

***Minnesota TIMSS:
The Rest of the Story***

TIMSS 2007

William H. Schmidt
Michigan State University
Mike Lindstrom SciMathMN

2007 Grade 8 Mathematics

Nation	Mean
Chinese Taipei	598
Korea, Rep. of	597
Singapore	593
Hong Kong SAR	572
Japan	570
Massachusetts, US	547

Nation	Mean
Minnesota, US	532

Significantly Higher than MN
Not Significantly Different from MN
Significantly Lower than MN

Nation	Mean
Hungary	517
England	513
Russian Federation	512
United States	508
Lithuania	506
Czech Republic	504
Slovenia	501
Armenia	499
Australia	496
Sweden	491
Malta	488
Scotland	487
Serbia	486
Italy	480
Malaysia	474
Norway	469
Cyprus	465
Bulgaria	464
Israel	463
Ukraine	462
Romania	461
Bosnia and Herzegovina	456
Lebanon	449
Thailand	441
Turkey	432
Jordan	427
Tunisia	420
Georgia	410
Iran, Islamic Rep. of	403

Nation	Mean
Bahrain	398
Indonesia	397
Syrian Arab Republic	395
Greece	391
Lithuania	381
Colombia	380
Oman	372
Palestinian Nat'l Auth.	367
Botswana	364
Kuwait	354
El Salvador	340
Saudi Arabia	329
Ghana	309
Qatar	307

2007 Grade 4 Mathematics

Nation	Mean
Hong Kong SAR	607
Singapore	599
Chinese Taipei	576
Massachusetts, US	572
Japan	568

Nation	Mean
Minnesota, US	554
Kazakhstan	549
Russian Federation	544
England	541

Nation	Mean
Latvia	537
Netherlands	535
Lithuania	530
United States	529
Germany	525
Denmark	523
Australia	516
Hungary	510
Italy	507
Austria	505
Sweden	503
Slovenia	502
Armenia	500
Slovak Republic	496
Scotland	494
New Zealand	492
Czech Republic	486
Norway	473
Ukraine	469
Georgia	438
Iran, Islamic Rep. of	402
Algeria	378
Colombia	355
Morocco	341
El Salvador	330
Tunisia	327
Kuwait	316
Qatar	296
Yemen	224

Significantly Higher than MN
Not Significantly Different from MN
Significantly Lower than MN

Grade 4 Mathematics: 1995 & 2007

Nation	Mean
Singapore	590
Japan	567
Hong Kong SAR	557
Netherlands	549
Czech Republic	541
Austria	531
Slovenia	525
Hungary	521
United States	518
Australia	517
Minnesota, US	516
Latvia	499
Scotland	493
England	484
Norway	476
New Zealand	469
Iran, Islamic Rep. of	387

Nation	Mean
Hong Kong SAR	607
Singapore	599
Japan	568
Minnesota, US	554
England	541
Latvia	537
Netherlands	535
United States	529
Australia	516
Hungary	510
Austria	505
Slovenia	502
Scotland	494
New Zealand	492
Czech Republic	486
Norway	473
Iran, Islamic Rep. of	402

Significantly Higher than MN
Not Significantly Different from MN
Significantly Lower than MN

Grade 8 Mathematics: 1995 & 2007

Nation	Mean
Singapore	609
Japan	581
Korea, Rep. of	581
Hong Kong SAR	569
Czech Republic	546
Sweden	540
Slovenia	531
Bulgaria	527
Hungary	527
Russian Federation	524
Australia	519
Minnesota, US	518
Norway	498
England	498
Scotland	493
United States	492
Romania	474
Lithuania	472
Cyprus	468
Iran, Islamic Rep. of	418
Colombia	360

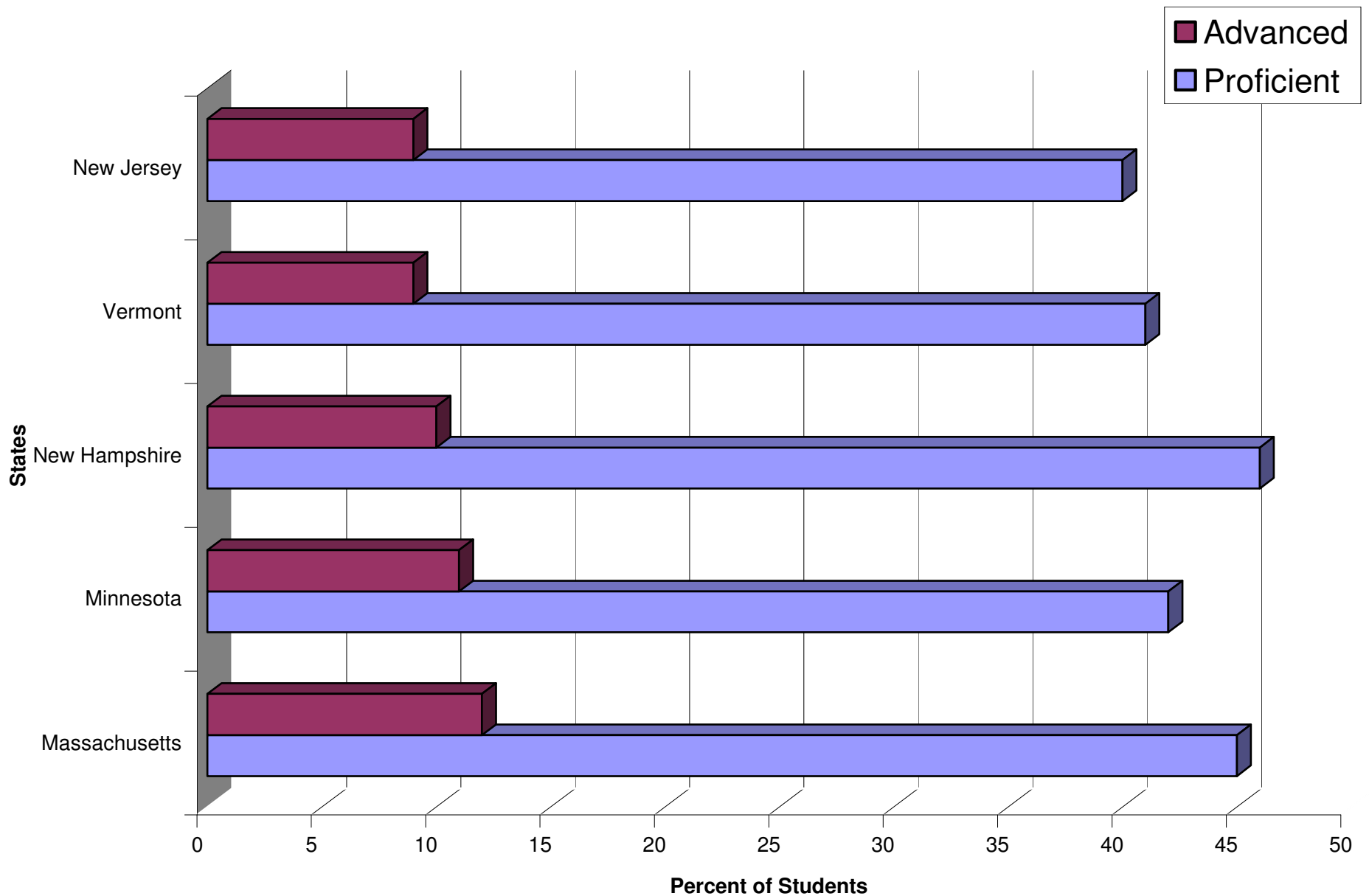
Nation	Mean
Korea, Rep. of	597
Singapore	593
Hong Kong SAR	572
Japan	570
Minnesota, US	532
Hungary	517
England	513
Russian Federation	512
United States	508
Lithuania	506
Czech Republic	504
Slovenia	501
Australia	496
Sweden	491
Scotland	487
Norway	469
Cyprus	465
Bulgaria	464
Romania	461
Iran, Islamic Rep. of	403
Colombia	380

Significantly Higher than MN

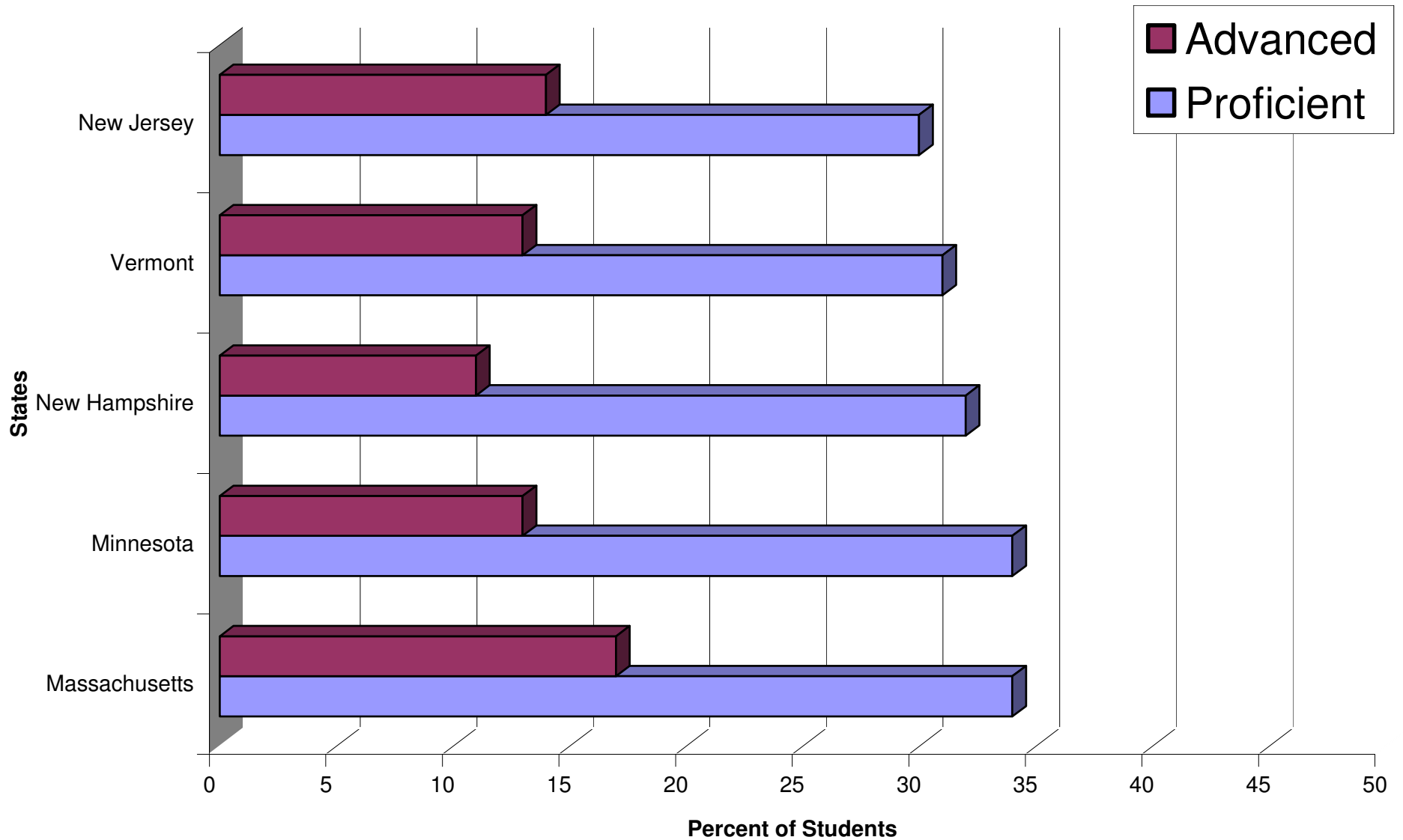
Not Significantly Different from MN

Significantly Lower than MN

2009 NAEP Grade 4 Mathematics



2009 NAEP Grade 8 Mathematics



Grade 4 Mathematics 1

1995

Meaning of Whole Numbers		Whole Number Operations		Common Fractions		Decimal Fractions		Measurement Units		Perimeter, Area, & Volume	
Singapore	82	Japan	80	Singapore	72	Singapore	83	Japan	77	Singapore	76
Japan	80	Singapore	79	Hong Kong	65	Hong Kong	73	Czech Republic	68	Hong Kong	71
Hong Kong	76	Hong Kong	77	Japan	63	Japan	71	Hong Kong	68	Czech Republic	68
Hungary	75	Czech Republic	74	Hungary	61	U.S.A.	47	Hungary	66	Japan	67
Minnesota	74	Hungary	71	Minnesota	60	International Mn	45	Singapore	61	Hungary	63
Czech Republic	73	Minnesota	68	U.S.A.	54	Australia	44	Australia	60	Australia	62
U.S.A.	70	U.S.A.	68	Australia	52	Czech Republic	40	Norway	60	Minnesota	60
Australia	69	International Mn	64	International Mn	50	Minnesota	39	International Mn	57	International Mn	59
International Mn	66	Australia	61	Czech Republic	50	Hungary	36	England	52	U.S.A.	58
Norway	61	Norway	58	England	49	England	32	Minnesota	49	England	55
England	59	England	53	Norway	39	Norway	29	U.S.A.	48	Norway	54

2007

Hong Kong SAR	80	Hong Kong SAR	75	Singapore	76	Singapore	83	Hong Kong SAR	74	Hong Kong SAR	78
Japan	77	Singapore	74	Hong Kong SAR	75	Hong Kong SAR	73	Singapore	69	Singapore	73
Singapore	74	Japan	60	Minnesota	68	Minnesota	65	Japan	68	Japan	65
Minnesota	70	Minnesota	56	England	62	England	57	England	62	Minnesota	63
England	69	Hungary	53	Japan	60	U.S.A.	57	Minnesota	59	Australia	55
Hungary	66	England	52	U.S.A.	59	Japan	56	Czech Republic	57	England	54
U.S.A.	66	U.S.A.	51	Australia	55	Australia	43	Hungary	57	U.S.A.	52
Australia	62	Czech Republic	47	Hungary	44	International Mn	38	Australia	54	Hungary	48
Czech Republic	60	International Mn	44	International Mn	42	Hungary	34	U.S.A.	49	International Mn	46
International Mn	56	Australia	43	Norway	38	Norway	29	International Mn	46	Czech Republic	43
Norway	53	Norway	36	Czech Republic	27	Czech Republic	20	Norway	44	Norway	40
Meaning of Whole Numbers		Whole Number Operations		Common Fractions		Decimal Fractions		Measurement Units		Perimeter, Area, & Volume	

Grade 4 Mathematics 2

1995

Geometry: Position & Shapes		Symmetry, Congruence, & Similarity		Proportionality		Patterns, Relations, & Functions		Equations & Formulas		Data Representation, Probability & Statistics	
Australia	72	Singapore	89	Singapore	64	Hong Kong	78	Japan	84	Singapore	81
Minnesota	71	Hong Kong	85	Japan	58	Singapore	77	Singapore	83	Japan	78
England	71	England	81	Czech Republic	57	Japan	77	Hong Kong	77	Hong Kong	76
Hong Kong	70	Australia	80	Hungary	55	Hungary	71	Hungary	72	Minnesota	74
U.S.A.	68	Japan	79	Hong Kong	53	Czech Republic	70	Czech Republic	71	U.S.A.	73
Czech Republic	67	Minnesota	79	Australia	51	Australia	70	U.S.A.	66	Czech Republic	67
Japan	67	U.S.A.	79	England	47	U.S.A.	69	International Mn	62	Australia	67
Singapore	65	Czech Republic	78	U.S.A.	46	International Mn	63	Australia	60	England	66
Hungary	62	Hungary	73	International Mn	45	England	62	Minnesota	60	International Mn	62
International Mn	62	International Mn	71	Minnesota	45	Minnesota	60	Norway	50	Hungary	60
Norway	58	Norway	56	Norway	41	Norway	55	England	48	Norway	60

2007

Hong Kong	78	HONG KONG SAF	83	Hong Kong	75	Singapore	71	Hong Kong	73	Hong Kong	85
Singapore	71	SINGAPORE	81	Singapore	69	Singapore	71	Singapore	69	Singapore	83
Japan	70	England	73	Japan	64	Japan	65	Japan	68	Japan	82
Minnesota	67	Minnesota	72	Minnesota	56	Minnesota	62	Minnesota	62	Minnesota	77
England	64	JAPAN	65	England	55	England	59	Hungary	59	England	75
Australia	61	Australia	65	U.S.A.	52	U.S.A.	57	U.S.A.	58	U.S.A.	74
U.S.A.	59	U.S.A.	64	Australia	52	HUNGARY	55	England	56	Australia	70
Hungary	55	Hungary	58	Hungary	46	Australia	51	Australia	48	Hungary	61
Czech Republic	50	International Mn	49	International Mn	42	Czech Republic	46	Czech Republic	46	Czech Republic	58
Norway	49	Czech Republic	48	Czech Republic	40	International Mn	46	International Mn	46	Norway	57
International Mn	49	Norway	47	Norway	37	Norway	42	Norway	39	International Mn	56
Geometry: Position & Shapes		Symmetry, Congruence, & Similarity		Proportionality		Patterns, Relations, & Functions		Equations & Formulas		Data Representation, Probability & Statistics	

