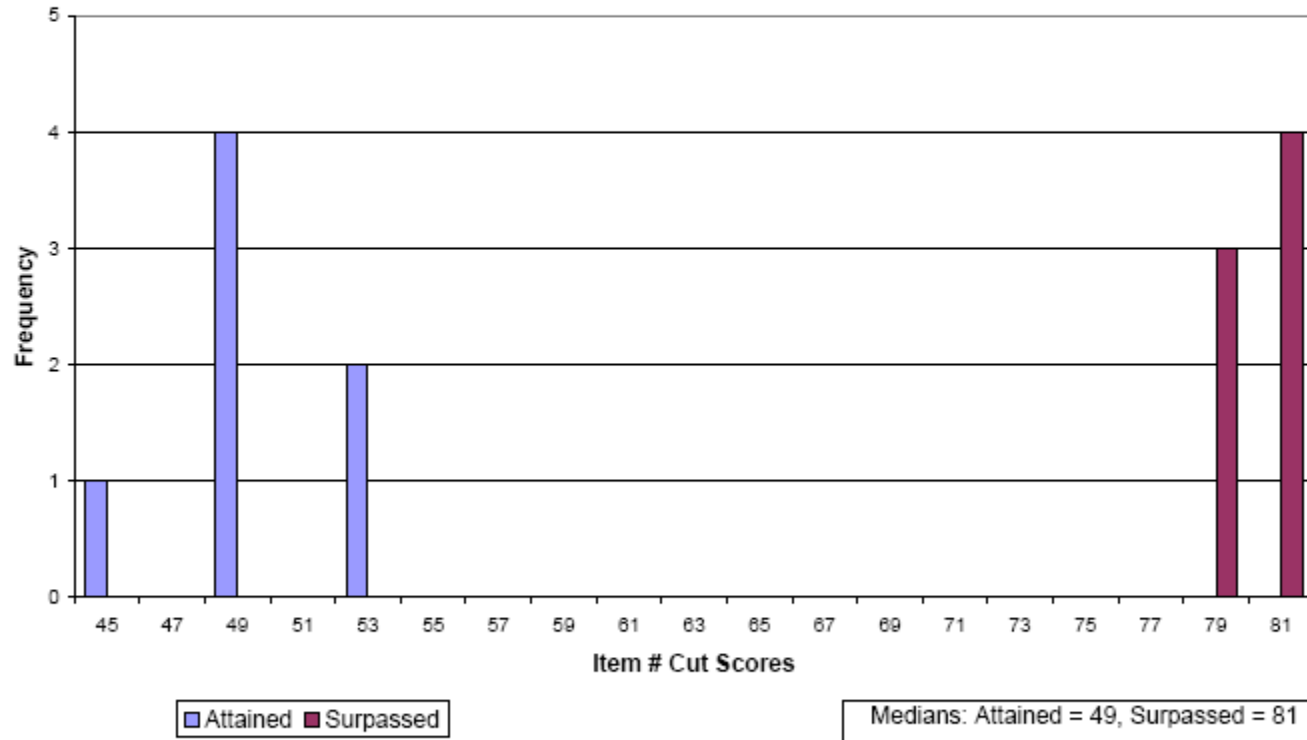
Medians: Attained = 20, Surpassed = 38

# Appendix I – Round 3 Recommendations, plus Round 4 for F.I.

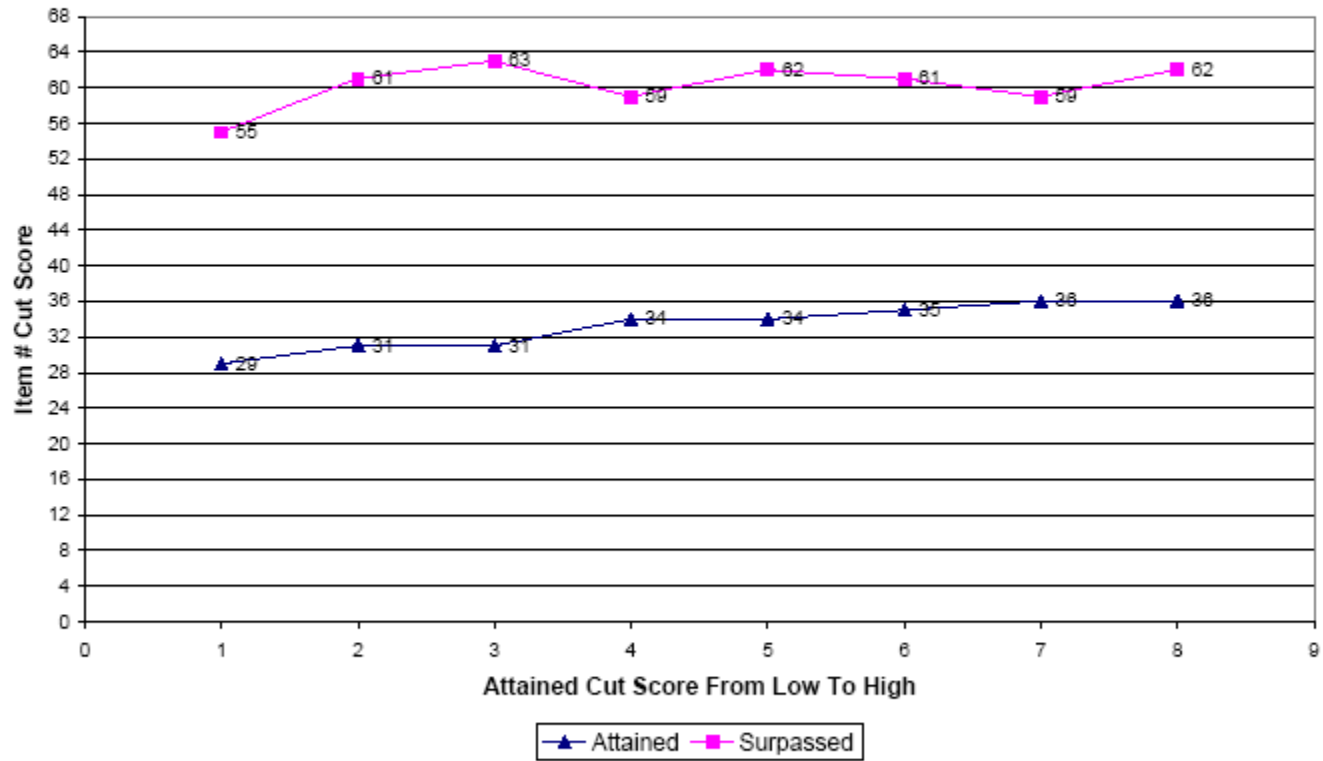
MI-Access - Participation  
Science Grade 1 -- Round 3  
Standard Setting - April 29-30, 2008



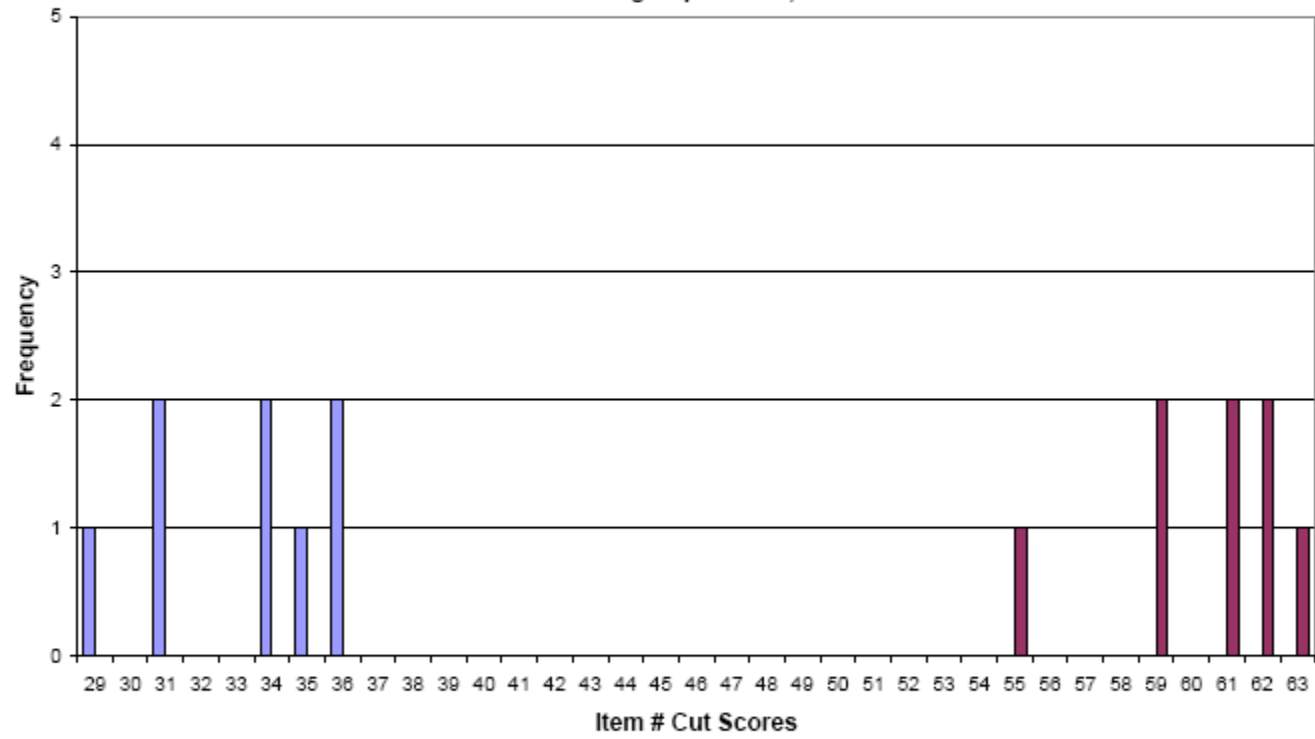
MI-Access - Participation  
Science Grade 11 -- Round 3  
Standard Setting - April 29-30, 2008



