



Common Core Standards: The New US Intended Curriculum

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How much change in the US
curriculum is represented by the
common core standards in
Mathematics and English
Language Arts and Reading?

	Categories of Cognitive Demand				
Topics	Memorize	Perform Procedures	Communicate Understanding	Solve Non-Routine Problems	Conjecture Generalize Prove
Multiple Step Equations					
Inequalities					
Literal Equations					
Lines / Slope and Intercept					
Operations on Polynomials					
Quadratic Equations					

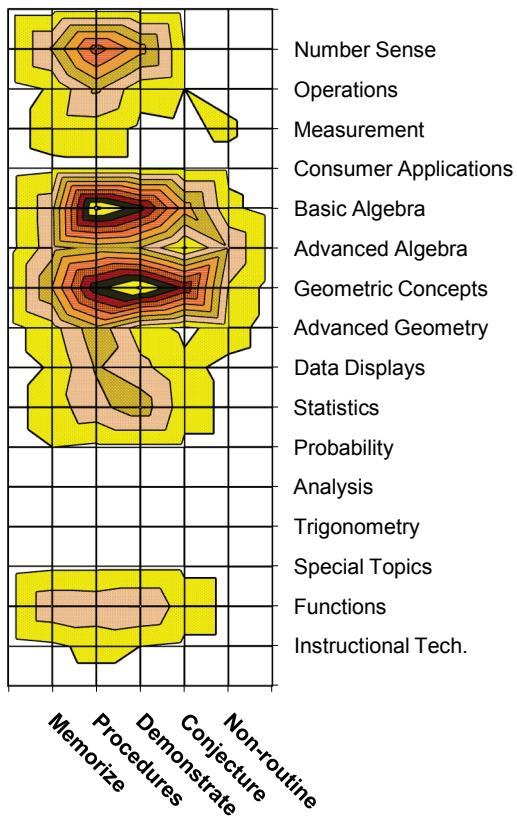
Cognitive Demand Categories for Language Arts / Reading