Grade 8 Mathematics 1

1995

Whole Numbers	Common Fractions	Decimal Fractions & Percents	Relations of Fractions	Estimating Quantity & Size	Rounding
Singapore 80	Singapore 82	Singapore 78	Singapore 85	Japan 78	Czech Republic 87
Japan 72	Japan 72	Czech Republic 73	Korea 78	Singapore 77	Singapore 87
Korea 68	Korea 70	Hong Kong 71	Japan 75	England 72	Korea 84
Czech Republic 67	Hong Kong 69	Japan 70	Hong Kong 74	Hong Kong 72	Minnesota 83
Hong Kong 65	Czech Republic 60	Hungary 69	Minnesota 66	Czech Republic 72	Hungary 80
Russian Federation 63	Hungary 58	Korea 68	Czech Republic 65	Korea 71	Japan 80
Hungary 61	Israel 57	Russian Federation 66	Sweden 62	Minnesota 70	U.S.A. 79
Sweden 59	Russian Federation 56	Minnesota 59	Australia 61	Australia 69	Sweden 78
Israel 59	Australia 55	Sweden 59	Hungary 61	Hungary 69	Australia 78
Thailand 56	Minnesota 55	Thailand 58	Thailand 60	Sweden 69	Thailand 75
Minnesota 56	Thailand 54	Israel 56	Norway 60	Norway 67	Hong Kong 74
International Mn 55	Sweden 53	U.S.A. 56	Russian Federation 59	Russian Federation 63	England 74
Australia 55	International Mn 52	International Mn 55	U.S.A. 59	U.S.A. 63	Russian Federation 73
Norway 53	Norway 51	Norway 54	Israel 58	International Mn 61	Norway 72
U.S.A. 52	U.S.A. 49	Australia 54	International Mn 57	Israel 58	International Mn 71
England 47	England 49	England 46	England 54	Thailand 57	Israel 69

2007

Singapore 72	Singapore 72	Singapore 78	S. Korea 79	S. Korea 67	Singapore 63
S. Korea 71	S. Korea 68	S. Korea 72	Singapore 79	Minnesota 65	Hong Kong 62
Hong Kong 68	Hong Kong 64	Hong Kong 71	Hong Kong 74	Japan 64	S. Korea 55
Japan 66	Japan 60	Japan 69	Japan 67	Singapore 63	Minnesota 50
Minnesota 66	Russian Federation 46	Minnesota 67	Minnesota 64	U.S.A. 60	Japan 49
U.S.A. 58	Hungary 46	Sweden 65	U.S.A. 56	Hungary 60	U.S.A. 46
England 58	Minnesota 45	England 62	Russian Federation 55	England 59	Hungary 40
Czech Republic 57	Sweden 42	Hungary 62	Hungary 54	Hong Kong 58	Sweden 40
Hungary 57	England 42	Czech Republic 62	Sweden 53	Australia 57	England 39
Australia 56	Australia 40	U.S.A. 60	Czech Republic 51	Sweden 54	Czech Republic 38
Sweden 55	U.S.A. 40	Australia 58	Australia 50	Czech Republic 54	Russian Federation 37
Russian Federation 54	Israel 37	Russian Federation 57	England 48	Russian Federation 51	Norway 35
Norway 51	Czech Republic 44	Norway 57	Norway 46	Norway 51	Australia 35
Thailand 43	Norway 36	Israel 48	Israel 46	International Mn 40	International Mn 29
Israel 43	International Mn 35	International Mn 46	International Mn 44	Thailand 40	Israel 28
International Mn 41	Thailand 31	Thailand 40	Thailand 36	Israel 39	Thailand 28
Whole Numbers	Common Fractions	Decimal Fractions & Percents	Relations of Fractions	Estimating Quantity & Size	Rounding

Grade 8 Mathematics 2

1995											
Measurement Units		Perimeter, Area, & Volume		2-D Geometry		Polygons & Circles		3-D Geometry & Transformations		Proportionality Concepts	
Singapore	78	Singapore	85	Japan	79	Korea	73	Japan	84	Singapore	70
Japan	75	Japan	73	Singapore	78	Japan	71	Singapore	79	Korea	57
Czech Republic	73	Hong Kong	64	Korea	76	Singapore	71	Czech Republic	78	Japan	57
Sweden	70	Korea	62	Hong Kong	73	Hong Kong	65	Hong Kong	78	Hong Kong	50
Korea	68	Czech Republic	49	Russian Federation	63	Israel	60	Korea	73	Sweden	39
Hungary	67	Russian Federation	45	Thailand	62	Czech Republic	57	Hungary	71	Australia	38
Norway	66	Hungary	43	Czech Republic	62	Russian Federation	57	Russian Federation	70	Czech Republic	37
Russian Federation	66	Australia	42	Hungary	62	Thailand	54	England	66	Thailand	36
Hong Kong	65	Thailand	40	Australia	59	Hungary	52	Australia	65	England	35
Australia	65	Sweden	39	Minnesota	56	Australia	50	Minnesota	65	Minnesota	35
Israel	63	International Mn	39	England	55	International	49	Israel	65	Hungary	35
Thailand	62	England	37	International Mn	54	England	47	Thailand	64	Russian Federation	33
International Mn	61	Israel	37	Israel	52	Minnesota	43	International Mn	33	International Mn	33
Minnesota	61	Norway	36	Norway	52	Sweden	43	Norway	59	U.S.A.	32
England	60	Minnesota	34	U.S.A.	48	Norway	42	U.S.A.	58	Israel	31
U.S.A.	53	U.S.A.	28	Sweden	46	U.S.A.	39	Sweden	56	Norway	31

2007											
Measurement Units		Perimeter, Area, & Volume		2-D Geometry		Polygons & Circles		3-D Geometry & Transformations		Proportionality Concepts	
Singapore	73	Singapore	70	S. Korea	74	S. Korea	68	Japan	73	Singapore	80
S. Korea	69	Hong Kong	66	Japan	72	Singapore	68	S. Korea	72	S. Korea	76
Hong Kong	67	S. Korea	64	Hong Kong	67	Hong Kong	66	Singapore	71	Hong Kong	65
Japan	67	Japan	60	Singapore	66	Japan	65	Hong Kong	71	Japan	62
England	57	Minnesota	48	England	48	Russian Federation	48	England	65	Russian Federation	48
Minnesota	57	England	45	Hungary	48	Hungary	47	Hungary	60	Minnesota	47
Czech Republic	53	Hungary	44	Russian Federation	48	England	45	Australia	59	England	46
Hungary	53	Russian Federation	44	Minnesota	45	Czech Republic	42	Minnesota	59	Hungary	45
Sweden	53	Czech Republic	41	Czech Republic	45	Sweden	40	Czech Republic	55	Czech Republic	44
U.S.A.	51	U.S.A.	40	Australia	40	Minnesota	42	U.S.A.	53	U.S.A.	44
Australia	49	Australia	38	U.S.A.	39	International Mn	38	Russian Federation	53	Australia	41
Russian Federation	49	Sweden	38	Sweden	39	Israel	37	Sweden	47	International Mn	37
Norway	45	International Mn	35	Israel	38	Australia	37	Norway	46	Thailand	37
Thailand	40	Norway	33	Thailand	37	U.S.A.	37	International Mn	42	Israel	33
International Mn	38	Israel	32	Norway	36	Thailand	36	Thailand	39	Norway	31
Israel	38	Thailand	29	International Mn	39	Norway	35	Israel	35	Sweden	25
Measurement Units		Perimeter, Area, & Volume		2-D Geometry		Polygons & Circles		3-D Geometry & Transformations		Proportionality Concepts	

Grade 8 Mathematics 3

1995									
Proportionality Problems		Patterns, Relations & Functions		Equations & Formulas		Data Representation & Analysis		Uncertainty & Probability	
Singapore	77	Japan	70	Singapore	80	Japan	84	Singapore	79
Japan	68	Korea	68	Minnesota	78	Korea	82	Korea	78
Korea	65	Singapore	67	Japan	72	Singapore	81	Japan	75
Hong Kong	64	Hong Kong	61	Hong Kong	71	Czech Republic	80	Hong Kong	73
Czech Republic	61	Czech Republic	60	Korea	70	Sweden	79	Sweden	69
Russian Federation	56	England	60	Czech Republic	64	Minnesota	78	Australia	68
Thailand	56	Hungary	59	Russian Federation	61	Hong Kong	76	Hungary	66
Hungary	56	Australia	58	Hungary	61	Norway	75	England	65
Australia	52	Minnesota	56	Israel	58	Australia	75	Norway	65
International	50	Thailand	53	Thailand	54	England	75	Czech Republic	63
Minnesota	49	Russian Federation	53	Australia	53	Thailand	74	U.S.A.	63
Sweden	49	Israel	53	U.S.A.	49	Hungary	74	Israel	62
England	47	International	51	International	49	Israel	73	Minnesota	61
Norway	47	U.S.A.	51	Norway	45	U.S.A.	73	International Mn	60
Israel	47	Norway	49	England	44	Russian Federation	72	Russian Federation	57
U.S.A.	45	Sweden	47	Sweden	44	International Mn	71	Thailand	56

2007									
Proportionality Problems		Patterns, Relations & Functions		Equations & Formulas		Data Representation & Analysis		Uncertainty & Probability	
S. Korea	69	S. Korea	66	S. Korea	70	S. Korea	72	S. Korea	87
Singapore	69	Singapore	64	Singapore	68	Singapore	72	Japan	76
Hong Kong	63	Japan	62	Hong Kong	65	Japan	71	Minnesota	75
Japan	54	Hong Kong	57	Japan	61	Minnesota	67	Singapore	72
England	49	Hungary	45	Russian Federation	51	Hong Kong	66	England	72
Minnesota	46	Minnesota	46	Minnesota	49	England	62	Hong Kong	69
Russian Federation	44	England	45	Hungary	46	U.S.A.	58	Australia	67
Hungary	42	Russian Federation	41	U.S.A.	44	Hungary	58	U.S.A.	67
Sweden	41	U.S.A.	41	England	42	Sweden	58	Sweden	62
U.S.A.	41	Australia	41	Czech Republic	39	Australia	56	Norway	58
Australia	41	Czech Republic	39	Israel	39	Czech Republic	54	Hungary	58
Czech Republic	38	Sweden	35	Australia	36	Norway	52	Czech Republic	57
Israel	36	Israel	34	International Mn	36	Russian Federation	48	Russian Federation	55
International Mn	34	International Mn	32	Sweden	33	Israel	44	Israel	51
Norway	32	Norway	32	Thailand	29	International Mn	41	International Mn	47
Thailand	30	Thailand	30	Norway	26	Thailand	40	Thailand	42

Comparing MN and the US: Grade 4 Mathematics

Topic	1995	2007
Meaning of Whole Numbers		
Whole Number Operations		
Common Fractions		
Decimal Fractions		
Measurement Units		
Perimeter, Area & Volume		
Geometry: Position & Shapes		
Symmetry, Congruence & Similarity		
Proportionality		
Patterns, Relations, & Functions		
Equations & Formulas		
Data Representation, Probability & Statistics		

	MN > US
	MN = US
	MN < US

Comparing MN and the US: Grade 8 Mathematics

Topic	1995	2007
Whole Numbers		
Common Fractions		
Decimal Fractions & Percents		
Relations of Fractions		
Estimating Quantity & Size		
Rounding		
Measurement Units		
Perimeter, Area & Volume		
2-D Geometry		
Polygons & Circles		
3-D Geometry & Transformations		
Proportionality Concepts		
Proportionality Problems		
Patterns, Relations, & Functions		
Equations & Formulas		
Data Representation & Analysis		
Uncertainty & Probability		

	MN>US
	MN=US
	MN<US

MN Grade 4 Student Mathematics Performance

	1995	2007
> 75% Correct	Symmetry, Congruence & Similarity	Data Representation
Between 50 to 74%	8 of 12 Topics	11 of 12 Topics
< 50% Correct	Decimal Fractions Measurement Units Proportionality	

MN Grade 8 Student Mathematics Performance

	1995	2007
> 75% Correct	Rounding Equations & Formulas Data Representation	Uncertainty & Probability
Between 50 to 74%	10 of 17 Topics	8 of 17 Topics
< 50% Correct	Perimeter, Area & Volume Polygons & Circles Proportionality Concepts Proportionality Problems	Common Fractions Perimeter, Area & Volume Polygons & Circles Proportionality Concepts Proportionality Problems 2-D Geometry Patterns, Relations & Functions Equations & Formulas

Instructional Content Constructs

❖ **Curricular Coherence**

- **Curricular Structure**

❖ **Curricular Focus**

- **Exposure Time (OTL)**

❖ **Curricular Rigor**

- **Level of Cognitive Complexity**

Top Achieving 1995 TIMSS Countries' Mathematics Curriculum

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number: Meaning	■	■	■	●	●			
Whole Number: Operations	■	■	■	■	●			
Measurement Units	◆	■	■	■	■	■	●	
Common Fractions			◆	■	■	●		
Equations & Formulas			◆	●	●	●	■	■
Data Representation & Analysis			◆	◆	●	●		◆
2-D Geometry: Basics			◆	●	●	●	■	■
2-D Geometry: Polygons & Circles				◆	●	●	■	■
Measurement: Perimeter, Area & Volume				●	●	●	●	◆
Rounding & Significant Figures				●	●			
Estimating Computations				●	●	●		
Whole Numbers: Properties of Operations				●	●			
Estimating Quantity & Size				◆	◆			
Decimal Fractions				●	■	●		
Relation of Common & Decimal Fractions				◆	■	●		
Properties of Common & Decimal Fractions					●	●		
Percentages					●	●		
Proportionality Concepts					●	●	●	◆
Proportionality Problems					●	●	■	■
2-D Geometry: Coordinate Geometry					◆	◆	●	●
Geometry: Transformations						●	●	●
Negative Numbers, Integers, & Their Properties						◆	●	
Number Theory							●	◆
Exponents, Roots & Radicals							●	●
Exponents & Orders of Magnitude							◆	◆
Measurement: Estimation & Errors							◆	
Constructions Using Straightedge & Compass							■	◆
3-D Geometry							●	■
Geometry: Congruence & Similarity								■
Rational Numbers & Their Properties								◆
Patterns, Relations & Functions								◆
Proportionality: Slope & Trigonometry								◆

- ◆ Intended by 4 out of the 6 top-achieving countries
- Intended by all but *one* of the top-achieving countries (5 out of 6).
- Intended by *all* of the top-achieving countries.