MI-Access - Supported Independence  
Science Grade 11 -- Round 3  
Standard Setting - April 29-30, 2008



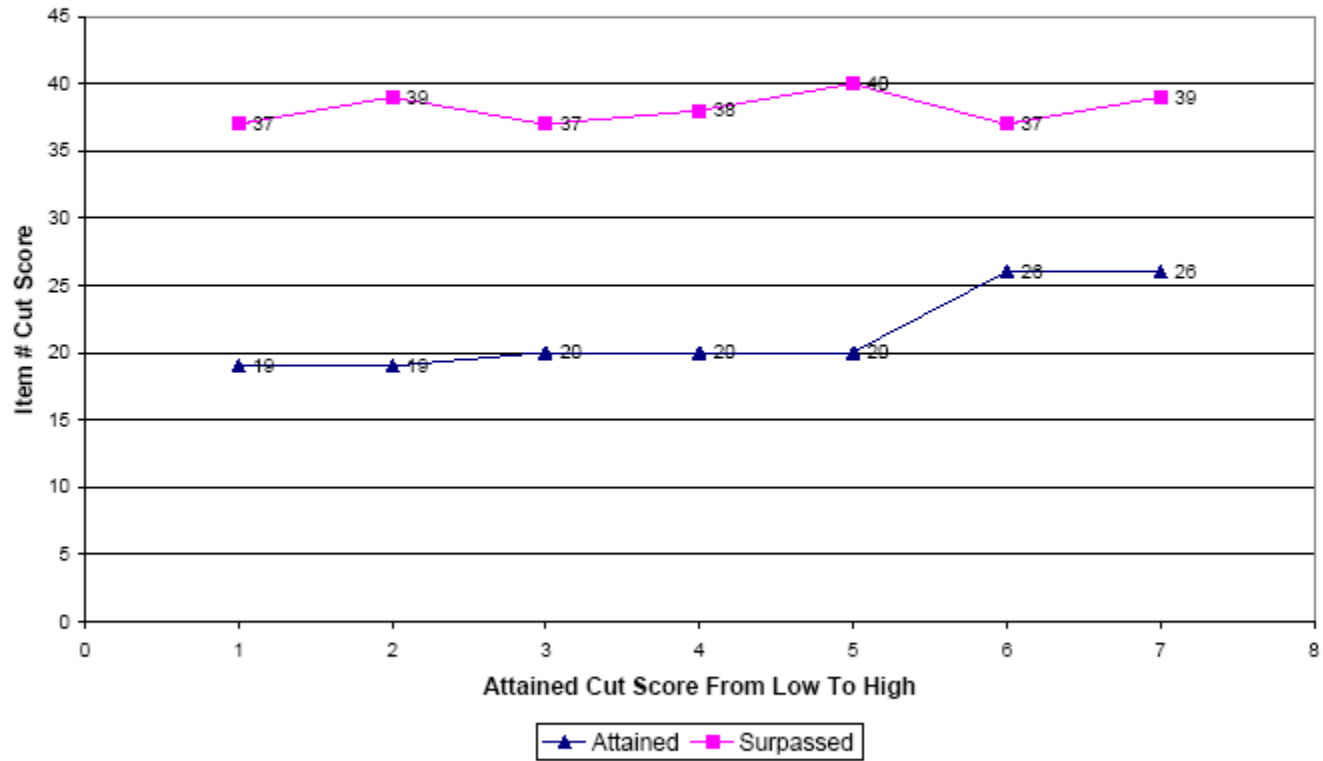
MI-Access - Supported Independence  
Science Grade 11 -- Round 3  
Standard Setting - April 29-30, 2008



