

***Looking Beneath the Surface  
What we can learn from the  
Minnesota TIMSS Science  
Results***

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# 2007 Grade 4 Mathematics

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

Nation	Mean
<b>Minnesota, US</b>	<b>554</b>
Kazakhstan	549
Russian Federation	544
England	541

Nation	Mean
Latvia	537
Netherlands	535
Lithuania	530
<b>United States</b>	<b>529</b>
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

# 2007 Grade 8 Mathematics

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

Nation	Mean
<b>Minnesota, US</b>	<b>532</b>

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

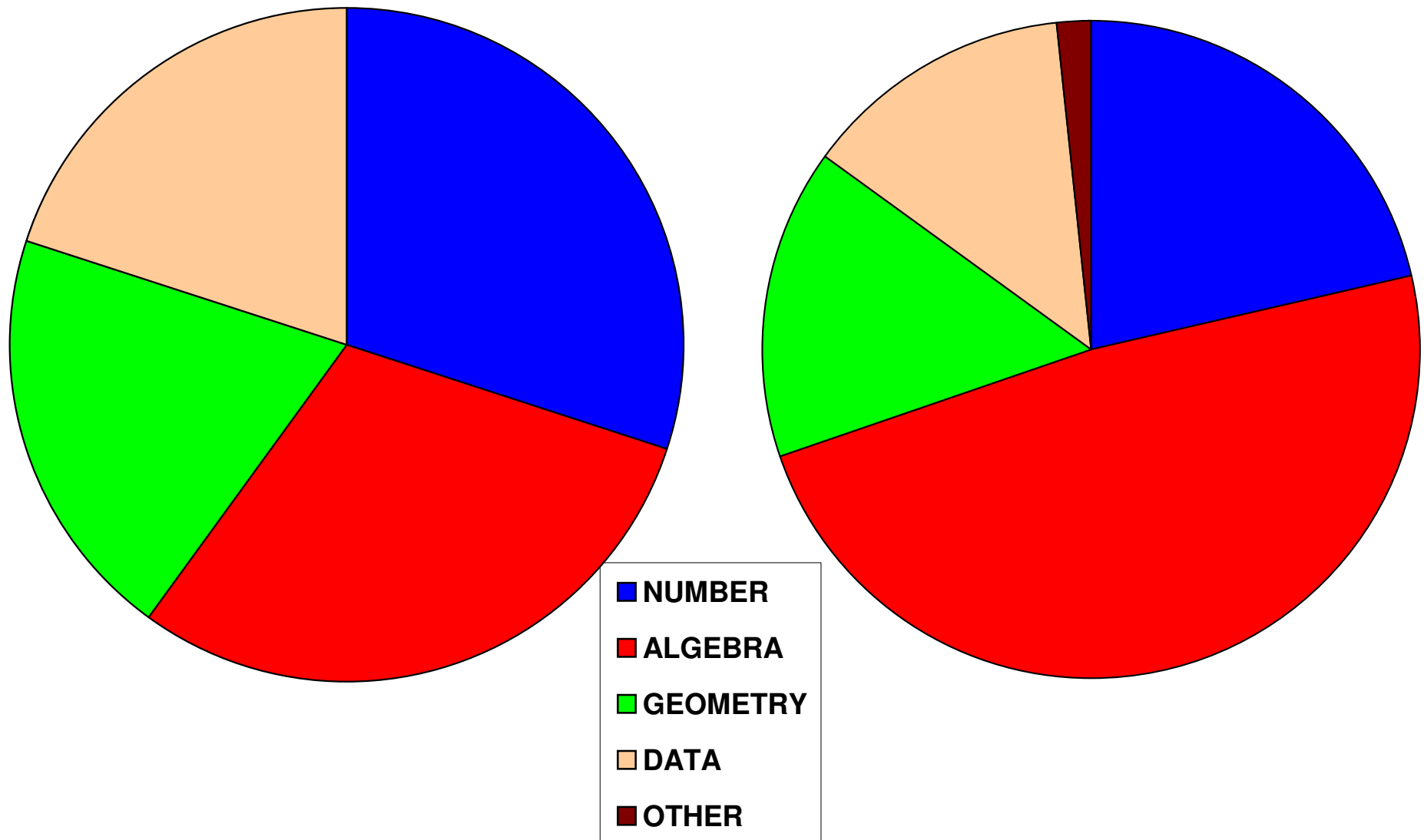
Nation	Mean
Hungary	517
England	513
Russian Federation	512
<b>United States</b>	<b>508</b>
Lithuania	506
Czech Republic	504
Slovenia	501
Armenia	499
Australia	496
Sweden	491
Malta	488
Scotland	487
Serbia	486
Italy	480
Malaysia	474
Norway	469
Cyprus	465
Bulgaria	464
Israel	463
Ukraine	462
Romania	461
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
Romania	387
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

# Grade 8 Mathematics Mean Teaching Emphasis

2007 TIMSS TEST EMPHASIS

2007



# 2007 Grade 4 Science

Nation	Mean
Singapore	587
<b>Massachusetts, US</b>	<b>571</b>

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

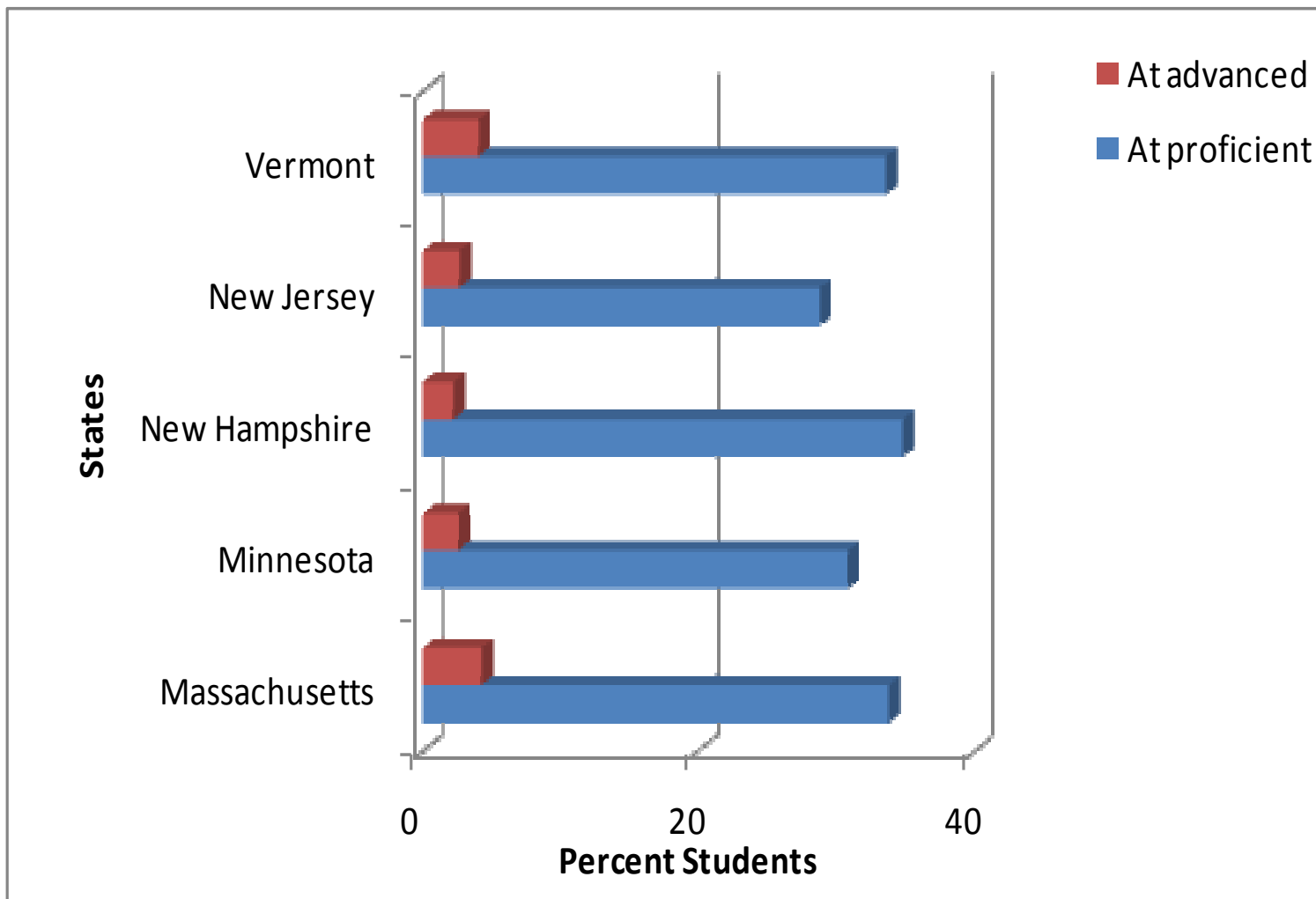
Nation	Mean
Hungary	536
Italy	535
Kazakhstan	533
Germany	528
Australia	527
Slovak Republic	526
Austria	526
Sweden	525
Netherlands	523
Slovenia	518
Denmark	517
Czech Republic	515
Lithuania	514
New Zealand	504
Scotland	500
Armenia	484
Norway	477
Ukraine	474
Iran, Islamic Rep. of	436
Georgia	418
Colombia	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: 1995 & 2007

<i>1995 Rescaled Scores</i>				<i>2007 Scores</i>	
<b>Nation</b>	<b>Mean</b>			<b>Nation</b>	<b>Mean</b>
Japan	553			Singapore	587
<b>Minnesota, US</b>	<b>553</b>			Hong Kong SAR	554
<b>United States</b>	<b>542</b>			<b>Minnesota, US</b>	<b>551</b>
Austria	538			Japan	548
Czech Republic	532			England	542
Netherlands	530			Latvia	542
England	528			<b>United States</b>	<b>539</b>
Singapore	523			Hungary	536
Australia	521			Australia	527
Scotland	514			Austria	526
Hong Kong SAR	508			Netherlands	523
Hungary	508			Slovenia	518
New Zealand	505			Czech Republic	515
Norway	504			New Zealand	504
Latvia	486			Scotland	500
Slovenia	464			Norway	477
Iran, Islamic Rep. of	380			Iran, Islamic Rep. of	436
<b>Significantly Higher than MN</b>					
<b>Not Significantly Different from MN</b>					
<b>Significantly Lower than MN</b>					

# 2005 NAEP Grade 4 Science



# 2007 Grade 8 Science

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

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

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

Nation	Mean
<b>United States</b>	<b>520</b>
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

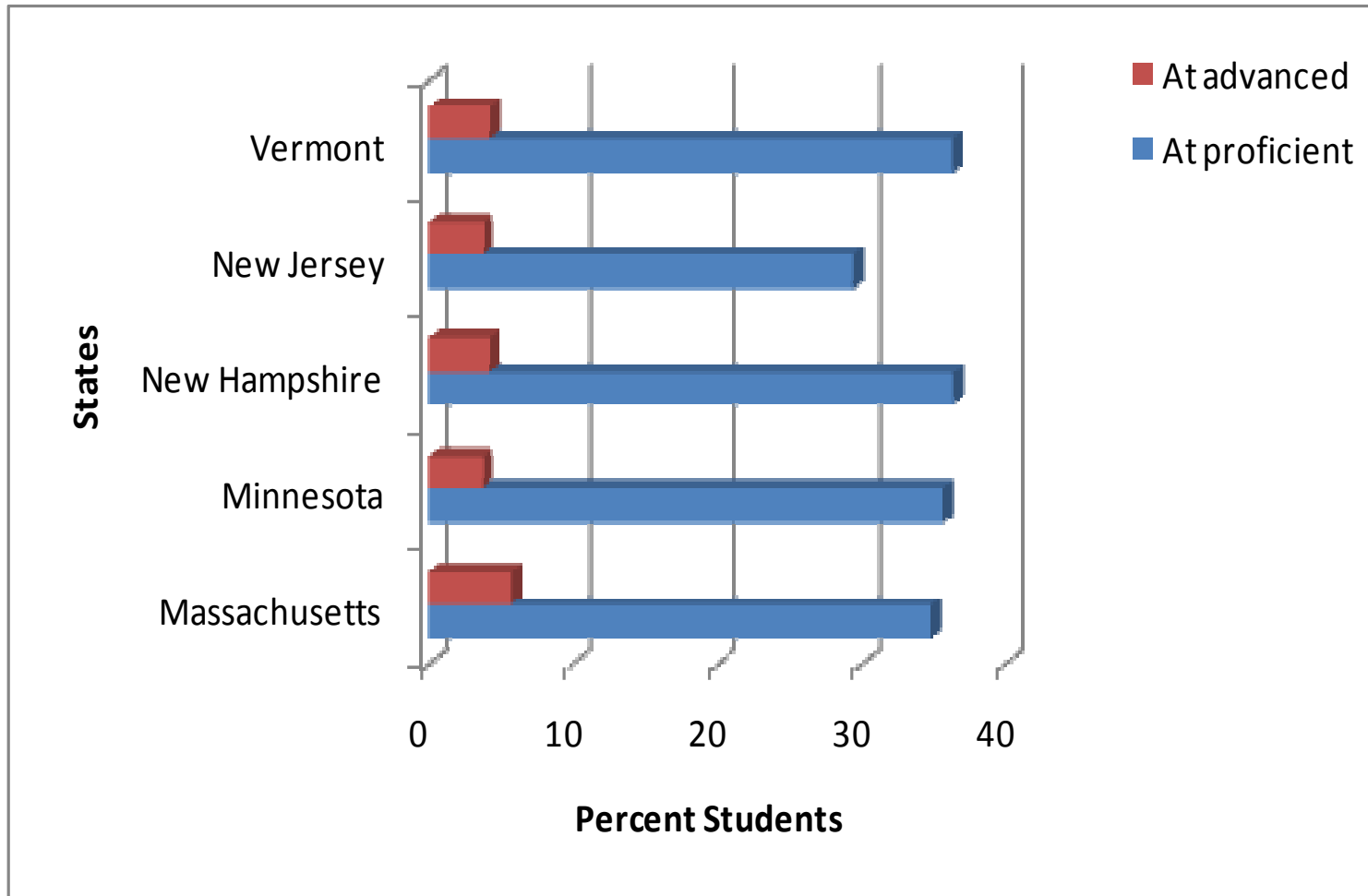
Nation	Mean
Indonesia	427
Oman	423
Georgia	421
Kuwait	418
Colombia	417
Lebanon	414
Egypt	408
Algeria	408
Palestinian Nat'l Auth.	404
Saudi Arabia	403
Morocco	402
El Salvador	387
Botswana	355
Qatar	319
Ghana	303