Alignment Formula

$$\text{alignment index} = 1 - \sum \frac{|x_1 - y_1|}{2}$$

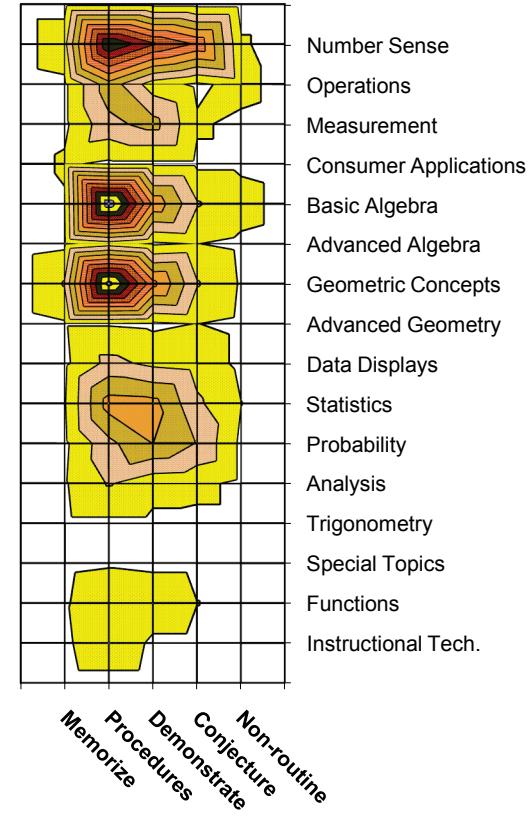
Course Grain Content Map

CC Grade 8 Math



Alignment index:
0.26

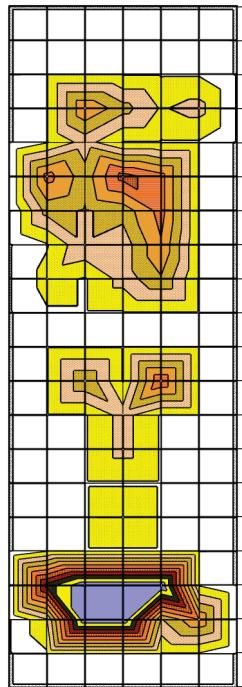
State AA Grade 8 Math



Fine Grain Content Map— Geometric Concepts

CC Grade 8 Math

Geometric Concepts



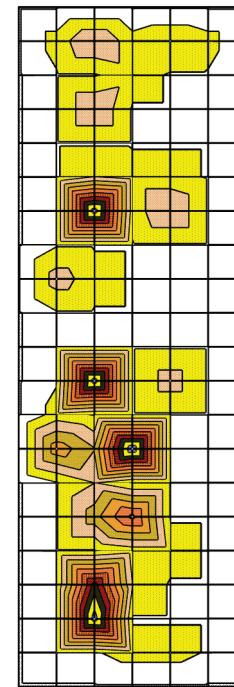
(non-specific)
Basic terminology
Points, lines, rays, segments and vectors
Patterns
Congruence
Similarity
Parallels
Triangles
Quadrilaterals
Circles
Angles
Polygons
Polyhedra
Models
3-D relationships
Symmetry
Transformations (e.g., flips, turns)
Pythagorean Theorem
Other: (topic not listed)

Memorize
Procedures
Demonstrate
Non-routine
Conjecture

□ -0.0038--0.0018	□ -0.0018-0.0002
■ 0.0002-0.0022	■ 0.0022-0.0042
■ 0.0042-0.0062	■ 0.0062-0.0082

State AA Grade 8 Math

Geometric Concepts



(non-specific)
Basic terminology
Points, lines, rays, segments and vectors
Patterns
Congruence
Similarity
Parallels
Triangles
Quadrilaterals
Circles
Angles
Polygons
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Models
3-D relationships
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Pythagorean Theorem
Other: (topic not listed)

Memorize
Procedures
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Non-routine
Conjecture

□ -0.0038--0.0018	□ -0.0018-0.0002
■ 0.0002-0.0022	■ 0.0022-0.0042
■ 0.0042-0.0062	■ 0.0062-0.0082

Table 1. Alignment of State and Common Core Math Standards

State Standards	Common Core Standards									
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9-12
State A				0.2					0.07	
State B							0.19	0.31	0.28	0.22
State C				0.3	0.21	0.16	0.16	0.15	0.22	
State D										0.12
State E									0.2	
State F		0.27	0.32	0.25	0.23	0.15	0.25	0.34	0.22	0.31
State G	0.34	0.27	0.41	0.3	0.18	0.19	0.24	0.28	0.33	0.15
State H	0.23	0.27	0.23	0.24	0.19	0.17	0.2	0.21	0.23	
State I	0.42	0.29	0.33	0.22	0.21	0.21	0.27	0.17	0.3	0.37
State J					0.15				0.23	
State K		0.23	0.32	0.28	0.28	0.24	0.06	0.09	0.16	0.3
State L										0.23
State M				0.18		0.22	0.19	0.3	0.3	0.32
State N	0.25	0.26	0.34	0.27	0.29	0.27	0.26	0.26	0.26	0.25
State O	0.25	0.19	0.27	0.25	0.21	0.25	0.23	0.25	0.2	0.27
State P					0.25				0.16	
State R	0.27	0.2	0.27	0.21	0.16	0.2		0.19		0.31
State S	0.35	0.29	0.4	0.31	0.19	0.21	0.2	0.3	0.29	0.33
State T								0.19		0.24
State U					0.17				0.14	0.11
State V									0.22	
State W				0.1	0.12	0.1	0.01	0.07	0.07	0.05
State X							0.17		0.15	
State AA		0.3	0.38	0.32	0.3	0.26	0.25	0.22	0.26	0.32
State AB	0.51	0.28	0.44	0.41	0.27	0.24	0.21	0.33	0.29	0.26
State AD	0.15	0.19	0.21	0.24	0.17	0.21	0.21	0.22	0.21	0.19
State AE			0.46	0.41	0.43	0.3				
NCTM	0.23	0.27	0.30	0.27	0.24	0.27	0.22	0.22	0.22	0.38
Min	0.15	0.19	0.21	0.10	0.12	0.10	0.01	0.07	0.07	0.05
Max	0.51	0.30	0.46	0.41	0.43	0.30	0.27	0.34	0.33	0.37
Average	0.31	0.25	0.34	0.27	0.22	0.21	0.19	0.23	0.22	0.24

