

Oregon Department of Education and Educational Policy Improvement Center

Alignment to Oregon Mathematics Content Standards

Grade 3 – 8 and High School, 2009-10

Overview

In 2008, WestEd was contracted by ODE to conduct an external alignment review to determine alignment among the 2007-08 OAKS item pools (grades 3 – high school) in mathematics and the state’s 2007 mathematics core standards (grades Kindergarten – 8), content standards (grades K -8), and elements of standards (grades 3-8). (Document 1.6) Based on the results of West Ed’s study ODE convened Oregon teachers to develop approximately 2,500 items to fill gaps in content, difficulty, and depth of knowledge. Oregon’s Technical Advisory Committee recommended supplementing the 2008 WestEd alignment study with a review of a 10 percent random sample of items selected from the 2010-11 OAKS item pools (grades 3 – high school).

To determine if new items that had been written since the WestEd study was conducted were matched to the standards, ODE contracted with the Educational Policy Improvement Center (EPIC) in Eugene, Oregon, to conduct an independent, external review of a portion of the rest of the item pool that will be used on the 2010-11 test. ODE selected a random sample of 296 items that represented a cross section of items across all score reporting categories of the grade 3 – high school mathematics content standards. There are three score reporting categories per grade; “core standards” in grades 3 – 8 and “disciplines” in high school (Table 1).

The alignment expert at EPIC was given copies of the items along with an excerpt of the Oregon content standards publication (Document 1.6).

- The EPIC mathematics alignment expert reviewed the items, identifying which standard they felt the item aligned to, and rated whether the match to that standard was strong (S), partial (P), or not a match (N).
- The expert indicated the specific standard each of the items best aligned to; this was done by indicating the three-digit standard code on the alignment spreadsheet.

This review was “blind” in that the EPIC mathematics alignment expert completed the work without seeing the codes applied to the items during the item development and review process. Upon the mathematics expert’s completion of the first round of alignment, EPIC’s project manager conducted a quality check against the Oregon Department of Education’s (ODE) intended standard match. Where there was a difference between ODE’s intended match and the math expert’s match, the EPIC math expert was asked to revisit his match and make adjustments where, in his professional judgment, it was appropriate. After that second round, ODE’s intended match coincided with the mathematics expert’s match for 95% of the items.

After the EPIC review was completed, ODE inserted the original coding for each item that it was designed to assess and the specific content standard the item was associated with. Table 2 on the following page shows the EPIC and ODE coding for each item.

Table 1. Score Reporting Categories for 2010-11 OAKS Mathematics

Grade	First Core Standard	Second Core Standard	Third Core Standard
3	3.1 <u>Number and Operations</u>: Develop an understanding of fractions and fraction equivalence.	3.2 <u>Number and Operations, Algebra, and Data Analysis</u>: Develop under-standings of multiplication and division, and strategies for basic multiplication facts and related division facts.	3.3 <u>Geometry and Measurement</u>: Describe and analyze properties of two-dimensional shapes, including perimeters.
4	4.1 <u>Number and Operations</u>: Develop an understanding of decimals, including the connections between fractions and decimals.	4.2 <u>Number and Operations and Algebra</u>: Develop fluency with multiplication facts and related division facts, and with multi-digit whole number multiplication.	4.3 <u>Measurement</u>: Develop an understanding of area and determine the areas of two-dimensional shapes.
5	5.1 <u>Number and Operations and Data Analysis</u>: Develop an understanding of and fluency with addition and subtraction of fractions and decimals.	5.2 <u>Number and Operations and Algebra</u>: Develop an understanding of and fluency with division of whole numbers.	5.3 <u>Geometry, Algebra, and Measurement</u>: Analyze 3-D shapes, including volume and surface area
6	6.1 <u>Number and Operations</u>: Develop an understanding of and fluency with multiplication and division of fractions and decimals.	6.2 <u>Number and Operations and Probability</u>: Connect ratio, rate, and percent to multiplication and division.	6.3 <u>Algebra</u>: Write, interpret, and use mathematical expressions and equations.
7	7.1 <u>Number and Operations and Algebra</u>: Develop an understanding of operations on all rational numbers and solving linear equations.	7.2 <u>Number and Operations, Algebra and Geometry</u>: Develop an understanding of and apply proportionality, including similarity.	7.3 <u>Measurement and Geometry</u>: Develop an understanding of and use formulas to determine surface area and volume.
8	8.1 <u>Algebra</u>: Analyze and represent linear functions, and solve linear equations and systems of linear equations.	8.2 <u>Data Analysis and Algebra</u>: Analyze and summarize data sets.	8.3 <u>Geometry and Measurement</u>: Analyze two- and three-dimensional spaces and figures by using distance and angle.
HS	<u>Algebra</u> (H.1A, H.2A, H.3A)	<u>Geometry</u> (H.1G, H.3G, H.3G)	<u>Statistics</u> (H.1S, H.2S)