2003 MN Mathematics Curriculum

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number: Meaning	•	•	•	•				
Whole Number: Operations	•	•	•	•	•			
Measurement Units	•	•	•	•	•	•	•	•
Common Fractions	•	•	•	•	•	•	•	
Equations & Formulas			•	•	•	•	•	•
Data Representation & Analysis	•	•	•	•	•	•	•	•
2-D Geometry: Basics			•	•	•	•	•	
2-D Geometry: Polygons & Circles	•	•	•	•	•	•	•	•
Measurement: Perimeter, Area & Volume			•	•	•	•	•	•
Rounding & Significant Figures				•	•	•		
Estimating Computations		•		•	•	•	•	•
Whole Numbers: Properties of Operations		•	•	•		•	•	•
Estimating Quantity & Size								
Decimal Fractions		•	•	•	•	•		
Relation of Common & Decimal Fractions							•	
Properties of Common & Decimal Fractions								
Percentages					•	•	•	•
Proportionality Concepts								
Proportionality Problems							•	•
2-D Geometry: Coordinate Geometry						•	•	•
Geometry: Transformations	•	•	•		•	•	•	•
Negative Numbers, Integers, & Their Properties					•	•		
Number Theory	•	•				•		
Exponents, Roots & Radicals							•	•
Exponents & Orders of Magnitude							•	•
Measurement: Estimation & Errors	•	•						
Constructions Using Straightedge & Compass						•		
3-D Geometry	•	•	•	•	•	•	•	•
Geometry: Congruence & Similarity				•				
Rational Numbers & Their Properties						•	•	•
Patterns, Relations & Functions		•	•	•	•		•	•
Proportionality: Slope & Trigonometry							•	

2007 MN Mathematics Curriculum

Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number: Meaning	●	●	●	●	●			
Whole Number: Operations	●	●	●	●	●	●		
Measurement Units	●	●	●		●	●		
Common Fractions			●	●	●	●	●	
Equations & Formulas	●	●	●	●	●	●	●	●
Data Representation & Analysis	●	●	●	●	●		●	●
2-D Geometry: Basics			●	●		●		●
2-D Geometry: Polygons & Circles	●	●	●	●		●	●	●
Measurement: Perimeter, Area & Volume			●	●	●	●	●	
Rounding & Significant Figures		●	●	●	●		●	
Estimating Computations		●	●	●	●	●		
Whole Numbers: Properties of Operations		●	●	●	●	●		●
Estimating Quantity & Size								
Decimal Fractions				●	●	●	●	
Relation of Common & Decimal Fractions				●	●	●		
Properties of Common & Decimal Fractions								
Percentages						●	●	
Proportionality Concepts						●	●	●
Proportionality Problems						●	●	
2-D Geometry: Coordinate Geometry				●	●	●	●	●
Geometry: Transformations	●	●		●			●	
Negative Numbers, Integers, & Their Properties								
Number Theory						●		
Exponents, Roots & Radicals							●	●
Exponents & Orders of Magnitude								●
Measurement: Estimation & Errors						●		
Constructions Using Straightedge & Compass								
3-D Geometry	●	●			●			
Geometry: Congruence & Similarity				●			●	
Rational Numbers & Their Properties						●	●	
Patterns, Relations & Functions	●	●	●	●	●	●		●
Proportionality: Slope & Trigonometry							●	●

Changes in 2007 MN Mathematics Curriculum from 2003

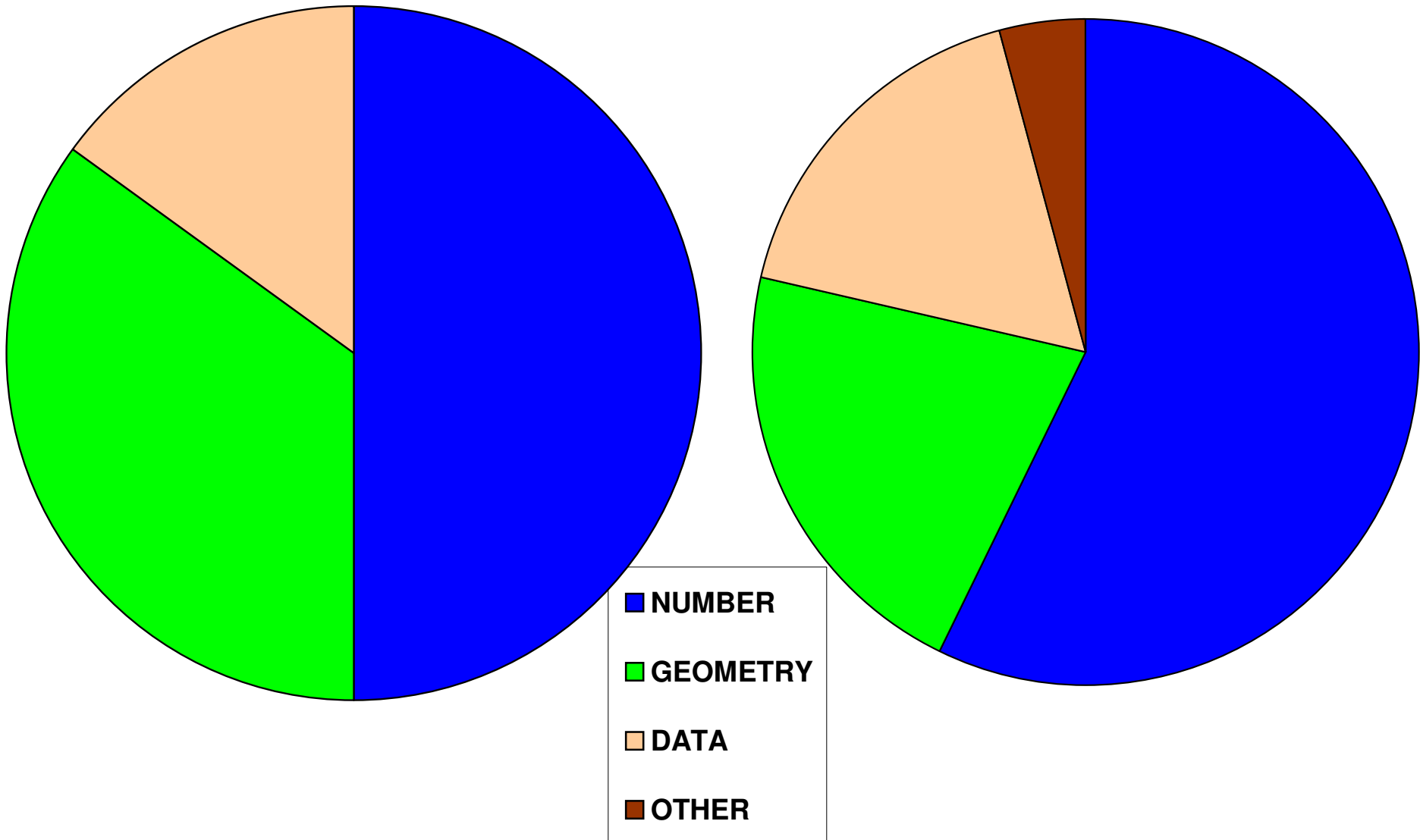
Topic	Grade							
	1	2	3	4	5	6	7	8
Whole Number: Meaning	●	●	●	●	●			
Whole Number: Operations	●	●	●	●	●	●		
Measurement Units	●	●	●	●	●	●	●	●
Common Fractions	●	●	●	●	●	●	●	●
Equations & Formulas	●	●	●	●	●	●	●	●
Data Representation & Analysis	●	●	●	●	●	●	●	●
2-D Geometry: Basics			●	●	●	●	●	●
2-D Geometry: Polygons & Circles	●	●	●	●	●	●	●	●
Measurement: Perimeter, Area & Volume			●	●	●	●	●	●
Rounding & Significant Figures		●	●	●	●	●	●	
Estimating Computations		●	●	●	●	●	●	●
Whole Numbers: Properties of Operations		●	●	●	●	●	●	●
Estimating Quantity & Size								
Decimal Fractions		●	●	●	●	●	●	
Relation of Common & Decimal Fractions				●	●	●	●	
Properties of Common & Decimal Fractions								
Percentages					●	●	●	●
Proportionality Concepts						●	●	●
Proportionality Problems						●	●	●
2-D Geometry: Coordinate Geometry				●	●	●	●	●
Geometry: Transformations	●	●	●	●	●	●	●	●
Negative Numbers, Integers, & Their Properties					●	●		
Number Theory	●	●				●		
Exponents, Roots & Radicals							●	●
Exponents & Orders of Magnitude							●	●
Measurement: Estimation & Errors	●	●				●		
Constructions Using Straightedge & Compass						●		
3-D Geometry	●	●	●	●	●	●	●	●
Geometry: Congruence & Similarity				●			●	
Rational Numbers & Their Properties						●	●	●
Patterns, Relations & Functions	●	●	●	●	●	●	●	●
Proportionality: Slope & Trigonometry							●	●

●	NEW in 2007
●	Same as 2003
●	Deleted in 2007

Grade 4 Mathematics Mean Teaching Emphasis

2007 TIMSS TEST EMPHASIS

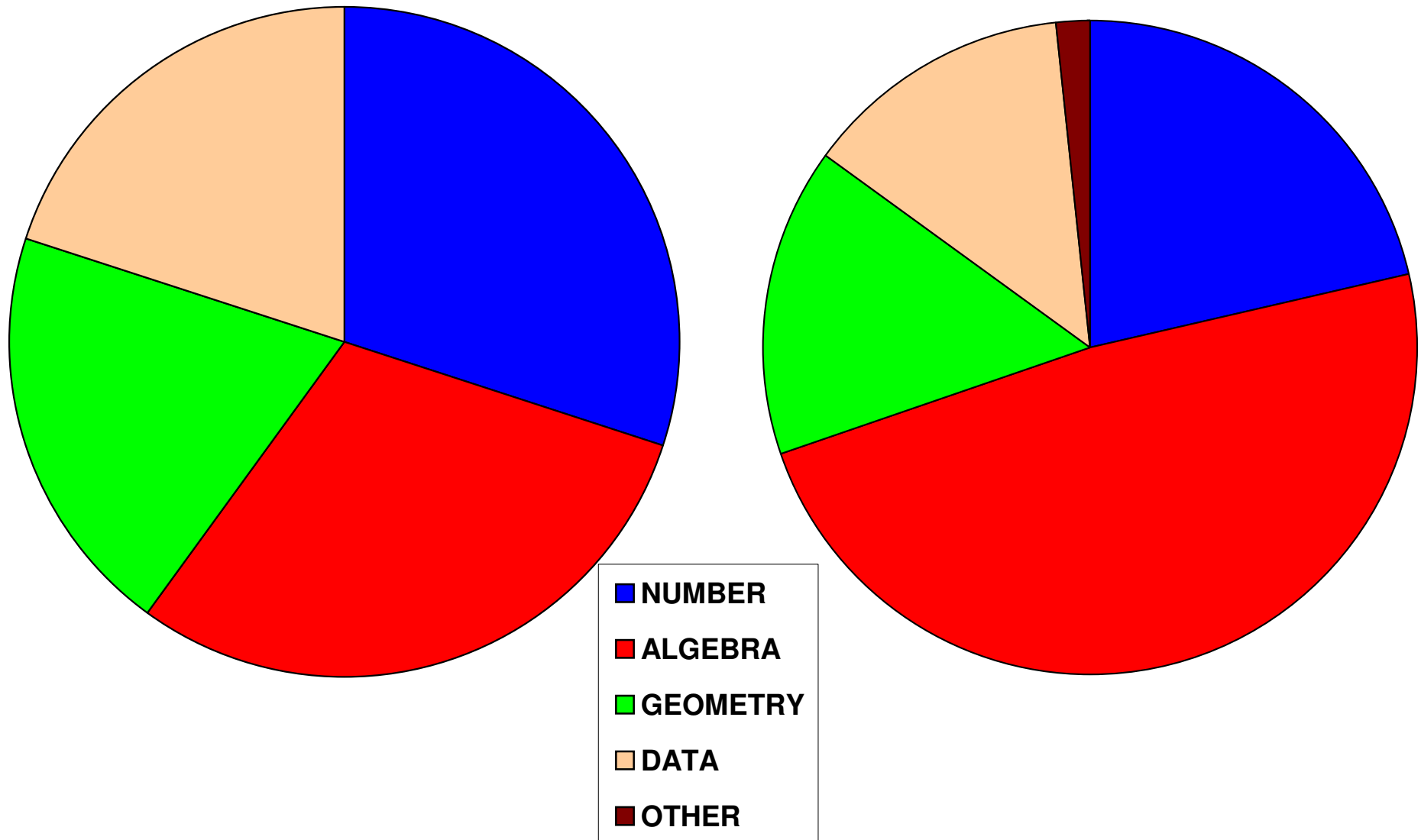
2007



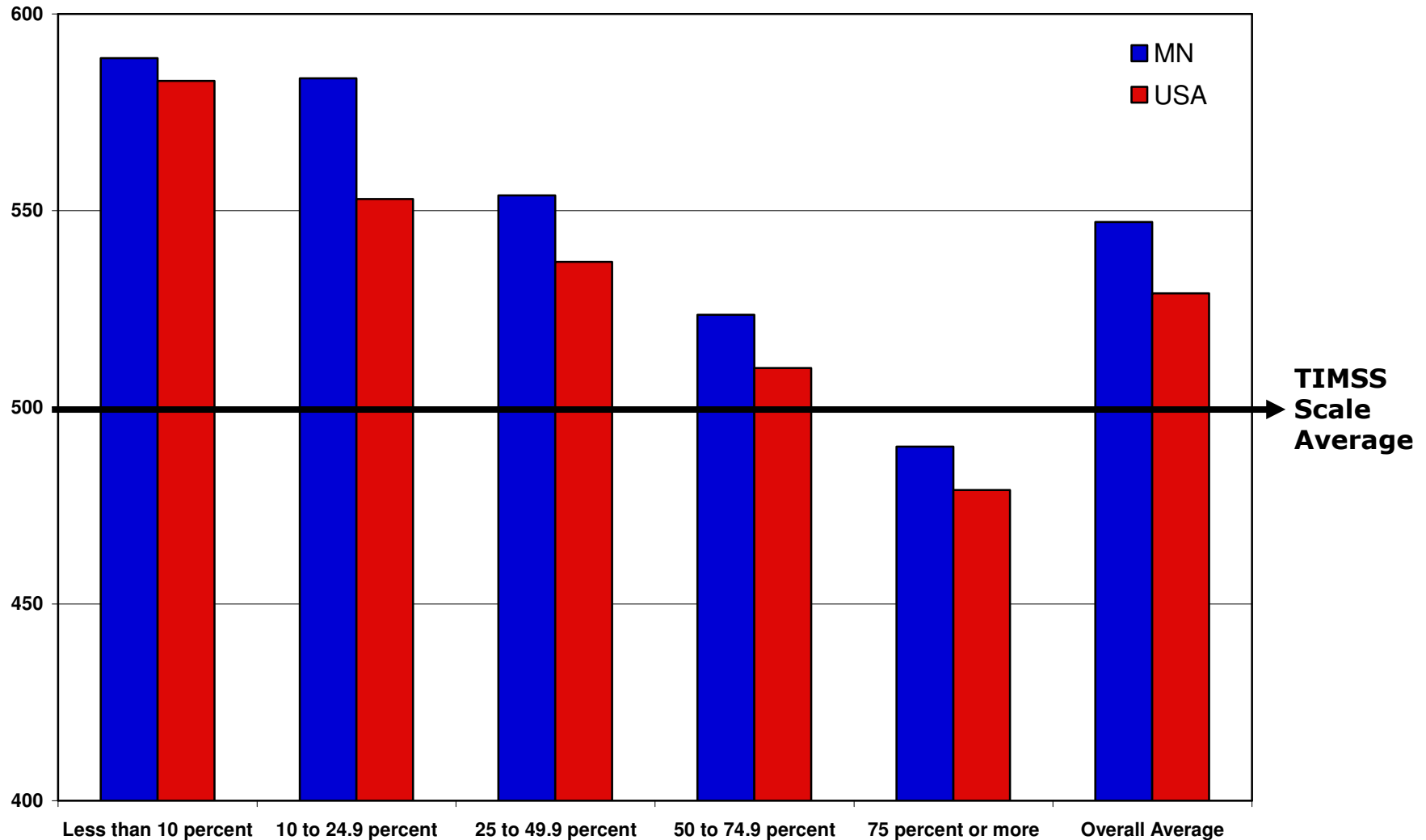
Grade 8 Mathematics Mean Teaching Emphasis