Table 1. Alignment of State and Common Core Math Standards

State Standards	Common Core Standards									
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9-12
State A				0.2					0.07	
State B							0.19	0.31	0.28	0.22
State C				0.3	0.21	0.16	0.16	0.15	0.22	
State D										0.12
State E									0.2	
State F		0.27	0.32	0.25	0.23	0.15	0.25	0.34	0.22	0.31
State G	0.34	0.27	0.41	0.3	0.18	0.19	0.24	0.28	0.33	0.15
State H	0.23	0.27	0.23	0.24	0.19	0.17	0.2	0.21	0.23	
State I	0.42	0.29	0.33	0.22	0.21	0.21	0.27	0.17	0.3	0.37
State J					0.15				0.23	
State K		0.23	0.32	0.28	0.28	0.24	0.06	0.09	0.16	0.3
State L										0.23
State M				0.18		0.22	0.19	0.3	0.3	0.32
State N	0.25	0.26	0.34	0.27	0.29	0.27	0.26	0.26	0.26	0.25
State O	0.25	0.19	0.27	0.25	0.21	0.25	0.23	0.25	0.2	0.27
State P					0.25				0.16	
State R	0.27	0.2	0.27	0.21	0.16	0.2		0.19		0.31
State S	0.35	0.29	0.4	0.31	0.19	0.21	0.2	0.3	0.29	0.33
State T								0.19		0.24
State U					0.17				0.14	
State V									0.22	
State W				0.1	0.12	0.1	0.01	0.07	0.07	0.05
State X							0.17		0.15	
State AA		0.3	0.38	0.32	0.3	0.26	0.25	0.22	0.26	0.32
State AB	0.51	0.28	0.44	0.41	0.27	0.24	0.21	0.33	0.29	0.26
State AD	0.15	0.19	0.21	0.24	0.17	0.21	0.21	0.22	0.21	0.19
State AE			0.46	0.41	0.43	0.3				
NCTM	0.23	0.27	0.30	0.27	0.24	0.27	0.22	0.22	0.22	0.38
Min	0.15	0.19	0.21	0.10	0.12	0.10	0.01	0.07	0.07	0.05
Max	0.51	0.30	0.46	0.41	0.43	0.30	0.27	0.34	0.33	0.37
Average	0.31	0.25	0.34	0.27	0.22	0.21	0.19	0.23	0.22	0.24

Table 2. Alignment of State and Common Core ELAR Standards

State Standards	Common Core Standards										
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9/10	Grade 11/12
State C						0.28			0.35	0.34	
State F		0.37	0.34	0.32	0.39	0.24	0.24	0.41	0.35	0.23	0.31
State G	0.32	0.34	0.40	0.24	0.29	0.31	0.44	0.43	0.48	0.39	
State H				0.19	0.16	0.14	0.17	0.22	0.23	0.25	
State I	0.29	0.34	0.35	0.37	0.37	0.34	0.38	0.39	0.40	0.38	0.34
State K					0.20	0.29	0.30			0.16	0.39
State L				0.38			0.26			0.37	
State M					0.11	0.10	0.15	0.14	0.15	0.11	0.18
State N	0.36	0.29	0.26	0.33	0.35	0.21	0.36	0.30	0.33	0.35	0.35
State O	0.31	0.33	0.40	0.34	0.19	0.30	0.38	0.34	0.32	0.39	0.39
State P				0.27	0.21						
State Q								0.37		0.33	0.33
State R	0.26	0.37	0.35	0.33	0.28	0.35	0.40	0.39	0.42		
State S				0.26	0.28	0.16	0.23	0.20	0.24	0.36	0.37
State T							0.29	0.13	0.33		
State U						0.25				0.32	0.38
State W						0.23				0.19	0.17
State Y		0.34	0.32	0.31	0.36	0.37	0.35	0.35	0.33	0.39	0.37
State Z				0.22		0.22			0.21	0.18	
State AA			0.14	0.14	0.15	0.15	0.38	0.38	0.35	0.23	0.38
	0.28	0.35	0.37	0.33	0.39	0.39	0.37	0.37	0.43	0.40	0.37
State AC					0.22	0.26	0.22	0.22	0.23	0.31	0.31
State AD	0.31	0.31	0.32	0.31	0.32	0.32	0.40	0.40	0.41	0.39	0.36
State AE	0.31	0.35	0.34	0.30	0.30		0.20				
Min	0.26	0.29	0.14	0.11	0.10	0.15	0.14	0.13	0.11	0.18	0.17
Max	0.36	0.37	0.40	0.37	0.39	0.39	0.44	0.43	0.48	0.40	0.39
Mean	0.30	0.34	0.31	0.26	0.26	0.27	0.31	0.32	0.32	0.33	0.33