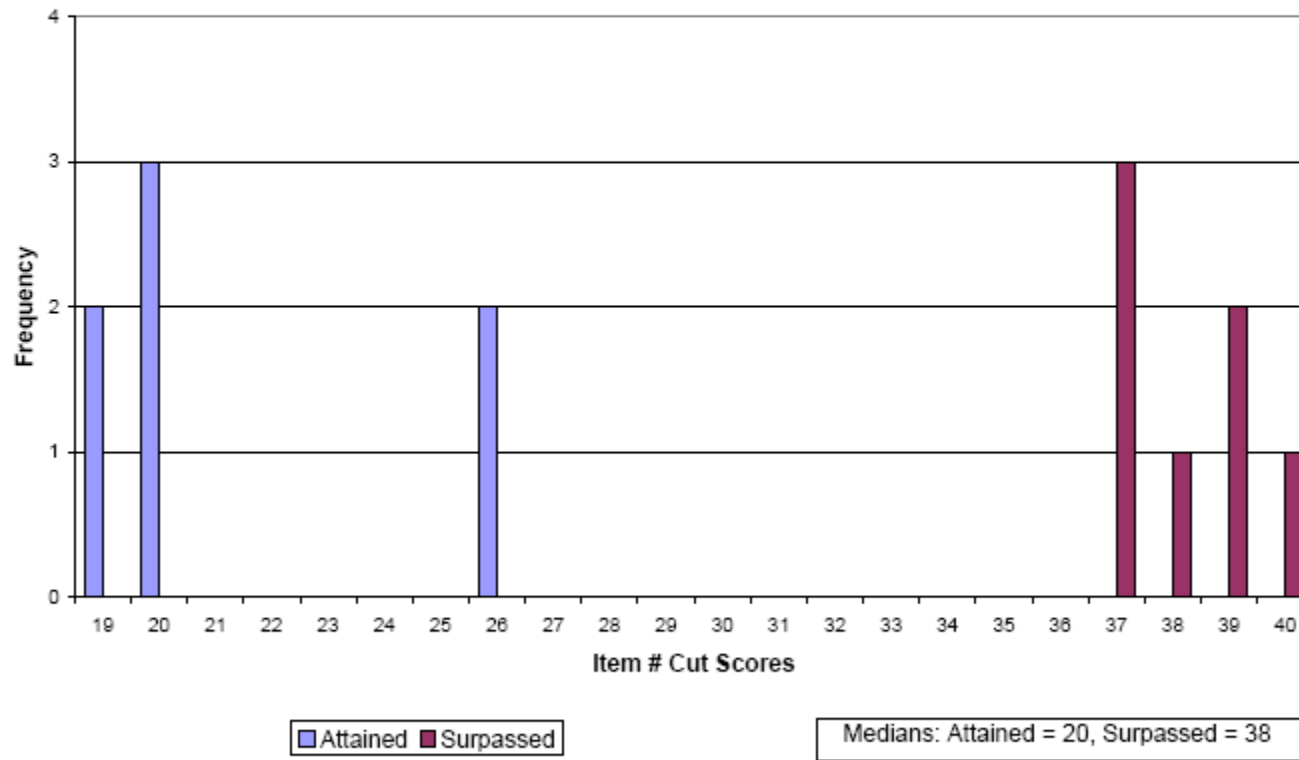
Attained Surpassed

Medians: Attained = 34, Surpassed = 61

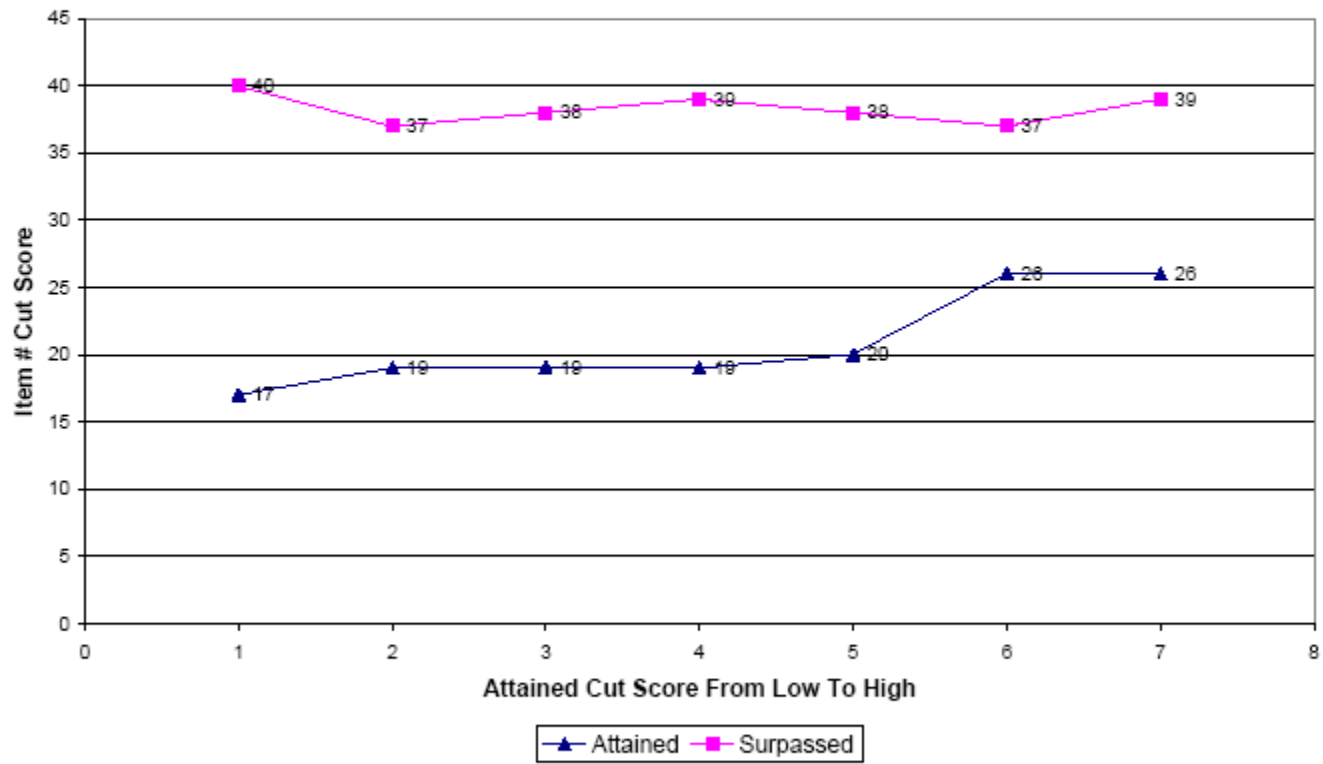
MI-Access - Functional Independence  
Science Grade 11 -- Round 3  
Standard Setting - April 29-30, 2008



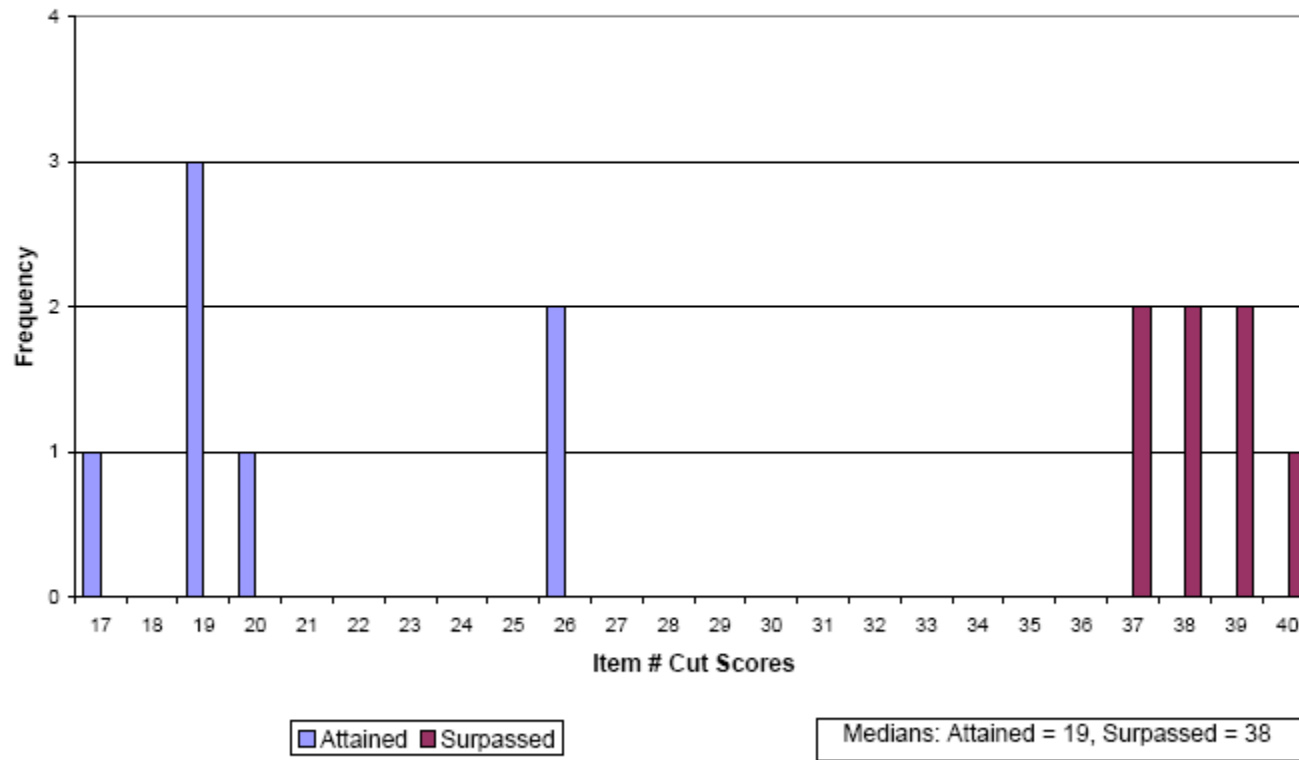
MI-Access - Functional Independence  
Science Grade 11 -- Round 3  
Standard Setting - April 29-30, 2008