2007 TIMSS TEST EMPHASIS

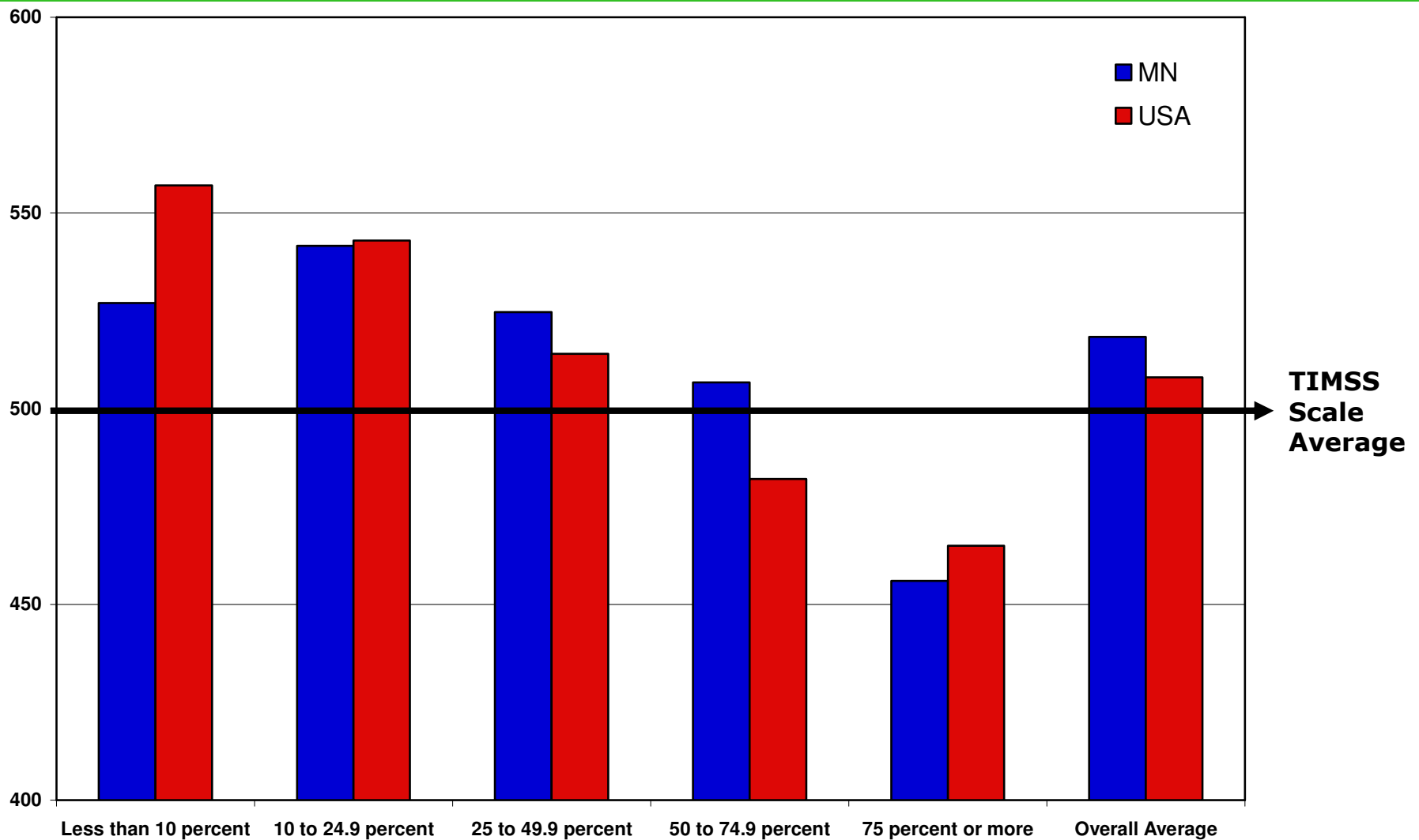
2007



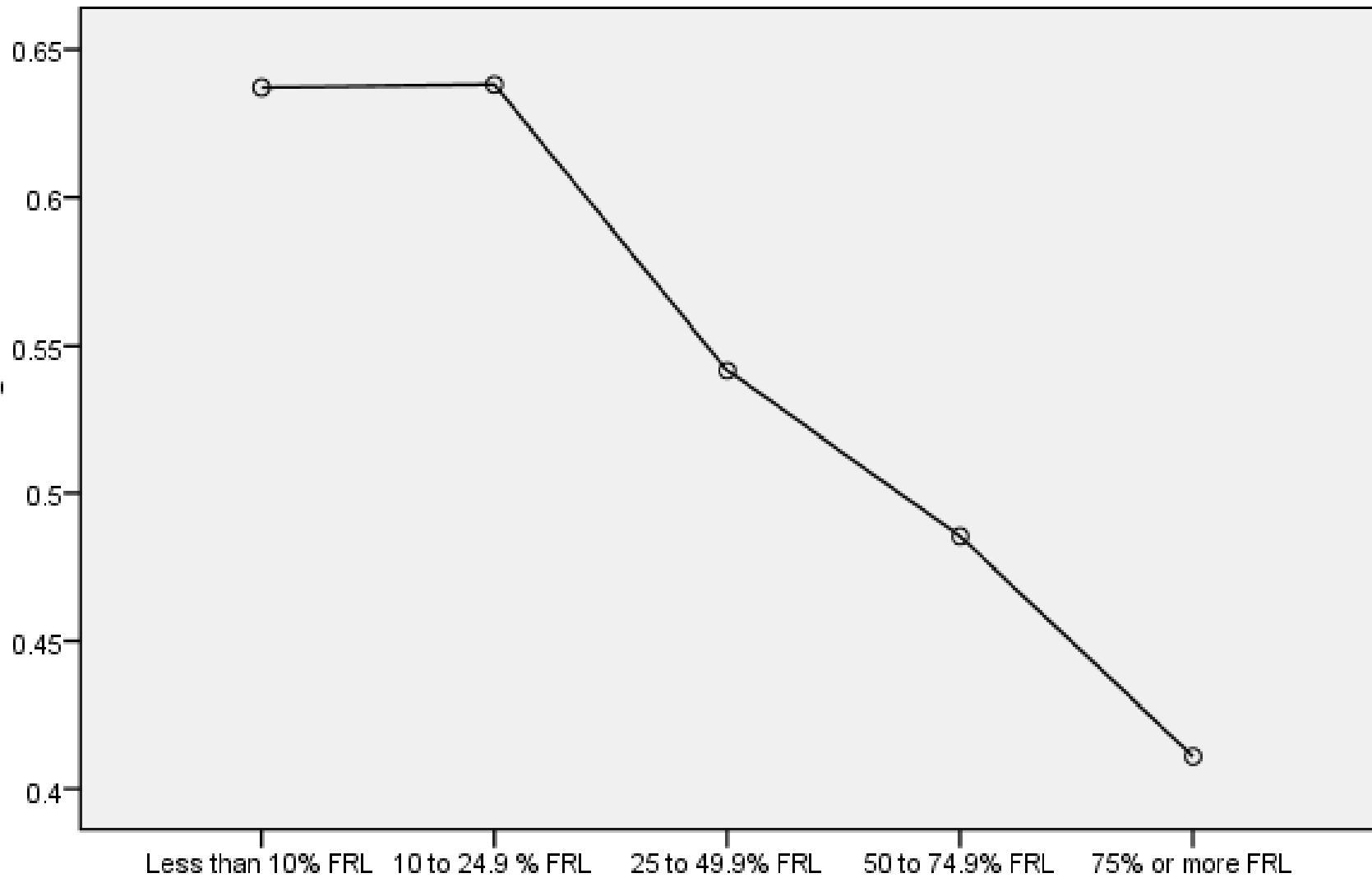
Grade 4 Mathematics Means in MN and the USA by Percentage of Students in School Eligible for Free or Reduced Lunch



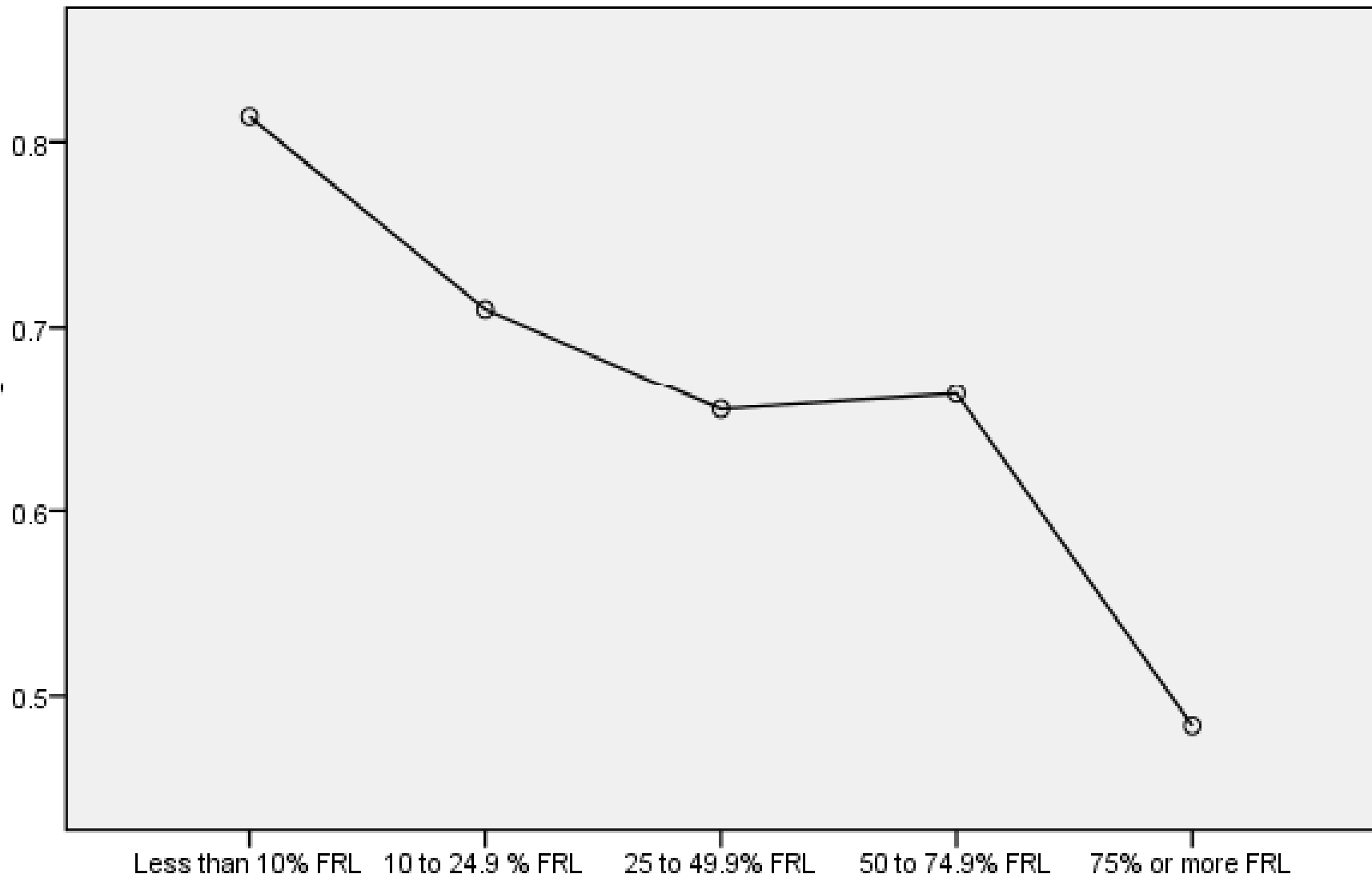
Grade 8 Mathematics Means in MN and the USA by Percentage of Students in School Eligible for Free or Reduced Lunch



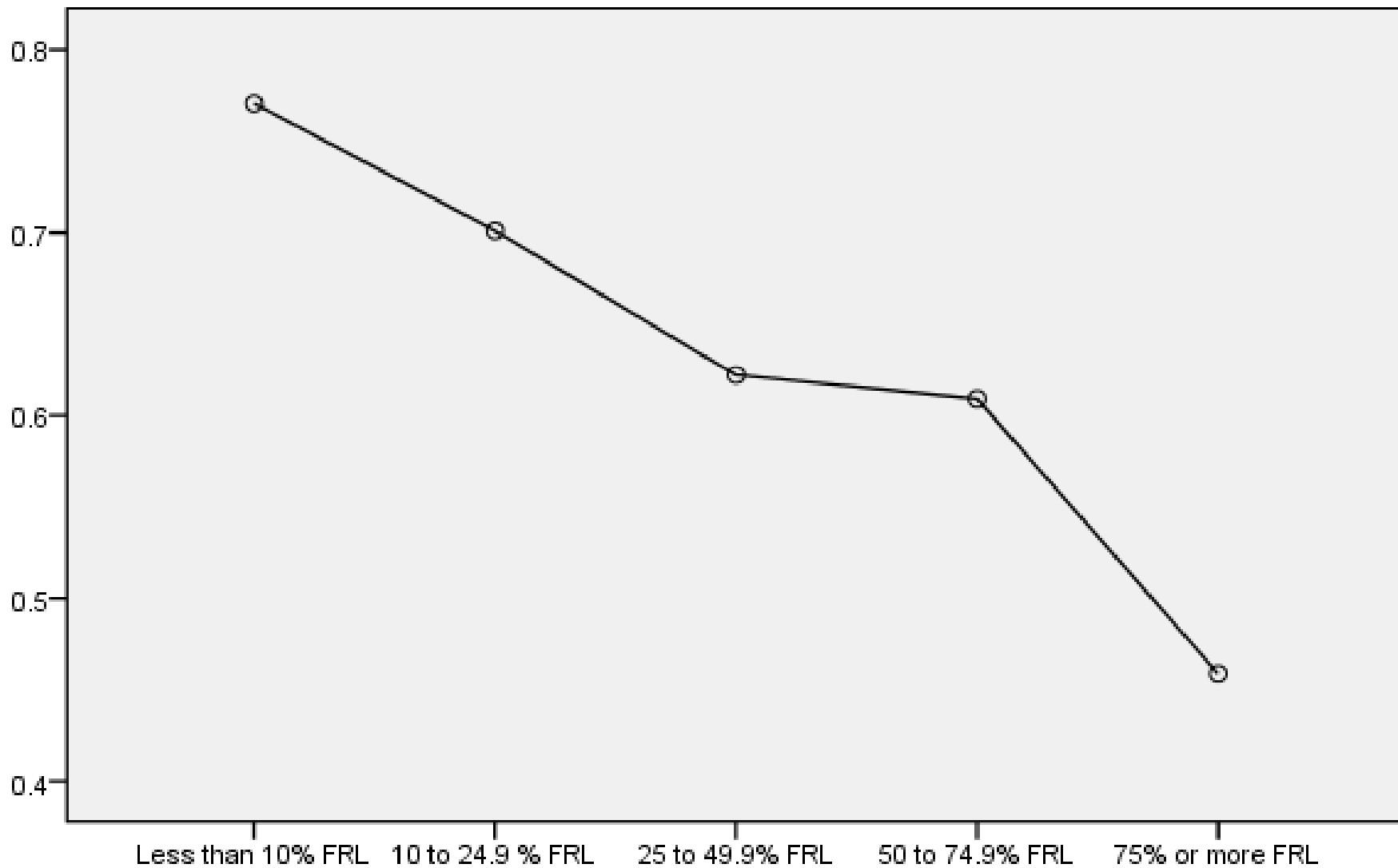
Grade 4 Whole Number Operation: Average Percent Correct by SES



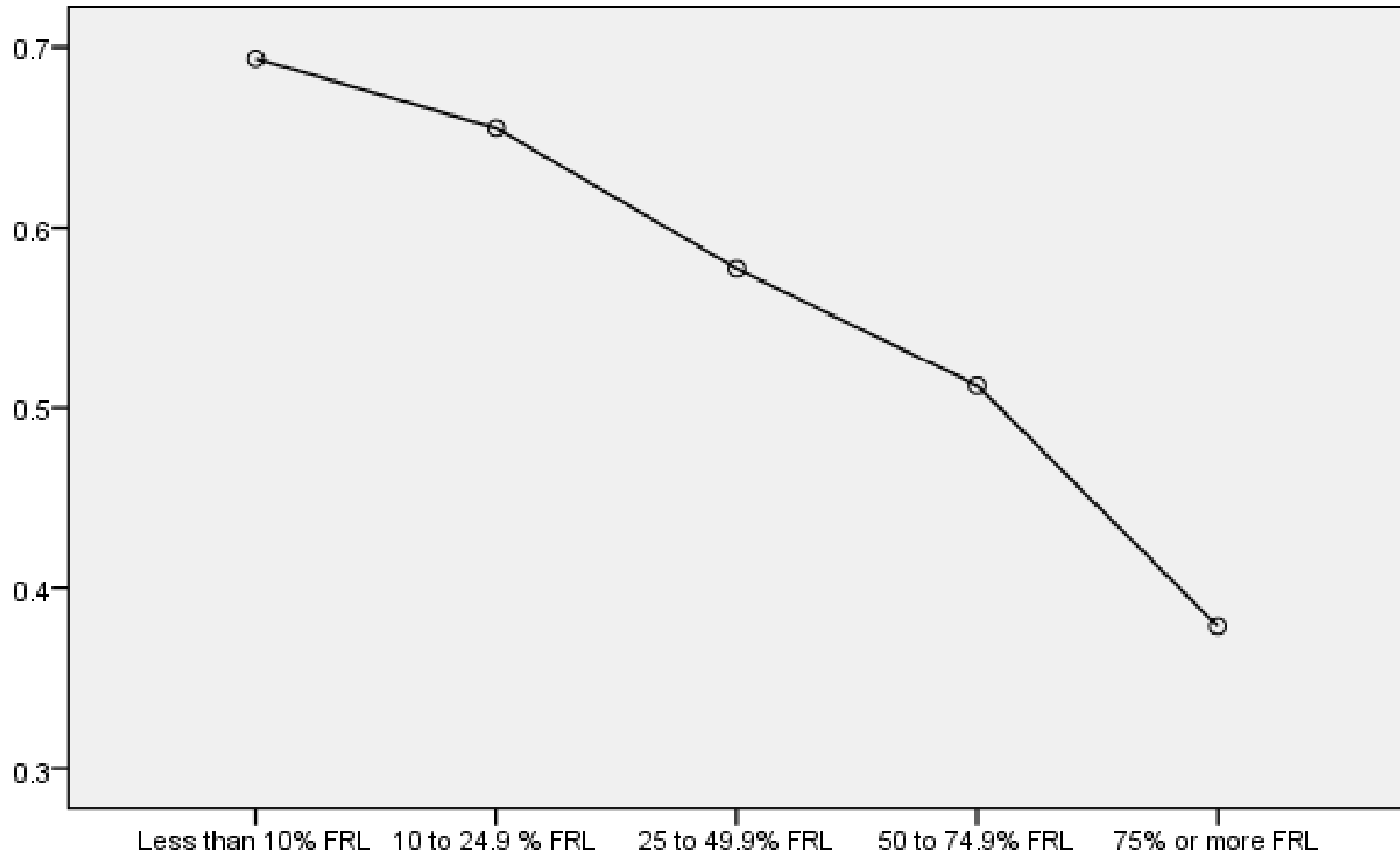
Grade 4 Common Fractions: Average Percent Correct by SES