Table 2. Alignment of State and Common Core ELAR Standards

State Standards	Common Core Standards										
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9/10	Grade 11/12
State C						0.28			0.35	0.34	
State F		0.37	0.34	0.32	0.39	0.24	0.24	0.41	0.35	0.23	0.31
State G	0.32	0.34	0.40	0.24	0.29	0.31	0.44	0.43	0.48	0.39	
State H				0.19	0.16	0.14	0.17	0.22	0.23	0.25	
State I	0.29	0.34	0.35	0.37	0.37	0.34	0.38	0.39	0.40	0.38	0.34
State K					0.20	0.29	0.30			0.16	0.39
State L				0.38			0.26			0.37	
State M					0.11	0.10	0.15	0.14	0.15	0.11	0.18
State N	0.36	0.29	0.26	0.33	0.35	0.21	0.36	0.30	0.33	0.35	0.35
State O	0.31	0.33	0.40	0.34	0.19	0.30	0.38	0.34	0.32	0.39	0.39
State P				0.27	0.21						
State Q							0.37		0.33		0.33
State R	0.26	0.37	0.35	0.33	0.28	0.35	0.40	0.39	0.42		
State S				0.26	0.28	0.16	0.23	0.20	0.24	0.36	0.37
State T							0.29	0.13	0.33		
State U						0.25				0.32	0.38
State W						0.23				0.19	0.17
State Y		0.34	0.32	0.31	0.36	0.37	0.35	0.35	0.33	0.39	0.37
State Z				0.22		0.22			0.21	0.18	
State AA			0.14	0.14	0.15	0.15	0.38	0.38	0.35	0.23	0.38
	0.28	0.35	0.37	0.33	0.39	0.39	0.37	0.37	0.43	0.40	0.37
State AC					0.22	0.26	0.22	0.22	0.23	0.31	0.31
State AD	0.31	0.31	0.32	0.31	0.32	0.32	0.40	0.40	0.41	0.39	0.36
State AE	0.31	0.35	0.34	0.30	0.30		0.20				
Min	0.26	0.29	0.14	0.11	0.10	0.15	0.14	0.13	0.11	0.18	0.17
Max	0.36	0.37	0.40	0.37	0.39	0.39	0.44	0.43	0.48	0.40	0.39
Mean	0.30	0.34	0.31	0.26	0.26	0.27	0.31	0.32	0.32	0.33	0.33

Table 3. Degree of Focus of Standards

	Number of Covered Topics in Math									
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grades 9-12
CC	36	51	66	69	90	89	156	202	132	240
NCTM		143			205			177		179
States	58.4	79.6	95.4	95.1	110.4	118.8	123.3	120.7	119.7	133.5

	Number of Covered Topics in ELAR										
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grades 10-11	Grades 11-12
CC	328	337	339	298	291	285	305	298	300	231	219
States	142	196.5	183.8	168.2	175	173	178.1	175.1	170.9	153.9	172.14

Table 3. Degree of Focus of Standards

	Number of Covered Topics in Math									
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grades 9-12
CC	36	51	66	69	90	89	156	202	132	240
NCTM		143			205			177		179
States	58.4	79.6	95.4	95.1	110.4	118.8	123.3	120.7	119.7	133.5

	Number of Covered Topics in ELAR										
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grades 10-11	Grades 11-12
CC	328	337	339	298	291	285	305	298	300	231	219
States	142	196.5	183.8	168.2	175	173	178.1	175.1	170.9	153.9	172.14

Table 4. Aggregated Alignment between Common Core and State Standards

State Standards	Math			ELAR		
	Grades 3-6	Grades 3-8	State Gr 3-8 Average	Grades 3-6	Grades 3-8	State Gr 3-8 Average
State C	0.39	0.42	0.2	--	--	--
State F	0.35	0.44	0.24		0.44	0.50
State G	0.38	0.44	0.25		0.44	0.50
State H	0.32	0.37	0.21		0.25	0.29
State I	0.38	0.45	0.23		0.47	0.50
State K	0.36	0.37	0.19	--	--	--
State M	--	--	--		0.19	0.21
State N	0.43	0.47	0.27		0.45	0.50
State O	0.34	0.40	0.23		0.41	0.48
State R	--	--	--		0.43	0.49
State S	0.36	0.43	0.25		0.37	0.40
State W	--	--	--	--	--	--
State Y	--	--	--		0.42	0.42
State AA	0.47	0.51	0.27		0.28	0.34
State	0.41	0.46	0.29		0.45	0.49
State AD	0.30	0.38	0.21		0.40	0.43
Min	0.15	0.19	0.22		0.19	0.21
Max	0.47	0.51	0.27		0.47	0.50
Mean	0.36	0.41	0.19		0.38	0.43
						0.30

