

Oregon Mathematics Standards Verification Technical Report (10/8/2010)

Educational Policy Improvement Center developed this report under contract to Oregon Dept. Education

This report was completed before the State Board of Education adopted the new Mathematics Achievement Standards. (See preface on page 6 for more on the context of this report).

PREFACE (February 9, 2011)

Please note that the following Oregon Mathematics Standards Verification Technical Report was prepared on October 8, 2010 before the Oregon Department of Education (ODE) presented the recommended cut scores to the State Board of Education for adoption. Since the report's publication, the State Board of Education adopted the following cut scores on October 28, 2010:

Grade	Cut Scores		
	Nearly Meets	Meets	Exceeds
3	205	212	219
4	212	219	227
5	219	225	234
6	222	227	237
7	228	232	242
8	230	234	245
HS	232	236	251

Following adoption by the State Board of Education, these cut scores went into retroactive effect for all OAKS Mathematics assessments administered during the 2010-2011 test window.

EXECUTIVE SUMMARY

2010 Mathematics Achievement Standards Verification

The Oregon Department of Education (ODE) conducted an achievement standards verification process for the Oregon Assessment of Knowledge and Skills for Mathematics on August 9-11, 2010. The research-based Bookmark Procedure was used to recommend achievement standards (cut scores) for Grades 3–8 and high school. ODE contracted with the Educational Policy Improvement Center (EPIC) to serve as external evaluators who monitored the process and documented evidence of validity for both the process and the results. This document summarizes the resulting recommendations and EPIC's evaluation results.

The recommended cut scores will be reviewed through a public process in September. The State Board of Education will then consider the cut scores on October 28, 2010. Oregon Assessment of Knowledge and Skills (OAKS) in mathematics will be aligned to the new 2007/2009 content standards.

Why is ODE setting new cut scores (achievement standards) for Mathematics?

Oregonians have legitimate concerns about changing cut scores now. Concerns include recent budget reductions, having resources needed to raise the rigor for all students, anticipating 2014-2015 assessment change to address the Common Core State Standards, and the impact that new cut scores and raising AYP targets could have on schools' federal ratings. On balance ODE will move forward with the request that the State Board of Education adopt the new cut scores because:

- Local Instruction - Math teachers are basing their instruction on the content standards adopted in 2007 and 2009 and the assessment needs to follow. In 2009 the majority of

Oregon Mathematics Standards Verification Technical Report (10/8/2010)

Educational Policy Improvement Center developed this report under contract to Oregon Dept. Education

This report was completed before the State Board of Education adopted the new Mathematics Achievement Standards. (See preface on page 6 for more on the context of this report).

districts responding to ODE's survey said they based 2009-10 mathematics instruction on the new content standards.

- Predictability - School districts are concerned that success at elementary and middle school does not closely align to success at high school. Students and parents may have a false impression of a student's math achievement based on current standards. Only 50% of students who met the existing 3rd grade standard were likely to be ready to meet the high school standard. The proposed cut scores will help ensure students who meet the standard at each grade level are on a path to success in meeting the high school cut scores.
- Federal Requirements - Federal law requires that Achievement Standards align with Content Standards. Given the scope of the 2007/2009 change in content standards it is very unlikely that the US Department of Education would approve ODE to assess these new content standards without an achievement standard setting review process.
- Preparation - A new common assessment of the Common Core State Standards will be ready in 2014-15. Without the proposed cut score changes, Oregon students would continue to fall behind their peers in preparing for the new assessment.
- National Competitiveness – States around the country are taking a hard look at what their students need to compete in the 21st century job market. For the sake of our students, and our future economy, we strive for higher standards and work to ensure that Oregon students are graduating ready to compete with their peers nationally and internationally. Based on ODE's analysis of national data (National Assessment of Educational Progress or NAEP), the proposed cut scores are consistent with the more rigorous achievement standards of other states in the nation and will place Oregon close to Washington State's achievement standards. This will make the transition to the Common Assessment achievement standards, scheduled in four years, more seamless for Oregon. A level consistent with the "NAEP Proficient" level is a good predictor for where the 2014-2015 Common Achievement Standards will likely land.

The extended assessment cut scores are also changing. On Monday, August 16, 2010 eighteen math content specialists and special education teachers from across Oregon's K-12 public school system met with ODE staff and members of the Behavioral Research and Teaching research group from the University of Oregon to set alternate achievement standards for students taking Oregon's alternate assessment the Extended Assessment. Oregon's Extended Assessment is developed for students with the most significant cognitive disabilities and, in parallel to the OAKS general assessment, underwent recent changes to the mathematics assessment to ensure alignment with the new 2007/2009 content standards. The panel's recommendations will be submitted to the State Board of Education for approval this fall. The recommendations are available on the ODE website at <http://www.ode.state.or.us/search/results/?id=223>

How were recommended achievement standards identified? Nearly fifty Oregon educators, parents, and business representatives met with ODE staff August 9 – 11 to review the math tests and establish cut scores. Their charge was to make recommendations to the State Board of Education for new mathematics achievement standards. Panelists included teachers and administrators from K-12 public schools, community colleges, colleges and universities, parents, and business and industry representatives from fields requiring strong math skills.

