DACSS604_Final

DACSS 604 Final Project

Code

AUTHOR
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Load Libraries

▶ Code

Load the Data

State Standards Mastery Summary

▶ Code

Year	Screening Window	Grade	Text Type	Reporting Category
<chr>	<fct>	<fct>	<fct>	<fct>
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	Informational Text	Reading
2024-2025	Fall	5	Informational Text	Reading
2024-2025	Fall	5	Informational Text	Reading
2024-2025	Fall	5	Informational Text	Reading

1-10 of 537 rows | 1-5 of 13 columns Previous **1** 2 3 4 5 6 ... 54 Next

Growth/Demographic Summary

▶ Code

...1	Grade	School_Year	Assignment Type	Test 1 PR	Test 1 Benchmark Category
<dbl>	<ord>	<ord>	<fct>	<dbl>	<ord>
1	5	2023-2024	Star Math	98	At/Above Benchmark

...1	Grade	School_Year	Assignment Type	Test 1 PR	Test 1 Benchmark Category
<dbl>	<ord>	<ord>	<fct>	<dbl>	<ord>
2	5	2023-2024	Star Math	25	On Watch
3	5	2023-2024	Star Math	88	At/Above Benchmark
4	5	2023-2024	Star Math	85	At/Above Benchmark
5	5	2023-2024	Star Math	75	At/Above Benchmark
6	5	2023-2024	Star Math	31	On Watch
7	5	2023-2024	Star Math	4	Urgent Intervention
8	5	2023-2024	Star Math	85	At/Above Benchmark
9	5	2023-2024	Star Math	49	At/Above Benchmark
10	5	2023-2024	Star Math	80	At/Above Benchmark

1-10 of 1,925 rows | 1-6 of 13 columns Previous **1** 2 3 4 5 6 ... 193 Next

Historical Summary Data Frames

▶ Code

Year	Screening Window	Subject	Benchmark_Status	% Students
<fct>	<fct>	<chr>	<ord>	<dbl>
2023-2024	Spring	ELA	At/Above Benchmark	67
2023-2024	Spring	ELA	Below Benchmark	33
2023-2024	Spring	Math	At/Above Benchmark	71
2023-2024	Spring	Math	Below Benchmark	29
2024-2025	Fall	ELA	At/Above Benchmark	78
2024-2025	Fall	ELA	Below Benchmark	22
2024-2025	Fall	Math	At/Above Benchmark	77
2024-2025	Fall	Math	Below Benchmark	23
2024-2025	Winter	ELA	At/Above Benchmark	82
2024-2025	Winter	ELA	Below Benchmark	18

1-10 of 12 rows Previous **1** 2 Next

▶ Code

Year	Screening Window	Grade	Subject	Median SGP
<fct>	<fct>	<ord>	<fct>	<dbl>
2023-2024	Fall-Winter	5	ELA	63
2023-2024	Fall-Winter	5	Math	35
2023-2024	Fall-Winter	6	ELA	60
2023-2024	Fall-Winter	6	Math	50
2023-2024	Fall-Winter	7	ELA	54
2023-2024	Fall-Winter	7	Math	63
2023-2024	Fall-Winter	8	ELA	48

Year	Screening Window	Grade	Subject	Median SGP
<fct>	<fct>	<ord>	<fct>	<dbl>
2023-2024	Fall-Winter	8	Math	52
2023-2024	Fall-Winter	9	ELA	58
2023-2024	Fall-Winter	9	Math	64

1-10 of 24 rows Previous **1** 2 3 Next

RQ1:

Are Rising Tide students making progress toward our achievement accountability goal: “80% of Rising Students will test as at or above Benchmark in Reading on the Renaissance Star Reading and Star Mathematics screening assessments.?

Historical Benchmark_Status

▶ Code

Statistical Test

Acheivement: Math

▶ Code

...1	Grade	School_Year	Assignment Type	Test 1 PR	Test 1 Benchmark Category
<dbl>	<ord>	<ord>	<fct>	<dbl>	<ord>
1	5	2023-2024	Star Math	98	At/Above Benchmark
2	5	2023-2024	Star Math	25	On Watch
3	5	2023-2024	Star Math	88	At/Above Benchmark
4	5	2023-2024	Star Math	85	At/Above Benchmark
5	5	2023-2024	Star Math	75	At/Above Benchmark
6	5	2023-2024	Star Math	31	On Watch
7	5	2023-2024	Star Math	4	Urgent Intervention
8	5	2023-2024	Star Math	85	At/Above Benchmark
9	5	2023-2024	Star Math	49	At/Above Benchmark
10	5	2023-2024	Star Math	80	At/Above Benchmark

1-10 of 961 rows | 1-6 of 14 columns Previous **1** 2 3 4 5 6 … 97 Next

▶ Code

```
Call:
lm(formula = `Test 1 PR` ~ School_Year_Fac + IEP_Status + `504_Status` +
    Low_Income_Status, data = star_dem_math)
```

```
Residuals:
    Min      1Q  Median      3Q     Max 
-59.329 -17.173   1.028  17.497  67.574 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)                64.173      1.245  51.531  < 2e-16 ***
School_Year_Fac2024-2025    4.157      1.472   2.824  0.00484 ** 
IEP_Status1               -32.747      1.730 -18.928  < 2e-16 ***
`504_Status`1              -1.826      2.296  -0.796  0.42649    
Low_Income_Status1         -6.454      1.645  -3.923 9.37e-05 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 22.78 on 956 degrees of freedom
Multiple R-squared:  0.2929,    Adjusted R-squared:  0.2899 
F-statistic:    99 on 4 and 956 DF,  p-value: < 2.2e-16
```

▶ Code

```
[1] 8742.117
```

▶ Code

```
[1] 8771.324
```

▶ Code

Acheivement: ELA

▶ Code

```

Call:
lm(formula = `Test 1 PR` ~ School_Year_Fac + IEP_Status, data = star_dem_ELA)

Residuals:
    Min      1Q  Median      3Q     Max 
-58.281 -19.490   0.346  19.346  61.510 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)                58.654      1.189   49.35  < 2e-16 ***
School_Year_Fac2024-2025    4.627      1.553    2.98  0.00296 ** 
IEP_Status1               -26.164      1.783  -14.67  < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 24.1 on 961 degrees of freedom
Multiple R-squared:  0.1884,    Adjusted R-squared:  0.1868 
F-statistic: 111.6 on 2 and 961 DF,  p-value: < 2.2e-16
```