# Grade 8 Science: 1995 & 2007

1995 Rescaled Scores		2007 Scores	
Nation	Mean	Nation	Mean
Singapore	580	Singapore	567
Czech Republic	555	Japan	554
Japan	554	Korea, Rep. of	553
Sweden	553	England	542
Korea, Rep. of	546	Czech Republic	539
<b>Minnesota, US</b>	<b>544</b>	Hungary	539
Hungary	537	<b>Minnesota, US</b>	<b>539</b>
England	533	Slovenia	538
Bulgaria	527	Hong Kong SAR	530
Russian Federation	523	Russian Federation	530
Australia	514	<b>United States</b>	<b>520</b>
Norway	514	Lithuania	519
Slovenia	514	Australia	515
<b>United States</b>	<b>513</b>	Sweden	511
Hong Kong SAR	510	Scotland	496
Scotland	501	Norway	487
Romania	471	Bulgaria	464
Lithuania	464	Romania	462
Iran, Islamic Rep. of	463	Iran, Islamic Rep. of	459
Cyprus	452	Cyprus	452
Colombia	365	Colombia	417
<b>Significantly Higher than MN</b>			
<b>Not Significantly Different from MN</b>			
<b>Significantly Lower than MN</b>			

# 2005 NAEP Grade 8 Science



# Grade 4 Science 1

1995													
Earth Features		Earth Processes		Earth in the Universe		Plants & Animals		Organs & Tissues		Life Processes &		Life Cycles & Genetics	
<b>Minnesota</b>	<b>67</b>	<b>Minnesota</b>	<b>70</b>	<b>Minnesota</b>	<b>88</b>	<b>Minnesota</b>	<b>89</b>	<b>Minnesota</b>	<b>70</b>	Japan	75	Czech Republic	73
Japan	63	Japan	62	Czech Republic	75	Japan	78	Singapore	67	Australia	70	<b>Minnesota</b>	<b>72</b>
<b>U.S.A.</b>	<b>60</b>	<b>U.S.A.</b>	<b>61</b>	Hong Kong	75	Australia	72	Australia	66	Czech Republic	69	Australia	71
England	59	Australia	56	Hungary	75	Czech Republic	72	Czech Republic	65	<b>Minnesota</b>	<b>69</b>	Japan	71
Czech Republic	58	England	55	Norway	75	Singapore	70	<b>U.S.A.</b>	<b>65</b>	England	69	<b>U.S.A.</b>	<b>70</b>
Hungary	58	Singapore	54	Australia	72	<b>U.S.A.</b>	<b>70</b>	Hong Kong	65	Singapore	69	Norway	68
Norway	56	Czech Republic	54	England	71	England	67	Japan	63	<b>U.S.A.</b>	<b>68</b>	England	68
Australia	56	Hungary	53	<b>U.S.A.</b>	<b>70</b>	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
	57		54		72		69		64		69		69

2007													
Earth Features		Earth Processes		Earth in the Universe		Plants & Animals		Organs & Tissues		Life Processes &		Life Cycles & Genetics	
<b>Minnesota</b>	<b>70</b>	Japan	70	England	66	Singapore	70	Hungary	63	Singapore	82	Singapore	62
Hong Kong	66	<b>Minnesota</b>	<b>67</b>	Singapore	66	<b>Minnesota</b>	<b>62</b>	Singapore	60	Hong Kong	63	Czech Republic	56
<b>U.S.A.</b>	<b>64</b>	England	65	Hong Kong	63	<b>U.S.A.</b>	<b>61</b>	<b>Minnesota</b>	<b>60</b>	<b>U.S.A.</b>	<b>58</b>	Hungary	56
Singapore	64	<b>U.S.A.</b>	<b>65</b>	<b>Minnesota</b>	<b>62</b>	England	60	England	59	England	56	<b>Minnesota</b>	<b>55</b>
England	63	Hong Kong	64	<b>U.S.A.</b>	<b>61</b>	Hungary	60	<b>U.S.A.</b>	<b>58</b>	<b>Minnesota</b>	<b>55</b>	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	<b>U.S.A.</b>	<b>52</b>
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
	60		62		59		59		57		55		53

# Grade 4 Science 2

1995													
Human Biology & Health		Matter		Energy & Physical Processes		Physical & Chemical Changes		Forces & Motion		Environmental & Resource Issues		Scientific Processes	
<b>Minnesota</b>	<b>75</b>	Japan	75	Japan	70	Japan	72	Japan	62	<b>Minnesota</b>	<b>79</b>	<b>Minnesota</b>	<b>67</b>
Australia	70	Singapore	67	<b>Minnesota</b>	<b>66</b>	<b>Minnesota</b>	<b>69</b>	Czech Republic	62	Japan	72	<b>U.S.A.</b>	<b>63</b>
<b>U.S.A.</b>	<b>69</b>	<b>Minnesota</b>	<b>66</b>	Australia	63	Hong Kong	68	Singapore	60	Australia	69	Australia	59
Norway	68	Australia	63	England	62	Czech Republic	67	<b>Minnesota</b>	<b>59</b>	<b>U.S.A.</b>	<b>68</b>	Singapore	54
Singapore	68	<b>U.S.A.</b>	<b>61</b>	Czech Republic	61	<b>U.S.A.</b>	<b>65</b>	Norway	58	Czech Republic	63	England	54
England	67	Czech Republic	61	<b>U.S.A.</b>	<b>61</b>	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	<b>U.S.A.</b>	<b>53</b>	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
	67		62		61		64		56		62		53

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	<b>Minnesota</b>	<b>63</b>	Hong Kong	70
Hong Kong	61	Japan	65	Hong Kong	61	Hong Kong	61	<b>Minnesota</b>	<b>67</b>	Hong Kong	61	England	69
Hungary	60	<b>Minnesota</b>	<b>61</b>	<b>Minnesota</b>	<b>58</b>	Hungary	58	Australia	62	Japan	59	<b>Minnesota</b>	<b>67</b>
<b>Minnesota</b>	<b>57</b>	England	59	England	56	<b>Minnesota</b>	<b>57</b>	England	62	Australia	58	<b>U.S.A.</b>	<b>67</b>
England	57	Hungary	59	<b>U.S.A.</b>	<b>55</b>	England	57	<b>U.S.A.</b>	<b>61</b>	England	58	Australia	67
<b>U.S.A.</b>	<b>55</b>	<b>U.S.A.</b>	<b>59</b>	Hungary	54	Czech Republic	55	Japan	61	<b>U.S.A.</b>	<b>57</b>	Japan	65
Australia	54	Czech Republic	58	Australia	53	<b>U.S.A.</b>	<b>55</b>	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
	58		60		57		57		61		56		64
Human Biology & Health		Matter		Energy & Physical Processes		Physical & Chemical Changes		Forces & Motion		Environmental & Resource Issues		Scientific Processes	

# 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

# MN Grade 4 Student Science Performance

	1995	2007
<b>≥ 75% Correct</b>	<b>Earth Processes</b> <b>Earth in the Universe</b> <b>Plants &amp; Animals</b> <b>Scientific Processes</b>	
<b>Between 50 to 74% Correct</b>	<b>10 of 14 Topics</b>	<b>14 of 14 Topics</b>
<b>&lt; 50% Correct</b>		

The 1995 Scores have been adjusted to account for the differences in difficulty of the 1995 & 2007 tests.

# 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	<b>Minnesota</b>	<b>67</b>	<b>Minnesota</b>	<b>74</b>	Japan	76	Singapore	72	<b>Minnesota</b>	<b>86</b>		
Hungary	67	England	67	Sweden	71	Singapore	74	Japan	70	Japan	82		
Korea	65	Singapore	67	Norway	70	Hong Kong	73	Korea	68	Korea	<b>81</b>		
Singapore	65	Norway	62	Czech Republic	67	Korea	72	Czech Republic	64	England	80		
<b>Minnesota</b>	<b>64</b>	<b>U.S.A.</b>	<b>61</b>	Japan	67	Czech Republic	72	Thailand	63	Israel	79		
Sweden	61	Russian Federation	61	Thailand	66	<b>Minnesota</b>	<b>70</b>	<b>Minnesota</b>	<b>63</b>	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	<b>U.S.A.</b>	<b>63</b>	Hungary	67	England	59	Russian Federation	76		
Japan	59	Czech Republic	57	Australia	63	Australia	67	<b>U.S.A.</b>	<b>58</b>	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		
<b>U.S.A.</b>	<b>57</b>	Israel	55	International Mn	58	<b>U.S.A.</b>	<b>64</b>	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		
	60		59		63		68		61		75		
2007													
<b>Minnesota</b>	<b>61</b>	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	<b>Minnesota</b>	<b>60</b>	<b>Minnesota</b>	<b>59</b>	Japan	62	Hong Kong	60		
Japan	58	<b>Minnesota</b>	<b>58</b>	<b>U.S.A.</b>	<b>58</b>	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	<b>Minnesota</b>	<b>56</b>	Hungary	51		
Sweden	56	<b>U.S.A.</b>	<b>53</b>	Singapore	57	England	55	Russian Federation	52	<b>Minnesota</b>	<b>49</b>		
Norway	54	Australia	52	England	56	<b>U.S.A.</b>	<b>54</b>	<b>U.S.A.</b>	<b>52</b>	<b>U.S.A.</b>	<b>47</b>		
Singapore	53	England	52	Russian Federation	55	Russian Federation	53	Czech Republic	47	England	47		
<b>U.S.A.</b>	<b>51</b>	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		
	52		52		54		52		51		49		
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
<b>Minnesota</b>	<b>65</b>	<b>Minnesota</b>	<b>71</b>	Korea	65	Czech Republic	54	Korea	67	Czech Republic	63
Japan	65	Japan	69	Czech Republic	60	Singapore	57	England	64	Israel	61
Thailand	64	Hungary	69	Hungary	57	<b>Minnesota</b>	<b>49</b>	<b>Minnesota</b>	<b>63</b>	Sweden	61
Hungary	63	England	68	Sweden	57	<b>U.S.A.</b>	<b>48</b>	Czech Republic	62	Hungary	61
Australia	62	Israel	68	Hong Kong	56	Israel	45	Australia	61	Norway	60
England	62	<b>U.S.A.</b>	<b>67</b>	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
<b>U.S.A.</b>	<b>54</b>	Korea	66	Russian Federation	54	Hong Kong	58	Russian Federation	58	Russian Federation	57
Russian Federation	52	Sweden	64	Israel	53	International Mn	40	<b>U.S.A.</b>	<b>57</b>	Thailand	53
Sweden	52	Russian Federation	63	<b>Minnesota</b>	<b>52</b>	Australia	39	Norway	57	International Mn	53
International Mn	51	Norway	63	International Mn	52	England	38	Sweden	57	<b>Minnesota</b>	<b>50</b>
Israel	50	International Mn	61	<b>U.S.A.</b>	<b>50</b>	Norway	32	International Mn	56	<b>U.S.A.</b>	<b>49</b>
Hong Kong	47	Hong Kong	60	Thailand	47	Thailand	31	Thailand	55	Hong Kong	49
	59		67		57		44		61		58
2007											
Singapore	64	<b>Minnesota</b>	<b>70</b>	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
<b>Minnesota</b>	<b>62</b>	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	<b>U.S.A.</b>	<b>49</b>	Czech Republic	52	Hungary	49
Czech Republic	57	Singapore	64	England	47	<b>Minnesota</b>	<b>46</b>	Hong Kong	51	Czech Republic	47
<b>U.S.A.</b>	<b>57</b>	Sweden	63	Hong Kong	44	Israel	44	Russian Federation	49	Hong Kong	45
Hong Kong	55	<b>U.S.A.</b>	<b>63</b>	<b>Minnesota</b>	<b>41</b>	Sweden	44	Sweden	45	Sweden	44
Australia	55	Hong Kong	63	Sweden	40	International Mn	43	Australia	45	<b>Minnesota</b>	<b>43</b>
Russian Federation	55	Russian Federation	62	<b>U.S.A.</b>	<b>40</b>	England	42	<b>Minnesota</b>	<b>45</b>	Australia	42
Sweden	53	Australia	62	Australia	39	S. Korea	42	<b>U.S.A.</b>	<b>43</b>	<b>U.S.A.</b>	<b>41</b>
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
	55		63		44		46		49		46
Interactions of Living Things		Human Biology & Health		Properties & Classification of Matter		Structure of Matter		Energy & Physical Processes		Physical Changes	