Oregon Mathematics Standards Verification Technical Report (10/8/2010)

Educational Policy Improvement Center developed this report under contract to Oregon Dept. Education

This report was completed before the State Board of Education adopted the new Mathematics Achievement Standards. (See preface on page 6 for more on the context of this report).

Participants were recruited from across Oregon to participate in grade-band groups at grades 3-4, 5-6, 7-8, and high school. Within each group ODE divided participants into two tables that were balanced in terms of relevant demographic characteristics (e.g., gender, geographic location). Participants used booklets that contained approximately 70 secure test items arranged from least to most difficult to verify the knowledge and skills that students should demonstrate at each assessed grade level. The current cut scores, as well as achievement standards for other states, and national and international assessments, such as the National Assessment of Educational Progress (NAEP) and Programme for International Student Assessment (PISA), were marked in the booklets. In addition, each booklet included a projected cut score for that grade level. These projected scores were derived by analyzing longitudinal student progression from grade 3 to the required high school “Meets” score. By working back from an international standard (PISA average for the Organization for Economic Cooperation and Development) grade by grade, ODE assessment staff was able to project the score level that would most likely result in the student meeting the high school standard.

Panelists participated in three review rounds in which they individually recommended three cut scores (*Nearly Meets*, *Meets*, and *Exceeds*) that defined four performance levels: *Does Not Yet Meet*, *Nearly Meets*, *Meets*, and *Exceeds* for grades 4, 6, 8, and high school. At the end of Round Three, each grade-band group also submitted group consensus cut scores for their target grade, which were then used to derive the cut score for the adjacent grade. Subsequently, adjacent grade level standards were derived for grades 3, 5, and 7 and reviewed by each grade-band panel as well as the whole group. All derived achievement standards were confirmed through panels’ review of the Ordered Item Booklets. They also considered impact data, an analysis which forecasts the potential percentages of students meeting, not meeting, and exceeding standards at each grade based on prior year’s test results.

What achievement standards did the group recommend for 2010-11 and beyond?

Table 1 summarizes the cut scores and associated impact data for the four target grade levels based on the final round of discussion and voting, the analysis of the impact data, and the cross-grade articulation discussion by the full panel. Participants reviewed these data at the workshop; impact data are based on 2009-10 test administration. Table 2 runs through the impact data, that is the percentage of Oregon students who would fall within certain achievement levels based on 2009-2010 student assessment.

Table 1. Participant-recommended Mathematics Cut Scores and Associated Impact Data for Target Grades*

Grade	Cut Scores			Impact Data**			
	Nearly Meets	Meets	Exceeds	Does Not Yet Meet	Nearly Meets	Meets	Exceeds
4	212	219	227	20%	33%	27%	19%
6	222	227	237	30%	23%	29%	18%
8	230	234	245	27%	19%	37%	16%

Oregon Mathematics Standards Verification Technical Report (10/8/2010)

Educational Policy Improvement Center developed this report under contract to Oregon Dept. Education

This report was completed before the State Board of Education adopted the new Mathematics Achievement Standards. (See preface on page 6 for more on the context of this report).

HS	232	237	251	30%	21%	43%	6%
----	-----	------------	-----	-----	-----	------------	----

* Percent totals may not equal 100 due to rounding.

**Impact data indicate percentage of Oregon students who would fall within certain achievement levels based on 2009-2010 student assessment.

Oregon Mathematics Standards Verification Technical Report (10/8/2010)

Educational Policy Improvement Center developed this report under contract to Oregon Dept. Education

This report was completed before the State Board of Education adopted the new Mathematics Achievement Standards. (See preface on page 6 for more on the context of this report).

Derived Cut Scores

Once all grade-band panels completed Round Three, ODE assessment staff derived the cut scores for the adjacent grades (Grades 3, 5, and 7) using linear interpolation (and extrapolation) of normative data. This method was used by CTB/McGraw-Hill in establishing the 2007 achievement standards. Table 2 shows the derived cut scores and impact data for Grades 3, 5, and 7 along with the target grade data.