▶ Code

```
[1] 8876.38
```

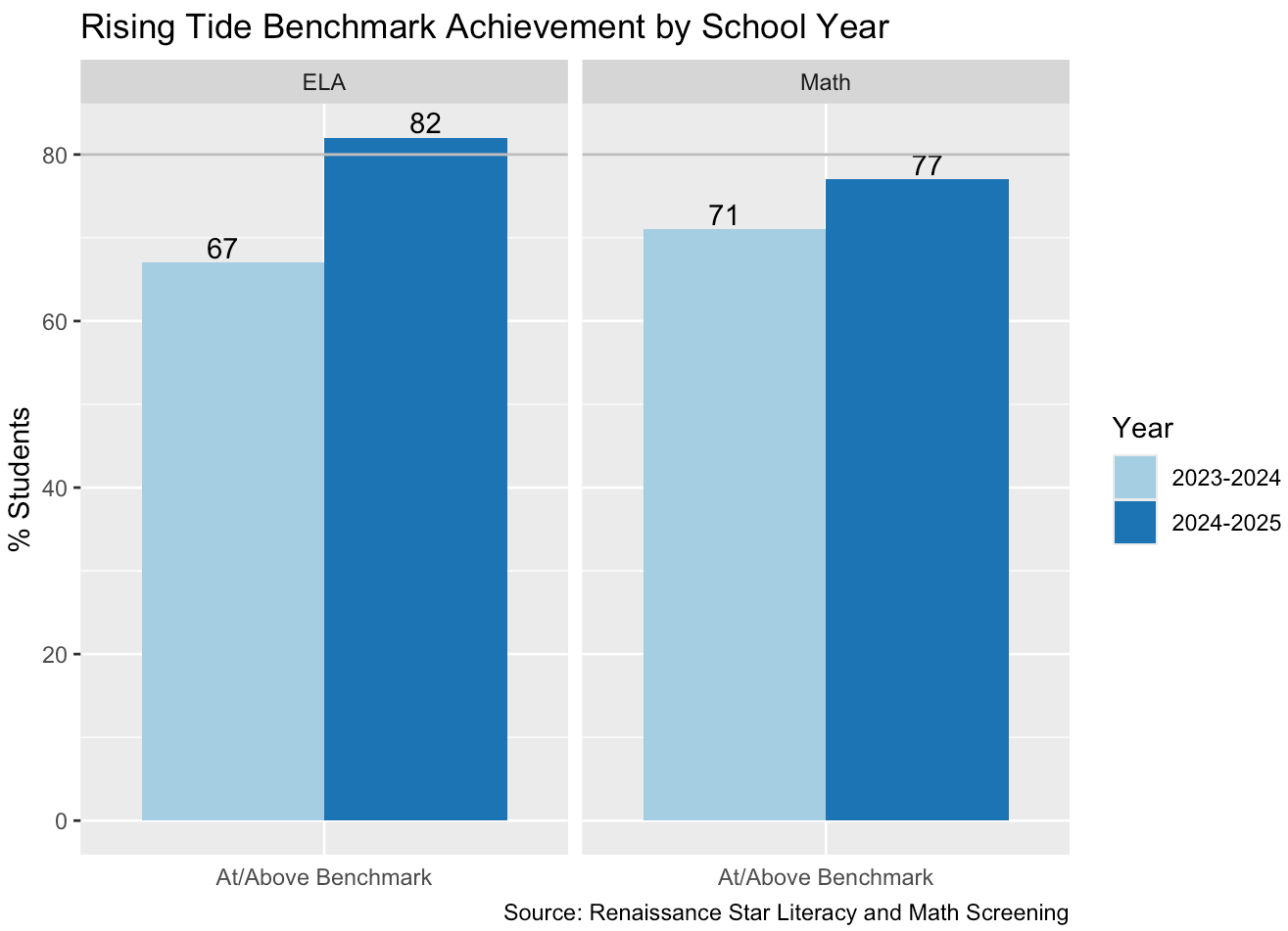
▶ Code

```
[1] 8895.864
```

Visual: RQ1

▶ Code

▶ Code



Subject Level Fall Winter Growth Comparison

ELA Growth

▶ Code

▶ Code

ELA Historical Growth

▶ Code

▶ Code

Math Growth

▶ Code

▶ Code

▶ Code

▶ Code

RQ2 Grade 5 Math

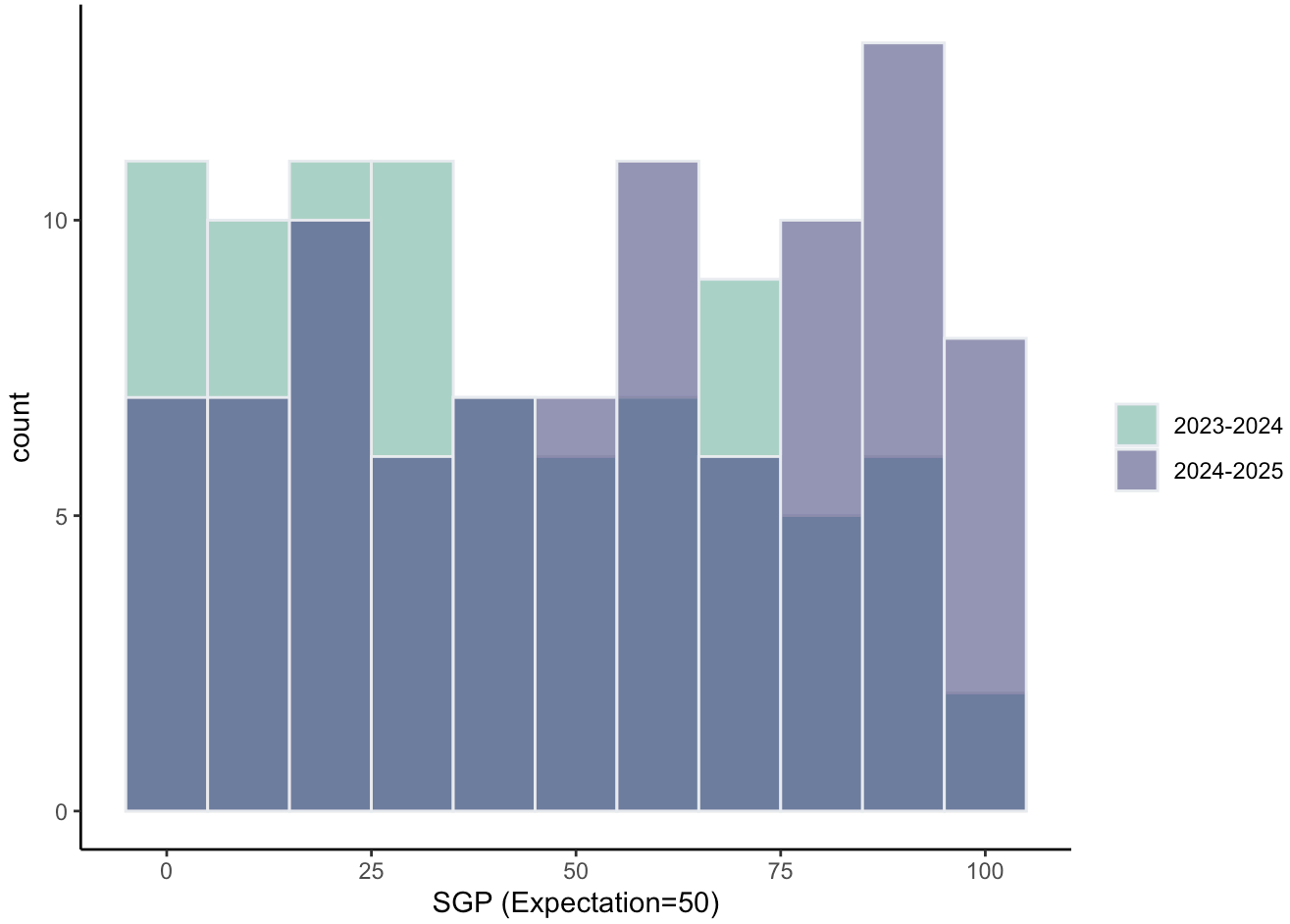
Is there a relationship between Rising Tide's Grade 5 Mathematics curriculum initiatives and Grade 5 student growth in mathematics?