# Grade 8 Science 3

1995									
Chemical Changes		Forces & Motion		Science, Technology, & Society		Environmental & Resource Issues		Scientific Processes	
Singapore	74	Czech Republic	78	Korea	74	Singapore	73	Singapore	75
Korea	66	Japan	74	Hungary	73	Thailand	70	Korea	64
Hungary	65	Singapore	73	Sweden	67	<b>Minnesota</b>	<b>68</b>	<b>Minnesota</b>	<b>63</b>
<b>Minnesota</b>	<b>65</b>	Korea	70	Singapore	66	England	67	Czech Republic	61
Czech Republic	64	Hong Kong	69	Japan	60	Australia	65	Australia	61
England	64	Hungary	69	Thailand	59	Korea	63	Japan	60
Japan	64	England	68	England	57	Japan	62	England	60
Australia	62	Sweden	68	Hong Kong	55	<b>U.S.A.</b>	<b>60</b>	<b>U.S.A.</b>	<b>59</b>
Russian Federation	62	Australia	67	Norway	52	Czech Republic	59	Hungary	57
<b>U.S.A.</b>	<b>61</b>	Norway	67	Czech Republic	52	Norway	58	Hong Kong	57
Israel	61	<b>Minnesota</b>	<b>63</b>	<b>Minnesota</b>	<b>52</b>	Hong Kong	53	Thailand	55
Hong Kong	58	Russian Federation	62	Australia	52	International Mn	53	International Mn	53
Sweden	57	<b>U.S.A.</b>	<b>61</b>	Israel	51	Sweden	52	Sweden	52
International Mn	56	International Mn	61	International Mn	48	Israel	52	Norway	52
Norway	53	Israel	55	<b>U.S.A.</b>	<b>48</b>	Hungary	49	Israel	52
Thailand	51	Thailand	56	Russian Federation	40	Russian Federation	47	Russian Federation	51
	62		67		58		59		58
2007									
England	55	Czech Republic	49	Singapore	51	Singapore	55	Japan	56
Singapore	55	Japan	49	Japan	50	<b>Minnesota</b>	<b>55</b>	Singapore	52
Hong Kong	48	S. Korea	48	Czech Republic	44	England	53	S. Korea	50
Japan	47	Singapore	48	Russian Federation	44	Australia	52	<b>Minnesota</b>	<b>48</b>
Australia	45	England	45	England	41	Hungary	51	England	46
<b>Minnesota</b>	<b>45</b>	Hungary	44	Hong Kong	39	S. Korea	51	Czech Republic	45
Russian Federation	44	<b>Minnesota</b>	<b>43</b>	S. Korea	39	Hong Kong	50	Hong Kong	43
Hungary	43	Hong Kong	42	<b>Minnesota</b>	<b>38</b>	Russian Federation	49	<b>U.S.A.</b>	<b>43</b>
<b>U.S.A.</b>	<b>43</b>	Russian Federation	41	<b>U.S.A.</b>	<b>37</b>	<b>U.S.A.</b>	<b>49</b>	Australia	42
Czech Republic	39	Sweden	41	Australia	36	Czech Republic	48	Hungary	40
S. Korea	37	<b>U.S.A.</b>	<b>40</b>	Hungary	34	Japan	48	Russian Federation	38
Norway	35	Australia	38	Sweden	26	Sweden	43	Israel	34
International Mn	34	Norway	32	International Mn	26	Norway	42	Sweden	34
Sweden	34	Israel	32	Thailand	19	Thailand	40	Thailand	29
Thailand	31	International Mn	31	Norway	17	International Mn	38	International Mn	29
Israel	30	Thailand	29	Israel	16	Israel	35	Norway	28
	42		41		35		48		41
Chemical Changes		Forces & Motion		Science, Technology, & Society		Environmental & Resource Issues		Scientific Processes	

# 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		

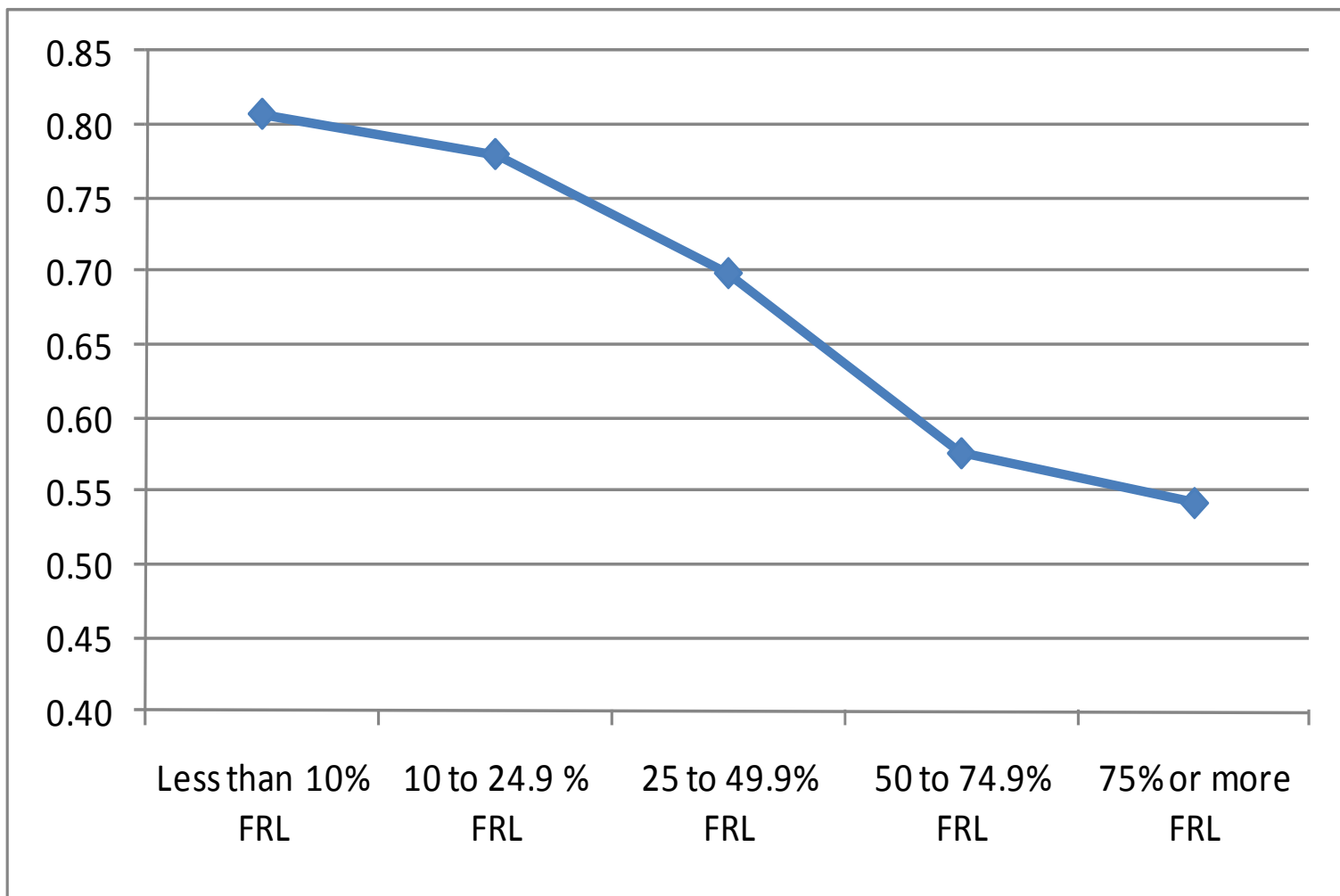
	MN>US
	MN=US
	MN<US

# MN Grade 8 Student Science Performance

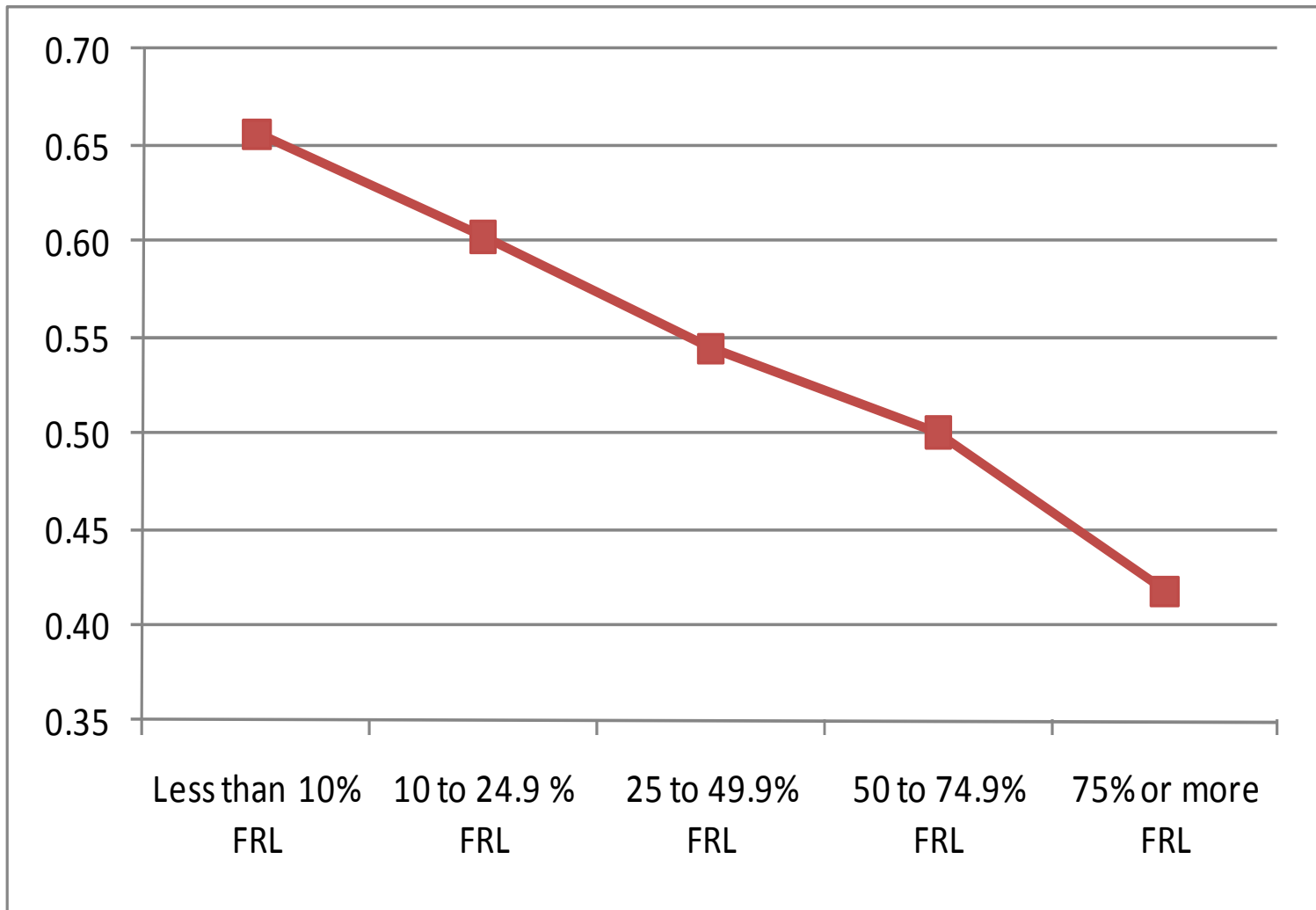
	1995	2007
<b>&gt; 75% Correct</b>		
<b>Between 50 to 74% Correct</b>	<b>11 of 17 Topics</b>	<b>8 of 17 Topics</b>
<b>&lt; 50% Correct</b>	<b>Properties &amp; Classification of Matter</b> <b>Physical Changes</b> <b>Chemical Changes</b> <b>Forces and Motion</b> <b>Science, Technology, &amp; Society</b> <b>Scientific Processes</b>	
		<b>Life Cycles &amp; Genetics</b> <b>Structure of Matter</b> <b>Energy and Physical Processes</b>

The 1995 Scores have been adjusted to account for the differences in difficulty of the 1995 & 2007 tests.

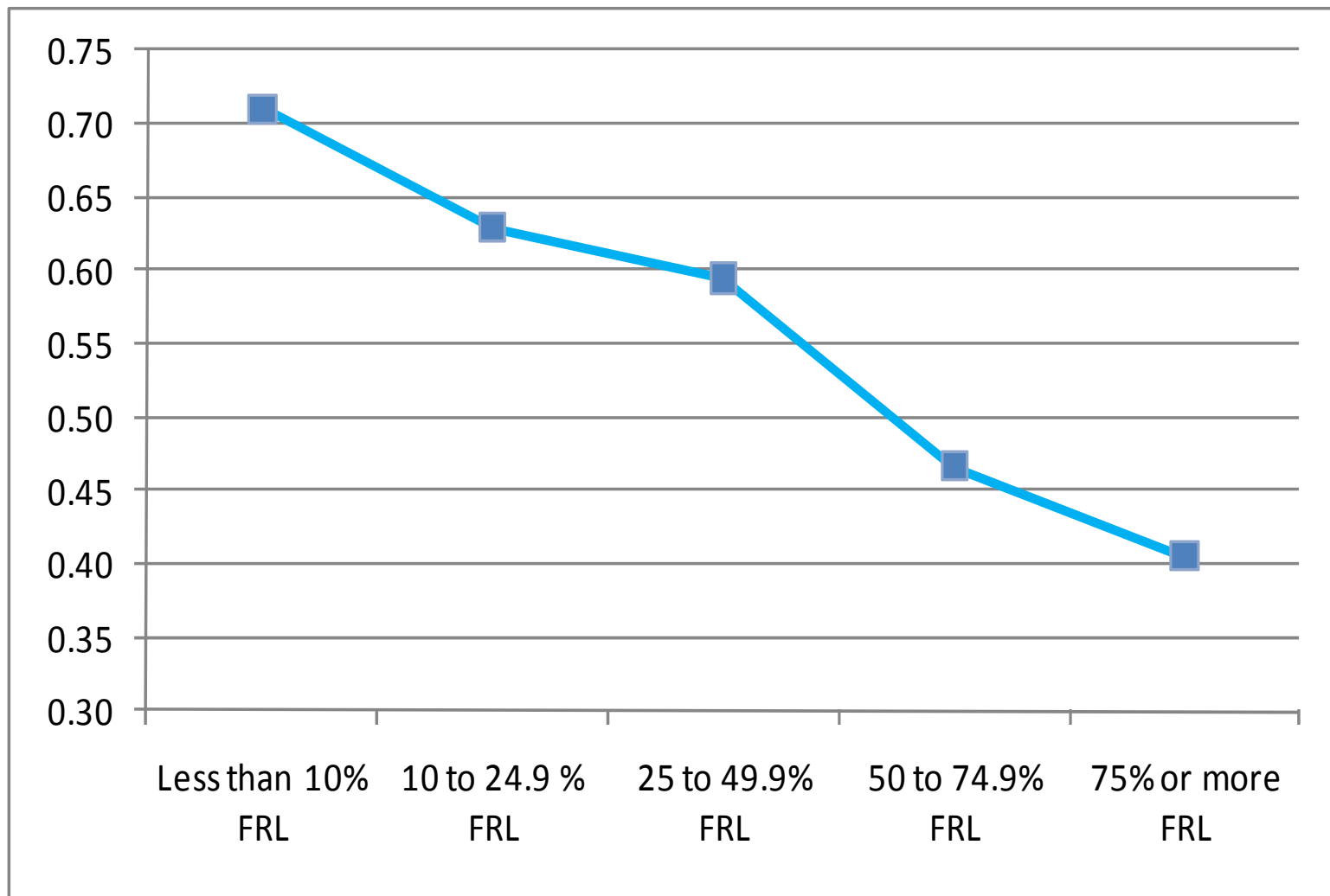
# Grade 4 Earth Features: Average Percent Correct by SES