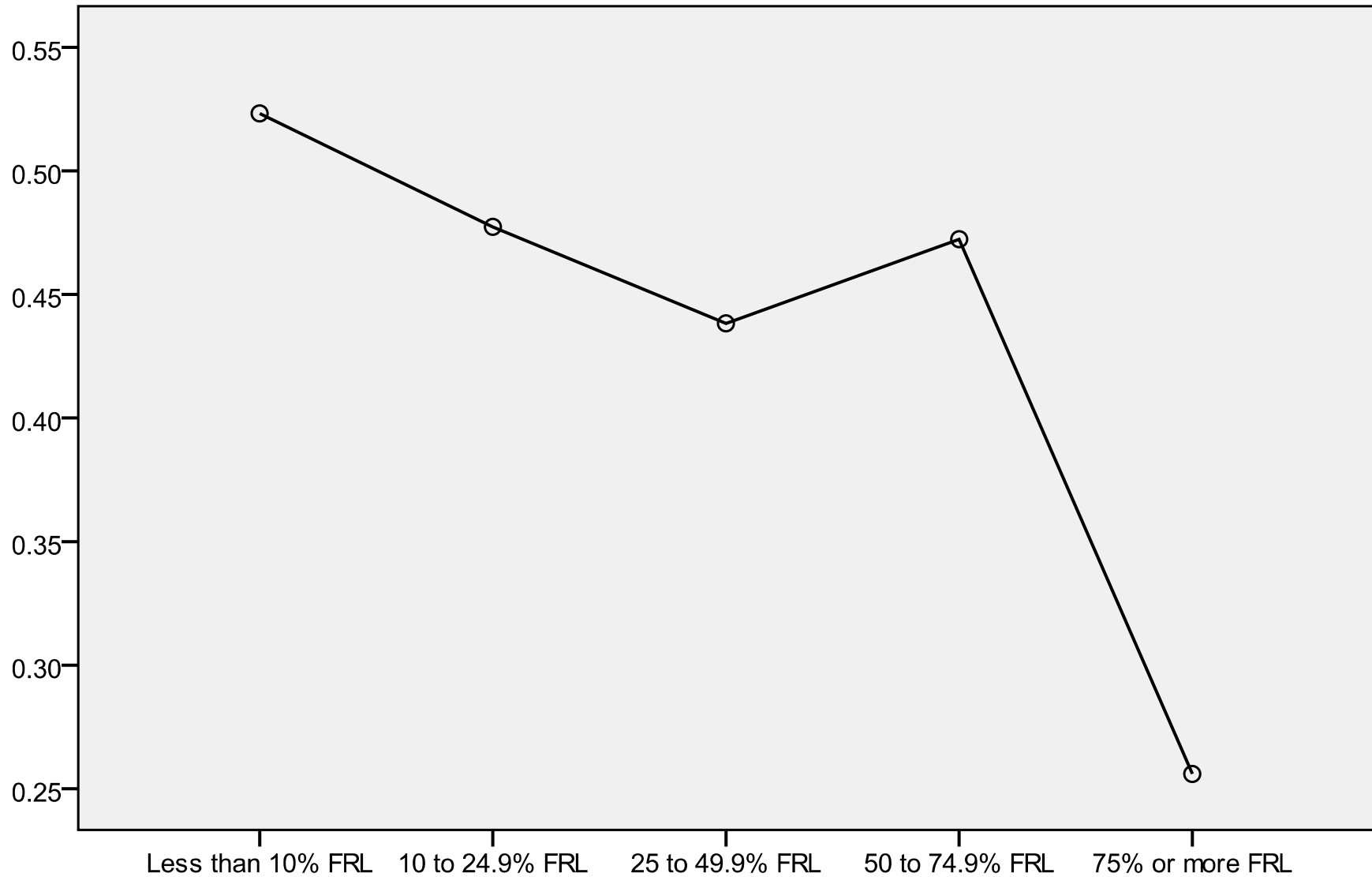
Grade 4 Decimal Fractions: Average Percent Correct by SES



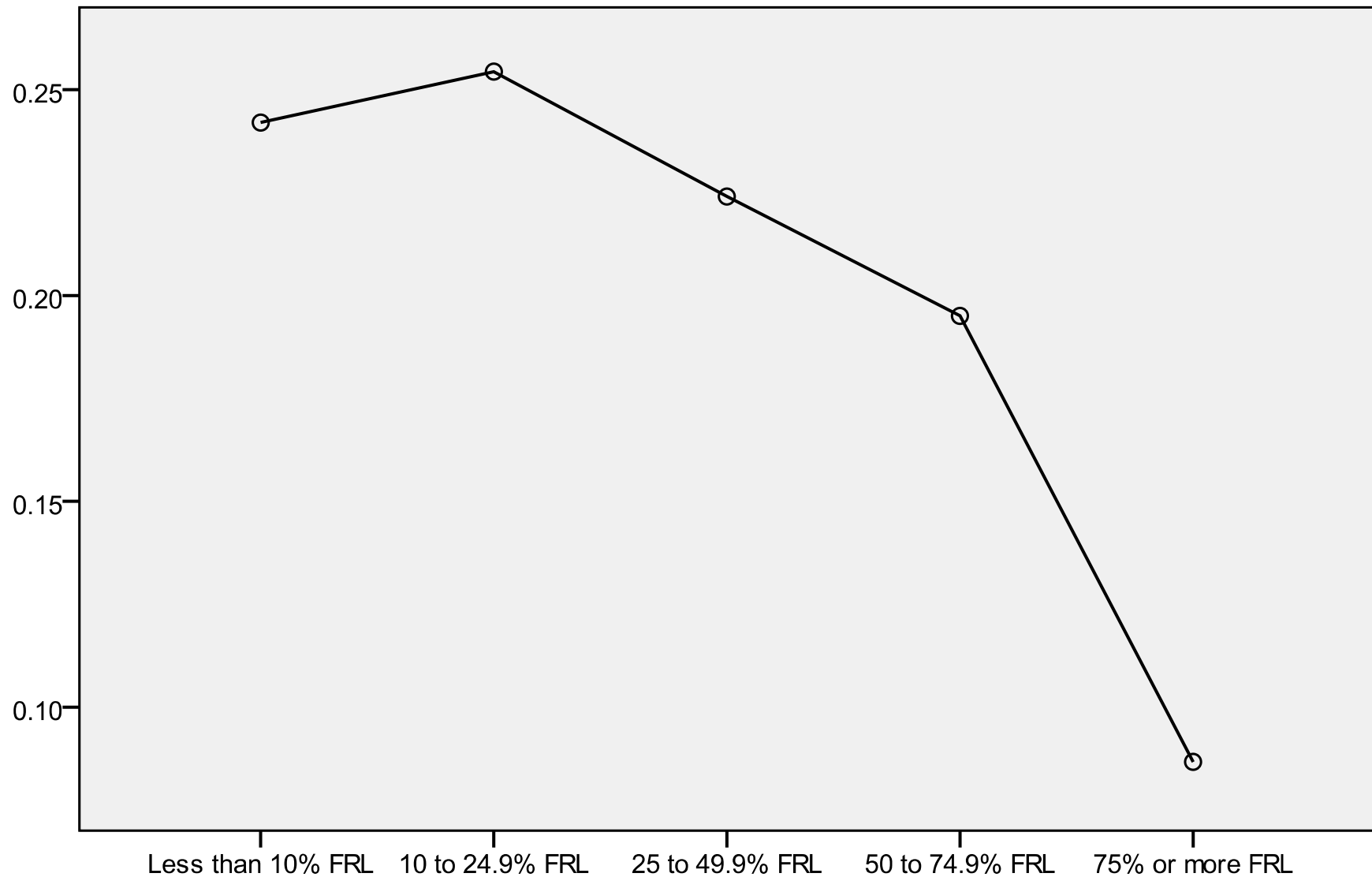
Grade 4 Measurement Units: Average Percent Correct by SES



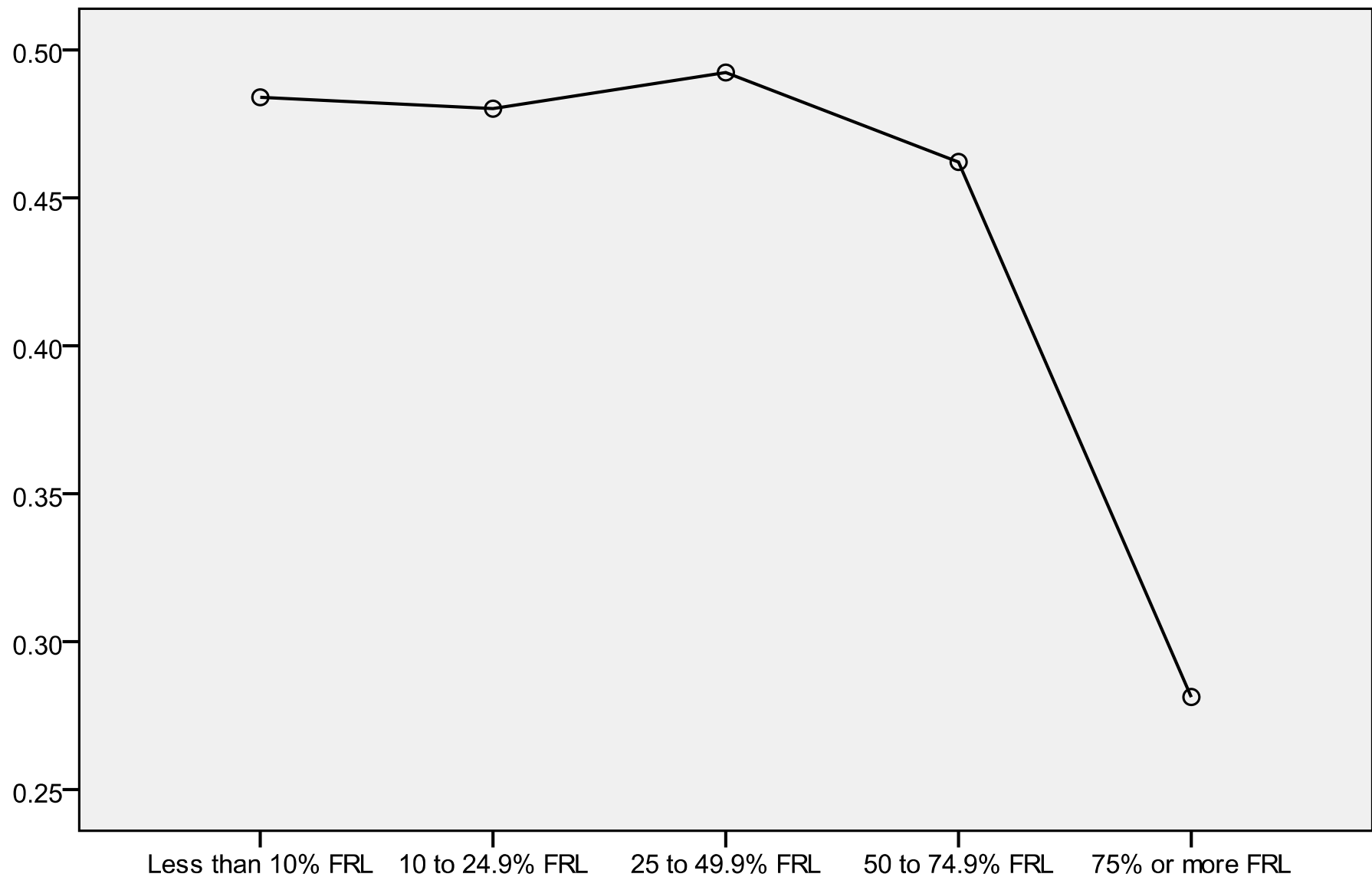
Grade 8 Common Fractions: Average Percent Correct by SES



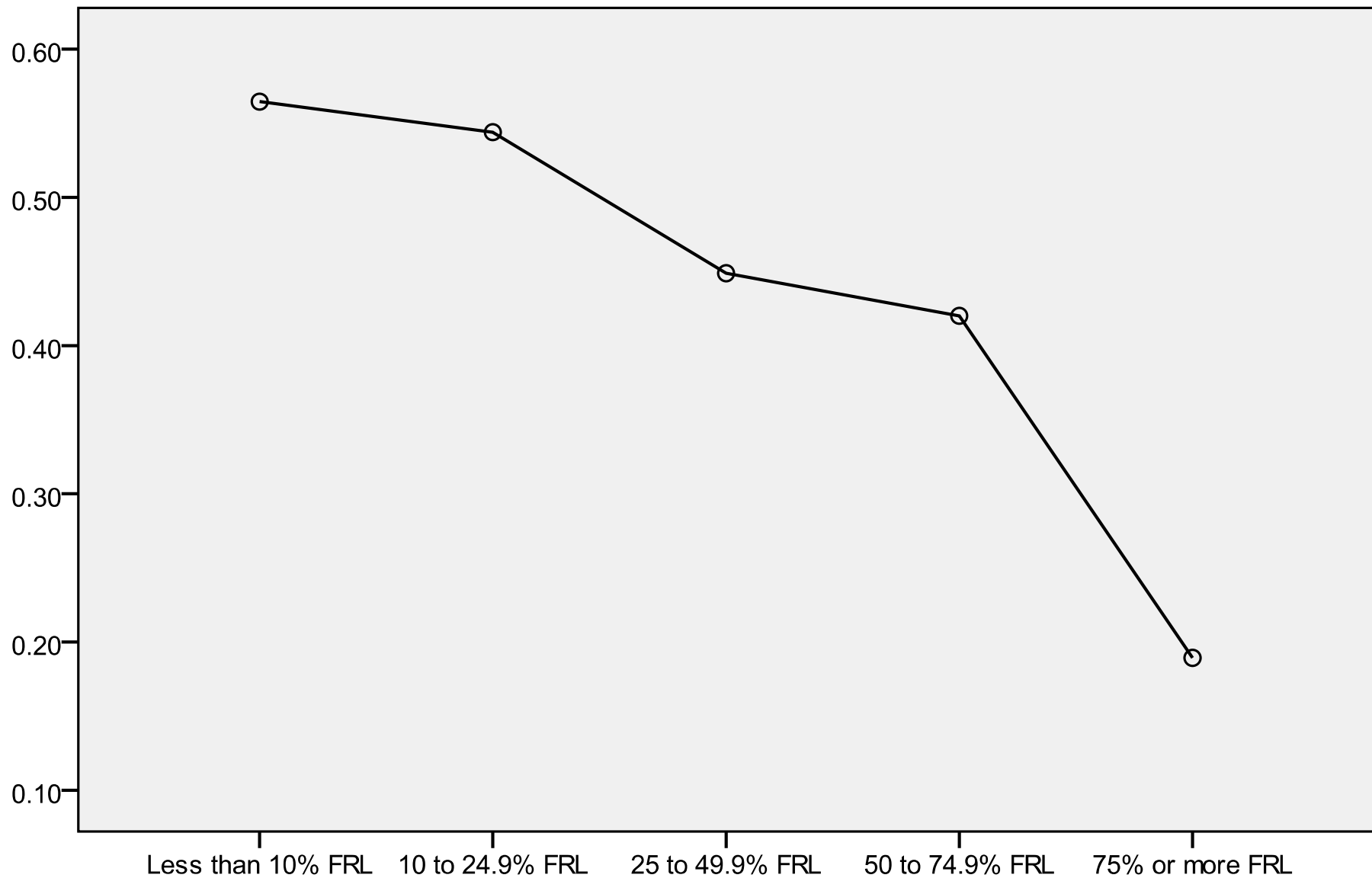
Grade 8 Congruence and Similarity: Average Percent Correct by SES