Table 2. Comparison of Independent Alignment Review with ODE Alignment Coding

Grade	Oregon Item ID (ITS ID)	External Alignment Review by EPIC		Current ODE Coding
		Content Standard Match (See Doc 1.6 for interpretation)	Strength of Match to Standard (Strong; Partial; No Relationship)	
03	12976	3.1.2	S	3.1.2
03	14807	3.1.1	P	3.1.1
03	14810	3.1.1	S	3.1.1
03	14844	3.1.1	S	3.1.1
03	14848	3.1.1	S	3.1.1
03	14857	3.1.1	S	3.1.1
03	15113	3.3.8	S	3.3.8
03	15132	3.3.8	S	3.3.8
03	15136	3.3.8	S	3.3.8
03	15251	3.2.7	S	3.2.7
03	16343	3.2.4	S	3.2.4
03	20828	3.2.2	S	3.2.2
03	21130	3.2.7	S	3.2.7
03	21215	3.3.8	S	3.3.8
03	22476	3.1.4	S	3.1.4
03	22493	3.2.7	S	3.2.7
03	26002	3.2.2	S	3.2.2
03	26214	3.1.2	S	3.1.2
03	26217	3.2.3	S	3.2.3
03	26220	3.2.1	S	3.2.1
03	26484	3.1.2	S	3.1.1
03	26502	3.1.2	S	3.1.2
03	26525	3.3.2	S	3.3.2
03	26579	3.1.1	S	3.1.1
03	26617	3.3.2	S	3.3.2
03	26654	3.1.4	S	3.1.4
03	26675	3.2.2	S	3.2.2
03	26678	3.3.2	S	3.3.2
03	27223	3.3.2	S	3.3.2
03	27331	3.3.4	S	3.3.4
03	27448	3.1.1	S	3.1.1
03	27506	3.2.3	S	3.2.3
03	27581	3.1.4	S	3.1.4
03	27841	3.3.3	S	3.3.3
03	28027	3.1.3	S	3.1.3
03	28034	3.1.3	S	3.1.3

**External Alignment Review
by EPIC**

Grade	Oregon Item ID (TTS ID)	Content Standard Match (See Doc 1.6 for interpretation)	Strength of Match to Standard (Strong; Partial; No Relationship)	Current ODE Coding
03	28040	3.3.2	S	3.3.2
03	28043	3.3.2	S	3.3.2
03	28871	3.2.4	S	3.2.4
03	28985	3.1.4	S	3.1.4
03	29020	3.1.3	P	3.1.3
03	29084	3.1.2	S	3.1.2
03	29336	3.2.3	S	3.2.3
03	29338	3.1.1	S	3.1.1
03	30972	3.1.1	S	3.1.1
04	14110	4.3.7	S	4.3.7
04	14138	4.3.7	S	4.3.7
04	15096	4.2.4	S	4.2.4
04	15745	4.3.7	S	4.3.7
04	16422	4.3.7	S	4.3.7
04	16669	4.1.1	S	4.1.1
04	16685	4.1.1	S	4.1.2
04	17549	4.1.4	S	4.1.4
04	17572	4.2.1	S	4.2.1
04	17638	4.2.4	S	4.2.4
04	17939	4.1.6	S	4.1.6
04	21760	4.2.2	S	4.2.2
04	22507	4.2.2	S	4.2.2
04	22510	4.1.4	S	4.1.4
04	25990	4.1.1	S	4.1.1
04	26040	4.2.3	S	4.2.3
04	26073	4.2.4	S	4.2.4
04	26276	4.2.3	S	4.2.3
04	26474	4.1.2	S	4.1.2
04	26504	4.1.2	S	4.1.2
04	26565	4.2.1	S	4.2.1
04	26652	4.1.6	S	4.1.6
04	27516	4.1.2	S	4.1.2
04	27574	4.3.6	S	4.3.6
04	27643	4.2.1	S	4.2.1
04	27645	4.2.1	S	4.2.1
04	27654	4.3.8	S	4.3.8
04	27658	4.3.3	S	4.3.3
04	27695	4.1.3	S	4.1.3