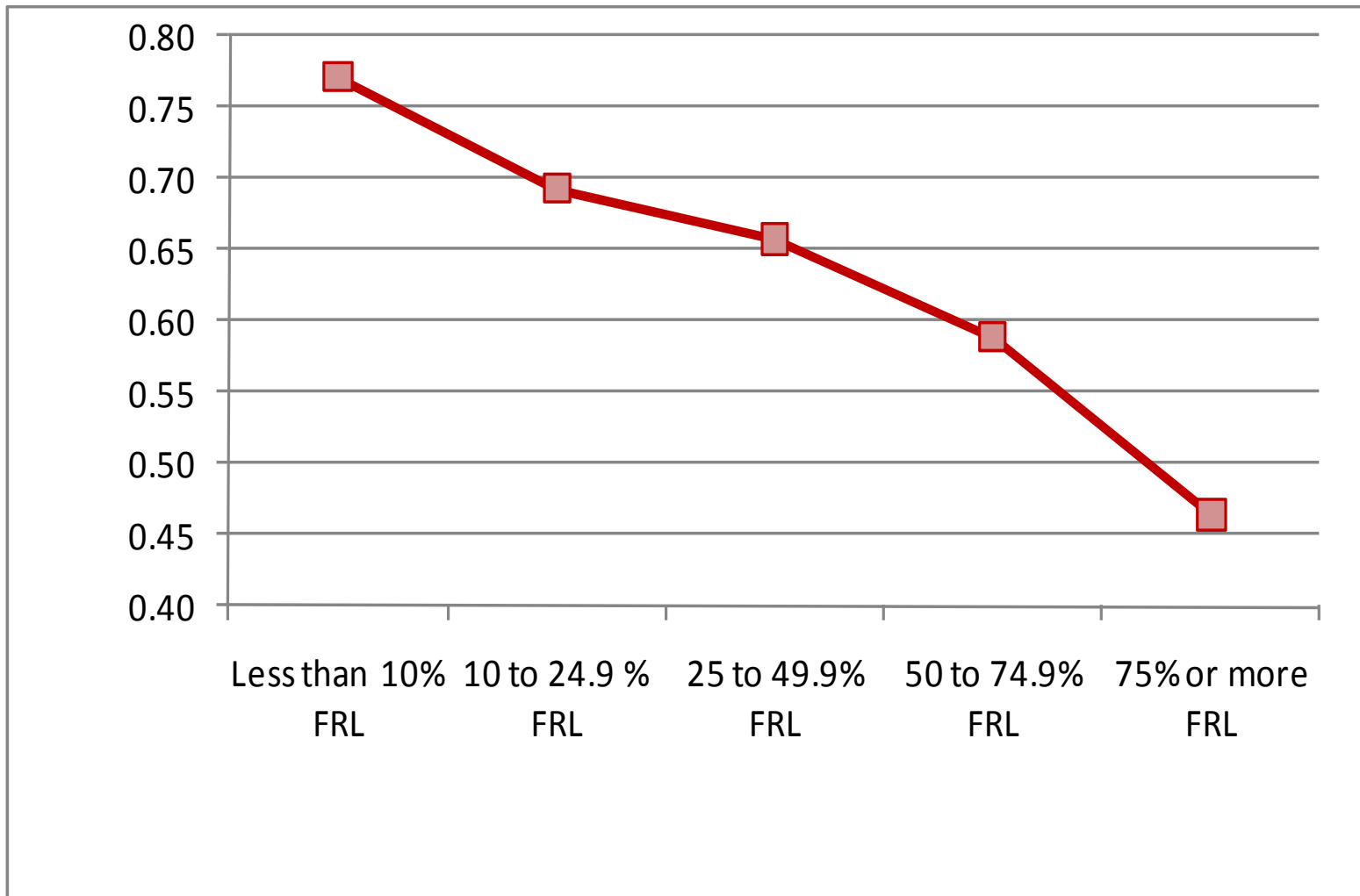
# Grade 4 Life Cycles and Genetics: Average Percent Correct by SES



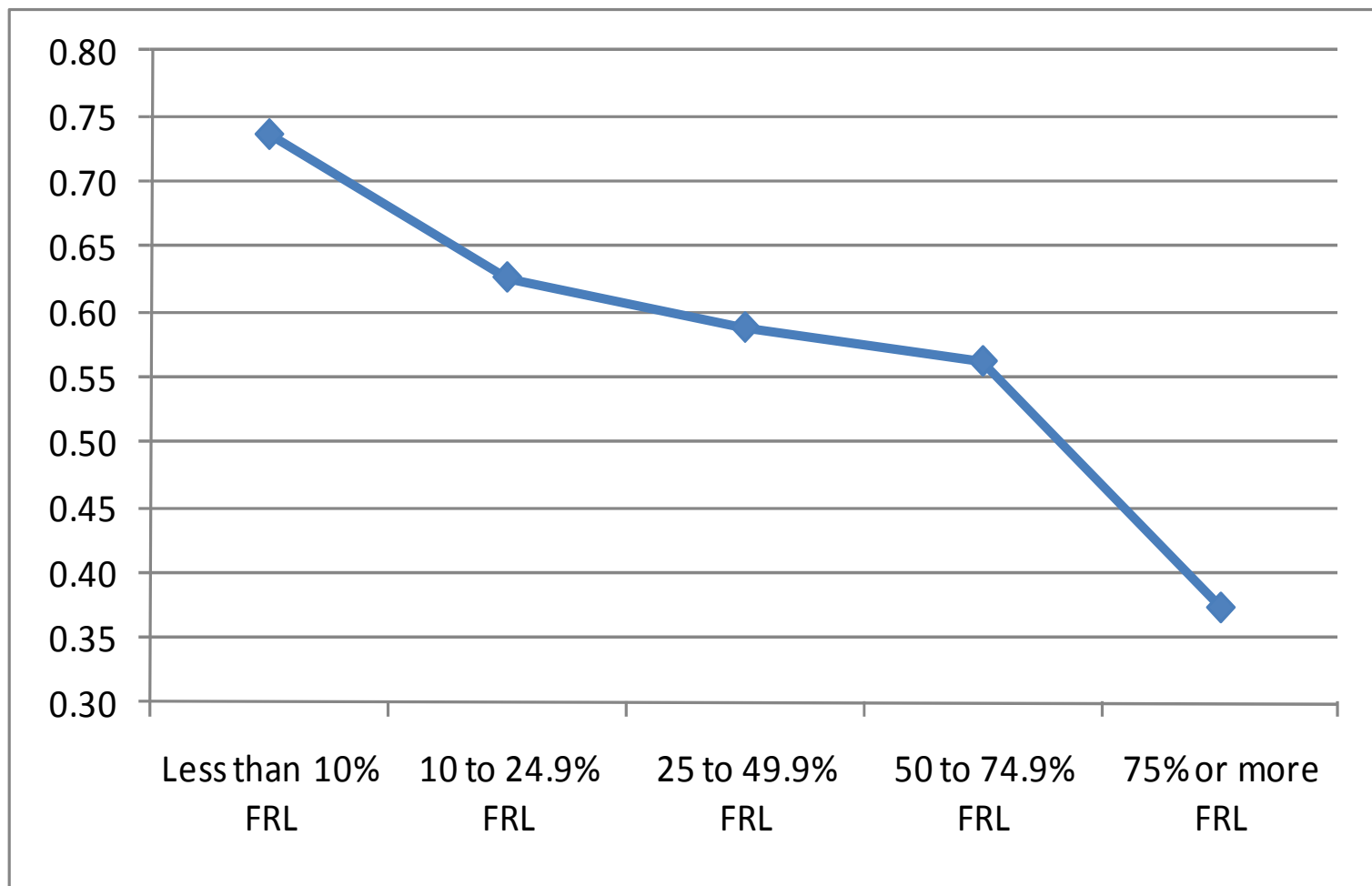
# Grade 4 Physical and Chemical Changes: Average Percent Correct by SES