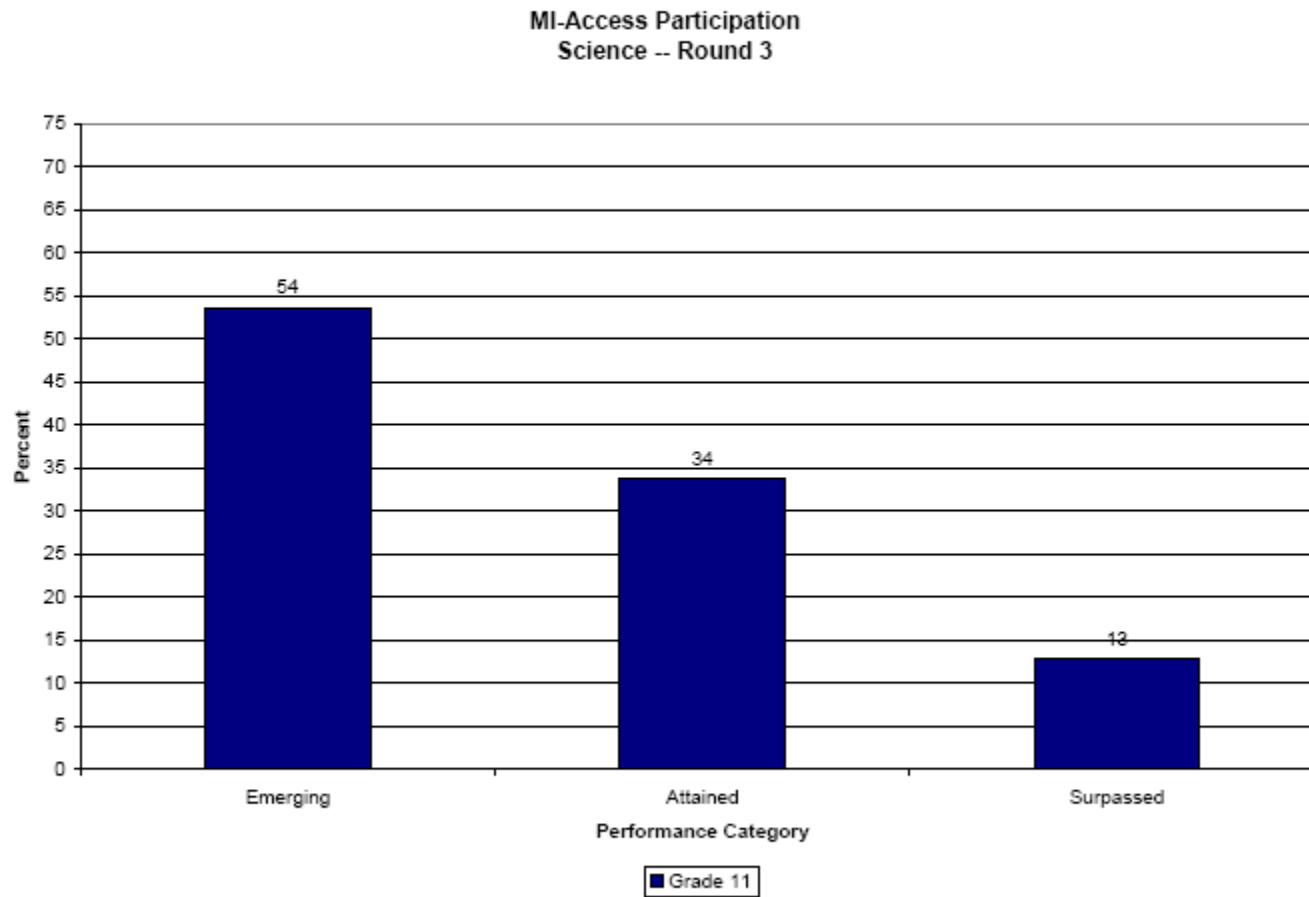
MI-Access - Functional Independence  
Science Grade 11 -- Round 4 & FINAL  
Standard Setting - April 29-30, 2008



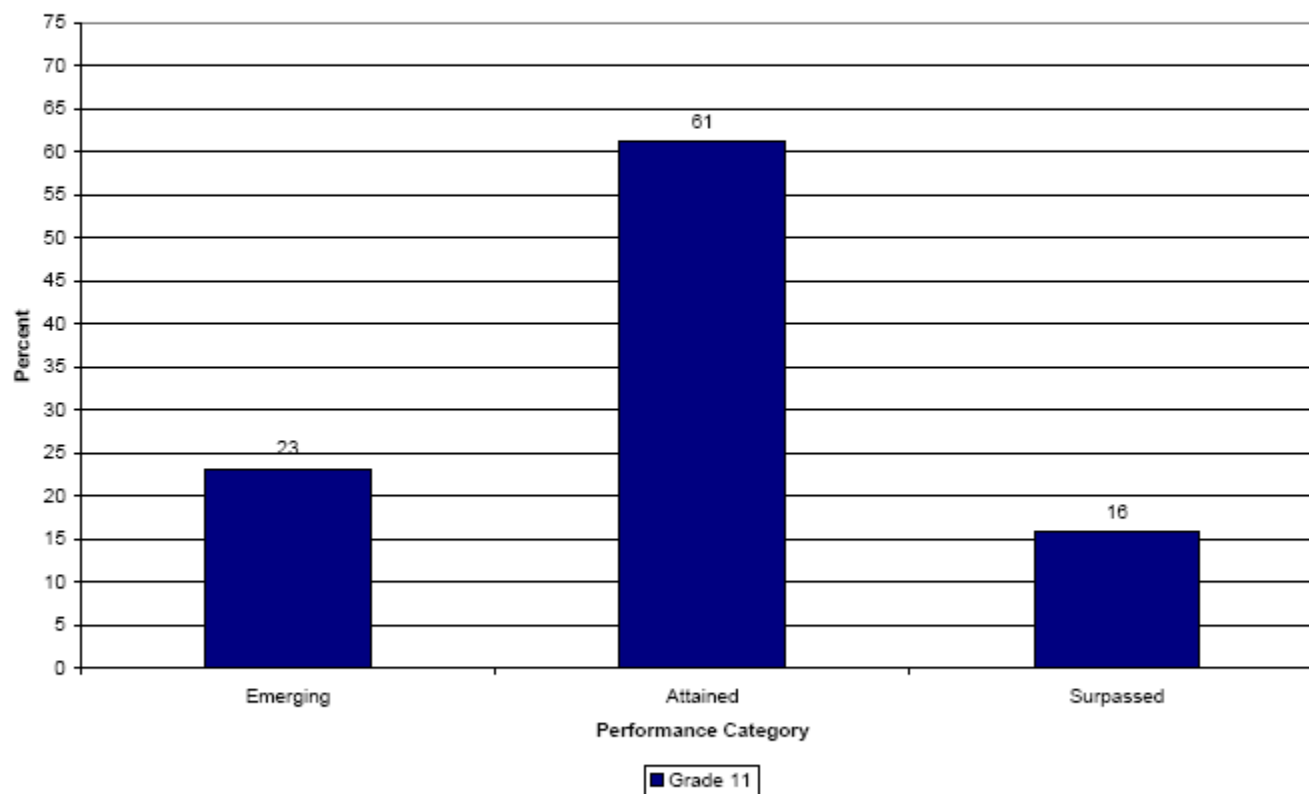
MI-Access - Functional Independence  
Science Grade 11 -- Round 4 & FINAL  
Standard Setting - April 29-30, 2008



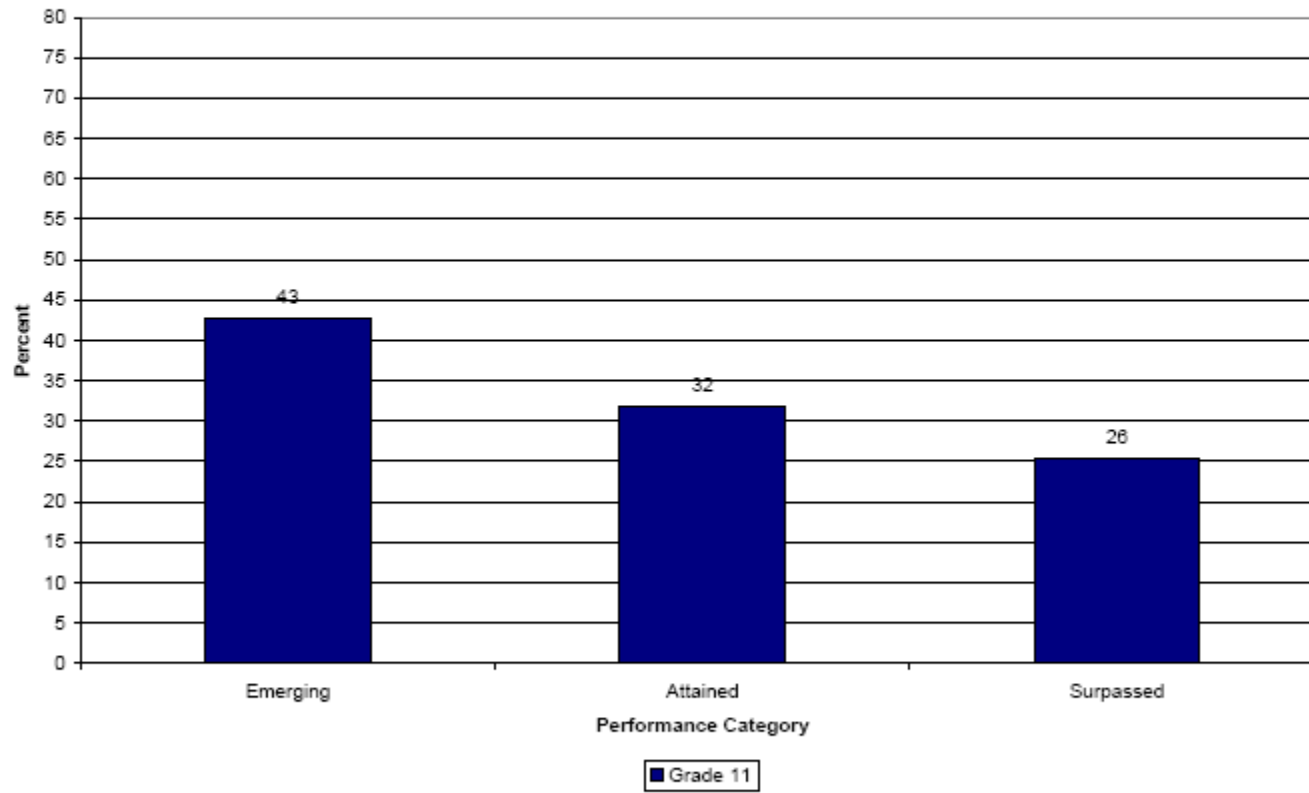
## Appendix J – Summary “Impact Data” % Graphs of Final Recommendations by Level of Assessment