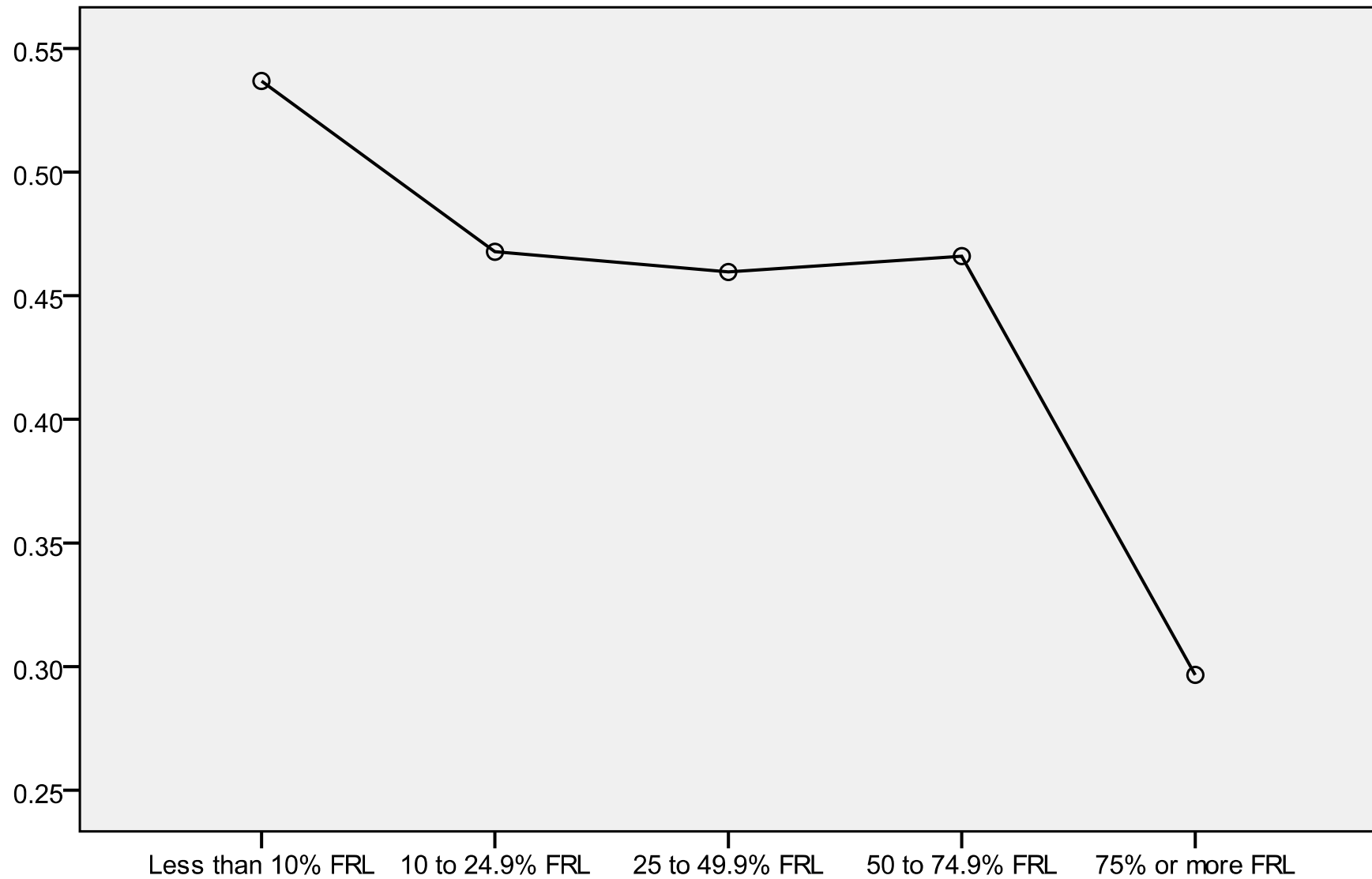
Grade 8 Proportionality Concepts: Average Percent Correct by SES



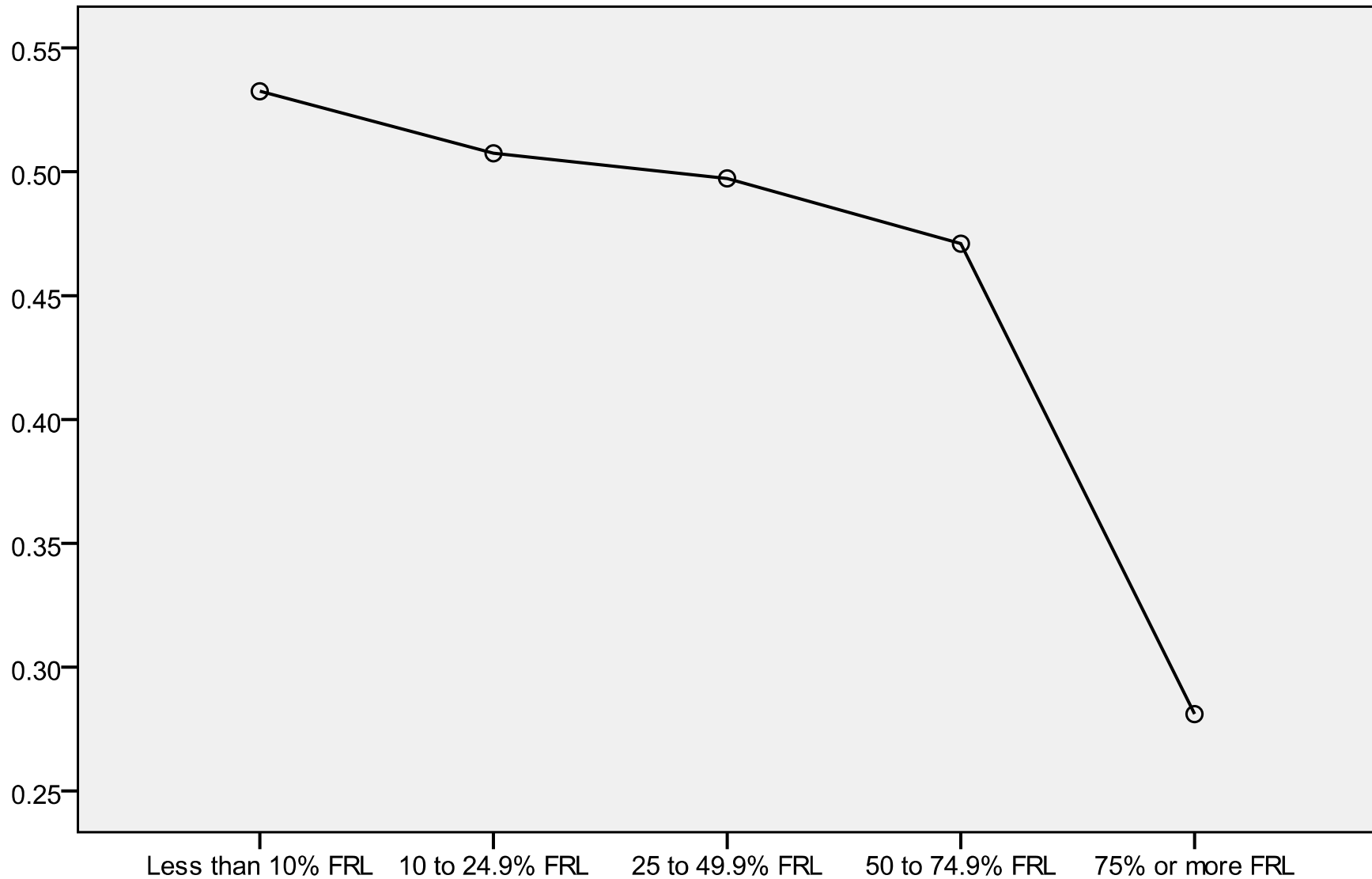
Grade 8 Proportionality Problems: Average Percent Correct by SES



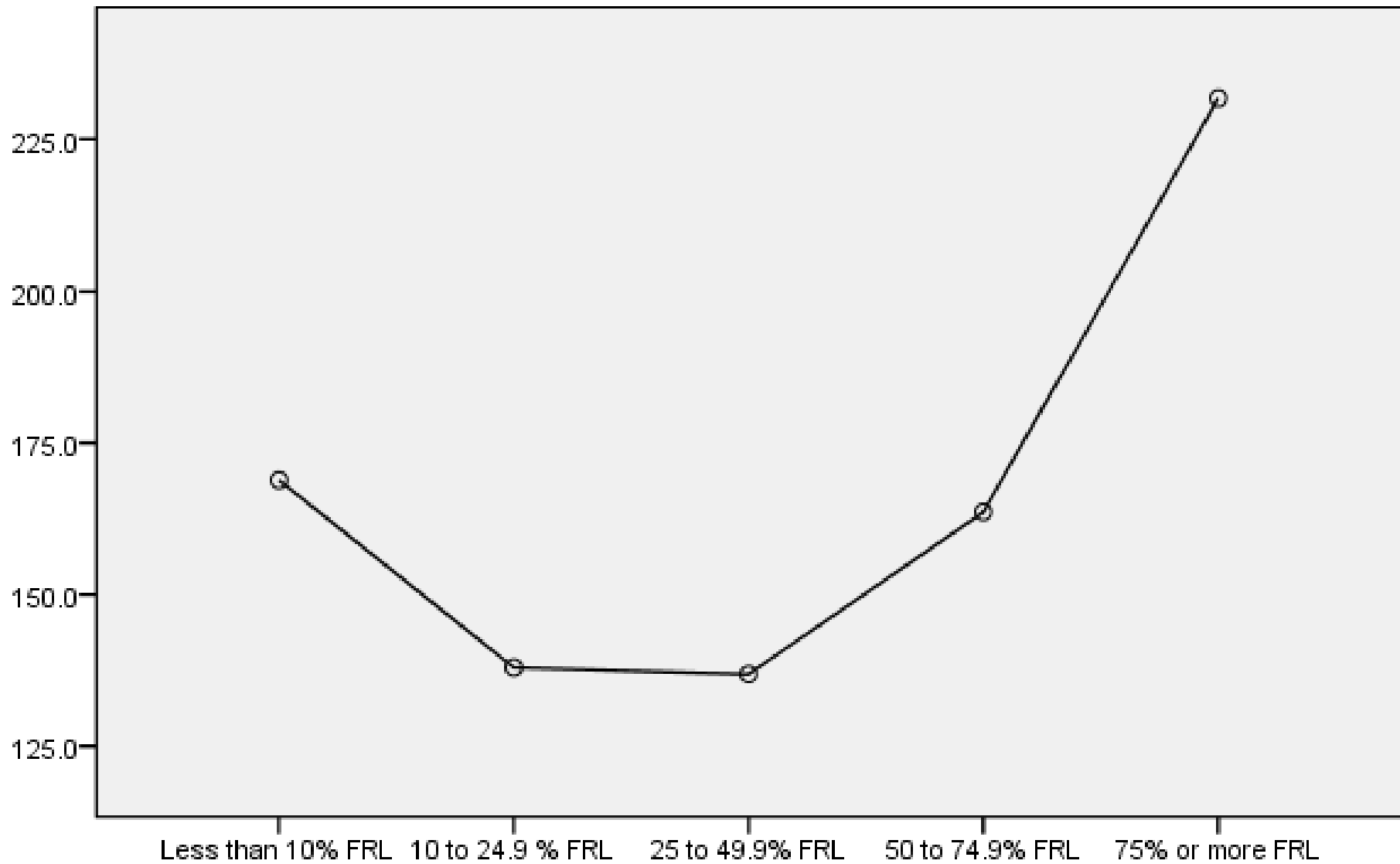
Grade 8 Functions: Average Percent Correct by SES



Grade 8 Equations: Average Percent Correct by SES



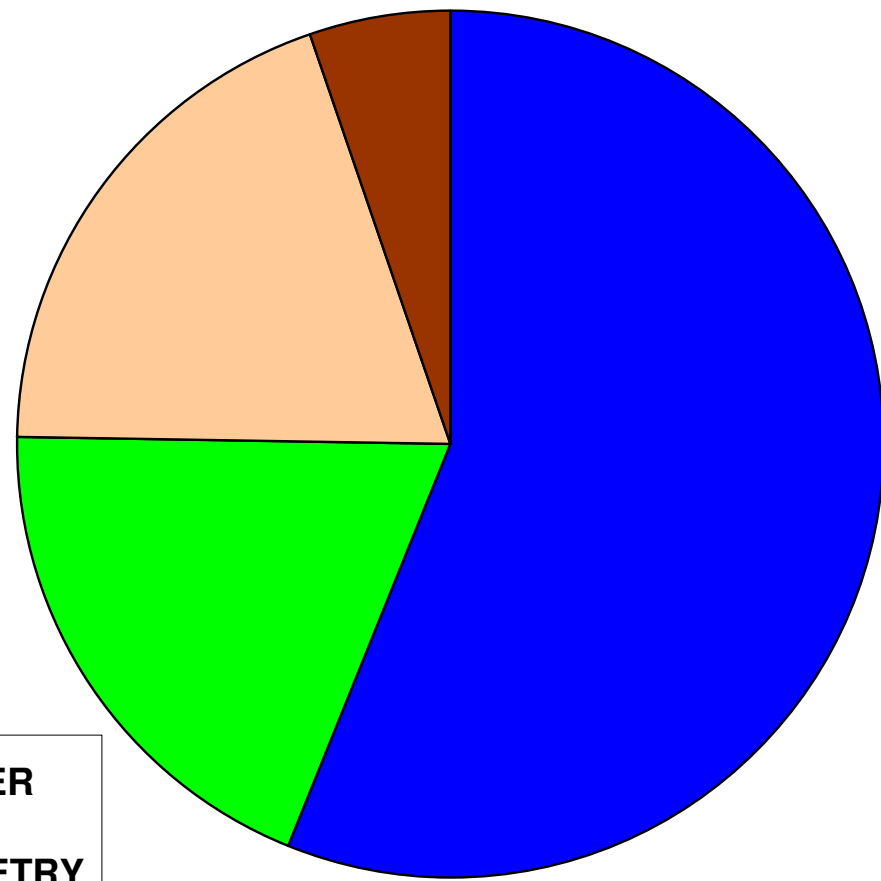
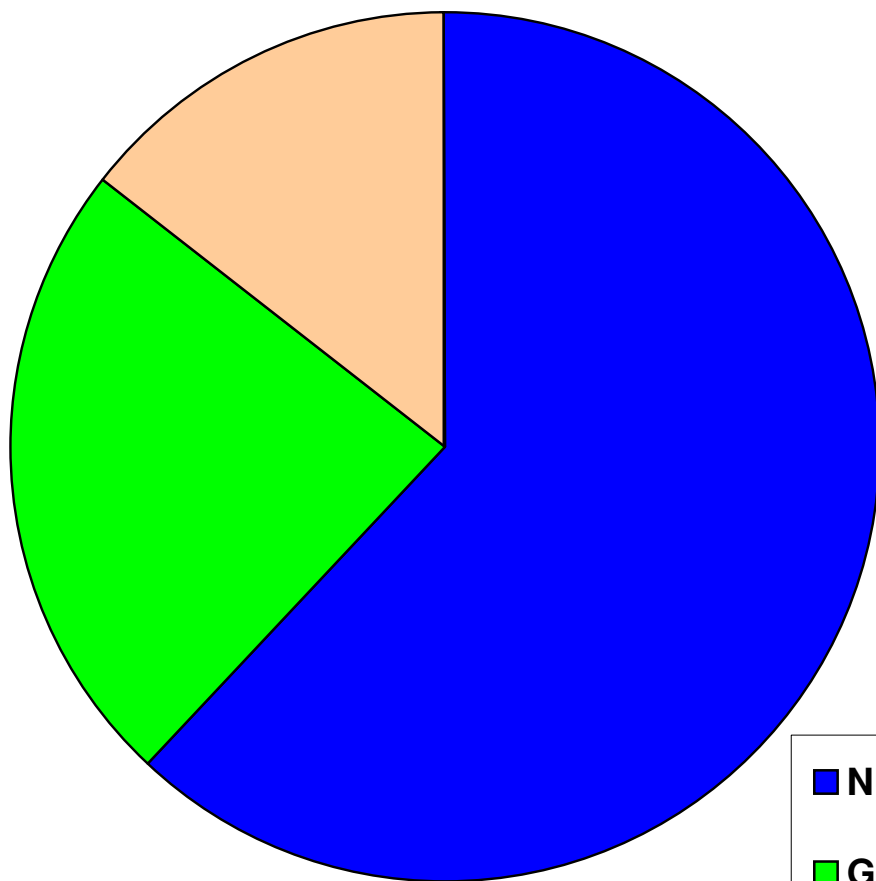
Grade 4 Yearly Total Mathematics Instructional Time by SES