# Grade 4 Environmental and Resource Issues: Average Percent Correct by SES

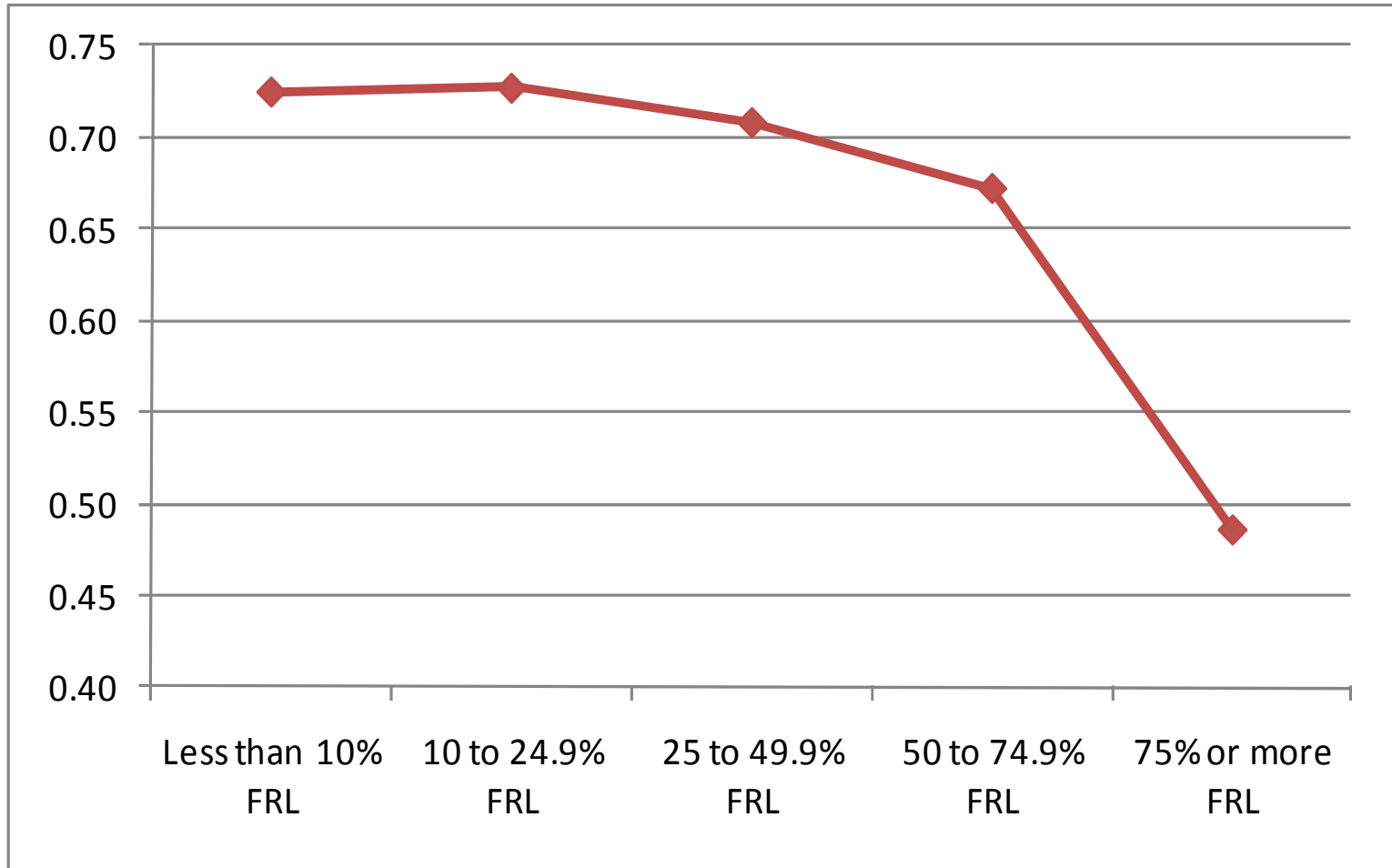


# Grade 8 Earth in the Universe: Average Percent Correct by SES

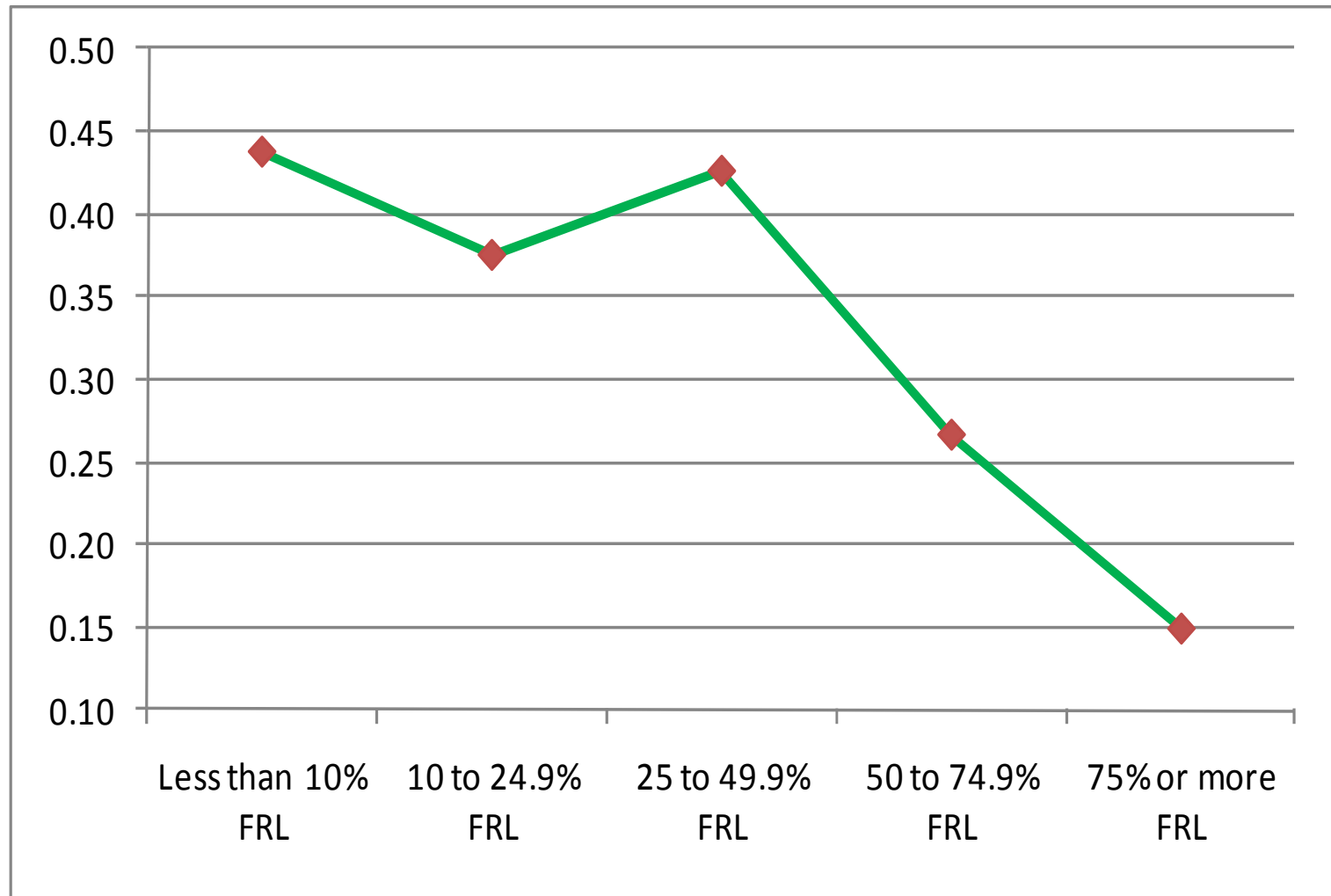




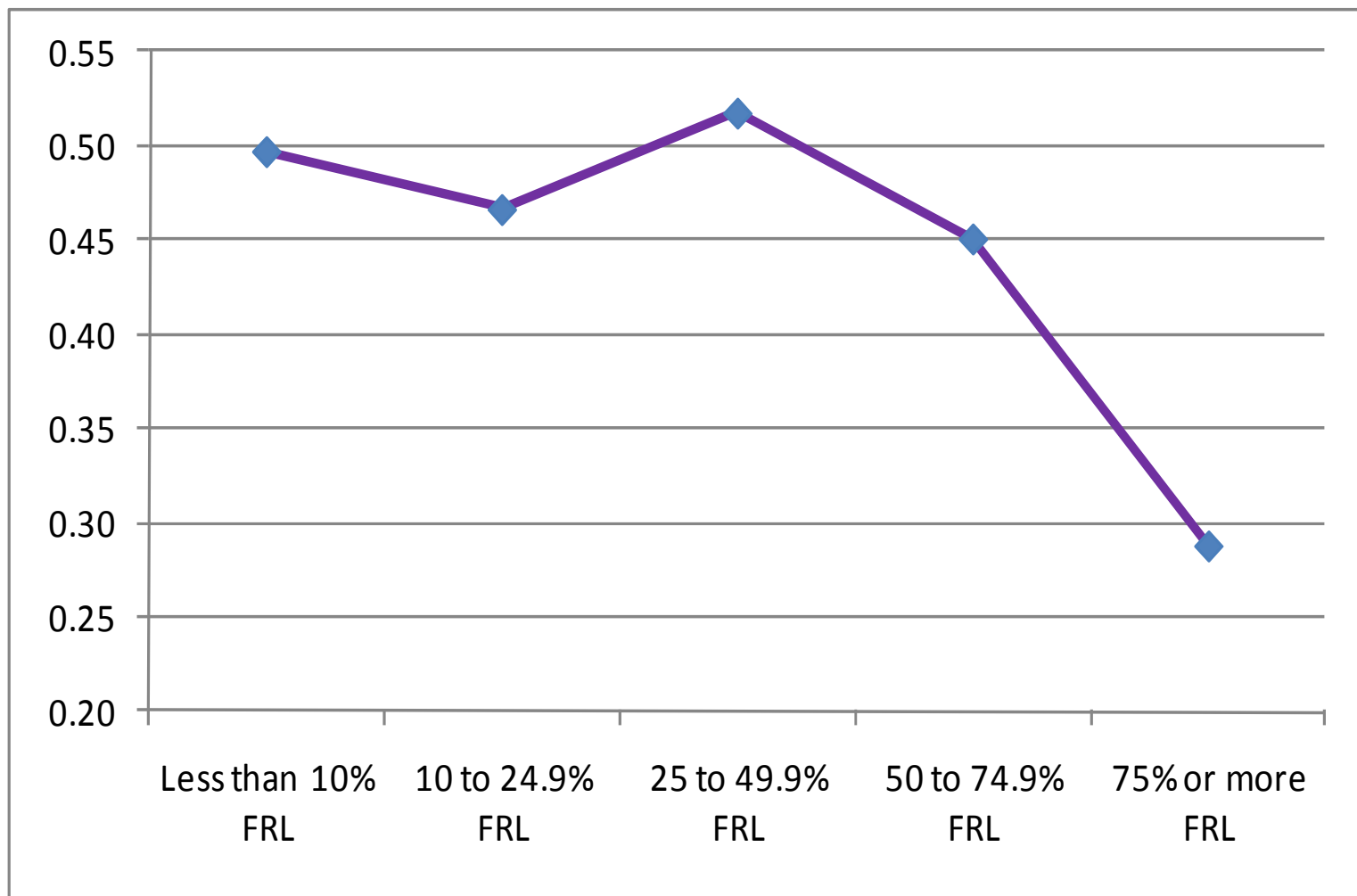
# Grade 8 Human Biology and Health: Average Percent Correct by SES



# Grade 8 Science, Technology and Society: Average Percent Correct by SES



# Grade 8 Earth in the Universe: Average Percent Correct by SES



# Instructional Content Constructs

## ❖ **Curricular Coherence**

- **Curricular Structure**

## ❖ **Curricular Focus**

- **Exposure Time (OTL)**

## ❖ **Curricular Rigor**

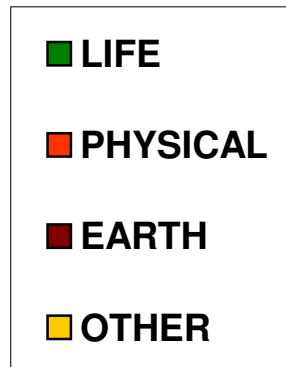
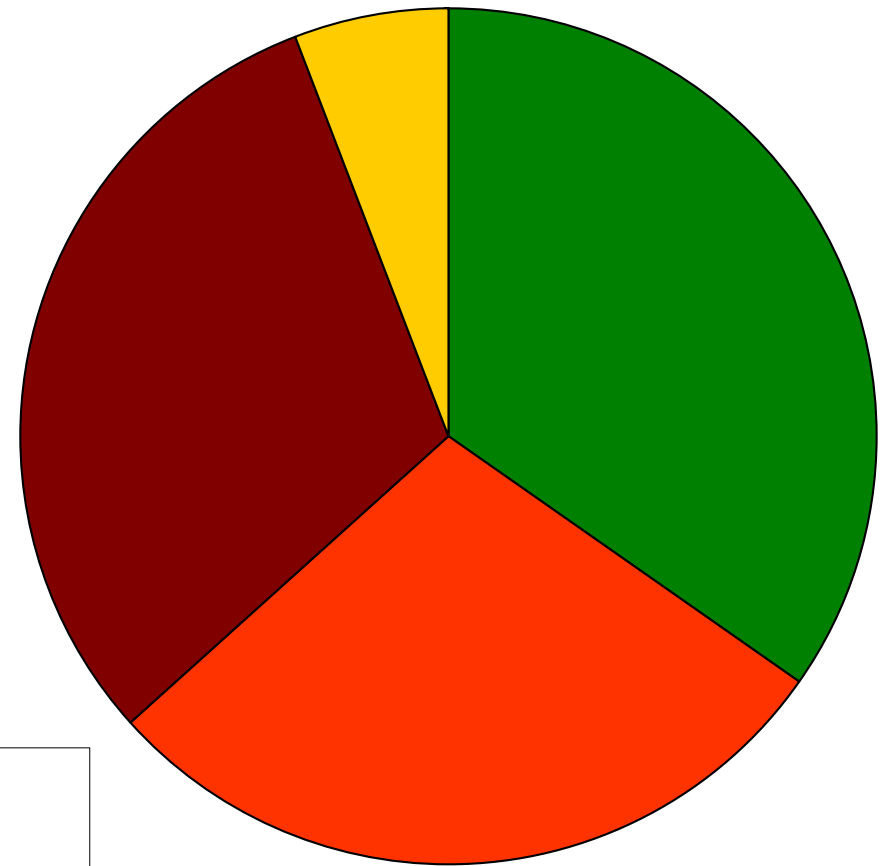
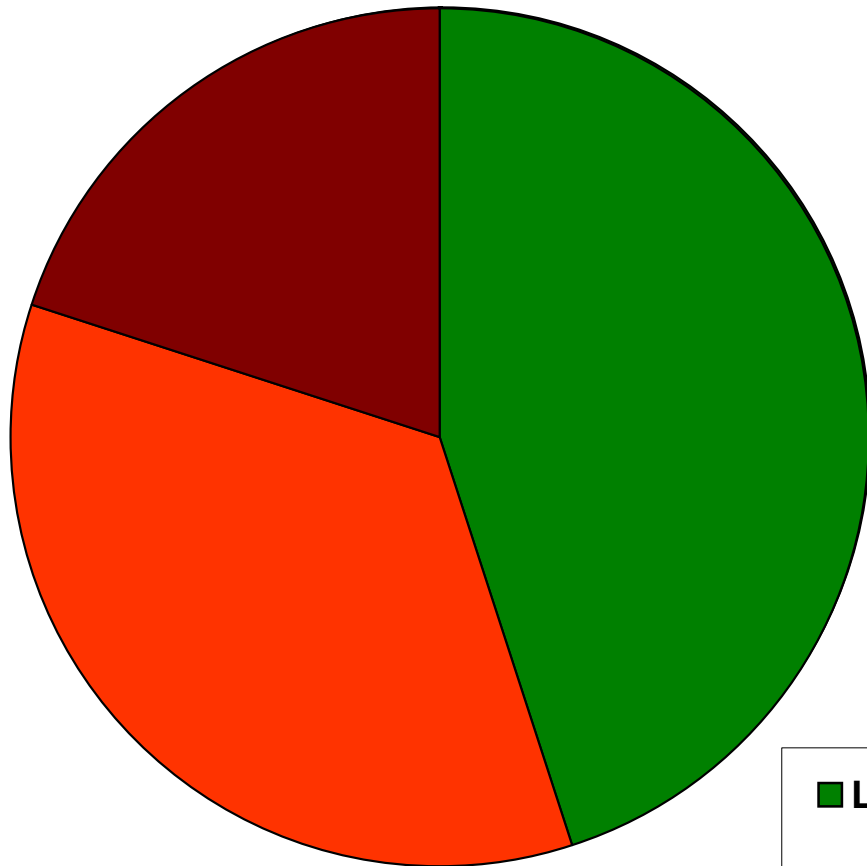
- **Level of Cognitive Complexity**



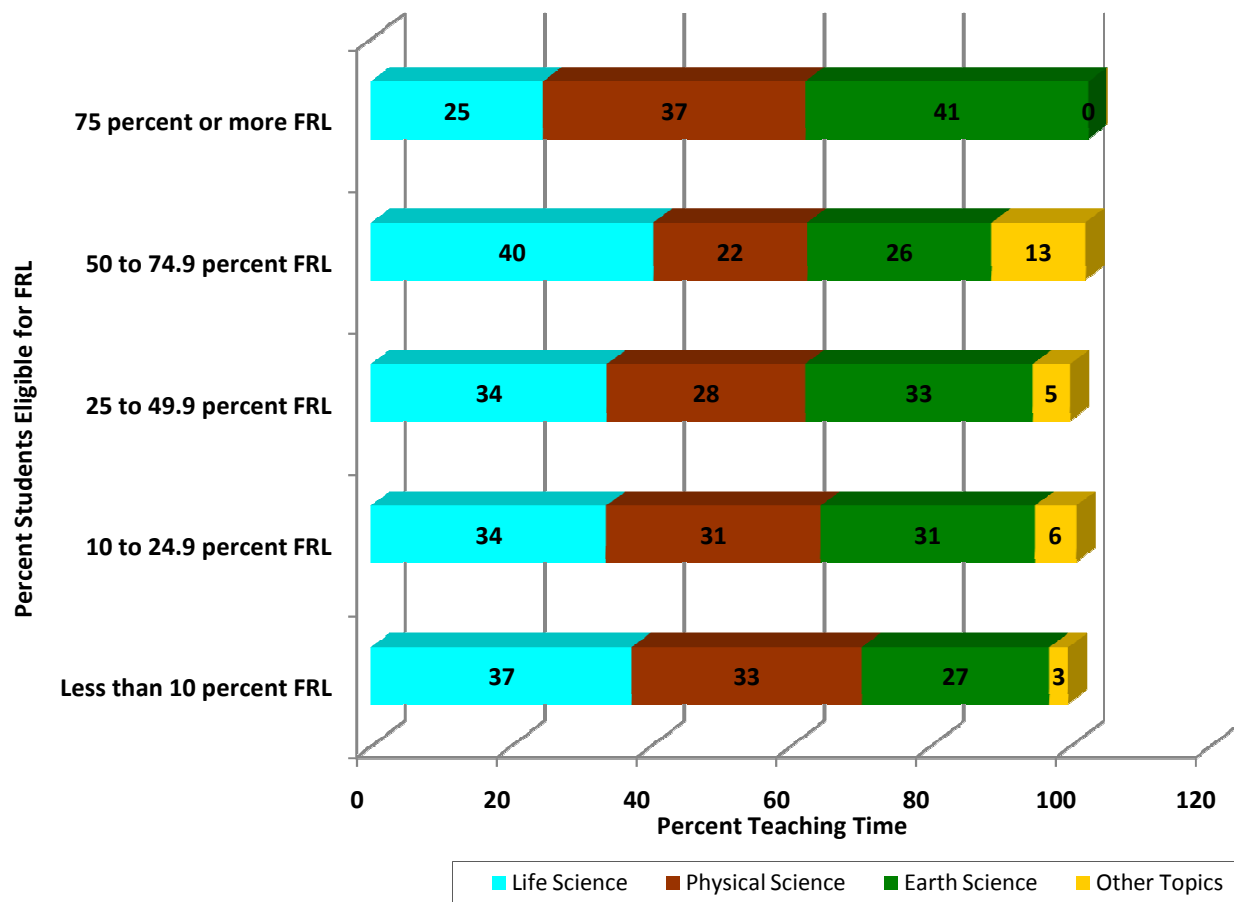
# Grade 4 Science Mean Teaching Emphasis