**External Alignment Review
by EPIC**

Grade	Oregon Item ID (TTS ID)	Content Standard Match (See Doc 1.6 for interpretation)	Strength of Match to Standard (Strong; Partial; No Relationship)	Current ODE Coding
04	27871	4.1.2	S	4.1.2
04	28247	4.3.7	S	4.3.7
04	28641	4.2.2	S	4.2.2
04	28649	4.1.6	S	4.1.6
04	29099	4.3.5	S	4.3.5
04	29130	4.1.6	P	4.1.6
04	29321	4.2.2	S	4.2.1
04	31074	4.3.2	S	4.3.2
04	31080	4.2.1	S	4.2.4
04	31081	4.2.4	S	4.2.4
05	7129	5.1.4	S	5.1.4
05	13046	5.1.5	S	5.1.5
05	14150	5.3.8	S	5.3.8
05	14200	5.3.8	S	5.3.8
05	14538	5.3.1	S	5.3.1
05	14539	5.1.6	S	5.1.6
05	14570	5.3.3	S	5.3.3
05	14975	5.2.1	S	5.2.3
05	14977	5.1.3	S	5.1.3
05	15012	5.1.5	P	5.1.5
05	15037	5.2.4	S	5.2.4
05	15042	5.2.4	S	5.2.4
05	16818	5.1.7	S	5.1.7
05	17006	5.1.5	S	5.1.5
05	17510	5.1.6	S	5.1.6
05	21169	5.2.4	S	5.2.4
05	22383	5.1.6	S	5.1.6
05	22408	5.3.1	S	5.3.1
05	22411	5.1.5	S	5.1.5
05	22436	5.3.8	S	5.3.8
05	22442	5.2.4	P	5.2.4
05	22458	5.3.1	S	5.3.1
05	22519	5.3.2	S	5.3.2
05	26616	5.2.2	S	5.2.2
05	26686	5.2.6	S	5.2.1
05	28162	5.1.5	S	5.1.5
05	28219	5.2.6	S	5.2.6
05	28244	5.2.6	S	5.2.6

**External Alignment Review
by EPIC**

Grade	Oregon Item ID (TTS ID)	Content Standard Match (See Doc 1.6 for interpretation)	Strength of Match to Standard (Strong; Partial; No Relationship)	Current ODE Coding
05	28246	5.2.6	S	5.2.6
05	28275	5.2.6	S	5.2.6
05	28278	5.2.6	S	5.2.6
05	28286	5.2.6	S	5.2.6
05	28316	5.3.5	S	5.3.5
05	31169	5.1.6	S	5.1.6
05	31186	5.2.6	S	5.2.6
06	12901	6.2.1	S	6.2.1
06	12977	6.2.4	S	6.2.4
06	12984	6.1.2	S	6.1.2
06	14206	6.2.4	S	6.2.3
06	14423	6.3.3	S	6.3.3
06	14463	6.2.2	S	6.2.2
06	14476	6.2.4	S	6.2.4
06	14487	6.2.4	S	6.2.4
06	14527	6.1.7	P	6.1.7
06	14583	6.2.4	S	6.2.4
06	14591	6.2.4	S	6.2.4
06	14730	6.1.3	S	6.1.3
06	16825	6.1.2	S	6.1.2
06	22534	6.3.3	S	6.3.3
06	22549	6.3.5	S	6.3.5
06	25964	6.1.1	S	6.1.1
06	25988	6.2.1	P	6.2.1
06	26010	6.2.1	S	6.2.1
06	26057	6.2.1	S	6.2.1
06	26120	6.1.1	S	6.1.1
06	26125	6.2.1	S	6.2.1
06	26162	6.2.1	S	6.2.1
06	26163	6.1.1	S	6.1.1
06	26176	6.2.1	S	6.2.1
06	26199	6.2.1	S	6.2.1
06	26347	6.2.2	S	6.2.2
06	26390	6.1.1	S	6.1.1
06	26854	6.1.3	S	6.1.1
06	27171	6.1.4	S	6.1.4
06	27230	6.2.3	S	6.2.3
06	27273	6.2.1	S	6.2.1