Summary Data Frames

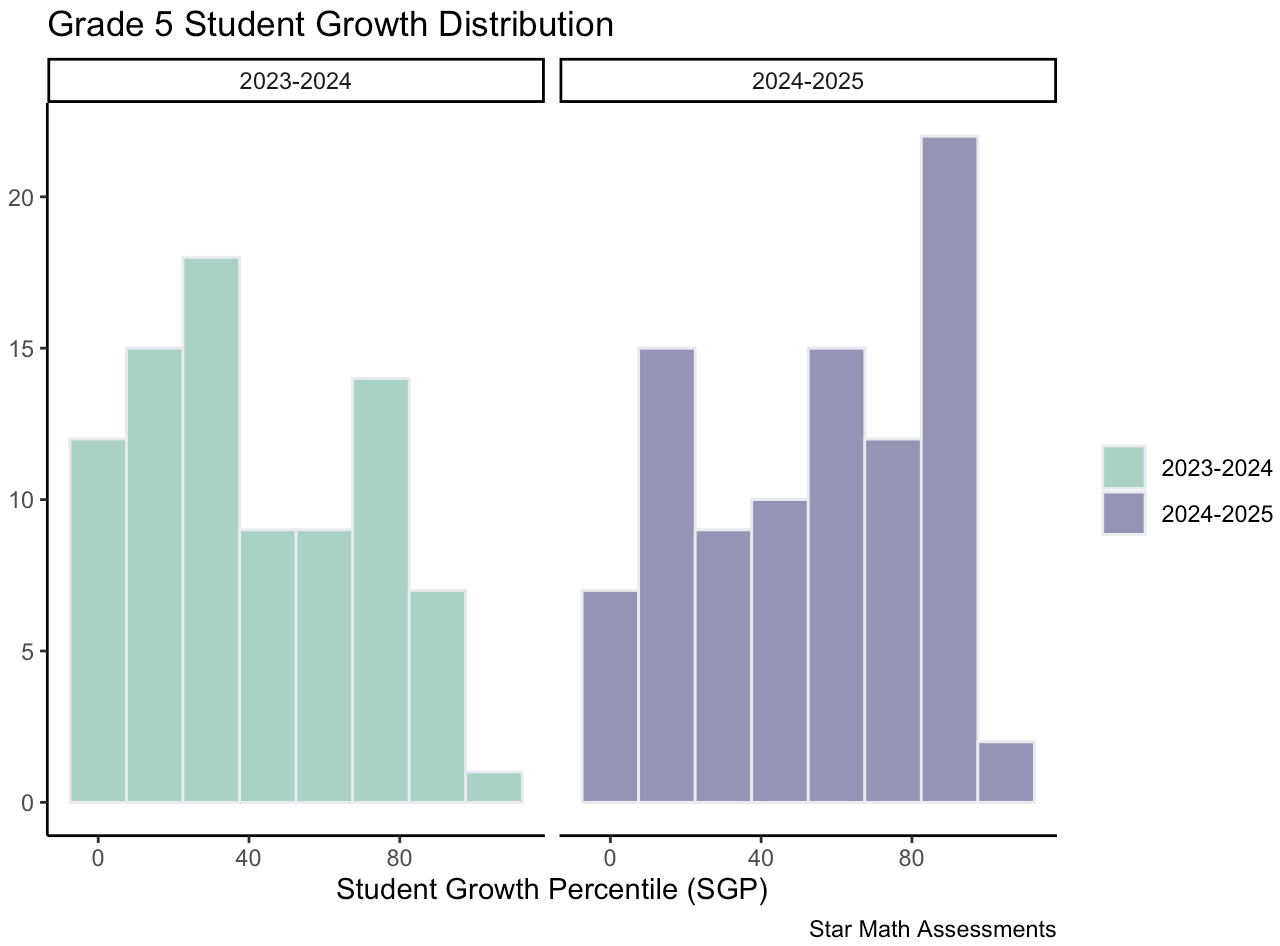
▶ Code

Visual: Growth Distribution

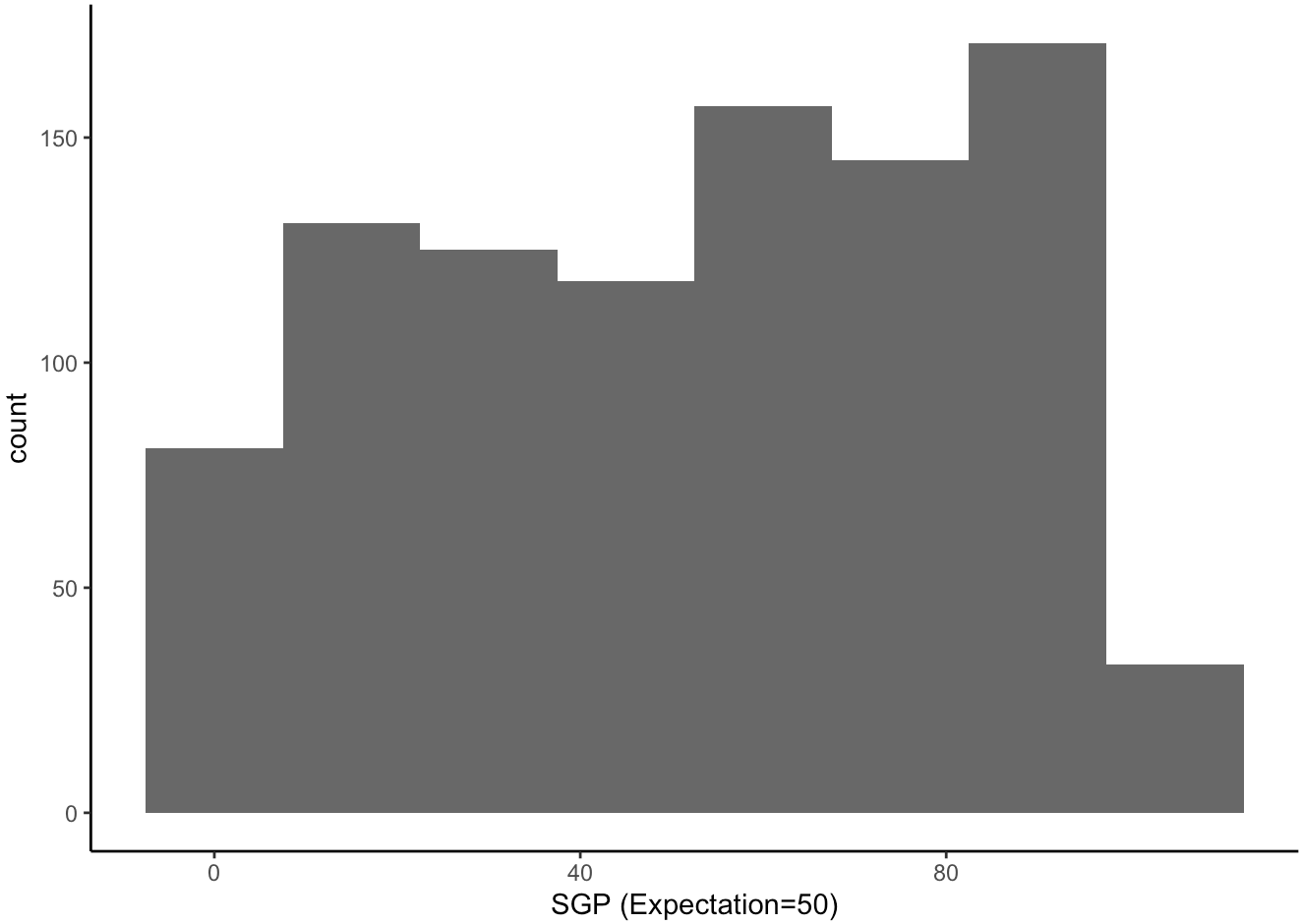
▶ Code


count
10
5
0
0
25
50
75
100
SGP (Expectation=50)
2023-2024
2024-2025

▶ Code


Grade 5 Student Growth Distribution
2023-2024
2024-2025
20
15
10
5
0
0
40
80
0
40
80
Student Growth Percentile (SGP)
Star Math Assessments
2023-2024
2024-2025

▶ Code



Statistical Tests

▶ Code

```
Call:
lm(formula = `SGP (Expectation=50)` ~ School_Year_Factor + IEP_Status +
    Low_Income_Status + `504_Status` + `Test 1 PR`, data = G5MathHistGrowth)

Residuals:
   Min     1Q Median     3Q    Max
-56.13 -25.43  -0.01  27.66  53.29

Coefficients:
                           Estimate Std. Error t value Pr(>|t|)
(Intercept)                 51.06482    7.30772   6.988 5.97e-11 ***
School_Year_Factor2024-2025 13.82626    4.57343   3.023  0.00289 **
IEP_Status1                -17.00046    6.14880  -2.765  0.00632 **
Low_Income_Status1          -3.28838    4.97102  -0.662  0.50918
`504_Status`1               -0.77230    6.88859  -0.112  0.91086
`Test 1 PR`                 -0.08415    0.09742  -0.864  0.38889
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 29.99 on 171 degrees of freedom
Multiple R-squared:  0.09237,   Adjusted R-squared:  0.06583
F-statistic:  3.48 on 5 and 171 DF,  p-value: 0.005071
```