2007 TIMSS TEST EMPHASIS

2007

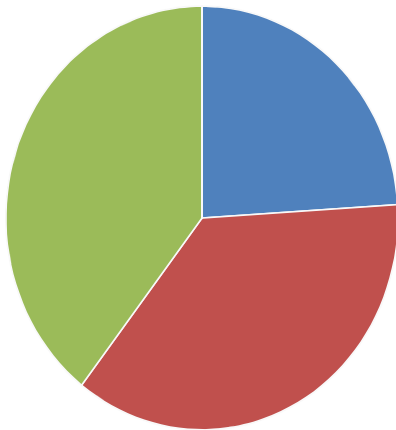


# Grade 4 Teachers' Reported Percent Teaching Time on Science Topics by School SES

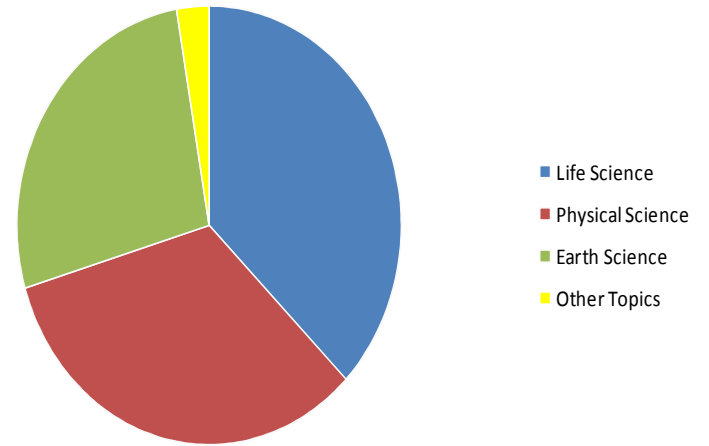


# Grade 4 Teachers' Reported Percent Teaching Time on Science Topics by School SES

Grade 4 Lowest SES Schools



Grade 4: Highest SES Schools

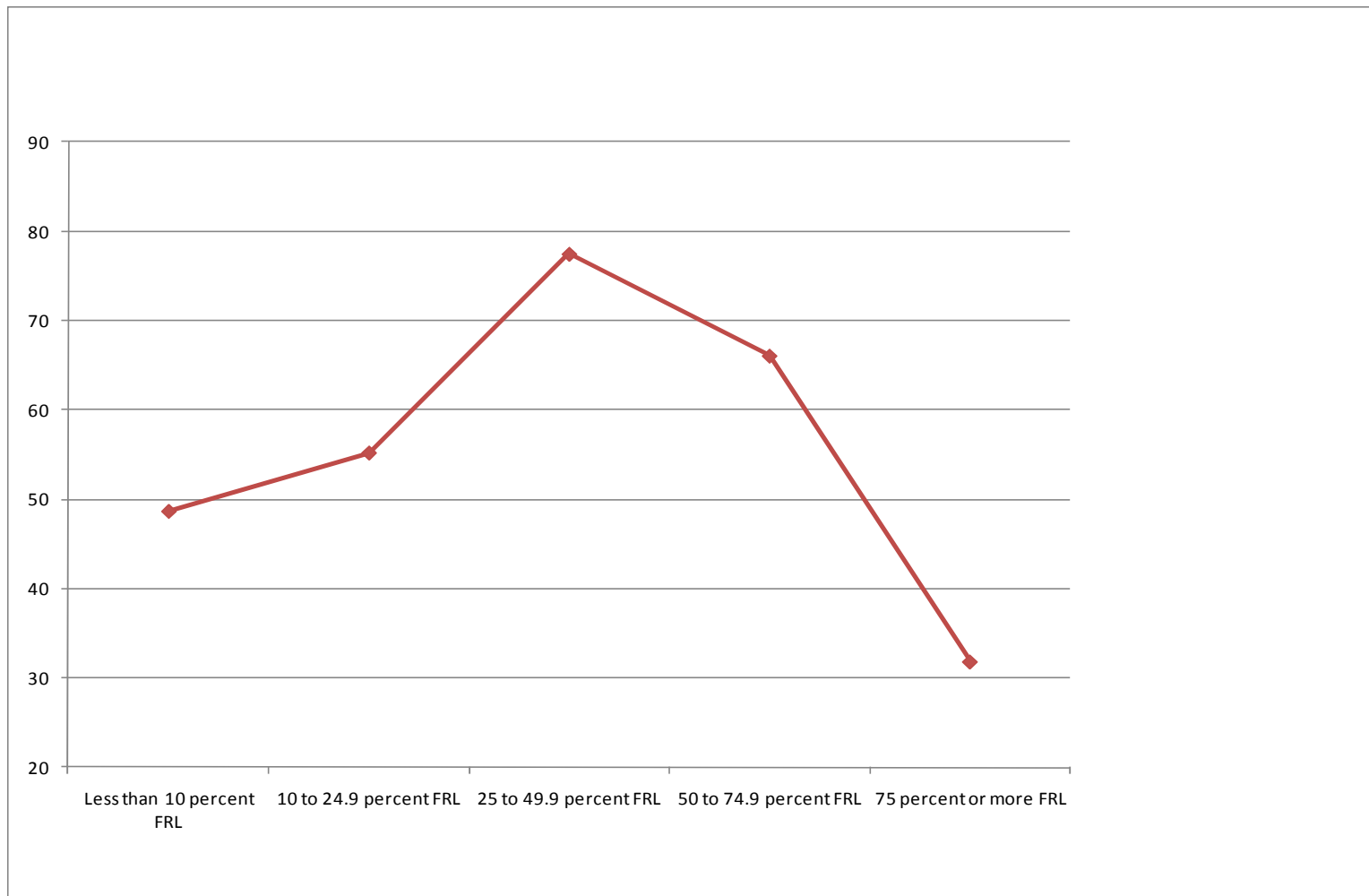




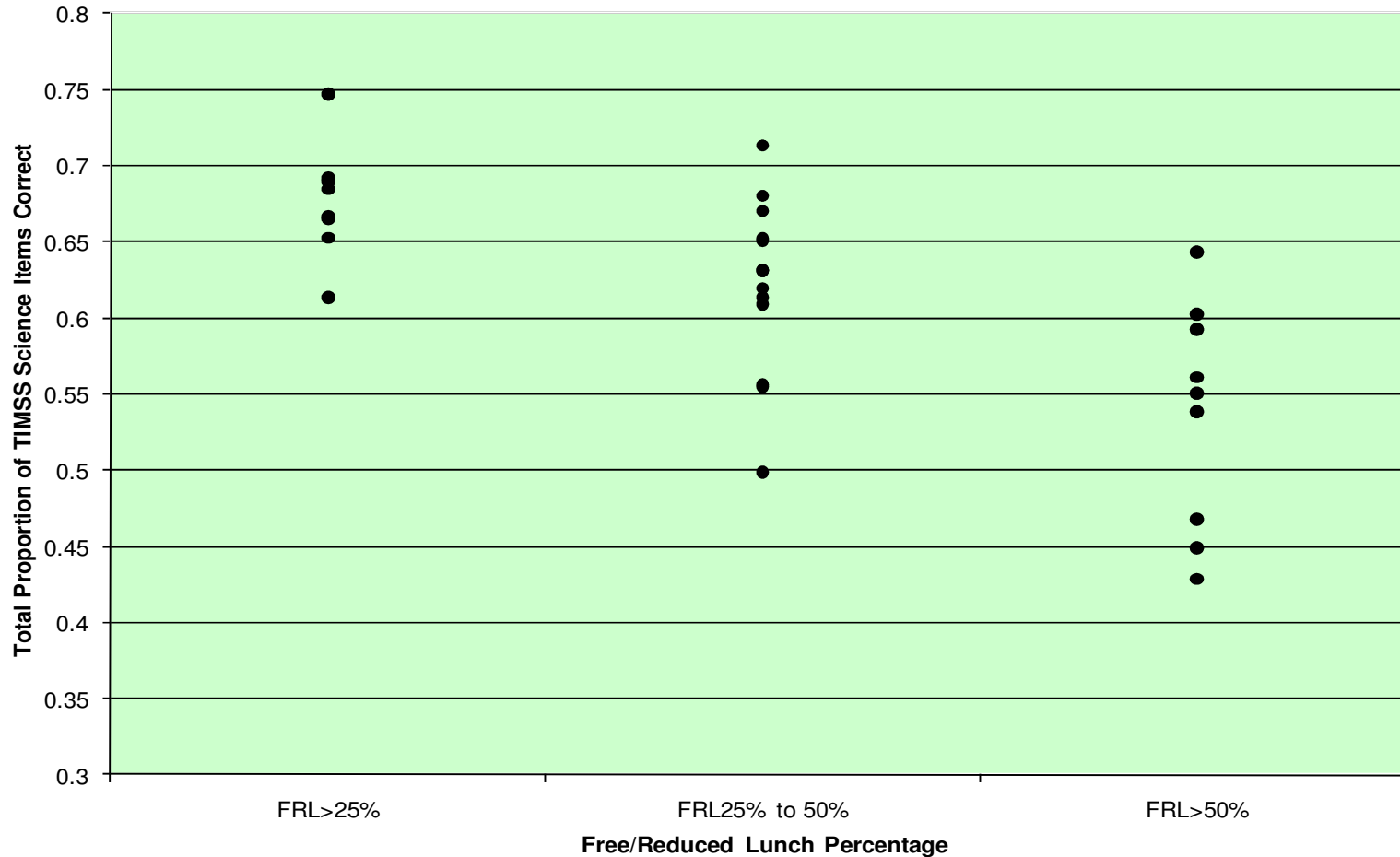
# Mean Percent of Grade 4 Science Teaching Time

<i>Topic</i>	<i>Highest SES</i>	<i>Lowest SES</i>	<i>Difference</i>
Life Science	37	25	<b>4+ Weeks</b>
Earth Science	27	41	<b>5 Weeks</b>