Grade 4 Mathematics Mean Teaching Emphasis

Highest SES Schools

Lowest SES Schools

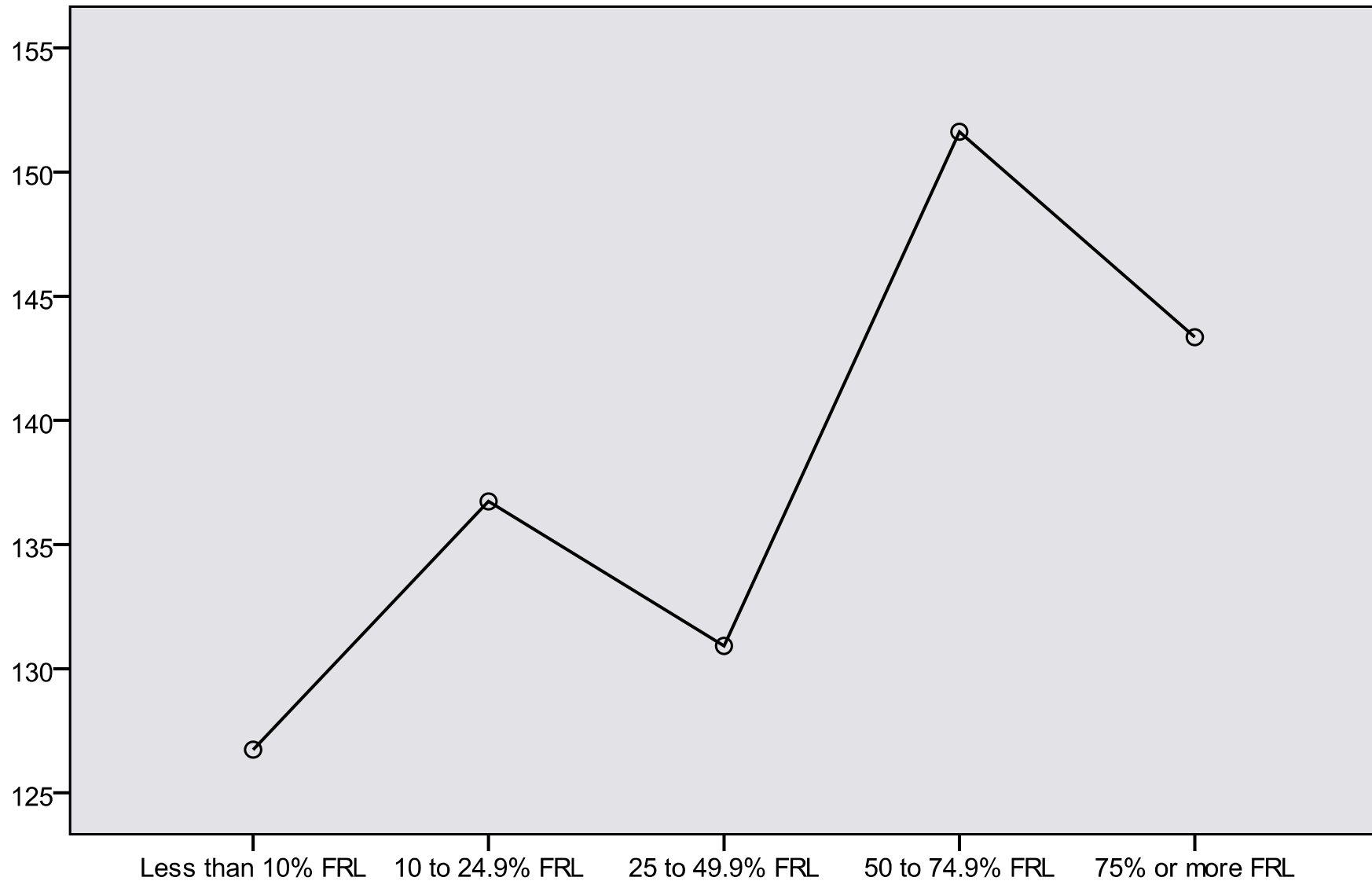


- NUMBER
- GEOMETRY
- DATA
- OTHER

Mean Percent of Grade 4 Mathematics Teaching Time

<i>Topic</i>	<i>Highest SES</i>	<i>Lowest SES</i>	<i>Difference</i>
Number	62	56	> 2 Weeks
Geometry	24	19	~ 2 Weeks
Other	0	5	~ 2 Weeks

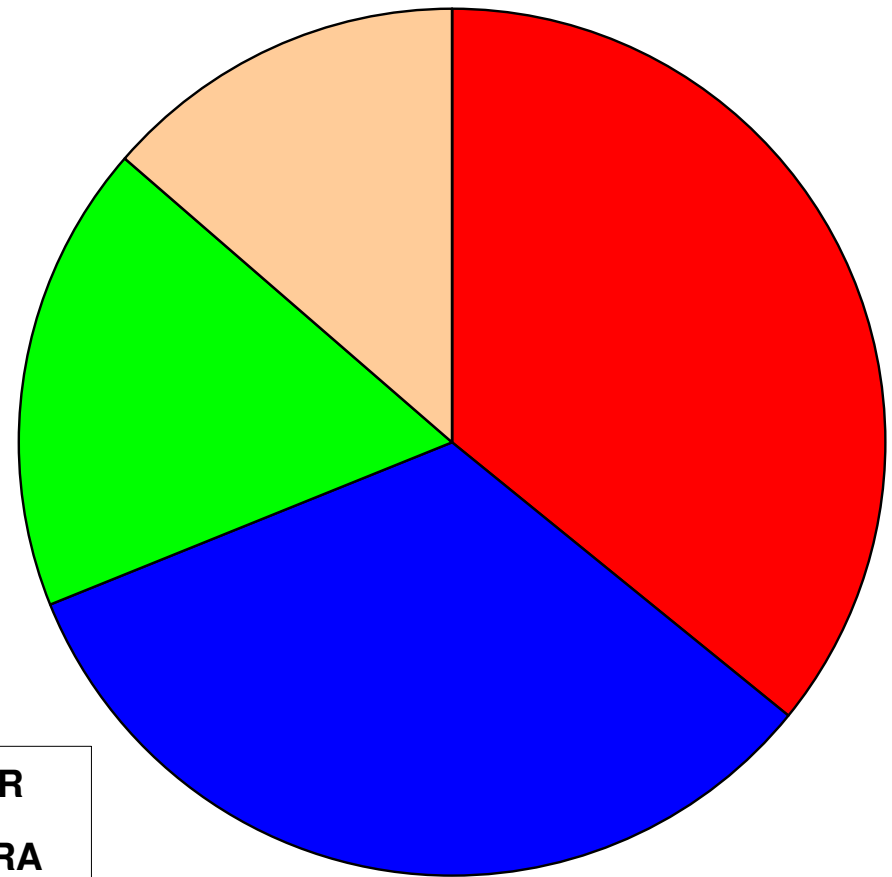
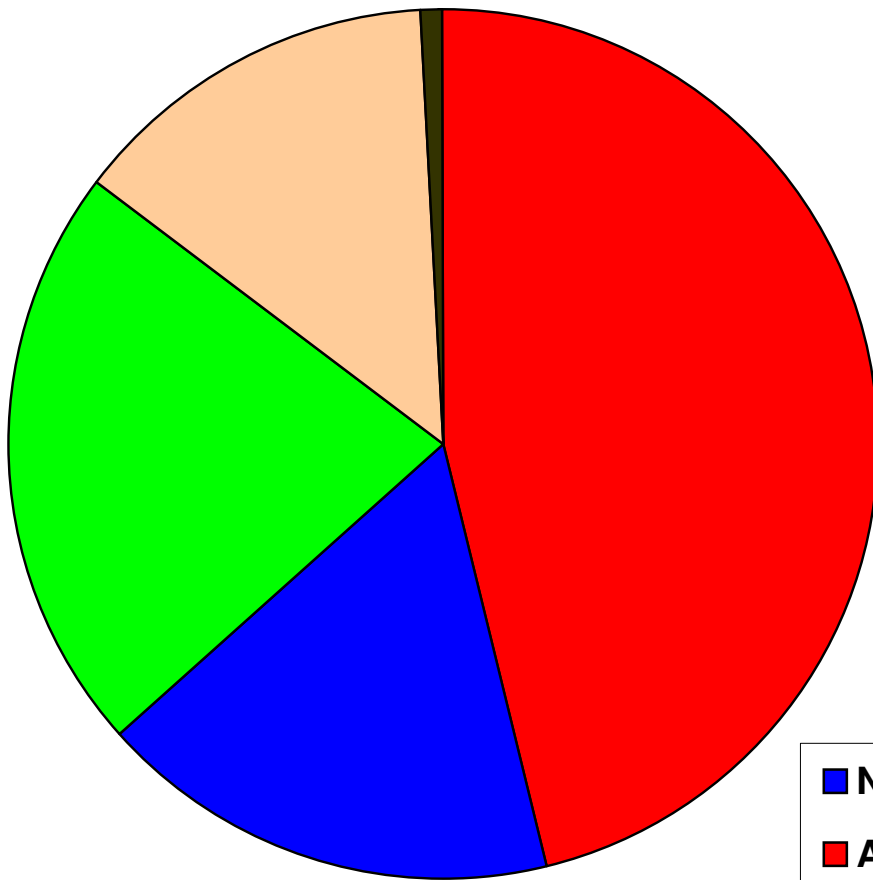
Grade 8 Yearly Total Mathematics Instructional Time by SES



Grade 8 Mathematics Mean Teaching Emphasis

Highest SES Schools

Lowest SES Schools



- NUMBER
- ALGEBRA
- GEOMETRY
- DATA
- OTHER

Mean Percent of Grade 8 Mathematics Teaching Time

<i>Topic</i>	<i>Highest SES</i>	<i>Lowest SES</i>	<i>Difference</i>
Algebra	46	36	~ 4 Weeks
Geometry	22	17	~ 2 Weeks
Number	17	33	~ 6 Weeks

Science Displays

2007 Grade 8 Science

Nation	Mean
Singapore	567
Chinese Taipei	561
Massachusetts, US	556
Japan	554
Korea, Rep. of	553

Nation	Mean
England	542
Hungary	539
Czech Republic	539
Minnesota, US	539
Slovenia	538
Hong Kong SAR	530
Russian Federation	530

Significantly Higher than MN
Not Significantly Different from MN
Significantly Lower than MN

Nation	Mean
United States	520
Lithuania	519
Australia	515
Sweden	511
Scotland	496
Italy	495
Armenia	488
Norway	487
Ukraine	485
Jordan	482
Malaysia	471
Thailand	471
Serbia	470
Bulgaria	470
Israel	468
Bahrain	467
Bosnia and Herzegovina	466
Romania	462
Iran, Islamic Rep. of	459
Malta	457
Turkey	454
Syrian Arab Republic	452
Cyprus	452
Tunisia	445

Nation	Mean
Indonesia	427
Oman	423
Georgia	421
Kuwait	418
Colombia	417
Lebanon	414
Egypt	408
Algeria	408
Palestinian Nat'l Auth.	404
Saudi Arabia	403
Morocco	402
El Salvador	387
Botswana	355
Qatar	319
Ghana	303

2007 Grade 4 Science

Nation	Mean
Singapore	587
Massachusetts, US	571

Nation	Mean
Chinese Taipei	557
Hong Kong SAR	554
Minnesota, US	551
Japan	548
Russian Federation	546
Latvia	542
England	542
United States	539

Nation	Mean
Hungary	536
Italy	535
Kazakhstan	533
Germany	528
Australia	527
Slovak Republic	526
Austria	526
Sweden	525
Netherlands	523
Slovenia	518
Denmark	517
Czech Republic	515
Lithuania	514
New Zealand	504
Scotland	500
Armenia	484
Norway	477
Ukraine	474
Iran, Islamic Rep. of	436
Georgia	418
Colombia	400
El Salvador	390
Algeria	354
Kuwait	348
Tunisia	318
Morocco	297
Qatar	294
Yemen	197

Significantly Higher than MN
Not Significantly Different from MN
Significantly Lower than MN

Grade 4 Science 1

1995

Earth Features	Earth Processes	Earth in the Universe	Plants & Animals	Organs & Tissues	Life Processes & Functions	Life Cycles & Genetics
Minnesota 67	Minnesota 70	Minnesota 88	Minnesota 89	Minnesota 70	Japan 75	Czech Republic 73
Japan 63	Japan 62	Czech Republic 75	Japan 78	Singapore 67	Australia 70	Minnesota 72
U.S.A. 60	U.S.A. 61	Hong Kong 75	Australia 72	Australia 66	Czech Republic 69	Australia 71
England 59	Australia 56	Hungary 75	Czech Republic 72	Czech Republic 65	Minnesota 69	Japan 71
Czech Republic 58	England 55	Norway 75	Singapore 70	U.S.A. 65	England 69	U.S.A. 70
Hungary 58	Singapore 54	Australia 72	U.S.A. 70	Hong Kong 65	Singapore 69	Norway 68
Norway 56	Czech Republic 54	England 71	England 67	Japan 63	U.S.A. 68	England 68
Australia 56	Hungary 53	U.S.A. 70	Hungary 66	England 62	Norway 67	Hong Kong 68
Hong Kong 54	Hong Kong 51	Japan 69	Hong Kong 65	Hungary 61	Hong Kong 66	Hungary 67
International Mn 53	International Mn 50	Singapore 69	International Mn 64	Norway 61	Hungary 64	Singapore 67
Singapore 53	Norway 42	International Mn 67	Norway 60	International Mn 59	International Mn 64	International Mn 64

2007

Minnesota 70	Japan 70	England 66	Singapore 70	Hungary 63	Singapore 82	Singapore 62
Hong Kong 66	Minnesota 67	Singapore 66	Minnesota 62	Singapore 60	Hong Kong 63	Czech Republic 56
U.S.A. 64	England 65	Hong Kong 63	U.S.A. 61	Minnesota 60	U.S.A. 58	Hungary 56
Singapore 64	U.S.A. 65	Minnesota 62	England 60	England 59	England 56	Minnesota 55
England 63	Hong Kong 64	U.S.A. 61	Hungary 60	U.S.A. 58	Minnesota 55	Australia 53
Japan 63	Australia 64	Australia 60	Hong Kong 59	Hong Kong 58	Japan 55	Japan 52
Australia 60	Hungary 60	Hungary 56	Australia 59	Czech Republic 56	Australia 48	England 52
Hungary 58	Singapore 60	Norway 55	Czech Republic 57	Australia 53	Hungary 48	U.S.A. 52
Norway 54	Czech Republic 60	Japan 54	Japan 56	Japan 53	Czech Republic 47	Hong Kong 49
International Mn 51	International Mn 51	Czech Republic 53	International Mn 50	Norway 50	International Mn 45	International Mn 43
Czech Republic 50	Norway 51	International Mn 50	Norway 50	International Mn 49	Norway 35	Norway 42
Earth Features	Earth Processes	Earth in the Universe	Plants & Animals	Organs & Tissues	Life Processes & Functions	Life Cycles & Genetics

Grade 4 Science 2

1995													
Human Biology & Health		Matter		Energy & Physical Processes		Physical & Chemical Changes		Forces & Motion		Environmental & Resource Issues		Scientific Processes	
Minnesota	75	Japan	75	Japan	70	Japan	72	Japan	62	Minnesota	79	Minnesota	67
Australia	70	Singapore	67	Minnesota	66	Minnesota	69	Czech Republic	62	Japan	72	U.S.A.	63
U.S.A.	69	Minnesota	66	Australia	63	Hong Kong	68	Singapore	60	Australia	69	Australia	59
Norway	68	Australia	63	England	62	Czech Republic	67	Minnesota	59	U.S.A.	68	Singapore	54
Singapore	68	U.S.A.	61	Czech Republic	61	U.S.A.	65	Norway	58	Czech Republic	63	England	54
England	67	Czech Republic	61	U.S.A.	61	Singapore	65	Australia	55	Hungary	62	Japan	53
Hong Kong	67	Hong Kong	60	Singapore	61	Australia	63	Hungary	55	England	60	Hong Kong	51
Czech Republic	66	Hungary	59	Hong Kong	59	England	61	Hong Kong	54	International Mn	58	Czech Republic	51
Japan	66	England	58	Hungary	57	Hungary	60	U.S.A.	53	Norway	58	Norway	48
Hungary	65	International Mn	58	International Mn	56	International Mn	59	International Mn	51	Singapore	57	International Mn	46
International Mn	63	Norway	56	Norway	53	Norway	58	England	49	Hong Kong	54	Hungary	40

2007													
Human Biology & Health		Matter		Energy & Physical Processes		Physical & Chemical Changes		Forces & Motion		Environmental & Resource Issues		Scientific Processes	
Japan	65	Singapore	72	Singapore	73	Singapore	69	Hong Kong	71	Singapore	62	Singapore	70
Singapore	64	Hong Kong	67	Japan	67	Japan	65	Singapore	70	Minnesota	63	Hong Kong	70
Hong Kong	61	Japan	65	Hong Kong	61	Hong Kong	61	Minnesota	67	Hong Kong	61	England	69
Hungary	60	Minnesota	61	Minnesota	58	Hungary	58	Australia	62	Japan	59	Minnesota	67
Minnesota	57	England	59	England	56	Minnesota	57	England	62	Australia	58	U.S.A.	67
England	57	Hungary	59	U.S.A.	55	England	57	U.S.A.	61	England	58	Australia	67
U.S.A.	55	U.S.A.	59	Hungary	54	Czech Republic	55	Japan	61	U.S.A.	57	Japan	65
Australia	54	Czech Republic	58	Australia	53	U.S.A.	55	Hungary	58	Hungary	57	Hungary	62
Czech Republic	54	Australia	55	Czech Republic	50	Australia	51	International Mn	54	Czech Republic	51	Czech Republic	57
Norway	51	International Mn	50	International Mn	47	International Mn	46	Czech Republic	54	International Mn	45	International Mn	56
International Mn	48	Norway	48	Norway	42	Norway	40	Norway	53	Norway	41	Norway	54
Human Biology & Health		Matter		Energy & Physical Processes		Physical & Chemical Changes		Forces & Motion		Environmental & Resource Issues		Scientific Processes	