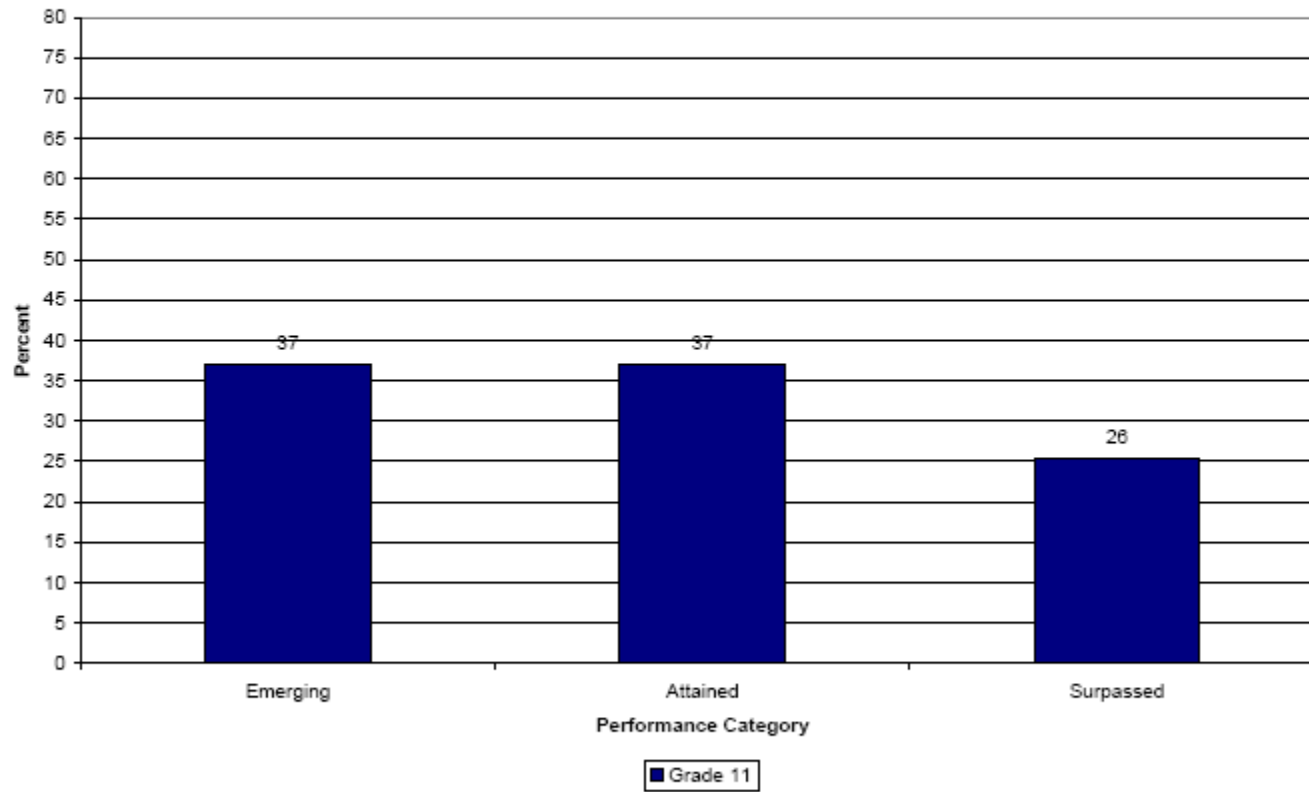
MI-Access Supported Independence  
Science -- Round 3