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06	27278	6.1.4	S	6.1.4
06	27356	6.1.4	S	6.1.4
06	27357	6.1.4	S	6.1.4
06	27358	6.1.4	S	6.1.4
06	27360	6.1.4	S	6.1.4
06	27404	6.22	S	6.22
06	27467	6.1.4	S	6.1.4
06	27475	6.1.4	S	6.1.4
06	27478	6.1.4	S	6.1.4
06	27563	6.1.1	S	6.1.1
06	27601	6.2.2	S	6.2.2
06	27666	6.1.2	S	6.1.4
06	27683	6.1.4	S	6.1.4
06	27848	6.3.3	S	6.3.3
06	28209	6.1.3	S	6.1.3
06	28217	6.1.3	S	6.1.3
06	28362	6.1.4	S	6.1.4
06	29247	6.2.1	S	6.2.1
06	29253	6.2.1	S	6.2.1
06	31453	6.3.5	S	6.3.5
06	31471	6.3.7	S	6.3.7
06	31477	6.3.5	S	6.3.5
07	1401	7.1.1	S	7.1.1
07	13080	7.3.5	S	7.3.5
07	14255	7.3.5	S	7.3.5
07	14257	7.3.5	S	7.3.5
07	14449	7.1.2	S	7.1.2
07	20232	7.3.5	S	7.3.5
07	20273	7.3.4	S	7.3.4
07	20296	7.3.6	P	7.3.6
07	20306	7.3.4	P	7.3.4
07	25987	7.1.1	S	7.1.1
07	26051	7.3.2	S	7.3.2
07	26182	7.1.3	S	7.1.3
07	26196	7.1.1	S	7.1.1
07	26224	7.1.1	S	7.1.1
07	26309	7.1.2	S	7.1.2
07	26450	7.3.6	S	7.3.6

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Grade	Oregon Item ID (TTS ID)	Content Standard Match (See Doc 1.6 for interpretation)	Strength of Match to Standard (Strong; Partial; No Relationship)	Current ODE Coding
07	26493	7.1.1	S	7.1.1
07	26808	7.3.6	S	7.3.6
07	27291	7.2.6	S	7.2.6
07	27298	7.1.4	S	7.1.4
07	27436	7.1.2	S	7.1.2
07	27466	7.3.2	S	7.3.2
07	27773	7.3.6	S	7.3.6
07	28353	7.1.2	S	7.1.2
07	28419	7.3.7	S	7.3.7
07	31695	7.3.3	S	7.3.3
08	12932	8.1.3	S	8.1.3
08	13078	8.3.5	S	8.3.5
08	14298	8.1.1	S	8.1.1
08	14300	8.1.3	S	8.1.3
08	14305	8.1.3	S	8.1.3
08	14309	8.3.4	S	8.3.4
08	15243	8.2.2	S	8.2.2
08	15262	8.1.2	S	8.1.2
08	15288	8.1.3	S	8.1.3
08	15376	8.1.5	S	8.1.5
08	15476	8.3.4	S	8.3.4
08	15479	8.3.4	S	8.3.4
08	21654	8.2.8	S	8.2.8
08	26053	8.2.2	S	8.2.2
08	26505	8.1.5	S	8.1.5
08	26523	8.3.4	S	8.3.4
08	26537	8.1.4	S	8.1.4
08	26591	8.1.3	S	8.1.3
08	27420	8.2.5	S	8.2.5
08	27775	8.1.5	S	8.1.5
08	27816	8.2.3	S	8.2.3
08	29409	8.3.2	S	8.3.2
08	31944	8.1.4	S	8.1.4
08	31951	8.3.3	S	8.3.3
08	31954	8.3.2	S	8.3.2
08	31957	8.2.2	S	8.2.2
08	31966	8.3.1	S	8.3.1
10	1743	H.1A.2	S	H.1A.2