Table 4. Aggregated Alignment between Common Core and State Standards

State Standards	Math			ELAR		
			State Gr 3-8 Average			State Gr 3-8 Average
	Grades 3-6	Grades 3-8		Grades 3-6	Grades 3-8	
State C	0.39	0.42	0.2	--	--	--
State F	0.35	0.44	0.24		0.44	0.50
State G	0.38	0.44	0.25		0.44	0.50
State H	0.32	0.37	0.21		0.25	0.29
State I	0.38	0.45	0.23		0.47	0.50
State K	0.36	0.37	0.19	--	--	--
State M	--	--	--		0.19	0.21
State N	0.43	0.47	0.27		0.45	0.50
State O	0.34	0.40	0.23		0.41	0.48
State R	--	--	--		0.43	0.49
State S	0.36	0.43	0.25		0.37	0.40
State W	--	--	--	--	--	--
State Y	--	--	--		0.42	0.42
State AA	0.47	0.51	0.27		0.28	0.34
State	0.41	0.46	0.29		0.45	0.49
State AD	0.30	0.38	0.21		0.40	0.43
Min	0.15	0.19	0.22		0.19	0.21
Max	0.47	0.51	0.27		0.47	0.50
Mean	0.36	0.41	0.19		0.38	0.43
						0.30

Table 5. Alignment of State Assessments and Common Core Math Standards

State Assessments	Common Core Standards						
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9-12
State A			0.11				
State G	0.17	0.21	0.21	0.21	0.17	0.29	0.17
State H	0.17				0.15		0.16
State I	0.27	0.22	0.14	0.21	0.24	0.31	0.2
State K	0.29	0.17	0.18	0.17	0.17	0.18	0.2
State L			0.23			0.14	0.24
State M		0.2				0.15	0.18
State N	0.14	0.28	0.19	0.19	0.3	0.21	0.15
State O	0.16	0.2			0.15	0.13	0.2
State P		0.22				0.16	
State S	0.15	0.18	0.16	0.14	0.17	0.22	0.1
State U		0.14				0.17	0.14
State V		0.22				0.19	
State W	0.18	0.21	0.23	0.21	0.29	0.27	0.17
State X				0.18		0.18	
State Y						0.15	
NAEP		0.28				0.21	
Min	0.14	0.11	0.14	0.14	0.15	0.13	0.10
Max	0.29	0.28	0.23	0.21	0.30	0.31	0.24
Average	0.19	0.20	0.19	0.18	0.21	0.20	0.17

Table 5. Alignment of State Assessments and Common Core Math Standards

State Assessments	Common Core Standards						
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9-12
State A			0.11				
State G	0.17	0.21	0.21	0.21	0.17	0.29	0.17
State H	0.17			0.15			0.16
State I	0.27	0.22	0.14	0.21	0.24	0.31	0.2
State K	0.29	0.17	0.18	0.17	0.17	0.18	0.2
State L			0.23			0.14	0.24
State M		0.2				0.15	0.18
State N	0.14	0.28	0.19	0.19	0.3	0.21	0.15
State O	0.16	0.2			0.15	0.13	0.2
State P		0.22				0.16	
State S	0.15	0.18	0.16	0.14	0.17	0.22	0.1
State U		0.14				0.17	0.14
State V		0.22				0.19	
State W	0.18	0.21	0.23	0.21	0.29	0.27	0.17
State X				0.18		0.18	
State Y						0.15	
NAEP		0.28				0.21	
Min	0.14	0.11	0.14	0.14	0.15	0.13	0.10
Max	0.29	0.28	0.23	0.21	0.30	0.31	0.24
Average	0.19	0.20	0.19	0.18	0.21	0.20	0.17