MI-Access Functional Independence  
Science -- Round 3

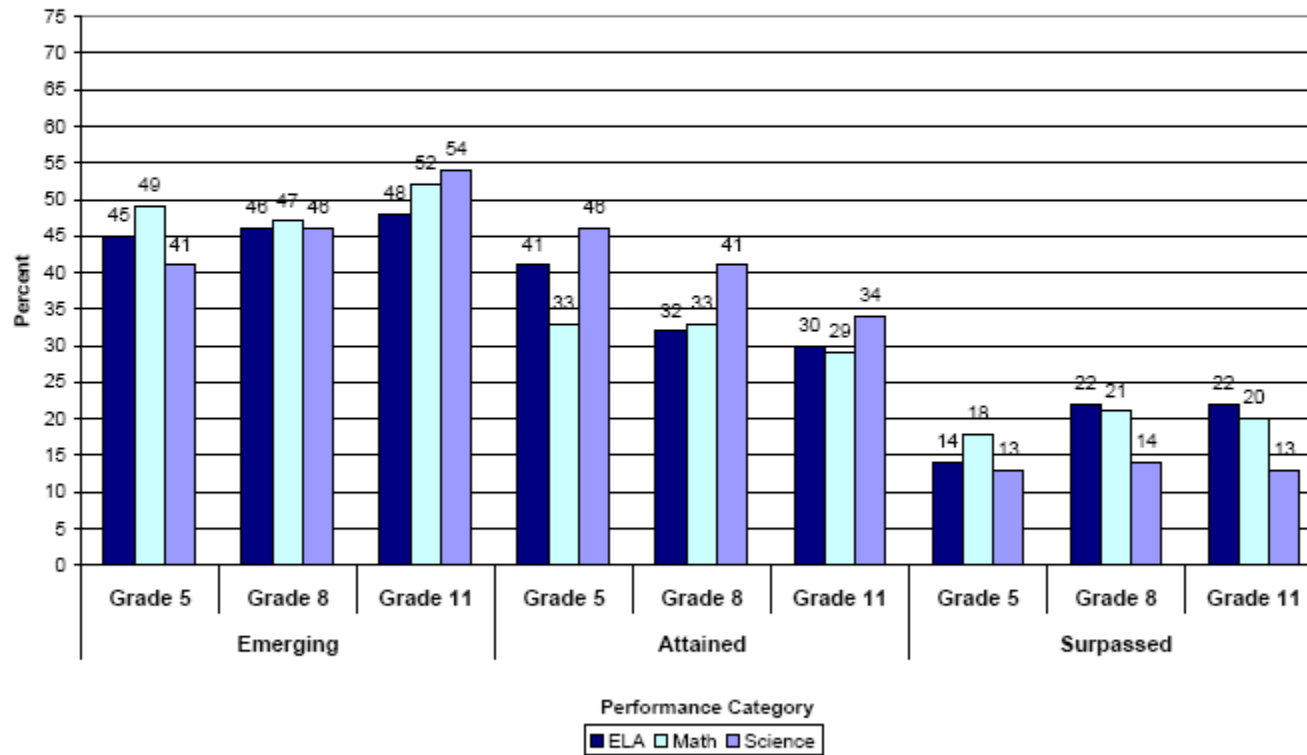


MI-Access Functional Independence  
Science -- Round 4 & FINAL

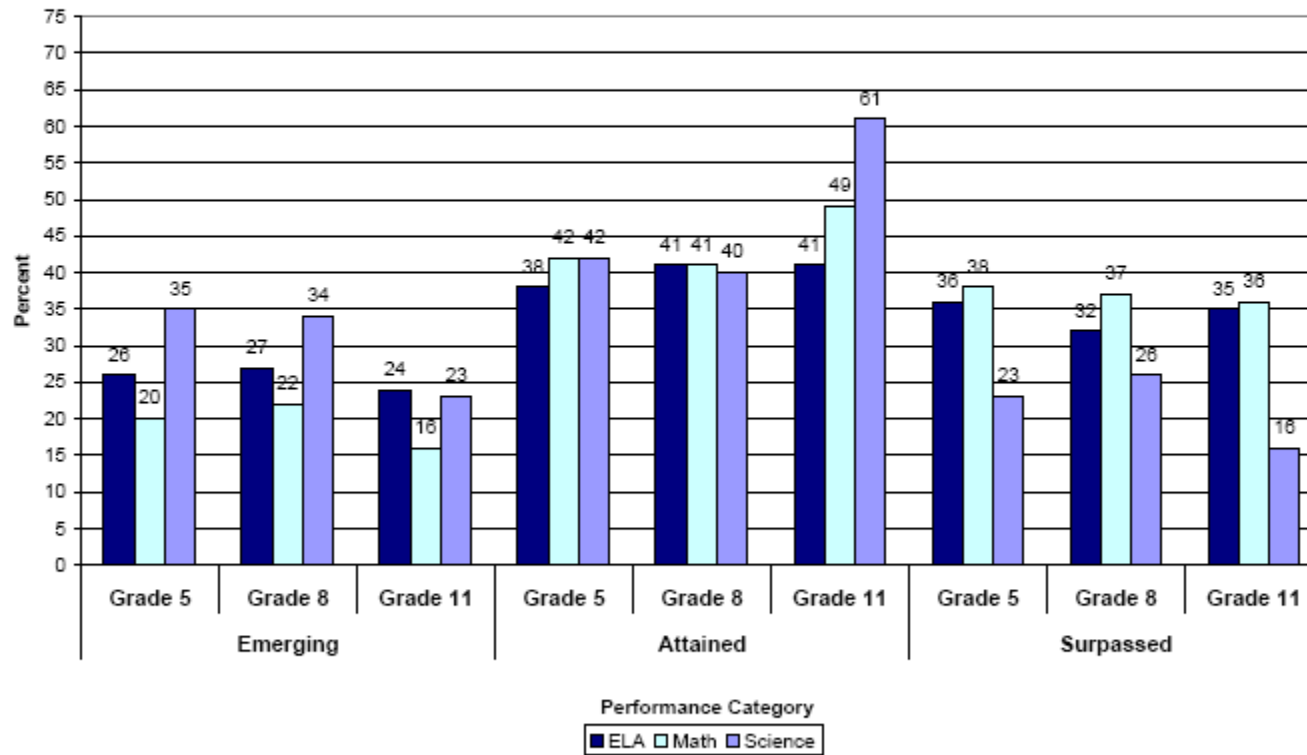


## Appendix K – Comparison Graphs (using panels' final recommendations)

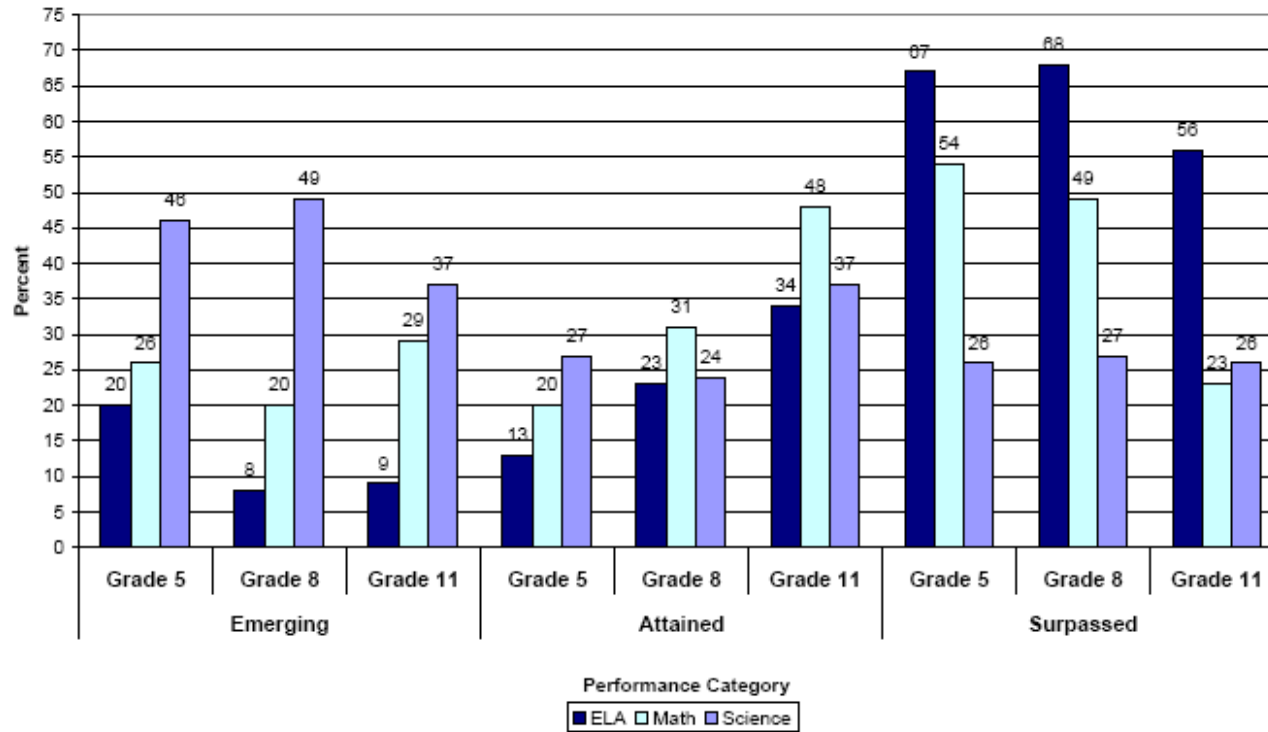
MI-Access Participation  
 ELA, Mathematics & Science  
 Percents of Students Scoring in Each Performance Category



**MI-Access Supported Independence  
 ELA, Mathematics & Science  
 Percents of Students Scoring in Each Performance Category**



**MI-Access Functional Independence  
 ELA, Mathematics & Science  
 Percents of Students Scoring in Each Performance Category**



## Appendix L – Summary Data on Assessments

### Summary Data for Spring 2008 Statewide Administration of the Participation, Supported Independence & Functional Independence Science Assessments

TestLevel	Subject	Grade	Sample Size	Max # Points	Mean Raw Score	Std Dev.
Participation	SCIENCE	11	297	90	43.1	31.5
Supported Indep.	SCIENCE	11	576	68	45.2	17.0
Functional Indep.	SCIENCE	11	1,875	45	23.7	7.1

## Appendix M – Item Data

### MI-Access Spring 2008 Core Item Difficulty Analysis

#### Participation Science - Grade 11

Number of Students = 297

Sequence #	Activity	Score Point	Pct. Scored At or Above	Sequence #	Activity	Score Point	Pct. Scored At or Above
1	15	1	69.4	46	4	3	48.1
2	15	2	69.0	47	19	1	48.1
3	20	1	65.7	48	19	2	48.1
4	20	2	65.3	49	4	4	47.8
5	15	3	63.3	50	6	2	47.8
6	15	4	63.0	51	14	5	47.5
7	14	1	61.6	52	14	6	46.1
8	2	1	61.3	53	8	1	45.8
9	2	2	60.9	54	8	2	45.5
10	14	2	60.9	55	2	5	45.1
11	20	3	60.3	56	5	3	44.8
12	20	4	59.6	57	2	6	44.1
13	1	1	56.9	58	6	3	44.1
14	10	1	56.6	59	5	4	43.8
15	14	3	56.6	60	9	1	43.1
16	1	2	56.2	61	6	4	42.8
17	14	4	56.2	62	9	2	42.8
18	2	3	55.9	63	8	3	41.8
19	10	2	55.9	64	10	5	41.8
20	16	1	55.9	65	10	6	41.4
21	2	4	55.6	66	8	4	41.1
22	3	1	55.6	67	3	5	40.7
23	3	2	55.6	68	3	6	40.4
24	16	2	55.6	69	4	5	40.4
25	11	1	54.2	70	16	5	40.4
26	11	2	53.2	71	1	5	40.1
27	10	3	52.9	72	19	3	40.1
28	4	1	52.5	73	1	6	39.7
29	4	2	52.2	74	9	3	39.7
30	16	3	52.2	75	19	4	39.7
31	10	4	51.9	76	4	6	39.4

<b>32</b>	3	3	51.2
<b>33</b>	16	4	51.2
<b>34</b>	20	5	50.8
<b>35</b>	1	3	50.5
<b>36</b>	15	5	50.5
<b>37</b>	1	4	50.2
<b>38</b>	11	3	50.2
<b>39</b>	20	6	50.2
<b>40</b>	11	4	49.8
<b>41</b>	3	4	49.5
<b>42</b>	15	6	49.5
<b>43</b>	5	1	48.8
<b>44</b>	6	1	48.8
<b>45</b>	5	2	48.5

<b>77</b>	16	6	39.4
<b>78</b>	9	4	39.1
<b>79</b>	11	5	38.0
<b>80</b>	11	6	37.0
<b>81</b>	5	5	35.7
<b>82</b>	6	5	35.4
<b>83</b>	6	6	35.0
<b>84</b>	5	6	34.7
<b>85</b>	8	5	32.0
<b>86</b>	8	6	31.6
<b>87</b>	9	5	30.0
<b>88</b>	9	6	30.0
<b>89</b>	19	5	25.9
<b>90</b>	19	6	25.9