▶ Code

```
[1] 1714.086
```

▶ Code

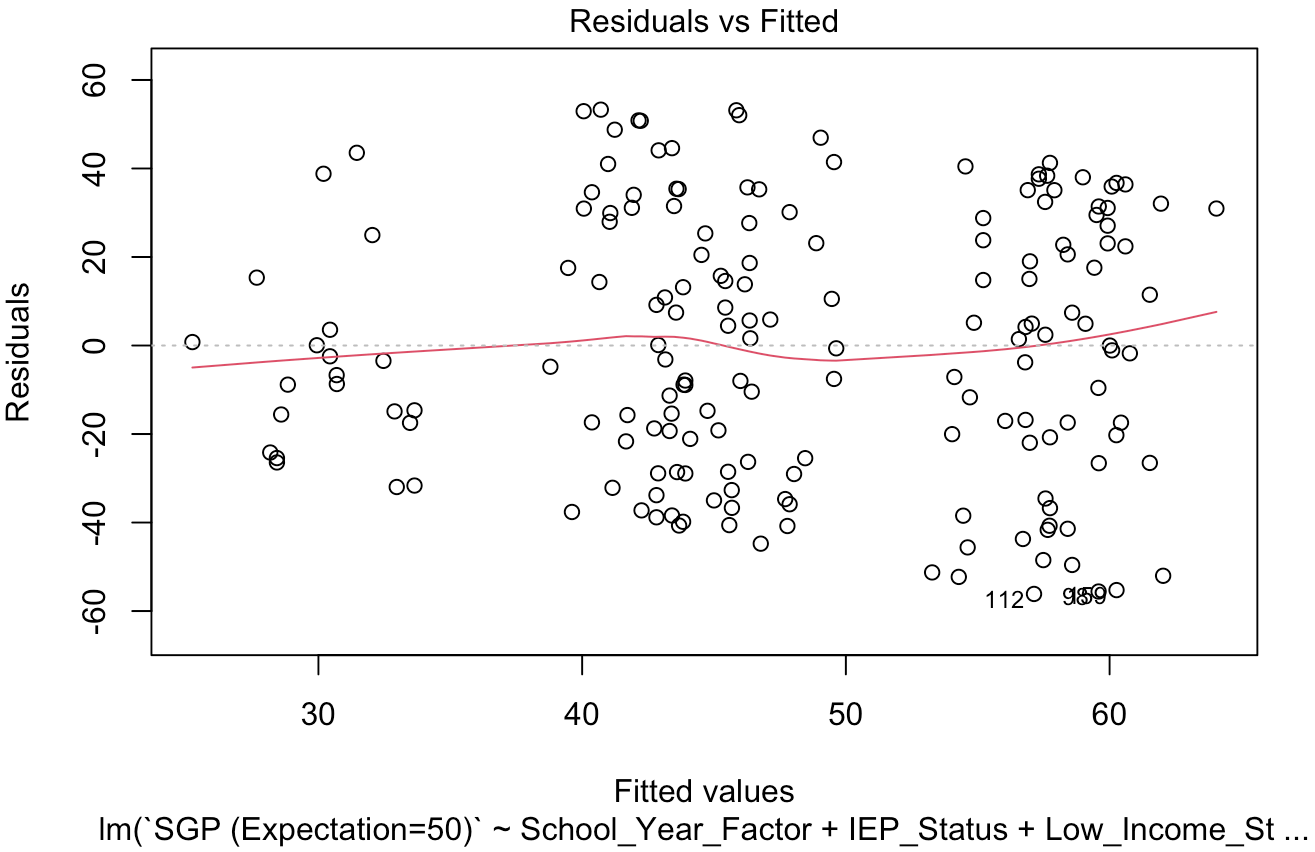
```
[1] 1736.319
```

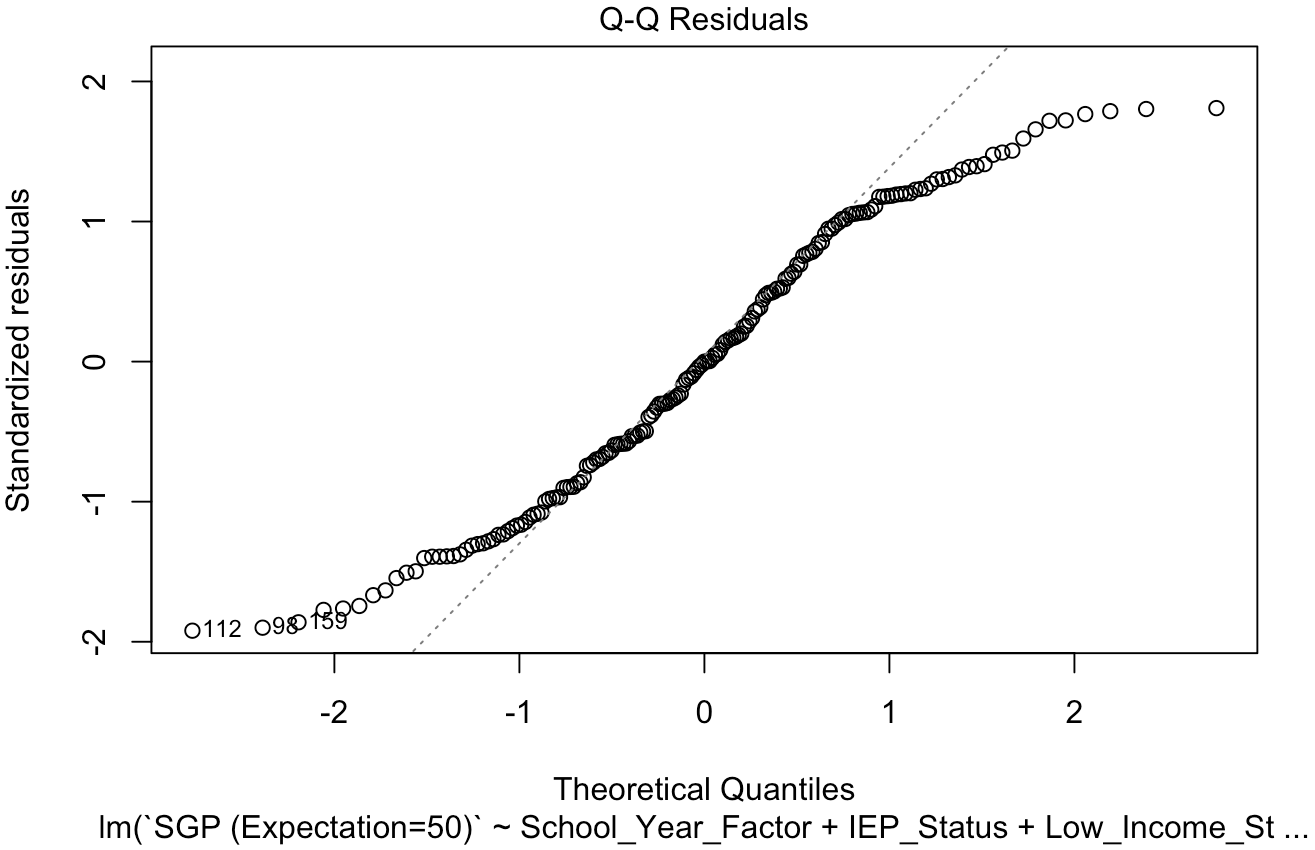
▶ Code

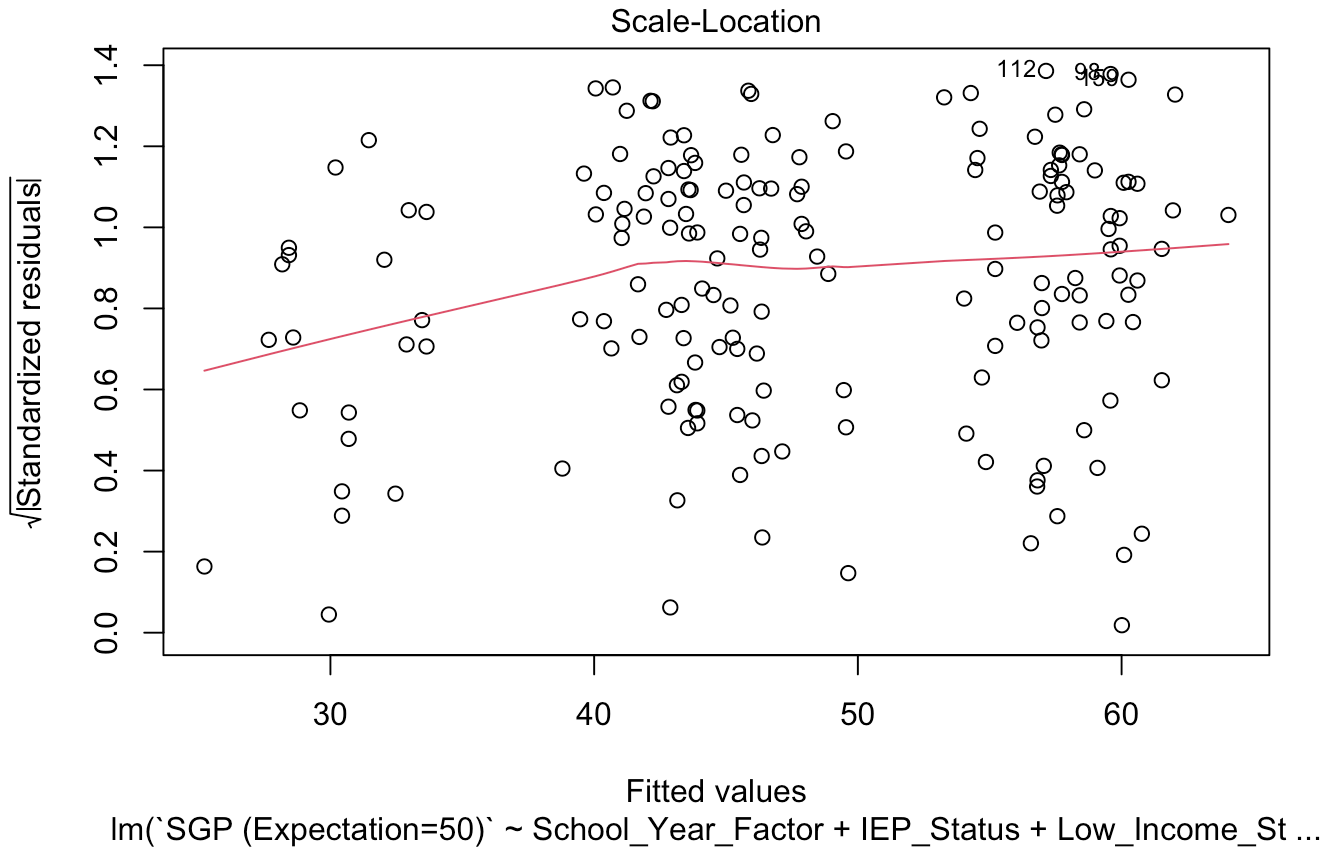
```
=====================================================
                              Dependent variable:
                          ---------------------------
                            `SGP (Expectation=50)`
-----------------------------------------------------
School_Year_Factor2024-2025          13.826***
                                      (4.573)

IEP_Status1                         -17.000***
                                      (6.149)

Low_Income_Status1                    -3.288
                                      (4.971)

`504_Status`1                         -0.772
                                      (6.889)

`Test 1 PR`                           -0.084
                                      (0.097)

Constant                             51.065***
                                      (7.308)

-----------------------------------------------------
Observations                            177
R2                                     0.092
Adjusted R2                            0.066
Residual Std. Error              29.988 (df = 171)
F Statistic                  3.480*** (df = 5; 171)
=====================================================
Note:                      *p<0.1; **p<0.05; ***p<0.01
```