# Grade 4 MN Teachers' Yearly Total Science Instructional Time by SES

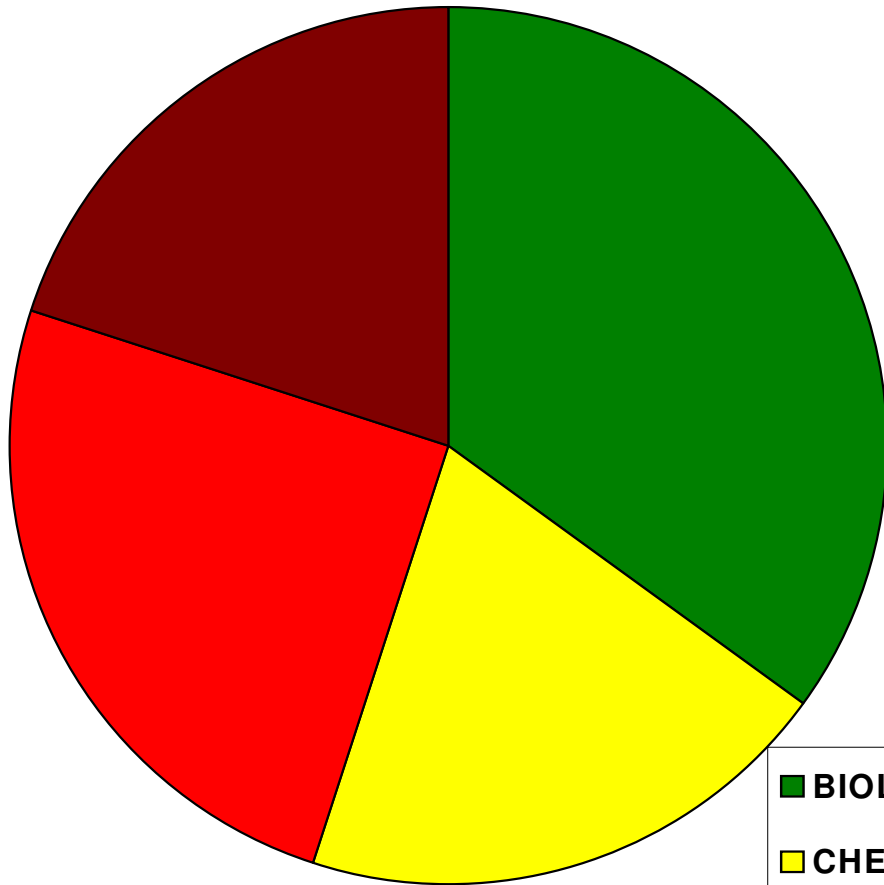


# MN Students Overall Percent Correct on TIMSS 2007 Science Fourth Grade Test by Percentage of FRL Students in School

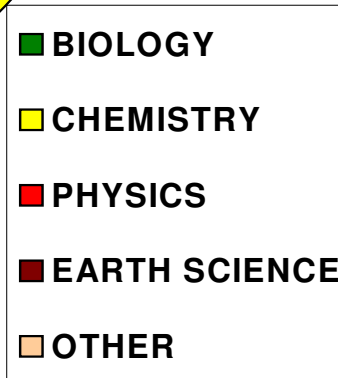
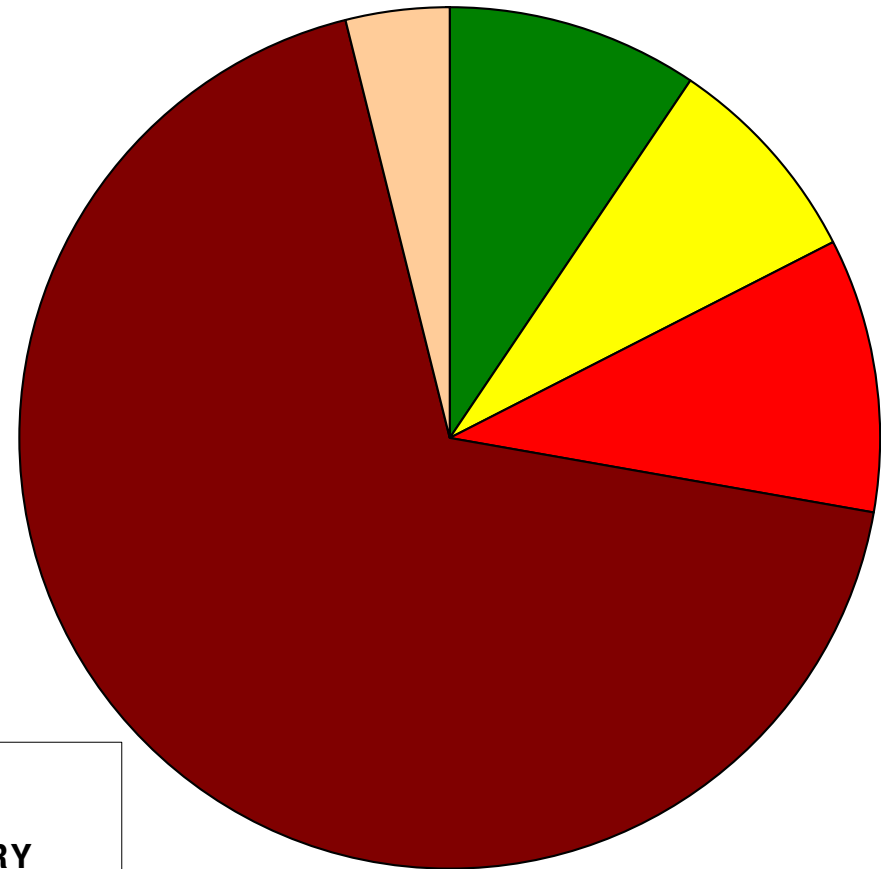


# Grade 8 Science Mean Teaching Emphasis

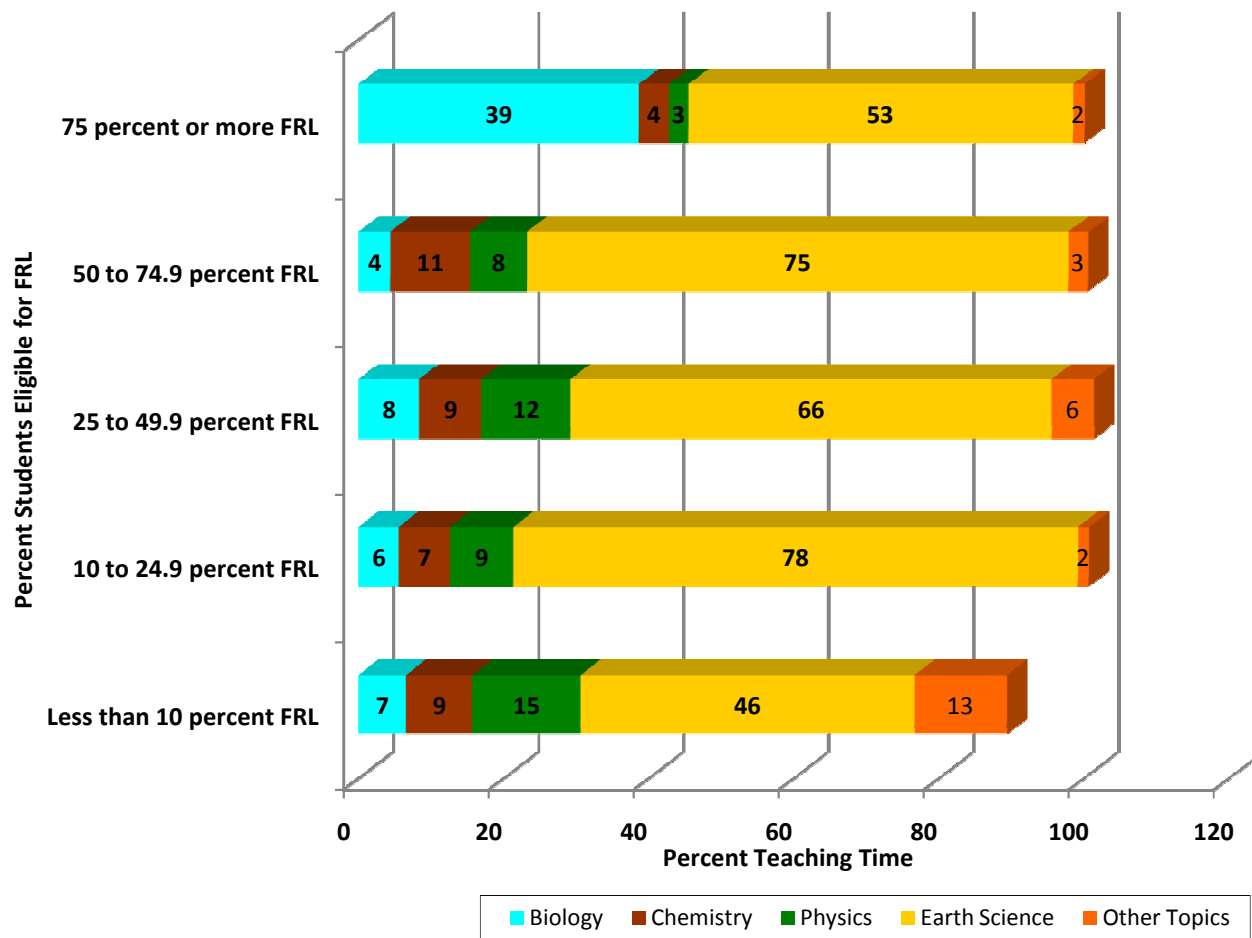
2007 TIMSS TEST EMPHASIS



2007

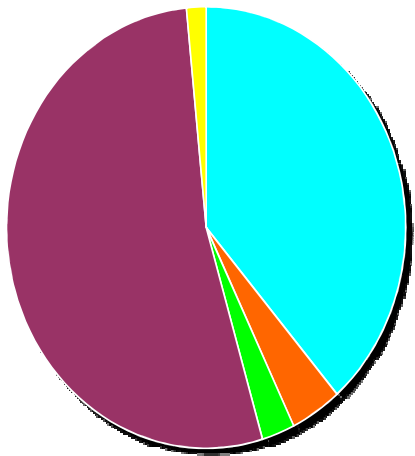


# Grade 8 Teachers' Reported Percent Teaching Time on Science Topics by School SES

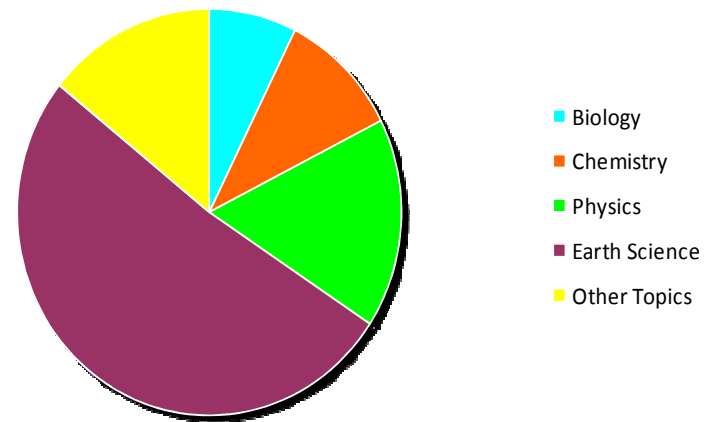


# Grade 8 Teachers' Reported Percent Teaching Time on Science Topics by School SES

Grade 8 Lowest SES Schools



Grade 8 Highest SES Schools

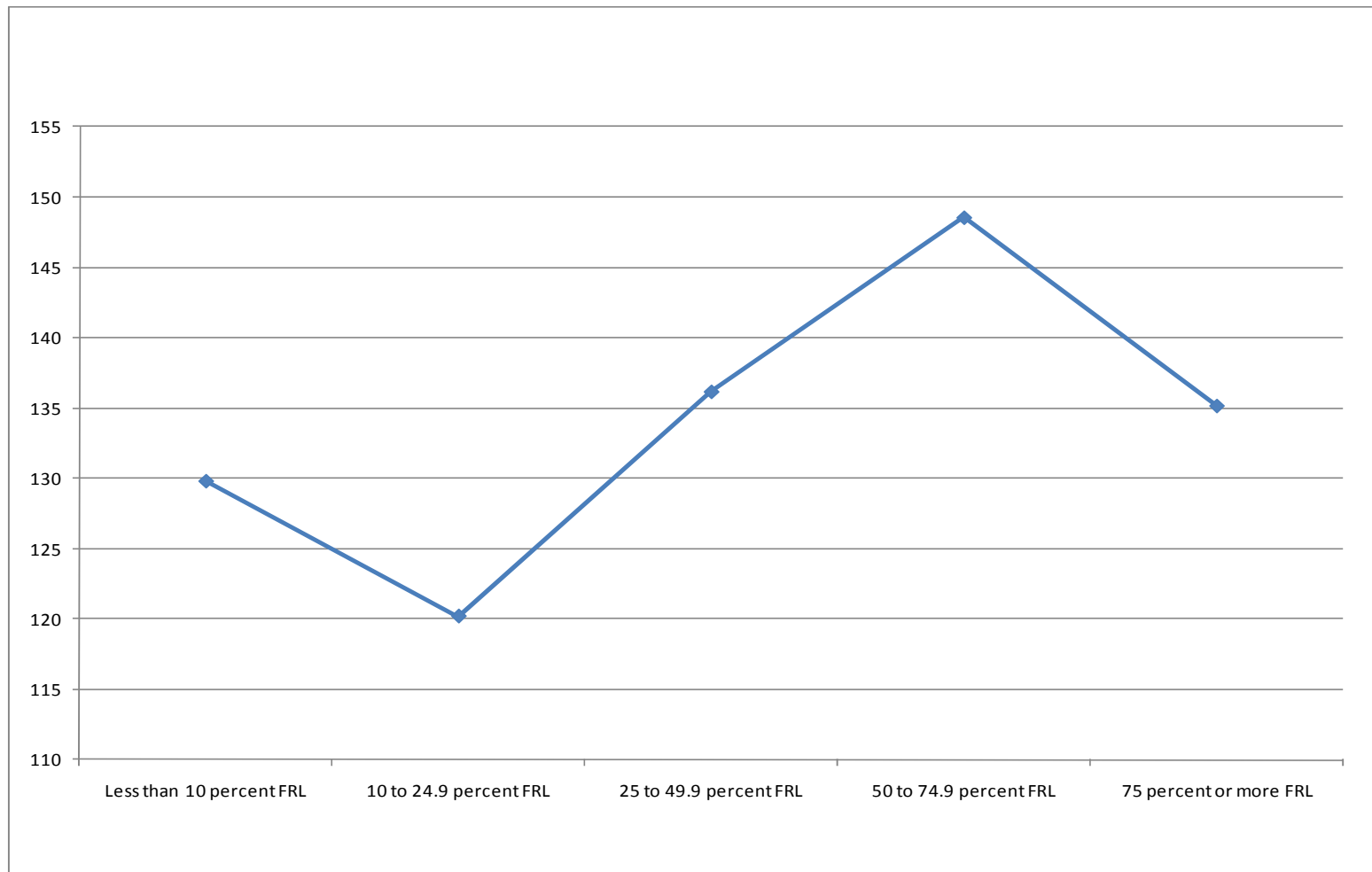


- Biology
- Chemistry
- Physics
- Earth Science
- Other Topics

# Mean Percent of Grade 8 Science Teaching Time

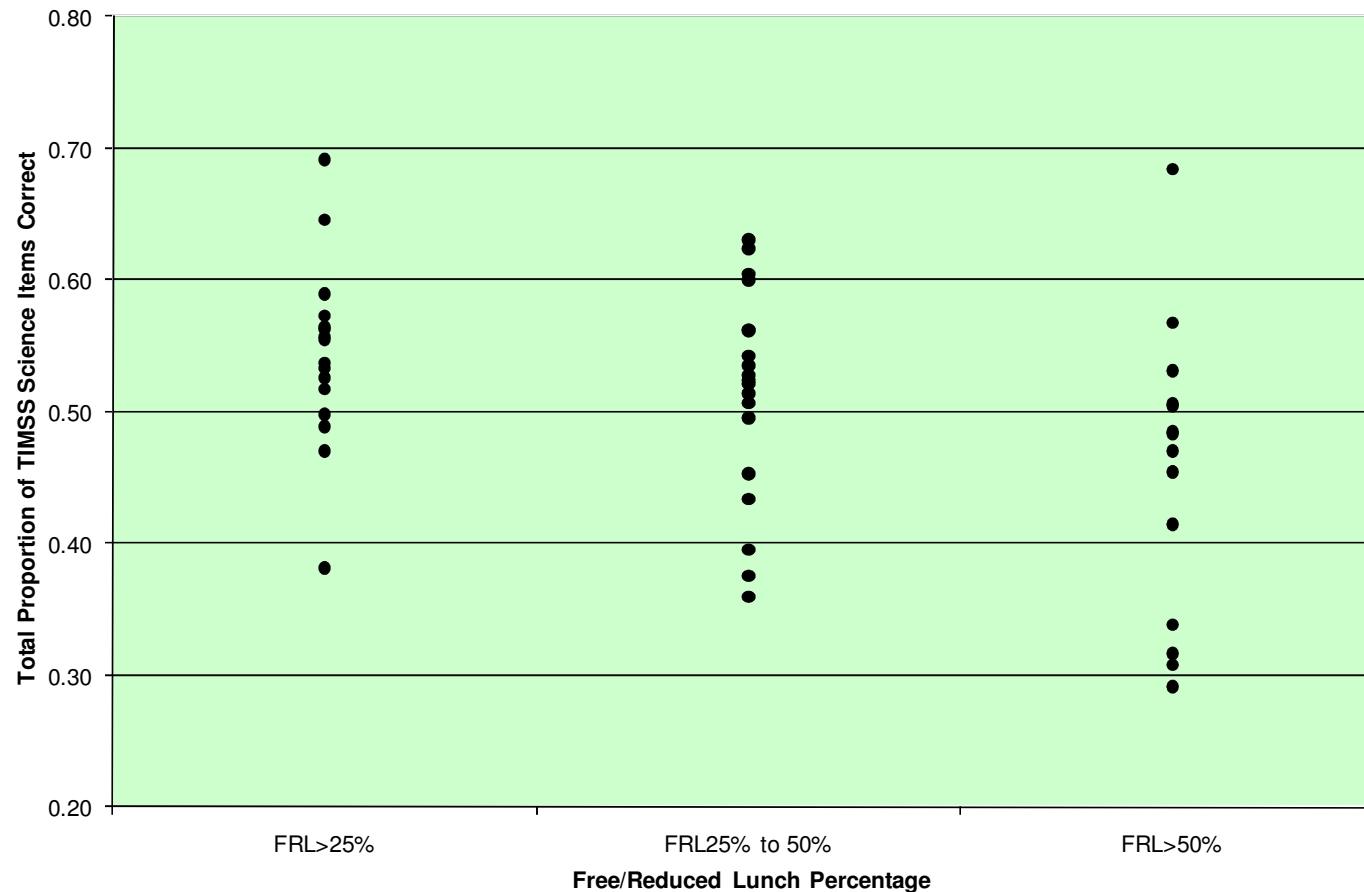
<i>Topic</i>	<i>Highest SES</i>	<i>Lowest SES</i>	<i>Difference</i>
Biology	7	39	<b>11+ Weeks</b>
Earth Science	46	53	<b>2+ Weeks</b>
Physics	15	3	<b>2+ Weeks</b>
Other Topics	13	2	<b>4 Weeks</b>