Table 6. Alignment of State Assessments and Common Core ELAR Standards

State Assessments	Common Core Assessments							
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9-10	Grade 11-12
State C	0.17	0.17	0.19	0.22	0.19	0.18	0.21	
State I	0.19	0.13	0.22	0.14	0.15	0.24	0.18	
State K	0.21	0.20	0.18	0.08	0.08	0.14	0.23	
State M	0.14	0.10	0.13	0.14	0.17	0.20		0.19
State N	0.21	0.23	0.32	0.26	0.26	0.21	0.28	0.27
State Q				0.16				0.12
State S	0.18	0.15	0.11	0.07	0.16	0.07	0.14	0.13
State U		0.16				0.11	0.10	
State W		0.24				0.12	0.18	
State Y	0.16	0.20	0.18	0.20	0.20	0.24	0.14	0.14
State AB						0.21		
State AC		0.14	0.17	0.16				
NAEP		0.25				0.24		
Min	0.14	0.10	0.11	0.07	0.08	0.07	0.10	0.12
Max	0.21	0.24	0.32	0.26	0.26	0.24	0.28	0.27
Average	0.18	0.17	0.19	0.16	0.17	0.17	0.18	0.17

Table 6. Alignment of State Assessments and Common Core ELAR Standards

State Assessments	Common Core Assessments							
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9-10	Grade 11-12
State C	0.17	0.17	0.19	0.22	0.19	0.18	0.21	
State I	0.19	0.13	0.22	0.14	0.15	0.24	0.18	
State K	0.21	0.20	0.18	0.08	0.08	0.14	0.23	
State M	0.14	0.10	0.13	0.14	0.17	0.20		0.19
State N	0.21	0.23	0.32	0.26	0.26	0.21	0.28	0.27
State Q				0.16				0.12
State S	0.18	0.15	0.11	0.07	0.16	0.07	0.14	0.13
State U			0.16			0.11	0.10	
State W			0.24			0.12	0.18	
State Y	0.16	0.20	0.18	0.20	0.20	0.24	0.14	0.14
State AB						0.21		
State AC		0.14	0.17	0.16				
NAEP		0.25				0.24		
Min	0.14	0.10	0.11	0.07	0.08	0.07	0.10	0.12
Max	0.21	0.24	0.32	0.26	0.26	0.24	0.28	0.27
Average	0.18	0.17	0.19	0.16	0.17	0.17	0.18	0.17

Table 7. Aggregated Alignment between Common Core and State Assessments

State Assessments	Math			ELAR		
	Grades 3-6	Grades 3-8	State Gr 3-8 Average	Grades 3-6	Grades 3-8	State Gr 3-8 Average
State C				0.23	0.24	0.19
State G	0.33	0.36	0.21			
State I	0.33	0.4	0.23	0.28	0.3	0.18
State K	0.35	0.4	0.19	0.23	0.23	0.15
State M				0.17	0.22	0.15
State N	0.35	0.41	0.22	0.36	0.37	0.25
State S	0.33	0.39	0.17	0.16	0.18	0.12
State W	0.37	0.43	0.23			
State Y				0.23	0.26	0.20
Min	0.33	0.36	0.17	0.16	0.18	0.15
Max	0.37	0.43	0.23	0.36	0.37	0.25
Mean	0.34	0.4	0.21	0.24	0.26	0.18

Table 7. Aggregated Alignment between Common Core and State Assessments

State Assessments	Math			ELAR		
	Grades 3-6	Grades 3-8	State Gr 3-8 Average	Grades 3-6	Grades 3-8	State Gr 3-8 Average
State C				0.23	0.24	0.19
State G	0.33	0.36	0.21			
State I	0.33	0.4	0.23	0.28	0.3	0.18
State K	0.35	0.4	0.19	0.23	0.23	0.15
State M				0.17	0.22	0.15
State N	0.35	0.41	0.22	0.36	0.37	0.25
State S	0.33	0.39	0.17	0.16	0.18	0.12
State W	0.37	0.43	0.23			
State Y				0.23	0.26	0.20
Min	0.33	0.36	0.17	0.16	0.18	0.15
Max	0.37	0.43	0.23	0.36	0.37	0.25
Mean	0.34	0.4	0.21	0.24	0.26	0.18

Some Issues

- The intended versus the enacted curriculum
- Assessments are samples
- Is lack of alignment due to content in a standard at one grade level and content in another standard at another grade level, indicating an important difference?
- What is the right grain size for defining content?

Conclusions

- There are large differences in the content messages of the common core standards grade by grade and state content standards for those same grades.
- There are large differences between the content messages of state assessments and the content messages of common core standards grade by grade.
- The real point is the enacted curriculum and that canon does differ from the intended curriculum of content standards and assessments.