Grade 8 Science 1

1995											
Earth Features		Earth Processes		Earth in the Universe		Diversity & Structure of Living Things		Life Processes & Functions		Life Cycles & Genetics	
Czech Republic	67	Minnesota	67	Minnesota	74	Japan	76	Singapore	72	Minnesota	86
Hungary	67	England	67	Sweden	71	Singapore	74	Japan	70	Czech Republic	82
Korea	65	Singapore	67	Norway	70	Hong Kong	73	Korea	68	U.S.A.	81
Singapore	65	Norway	62	Czech Republic	67	Korea	72	Czech Republic	64	England	80
Minnesota	64	U.S.A.	61	Japan	67	Czech Republic	72	Thailand	63	Israel	79
Sweden	61	Russian Federation	61	Thailand	66	Minnesota	70	Minnesota	63	Sweden	78
Thailand	60	Sweden	60	Singapore	65	Thailand	69	Hungary	60	Norway	78
Russian Federation	59	Korea	59	Korea	64	Sweden	68	Russian Federation	59	Korea	76
Norway	59	Japan	58	U.S.A.	63	Hungary	67	England	59	Russian Federation	76
Japan	59	Czech Republic	57	Australia	63	Australia	67	U.S.A.	58	Japan	75
England	59	Australia	57	England	59	Russian Federation	66	Australia	57	Hungary	74
Australia	57	Thailand	56	Hungary	59	England	64	Israel	57	Australia	73
U.S.A.	57	Israel	55	International Mn	58	U.S.A.	64	Hong Kong	56	International Mn	70
Israel	56	International Mn	54	Hong Kong	58	International Mn	61	Sweden	55	Singapore	69
International Mn	55	Hong Kong	52	Israel	56	Israel	60	International Mn	55	Thailand	67
Hong Kong	54	Hungary	51	Russian Federation	57	Norway	59	Norway	54	Hong Kong	65

2007											
Earth Features		Earth Processes		Earth in the Universe		Diversity & Structure of Living Things		Life Processes & Functions		Life Cycles & Genetics	
Minnesota	61	Czech Republic	60	Czech Republic	61	Singapore	61	Singapore	68	S. Korea	65
Hungary	59	Hong Kong	60	S. Korea	60	S. Korea	60	S. Korea	63	Japan	60
Czech Republic	59	Japan	59	Minnesota	60	Minnesota	59	Japan	62	Hong Kong	60
Japan	58	Minnesota	58	U.S.A.	58	Japan	57	Hong Kong	59	Singapore	57
Russian Federation	57	Russian Federation	57	Sweden	57	Hungary	56	England	58	Russian Federation	52
S. Korea	57	Singapore	56	Norway	57	Czech Republic	56	Minnesota	56	Hungary	51
Sweden	56	U.S.A.	53	Singapore	57	England	55	Russian Federation	52	Minnesota	49
Norway	54	Australia	52	England	56	U.S.A.	54	U.S.A.	52	U.S.A.	47
Singapore	53	England	52	Russian Federation	55	Russian Federation	53	Czech Republic	47	England	47
U.S.A.	51	Sweden	51	Australia	53	Hong Kong	51	Sweden	47	Czech Republic	46
Australia	51	Hungary	50	Hong Kong	51	Australia	50	Australia	47	Australia	44
Hong Kong	50	S. Korea	50	Hungary	49	Sweden	48	Hungary	43	Sweden	41
England	50	Norway	47	Thailand	49	Thailand	44	International Mn	43	Israel	39
International Mn	38	Thailand	46	Japan	48	Norway	42	Thailand	41	International Mn	38
Israel	37	International Mn	41	International Mn	45	International Mn	41	Norway	38	Norway	38
Thailand	34	Israel	40	Israel	38	Israel	41	Israel	38	Thailand	35
Earth Features		Earth Processes		Earth in the Universe		Diversity & Structure of Living Things		Life Processes & Functions		Life Cycles & Genetics	

Grade 8 Science 2

1995											
Interactions of Living Things		Human Biology & Health		Properties & Classification of Matter		Structure of Matter		Energy & Physical Processes		Physical Changes	
Korea	69	Singapore	74	Japan	67	Russian Federation	56	Singapore	71	Japan	67
Singapore	66	Czech Republic	72	Singapore	67	Hungary	54	Japan	69	Singapore	63
Minnesota	65	Minnesota	71	Korea	65	Czech Republic	54	Korea	67	Czech Republic	63
Japan	65	Japan	69	Czech Republic	60	Singapore	53	England	64	Israel	61
Thailand	64	Hungary	69	Hungary	57	Minnesota	49	Minnesota	63	Sweden	61
Hungary	63	England	68	Sweden	57	U.S.A.	48	Czech Republic	62	Hungary	61
Australia	62	Israel	68	Hong Kong	56	Israel	45	Australia	61	Norway	60
England	62	U.S.A.	67	Norway	55	Sweden	43	Hungary	60	England	59
Norway	60	Thailand	67	Australia	55	Korea	42	Hong Kong	60	Korea	57
Czech Republic	58	Australia	66	England	55	Japan	41	Israel	59	Australia	57
U.S.A.	54	Korea	66	Russian Federation	54	Hong Kong	40	Russian Federation	58	Russian Federation	57
Russian Federation	52	Sweden	64	Israel	53	International Mn	40	U.S.A.	57	Thailand	53
Sweden	52	Russian Federation	63	Minnesota	52	Australia	39	Norway	57	International Mn	53
International Mn	51	Norway	63	International Mn	52	England	38	Sweden	57	Minnesota	50
Israel	50	International Mn	61	U.S.A.	50	Norway	32	International Mn	56	U.S.A.	49
Hong Kong	47	Hong Kong	60	Thailand	47	Thailand	31	Thailand	55	Hong Kong	49

2007											
Interactions of Living Things		Human Biology & Health		Properties & Classification of Matter		Structure of Matter		Energy & Physical Processes		Physical Changes	
Singapore	64	Minnesota	70	Singapore	53	Singapore	64	Singapore	63	S. Korea	57
S. Korea	62	S. Korea	69	S. Korea	53	Czech Republic	60	S. Korea	59	Singapore	55
Minnesota	62	Czech Republic	66	Japan	50	Russian Federation	60	Japan	58	Japan	53
Hungary	60	England	66	Hungary	50	Hungary	57	England	54	England	52
Japan	59	Hungary	65	Czech Republic	49	Japan	52	Hungary	54	Russian Federation	49
England	58	Japan	65	Russian Federation	48	U.S.A.	49	Czech Republic	52	Hungary	49
Czech Republic	57	Singapore	64	England	47	Minnesota	46	Hong Kong	51	Czech Republic	47
U.S.A.	57	Sweden	63	Hong Kong	44	Israel	44	Russian Federation	49	Hong Kong	45
Hong Kong	55	U.S.A.	63	Minnesota	41	Sweden	44	Sweden	45	Sweden	44
Australia	55	Hong Kong	63	Sweden	40	International Mn	43	Australia	45	Minnesota	43
Russian Federation	55	Russian Federation	62	U.S.A.	40	England	42	Minnesota	45	Australia	42
Sweden	53	Australia	62	Australia	39	S. Korea	42	U.S.A.	43	U.S.A.	41
Norway	46	Norway	59	Israel	37	Australia	35	International Mn	40	Norway	40
Israel	44	Thailand	57	International Mn	35	Thailand	35	Norway	39	Israel	39
Thailand	43	Israel	54	Norway	34	Norway	31	Israel	38	International Mn	37
International Mn	42	International Mn	50	Thailand	33	Hong Kong	29	Thailand	38	Thailand	34
Interactions of Living Things		Human Biology & Health		Properties & Classification of Matter		Structure of Matter		Energy & Physical Processes		Physical Changes	

Comparing MN and the US: Grade 4 Science

Topic	1995	2007
Earth Features		
Earth Processes		
Earth in the Universe		
Plants & Animals		
Organs & Tissues		
Life Processes & Functions		
Life Cycles & Genetics		
Interactions of Living Things		
Human Biology and Health		
Matter		
Energy and Physical Processes		
Physical & Chemical Changes		
Forces and Motion		
Environmental & Resource Issues		
Scientific Processes		

	MN>US
	MN=US
	MN<US

Comparing MN and the US: Grade 8 Science

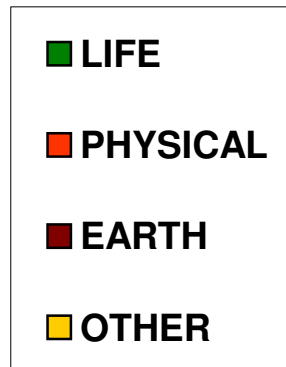
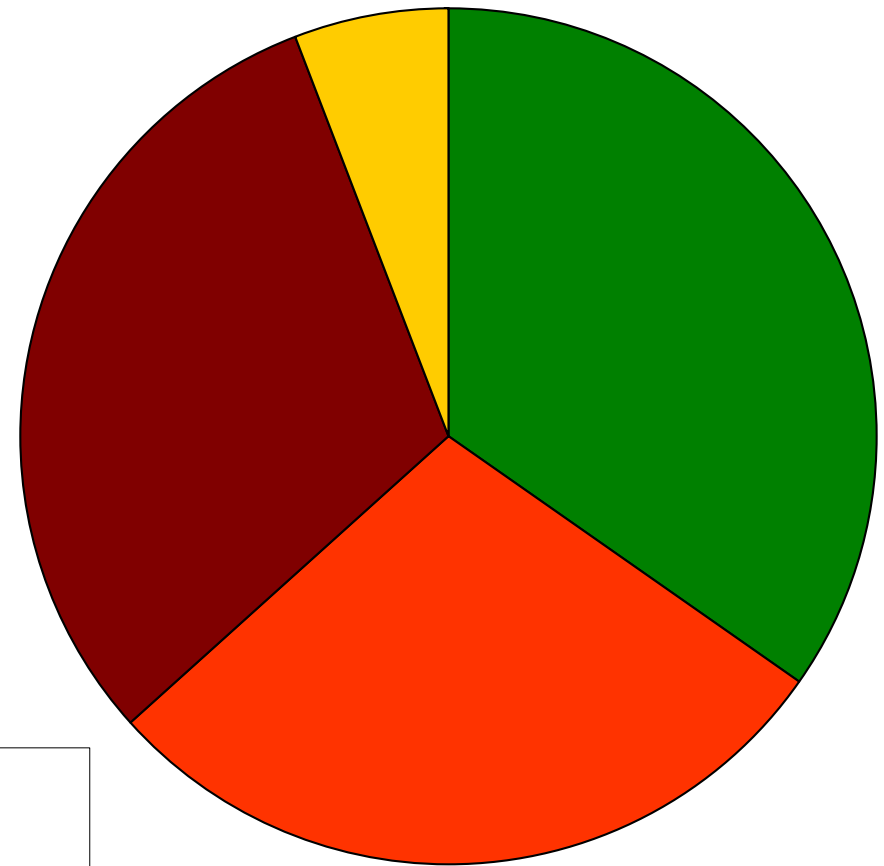
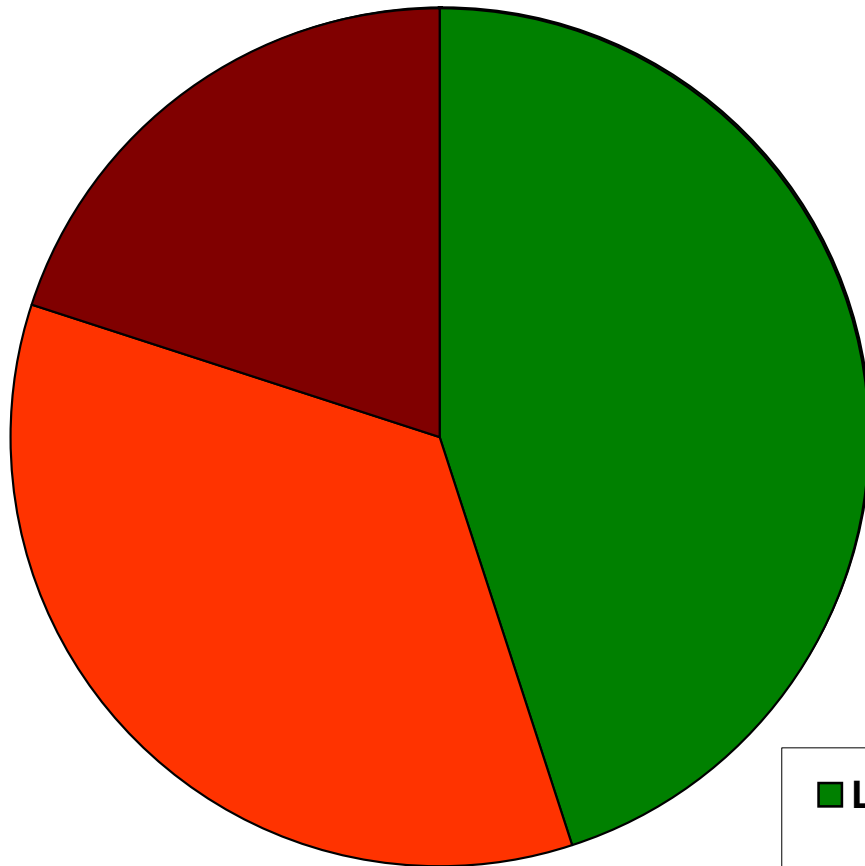
Topic	1995	2007
Earth Features		
Earth Processes		
Earth in the Universe		
Diversity & Structure of Living Things		
Life Processes & Functions		
Life Cycles & Genetics		
Interactions of Living Things		
Human Biology and Health		
Properties & Classification of Matter		
Structure of Matter		
Energy and Physical Processes		
Physical Changes		
Chemical Changes		
Forces and Motion		
Science, Technology, & Society		
Environmental & Resource Issues		
Scientific Processes		

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	MN=US
	MN<US

Grade 4 Science Mean Teaching Emphasis

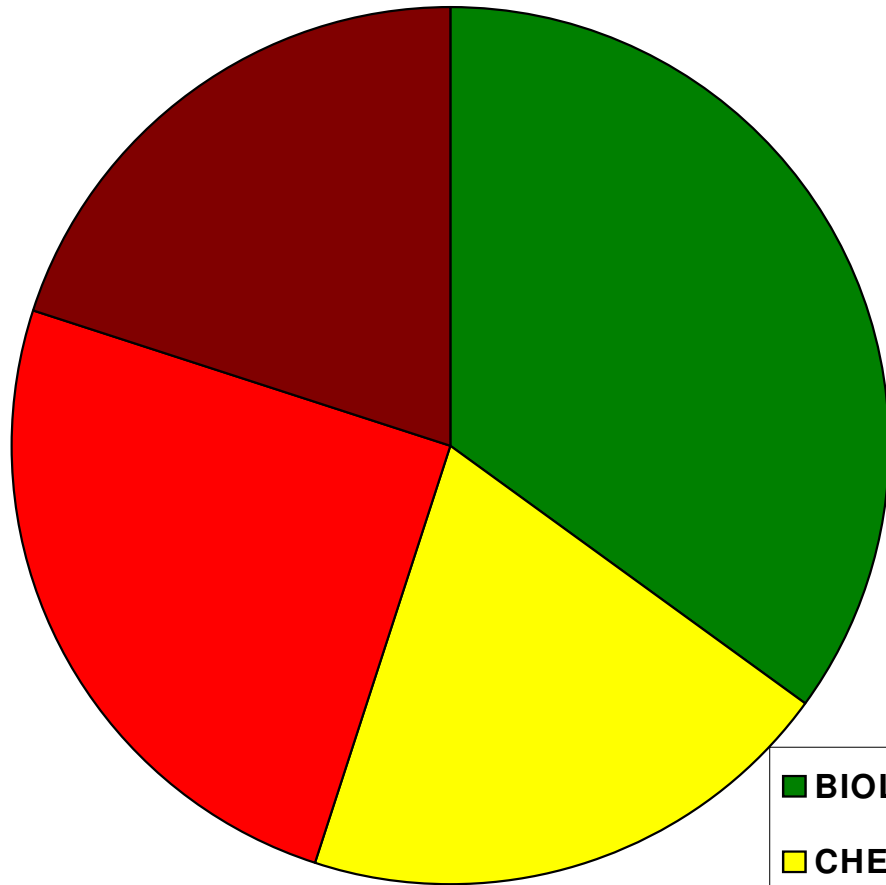
2007 TIMSS TEST EMPHASIS

2007



Grade 8 Science Mean Teaching Emphasis

2007 TIMSS TEST EMPHASIS



2007