**MI-Access Spring 2008 Core Item Difficulty Analysis  
Supported Independence Science - Grade 11**

Number of Students = 576

Sequence #	Activity	Score Point	Pct. Scored At or Above	Sequence #	Activity	Score Point	Pct. Scored At or Above
1	8	1	87.5	35	5	1	67.9
2	8	2	87.2	36	5	2	67.0
3	1	1	87.0	37	15	3	66.5
4	10	1	86.6	38	21	3	66.0
5	1	2	86.5	39	3	3	65.1
6	10	2	86.3	40	15	4	65.1
7	18	1	84.4	41	21	4	64.9
8	18	2	83.7	42	19	1	64.8
9	8	3	82.6	43	3	4	63.9
10	8	4	82.5	44	19	2	63.5
11	10	3	79.2	45	7	1	60.6
12	12	1	78.8	46	7	2	59.7
13	12	2	78.6	47	2	3	59.5
14	10	4	78.1	48	5	3	58.7
15	18	3	77.1	49	5	4	57.5
16	6	1	76.7	50	22	3	57.1
17	1	3	76.6	51	2	4	56.9
18	6	2	75.9	52	4	1	56.4
19	1	4	75.7	53	14	1	56.4
20	18	4	75.7	54	22	4	56.3
21	21	1	74.7	55	14	2	55.9
22	15	1	74.0	56	4	2	55.2
23	15	2	73.8	57	19	3	52.4
24	21	2	73.8	58	7	3	52.1
25	3	1	72.2	59	19	4	51.4
26	3	2	72.0	60	7	4	51.0
27	2	1	71.9	61	4	3	47.4
28	22	1	71.5	62	4	4	46.5
29	2	2	71.2	63	17	1	45.8
30	22	2	70.7	64	17	2	45.0
31	12	3	70.3	65	14	3	43.2
32	12	4	69.8	66	14	4	42.4
33	6	3	69.6	67	17	3	34.0

34	6	4	69.1	68	17	4	32.5
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**MI-Access April 28-29, 2008 Standard Setting  
Functional Independence Science Grade 11  
Item Statistics Table**

<b>Item Order #</b>	<b>Item Number</b>	<b>P-value</b>
1	10	0.79
2	8	0.76
3	54	0.69
4	55	0.69
5	9	0.67
6	51	0.65
7	19	0.64
8	25	0.64
9	29	0.63
10	40	0.63
11	23	0.62
12	46	0.62
13	36	0.62
14	50	0.61
15	33	0.60
16	20	0.59
17	6	0.57
18	11	0.57
19	13	0.57
20	48	0.56
21	27	0.55
22	15	0.54
23	2	0.53
24	16	0.53
25	35	0.53
26	7	0.52
27	17	0.52
28	43	0.51
29	47	0.50
30	24	0.49
31	38	0.48
32	42	0.48
33	32	0.46
34	4	0.45
35	14	0.45
36	52	0.45
37	22	0.44
38	21	0.42
39	37	0.42
40	31	0.41
41	44	0.36
42	1	0.33
43	41	0.30
44	28	0.30
45	5	0.29



**Appendix O**

**Evaluation Form**

**MI-Access Assessments Standards-Setting Sessions  
Grade 11 Science Assessments  
April 29-30, 2008**

*(21 Total Evaluations)*

Please share with us your feedback about the standards-setting process, activities and outcomes. Your feedback will help the OEAA evaluate the training, methods, materials, and results of the sessions. Please do not put your name on the form as your feedback should be anonymous. Place an **X** under the response option that best reflect your opinions related to each statement below.

1. Indicate the level of success of various components of the standards-setting session in which you participated.

<i>Component</i>	<i>Not Very Successful</i>	<i>Partially Successful</i>	<i>Successful</i>	<i>Very Successful</i>
Introduction to the MI-Access Assessment			11 52%	10 48%
Standard-setting process intro. – Large group	1 5%		11 52%	9 43%
Performance Level Descriptor review		1 5%	10 48%	9 43%
Standard-setting orientation – Small group		3 14%	5 24%	13 62%
Group discussions of the panel		1 5%	7 33%	13 62%
Data presentations before Rounds 2 & 3	2 10%	1 5%	7 33%	11 52%

2. Indicate the importance of each of these factors in making your cut-score recommendations.

<i>Factor</i>	<i>Not Important</i>	<i>Somewhat Important</i>	<i>Important</i>	<i>Very Important</i>
Performance Level Descriptors	1 5%	1 5%	9 43%	10 48%
Your perception of the assessment's difficulty		5 24%	4 19%	12 57%
Your own professional experiences		1 5%	11 52%	9 43%
Your initial judgments (Round 1)		5 24%	9 43%	7 33%
Group discussions of the panel		1 5%	2 10%	18 86%
Feedback data provided to the panel		1 5%	8 38%	12 57%
Policy environment in the state	1 5%	5 24%	6 29%	9 43%

What students would vs. should be able to do			3 14%	18 86%
--	--	--	----------	-----------

3. I understood the **task** of recommending performance standards when I did my work for:

	<i>Not Very Well</i>	<i>Moderately Well</i>	<i>Very Well</i>
Round 1		5 24%	16 76%
Round 2		1 5%	20 95%
Round 3		1 5%	20 95%

4. I understood the **data** that were provided to the panel prior to:

	<i>Not Very Well</i>	<i>Moderately Well</i>	<i>Very Well</i>
Round 2		5 24%	16 76%
Round 3		3 14%	18 86%

5. How confident are you with your *personal* classification of students at each level of proficiency?

<i>Performance Level</i>	<i>Not Confident</i>	<i>Somewhat Confident</i>	<i>Confident</i>	<i>Very Confident</i>
Surpassed the Standard			10 48%	11 52%
Attained the Standard		1 5%	7 33%	13 62%
Emerging Toward the Standard		1 5%	6 29%	14 66%

6. What strategies did you use to recommend *MI-Access* performance levels?

- Group discussion was very helpful and forced us to discuss all kids in the state.
- Personal experience and group discussion.
- At first glance of the test booklets, I labeled the questions either E, A, or S and then compared those again when I looked at the item booklet.
- Personal experience, assessment administrator, and classroom teacher.
- Zone for 1,2-single pick for 3.
- The most difficult thing about coming was the unknown. I don't know hoe to prepare people for this, but that was the only downside.
- Knowledge of students, data provided, complexity of questions, discussion amongst group and facilitator, and EGLCEs.
- My understanding of the students and the EGLCEs, etc.
- How students "should" do given instruction on EGLCEs. Percent of students who scored "well" on a given item. Functional/real world item vs. science concept.
- My former experience with standard setting, the instruction I received from facilitator was excellent, my other members and my experience. XXX's comments were very helpful as well.
- Personal/professional. What we decided P-students should know. Knowing science will continue to increase in classroom.
- Good give and take. Good discussion. Good problem-solving.

- Expect to see improvement. Teachers need help on test protocol.
  - Item mapping; being able to make accommodation or modification for testing.
7. Use the space below to make any additional comments about the process or your experience. **Thank you for taking the time to evaluate the sessions.**
- Our facilitator was quite redundant in her explanations. Even though it was clear we all understood the process and expectations. She continued to drag the process out and kept talking. She also discouraged group discussion; instead we had to wait and only let one person talk at a time, even though it was beneficial discussion. The group members worked very well together.
  - Good session!
  - Directions were overly repetitive and redundant. Panelists were discouraged from having discussions that would have been helpful. Note: the group of panelist was great! We got along and worked well as a team.
  - I think we should have had more discussion in between rounds and allowed to share information more.
  - Great process, useful in other curricular areas!
  - Please consider me again.
  - It was a wonderful experience.
  - Nice job.
  - It was great and this is great personal development to take home to my district.
  - Great food. Good accommodations. Facilitator did a good job.

*Adapted from Hambleton, R. (2001). Setting performance standards on educational assessments and criteria for evaluating the process. In Cizek, G. (Ed.) Setting performance standards: Concepts, methods and perspectives, Mahwah: NJ: Lawrence Erlbaum Associates.*

**Appendix P**



Corporate Headquarters  
P.O. Box 382  
4 Hardscrabble Heights  
Brewster, NY 10509-0382  
Corporate (845) 277-8100  
Fax: (845) 277-8115  
www.QuestarAI.com

2 May 2008

**TO:** *MI-Access* Grade 11 Functional Independence Standard Setting Panel

**FROM:** Michael Beck

We are contacting you as a standard-setting panelist for the *MI-Access* Functional Independence level – the sessions you attended in Bloomfield Hills on April 29 and 30. In preparing the final report of the process and results of these sessions, it was discovered that our data analysts inadvertently prepared some incomplete data to your panel between the 2<sup>nd</sup> and 3<sup>rd</sup>/final rounds of the process. Only the Functional Independence (FI) data were affected by this inadvertent reporting.