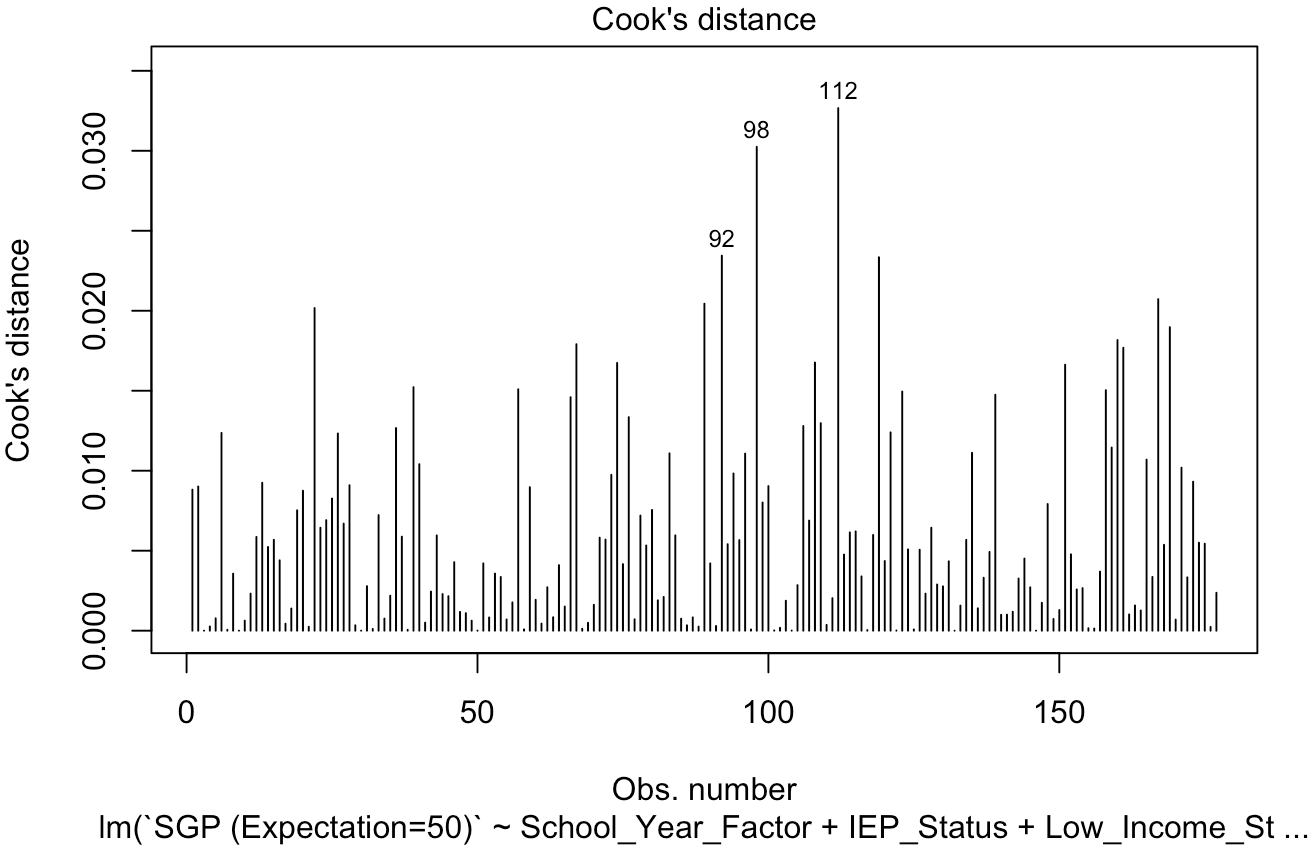
Diagnosing Model Fit

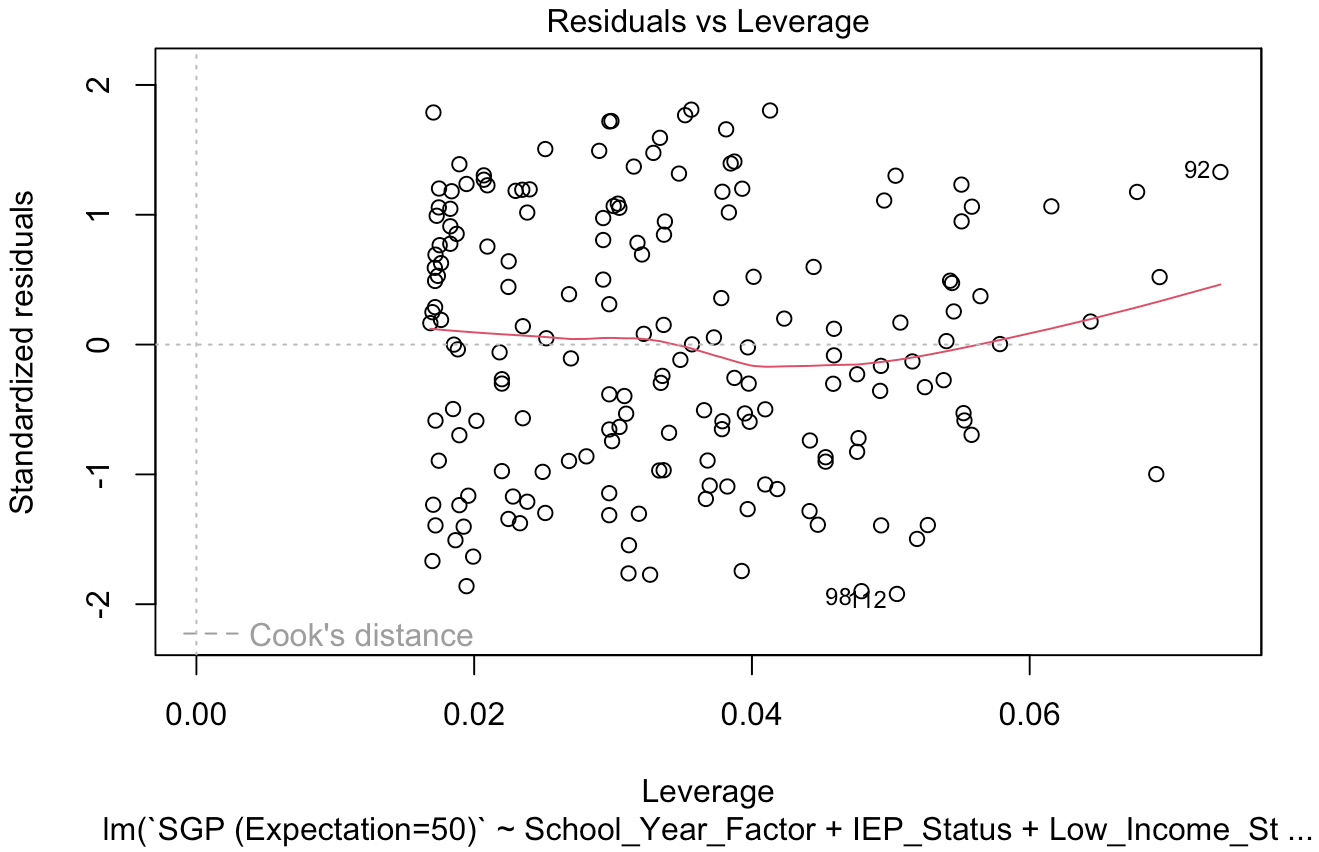
▶ Code

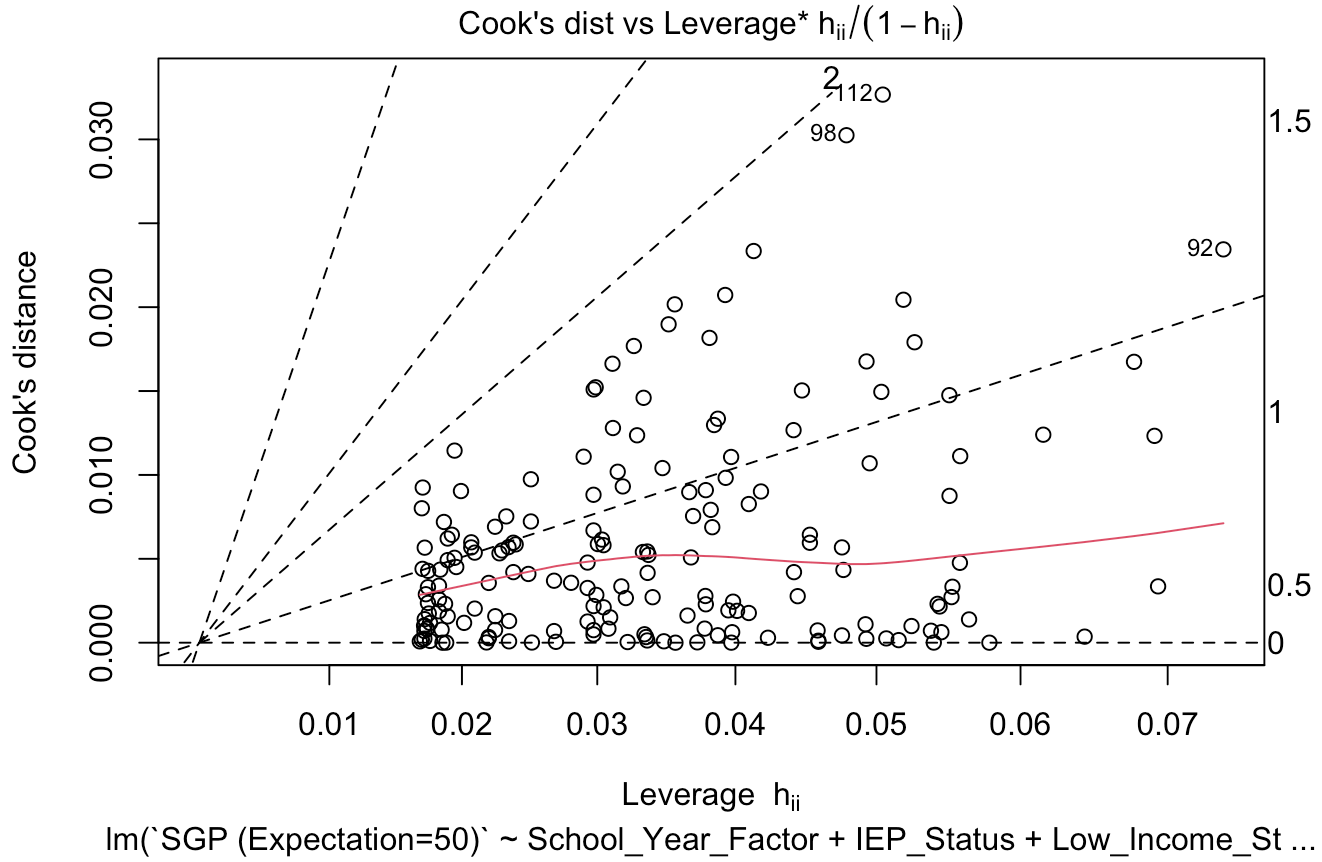

Residuals vs Fitted
Residuals
60
40
20
0
-20
-40
-60
30
40
50
60
Fitted values
lm(`SGP (Expectation=50)` ~ School_Year_Factor + IEP_Status + Low_Income_St ...


Q-Q Residuals
Standardized residuals
Theoretical Quantiles
lm(`SGP (Expectation=50)` ~ School_Year_Factor + IEP_Status + Low_Income_St ...
112
98
159
-2
-1
0
1
2


Scale-Location
√|Standardized residuals|
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
112
30
40
50
60
Fitted values
lm(`SGP (Expectation=50)` ~ School_Year_Factor + IEP_Status + Low_Income_St ...


Cook's distance
112
98
92
0.030
0.020
0.010
0.000
Cook's distance
0
50
100
150
Obs. number
lm(`SGP (Expectation=50)` ~ School_Year_Factor + IEP_Status + Low_Income_St ...


Residuals vs Leverage
Standardized residuals
2
1
0
-1
-2
92
98
112
Cook's distance
0.00
0.02
0.04
0.06
Leverage
lm(`SGP (Expectation=50)` ~ School_Year_Factor + IEP_Status + Low_Income_St ...



▶ Code

```
[1] 0.02234637
```

Visual G5 Math Growth

▶ Code

▶ Code

▶ Code

▶ Code

Visual G5 IEP Growth

▶ Code

▶ Code

RQ 3: ELA State Standards Mastery

Is there a relationship between the text type of a literacy standard (informational vs. literature) and Rising Tide High School students' mastery of the standard?