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Grade	Oregon Item ID (TTS ID)	Content Standard Match (See Doc 1.6 for interpretation)	Strength of Match to Standard (Strong; Partial; No Relationship)	Current ODE Coding
10	1746	H.1A.1	S	H.1A.1
10	1747	H.2G.1	S	H.2G.1
10	1789	H.3G.4	S	H.3G.4
10	1790	H.1A.2	S	H.1A.2
10	1828	H.1A.2	S	H.1A.2
10	1836	H.2S.1	S	H.2S.2
10	1838	H.1S.1	S	H.1S.1
10	1851	H.1G.5	S	H.1G.5
10	1869	H.1G.5	P	H.1G.5
10	1971	H.2S.2	S	H.2S.2
10	6275	H.2S.1	S	H.2S.1
10	6348	H.2S.3	S	H.2S.3
10	6479	H.3G.2	S	H.3G.2
10	6699	H.3A.5	S	H.3A.5
10	6700	H.3G.4	S	H.1A.2
10	6755	H.1G.7	S	H.1G.7
10	6959	H3G.4	S	H3G.4
10	7108	H.2S.1	S	H.2S.1
10	7388	H.1G.5	S	H.1G.5
10	7680	H.2S.2	S	H.2S.2
10	7743	H.2S.2	S	H.2S.2
10	7831	H.3A.1	S	H.3A.1
10	7916	H.2S.2	S	H.2S.2
10	13059	H.1A.2	S	H.1A.2
10	13073	H.1A.2	S	H.1A.2
10	14235	H.2A.8	S	H.2A.8
10	14349	H.1G.7	S	H.1G.7
10	14364	H.3A.5	S	H.3A.5
10	14899	H.1A.2	S	H.1A.2
10	15592	H.3A.2	S	H.3A.2
10	15617	H.3A.1	S	H.3A.1
10	15969	H.1S.1	S	H.1S.1
10	16485	H.1G.6	S	H.1G.6
10	16686	H.3G.1	S	H.3G.1
10	16700	H.3G.1	S	H.3G.1
10	22676	H.1A.2	S	H.1A.2
10	22709	H.3A.3	S	H.3A.3
10	22710	H.3A.3	R	H.3A.3

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10	22778	H.3A.3	P	H.3A.3
10	22784	H.2A.7	S	H.2A.7
10	22793	H.1G.3	S	H.1G.3
10	22799	H.2S.3	S	H.2S.3
10	22805	H.2S.2	S	H.2S.2
10	26151	H.2A.1	S	H.2A.1
10	26197	H.2A.1	S	H.2A.1
10	26439	H.1G.4	S	H.1G.4
10	26634	H.1G.5	S	H.1G.5
10	26704	H.2A.2	S	H.2A.2
10	26716	H.2A.2	S	H.2A.2
10	26734	H.1G.6	S	H.1G.6
10	27287	H.2A.2	S	H.2A.2
10	27315	H.2S.1	S	H.2S.1
10	27422	H.1S.4	S	H.1S.4
10	27426	H.1A.5	S	H.1A.5
10	27432	H.1A.2	S	H.1A.2
10	27489	H.1A.2	S	H.1A.2
10	27963	H.1S.5	S	H.1S.5
10	28497	H.2A.7	S	H.2A.7
10	28612	H.2A.7	S	H.2A.7
10	28619	H.1A.5	S	H.1A.5
10	28637	H.1A.5	S	H.1A.5
10	28638	H.1A.5	S	H.1A.5
10	29081	H.1A.3	S	H.1A.3
10	29342	H.2A.2	S	H.2A.2
10	29412	H.2A.2	S	H.2A.2
10	29433	H.3G.3	S	H.3G.3
10	32021	H.1A.5	S	H.2A.7
10	32044	H.2A.7	S	H.2A.7
10	32056	H.1G.7	S	H.1G.7
10	32070	H.1G.3	S	H.1G.3

Summary

As reflected Table 1, the EPIC mathematics alignment expert found that 95 percent of the 296 items reviewed had a strong match to the grade-level core standard (Table 1) assessed on the mathematics test.

The strong degree of categorical concurrence provided further evidence that the ODE item developments and review procedure maintains fidelity with the State Board-adopted mathematics content standards.

At the narrower content standard level, the EPIC assignment was consistent with ODE coding for 274 out of 296 items (93 percent).