You will recall that you made your first round of recommendations totally by using judgment – how students should perform of this assessment in order to have their Science achievement classified as Attaining the Performance Standard or Surpassing the Performance Standard. Between the 1<sup>st</sup> and 2<sup>nd</sup> rounds of the process, we showed you the recommendations of each of your fellow judges (anonymously). In addition, you saw item difficulty (or *p*-value) data for each of the sequenced items. After the 2<sup>nd</sup> round, we again showed you the recommendations of each of your fellow judges and added the anticipated statewide “impact data” – that is, the approximate percent of students whose scores would fall in each of the three categories were the Round 2 median recommendations to be used. It was this later set of data that was inadvertently reported incorrectly. Listed below are the approximate percents of students whose Functional Independence scores would fall in each performance category based on the Round 2 median judgments:

	Performance Category			
	Emerging	Attained	Surpassed	“Proficient” (A + S)
Reported on April 30	32%	65%	3%	68%
<b>CORRECT data</b>	<b>43%</b>	<b>32%</b>	<b>26%</b>	<b>58%</b>

Because we have discovered that these data were not properly reported to you, we would like to give you the opportunity to reconsider your final “Round 3” judgments. Listed below are the recommendations you gave us for each of the three rounds for both cuts, listed in terms of the “ordered-item” number in the booklet. In addition, we have attached the Round 2 graphs displaying the recommendations of each of the seven judges in your panel. As you will recall, the FI assessment is composed of 45 selected-response items.

### Judge Recommendations By Round

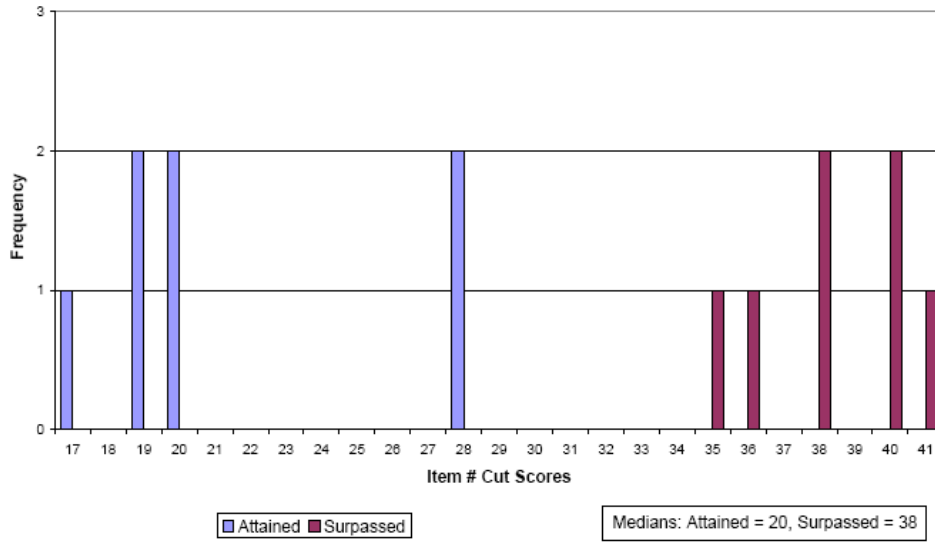
Judge	Attained			Surpassed		
	1	2	3	1	2	3
1	10	20	20	32	38	38
2	19	20	20	37	38	37
3	21	19	19	37	40	39
4	17	19	20	40	40	40
5	7	17	19	26	41	37
6	27	28	26	35	35	39
7	28	28	26	43	36	37

**(Note: judges were provided only their personal recommendations, not those of all judges)**

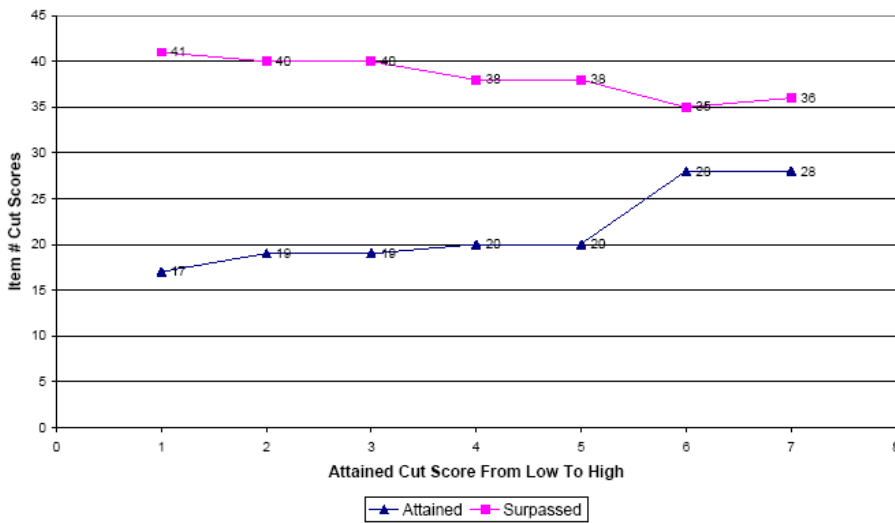
Directions you were given during the session were to “consider” the various data provided to you, including these impact data, as you wished. However, based on your discussions and the orientation/direction provided, while the data were to be considered, you were to – and, we believe, successfully *did* – focus primarily on your judgment in making your recommendations. Since the final set of data provided to you were not correct, however, we would like to give you an opportunity to reconsider your final recommendations for either or both cut scores.

We would like to hear from each of you about *whether or not* you wish to change your final Round 3 recommendation. You can contact me by e-mail at [mbeck@Questarai.com](mailto:mbeck@Questarai.com). Should any panelists so desire, we will also host a short conference call at 4:00 PM on Wednesday, May 7. If you wish to participate in this, please let me know in advance; the call-in number for this call will be 800-761-7572, followed by a code of 2026066. Please let me know your decision both with regard to your Round 3 recommendations and your interest in participating in a conference call to discuss this topic further. As you will recall, these recommendations will be presented to the state Board of Education soon, so we would appreciate hearing from you by 5 PM on May 7. We apologize for this added intrusion, and we greatly appreciate your continued support of our MI-Access program.

MI-Access - Functional Independence  
Science Grade 11 -- Round 2  
Standard Setting - April 29-30, 2008



MI-Access - Functional Independence  
Science Grade 11 -- Round 2  
Standard Setting - April 29-30, 2008



## Appendix Q

### **Listing of e-mails received from each Functional Independence standard-setting panelist stating their final cut-score recommendations\***

#### **JUDGE 1**

Hi Mike,

I am still comfortable with my recommendations, however if there are panelists that wish to further discuss the cuts, I am certainly willing to discuss it on the 7th at 3:00 PM. I have left that time open pending your response.

XXXXXXXX

#### **JUDGE 2**

Hello Mike,

I was judge # 2. I would like to change my scores to the following:

Attained: 19

Surpassed: 39

Thanks,

XXXXXX

#### **JUDGE 3**

Mike,

Sorry about the error and you having to do all of this extra work! After reviewing the information that you've provided, I would like to change my final recommendation to Attained=19 and Surpassed=38. If this doesn't make sense, or if you have more questions, feel free to e-mail me back.

Thanks Mike!

XXXX

**JUDGE 4**

Thank you for the chance to review the recommendations one more time. I would like to change my recommendation for Attained from 20 to 17. I would like to keep my recommendation for Surpassed unchanged at 40.

XXXXXXXXXX

**JUDGE 5**

Mike and Vince,

Thank-you for the opportunity to look at the data again. In light of the new information I would like to keep my original recommendations the same. I feel that they are a realistic representation of what students \*should\* know and will help guide instruction.

Thank-you,

XXXXXXXXXX

**JUDGE 6**

Hello, I do not wish to change my cut-offs. I appreciate it the fact that you sent this to us. Thanks, XXXXXXXX

**JUDGE 7**

Mike:

I would leave my results the same and would not like to change my recommendation.

XXXXXXXXXX

"The question is not whether we can afford to invest in every child; it is whether we can afford not to." (Marian Wright Edelman)

**\* XXXXX is used to replace judge names and identifying information.**