# Grade 8 MN Teachers' Yearly Total Science Instructional Time by SES

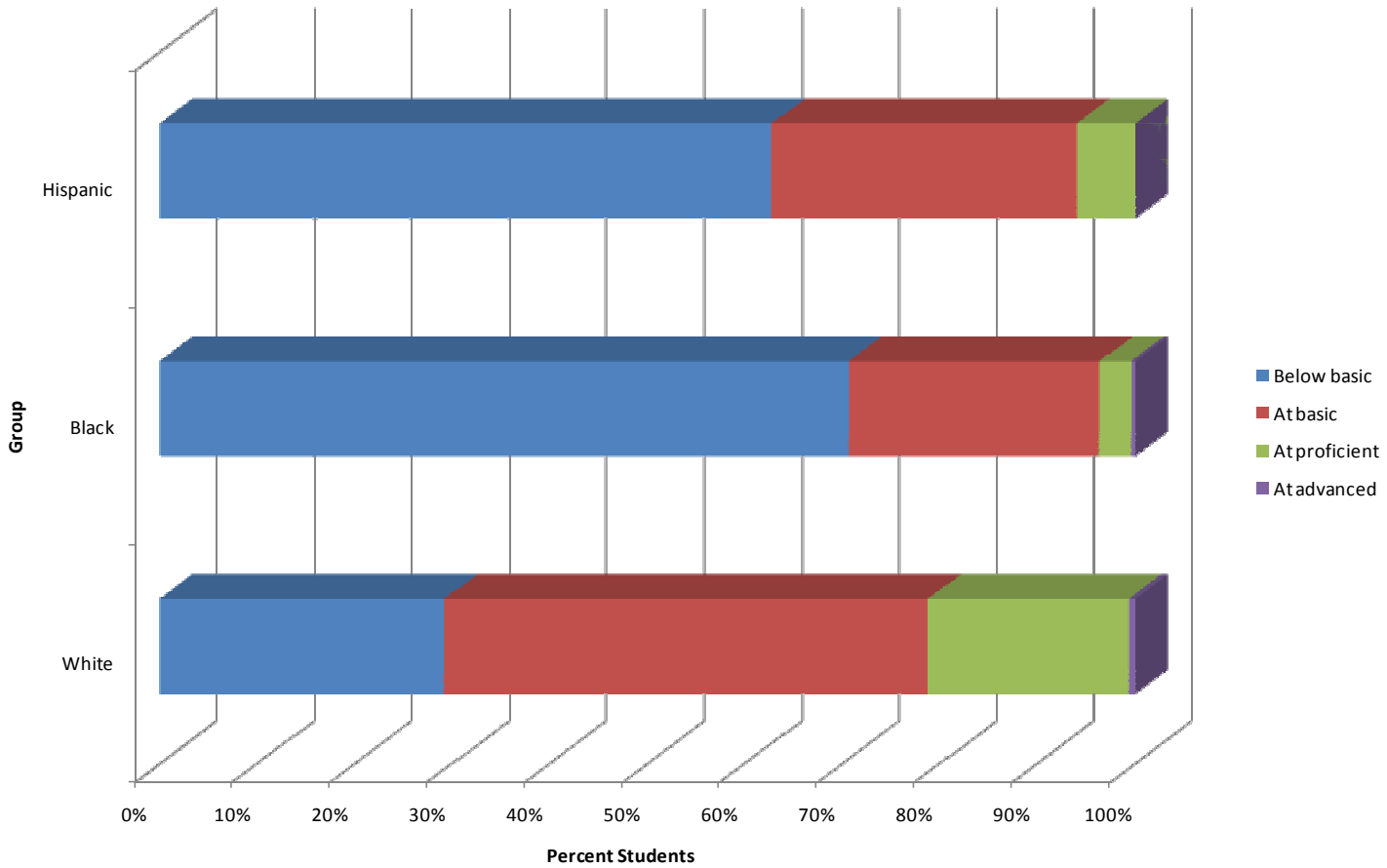




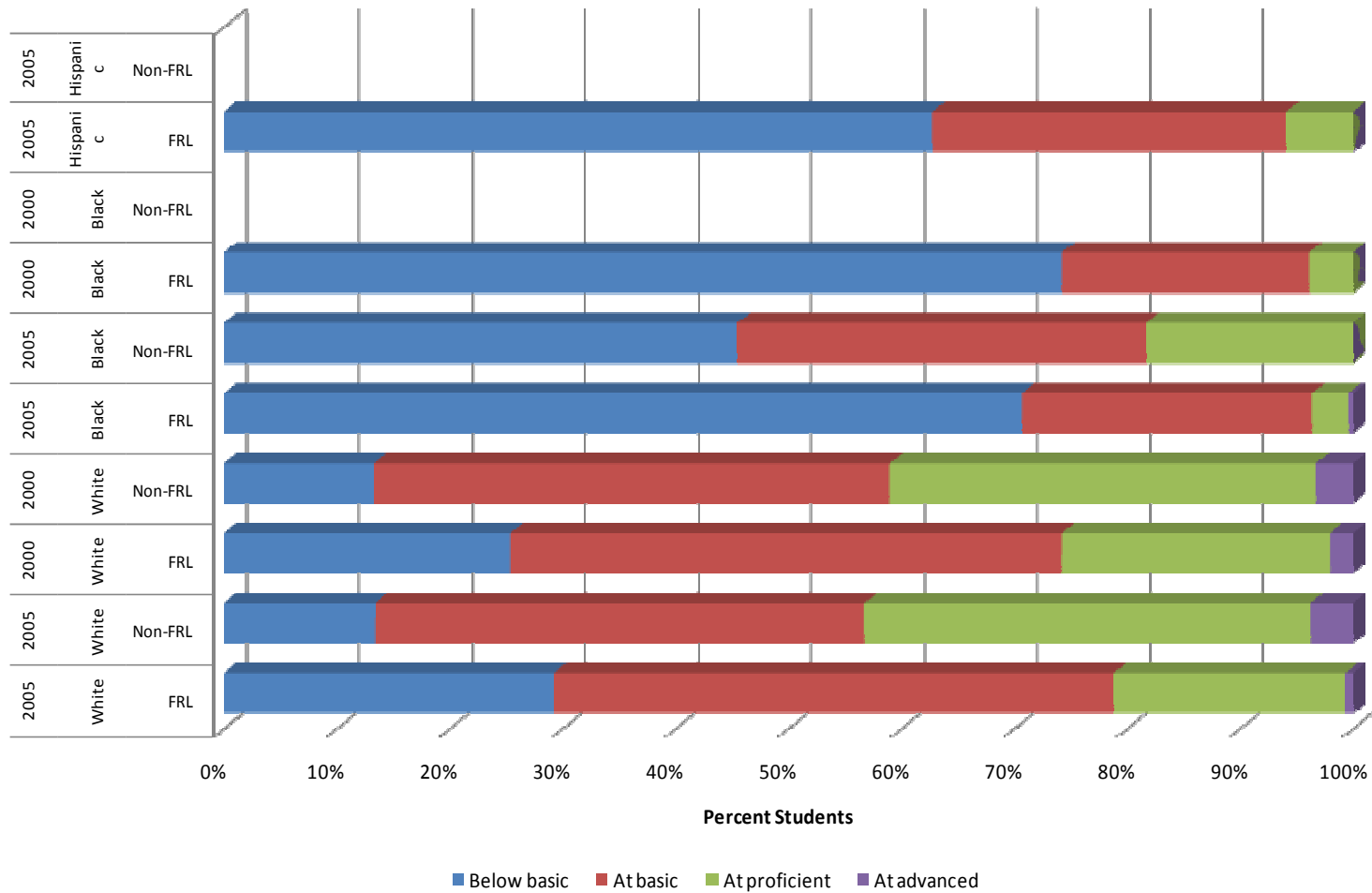
# MN Students Overall Percent Correct on TIMSS 2007 Science Eighth Grade Test by Percentage of FRL Students in School



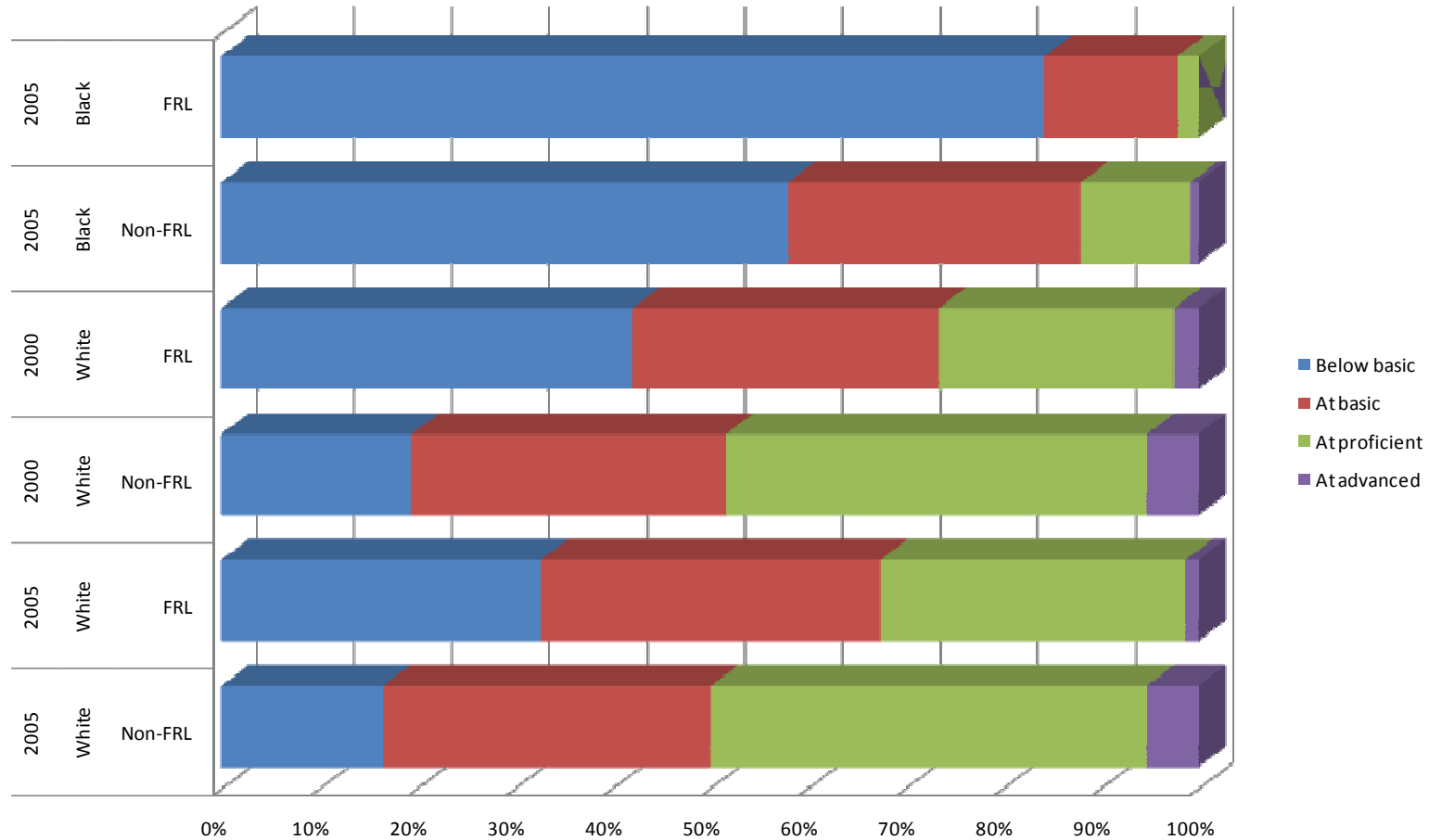
### MN Grade 4 Students Eligible for School Lunch Program: NAEP 2005 Science Proficiency Levels by Ethnicity



## MN Grade 4 Students: NAEP 2005 and 2000 Science Proficiency Levels by Ethnicity and School Lunch Eligibility



## MN Grade 8 Students: NAEP 2005 and 2000 Science Proficiency Levels by Ethnicity and School Lunch Eligibility



## MN Grade 4 Students: NAEP 2009, 2007 and 2005 Math Proficiency Levels by Ethnicity and School Lunch Eligibility