Cross-grade Articulation (Smoothing)

The cut scores and associated impact data determined for the adjacent grades by interpolation were presented to the participants during the cross-grade articulation, or “smoothing,” discussion on Day 3. The purpose of this smoothing discussion was to establish a set of cut scores that was well-articulated and, at the same time, considerate of the participants’ original recommendations. As participants reviewed the derived scores and impact data, each grade-band panel and the group as a whole gave careful consideration to the final recommended scores. Tony Alpert, Director of Assessment, was present during these discussions to answer policy-related questions.

Table 2. Recommended and Derived Cut Scores and Impact Data for All Grades Showing Cross-Grade Articulation.

Grade	Cut Scores			Impact Data**				
	Nearly Meets	Meets	Exceeds	Does Not Yet Meet	Nearly Meets	Meets	Exceeds	Meets & Above
3*	205	212	219	25%	28%	29%	18%	47%
4	212	219	227	20%	33%	27%	19%	46%
5*	219	225	234	21%	30%	34%	16%	50%
6	222	227	237	30%	23%	29%	18%	47%
7*	228	232	242	29%	19%	34%	18%	52%
8	230	234	245	27%	19%	37%	16%	53%
HS	232	237	251	30%	21%	43%	6%	49%

*Derived data confirmed by Oregon panelists reviewing Ordered Item Booklets.

**Impact data indicate percentage of Oregon students who would fall within certain achievement levels based on 2009-2010 student assessment

Oregon Mathematics Standards Verification Technical Report (10/8/2010)

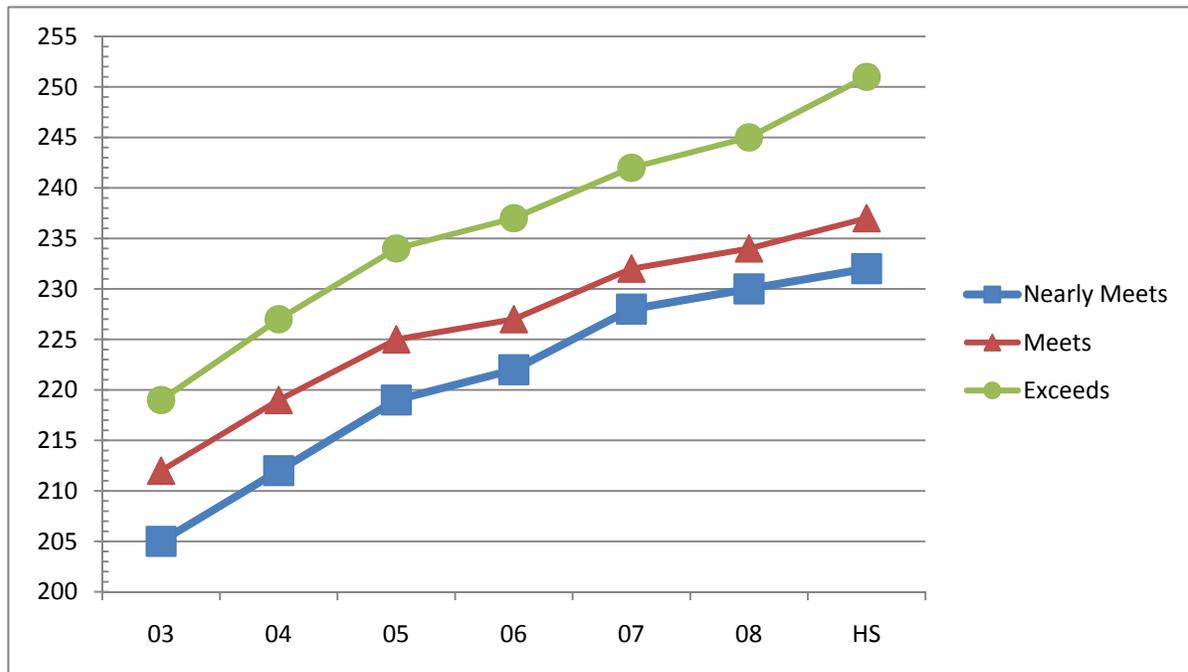
Educational Policy Improvement Center developed this report under contract to Oregon Dept. Education

This report was completed before the State Board of Education adopted the new Mathematics Achievement Standards. (See preface on page 6 for more on the context of this report).

Summary:

Figure 1 below displays the recommended cut scores at the *Nearly Meets*, *Meets*, and *Exceeds* levels from grade 3 through high school.

Figure 1. Cross-Grade Progression of Recommended Cut Scores



The State Board of Education will consider adoption of the cut scores on October 28, 2010.

Oregon Mathematics Standards Verification Technical Report (10/8/2010)

Educational Policy Improvement Center developed this report under contract to Oregon Dept. Education

**This report was completed before the State Board of Education adopted the new Mathematics Achievement Standards.
(See preface on page 6 for more on the context of this report).**