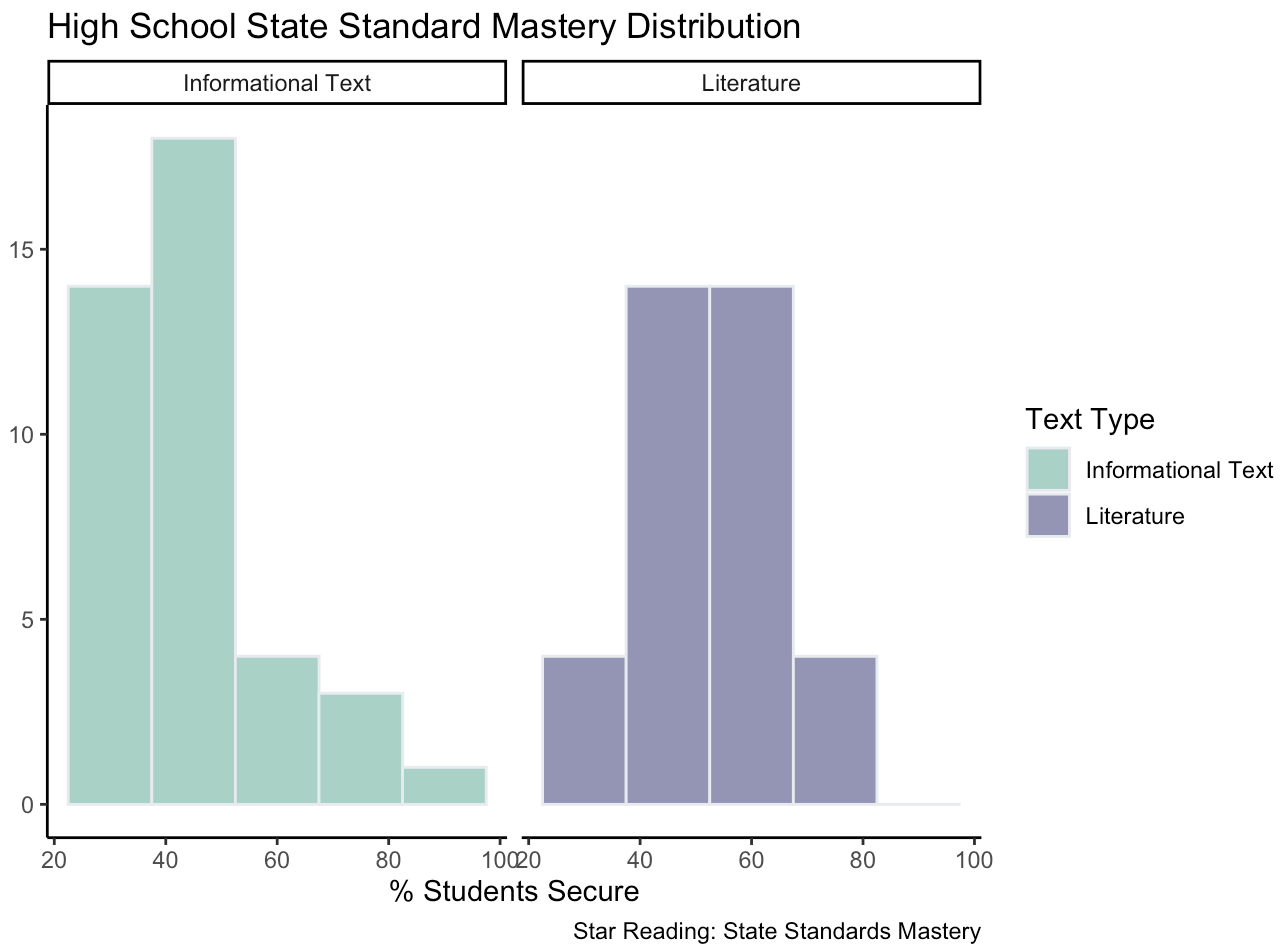
##Visual: Distribution ELA Standards Mastery

▶ Code

Year	Screening Window	Grade	Text Type	Reporting Category
<chr>	<fct>	<fct>	<fct>	<fct>
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading
2024-2025	Fall	9	Informational Text	Reading

1-10 of 114 rows | 1-5 of 13 columns Previous **1** 2 3 4 5 6 … 12 Next

▶ Code



Star Reading: State Standards Mastery

Statistical Tests

▶ Code

```
Call:
lm(formula = `% Secure` ~ (`Text Type` + `Screening Window` + 
    Domain), data = ELA_Standards)

Residuals:
    Min      1Q  Median      3Q     Max 
-40.934  -8.667   2.097   8.740  34.360 

Coefficients:
                                                  Estimate Std. Error t value
(Intercept)                                         47.593      1.932  24.631
`Text Type`Literature                                4.294      1.707   2.515
`Screening Window`Winter                             6.658      1.698   3.920
DomainIntegration of Knowledge and Ideas             4.310      2.248   1.917
DomainKey Ideas and Details                          2.458      2.137   1.150
DomainRange of Reading and Level of Text Complexity -4.611      3.022  -1.526
                                                  Pr(>|t|)
(Intercept)                                        < 2e-16 ***
`Text Type`Literature                             0.012609 *
`Screening Window`Winter                          0.000118 ***
DomainIntegration of Knowledge and Ideas          0.056484 .
DomainKey Ideas and Details                       0.251263
DomainRange of Reading and Level of Text Complexity 0.128519
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12.82 on 222 degrees of freedom
  (309 observations deleted due to missingness)
Multiple R-squared:  0.121, Adjusted R-squared:  0.1012 
F-statistic:  6.11 on 5 and 222 DF,  p-value: 2.523e-05
```

▶ Code

```
Call:
lm(formula = `% Secure` ~ (`Text Type` + `Screening Window` + 
    Domain), data = HS_ELA_Standards)

Residuals:
    Min      1Q  Median      3Q     Max 
-28.378  -8.155  -1.182   7.971  40.030 

Coefficients:
                                                  Estimate Std. Error t value
(Intercept)                                         39.314      3.175  12.382
```

```
`Text Type`Literature                                 8.840      2.806   3.151
`Screening Window`Winter                              4.947      2.791   1.773
DomainIntegration of Knowledge and Ideas              7.276      3.694   1.970
DomainKey Ideas and Details                           1.708      3.512   0.486
DomainRange of Reading and Level of Text Complexity   3.417      4.967   0.688
                                                     Pr(>|t|)
(Intercept)                                           <2e-16 ***
`Text Type`Literature                                 0.0024 **
`Screening Window`Winter                              0.0806 .
DomainIntegration of Knowledge and Ideas              0.0528 .
DomainKey Ideas and Details                           0.6282
DomainRange of Reading and Level of Text Complexity   0.4938
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 12.17 on 70 degrees of freedom
  (38 observations deleted due to missingness)
Multiple R-squared:  0.1886,    Adjusted R-squared:  0.1307
F-statistic: 3.255 on 5 and 70 DF,  p-value: 0.01063
```

▶ Code

```
[1] 603.2177
```

▶ Code

```
[1] 619.5328
```

▶ Code

```
================================================================================
                                                   Dependent variable:
                                               -------------------------
                                                       `% Secure`
--------------------------------------------------------------------------------
`Text Type`Literature                                    4.294**
                                                         (1.707)

`Screening Window`Winter                                6.658***
                                                         (1.698)

DomainIntegration of Knowledge and Ideas                 4.310*
                                                         (2.248)

DomainKey Ideas and Details                               2.458
                                                         (2.137)

DomainRange of Reading and Level of Text Complexity      -4.611
                                                         (3.022)

Constant                                                47.593***
                                                         (1.932)
```

```
---------------------------------------------------------------------------
Observations                                                    228
R2                                                             0.121
Adjusted R2                                                    0.101
Residual Std. Error                                      12.823 (df = 222)
F Statistic                                          6.110*** (df = 5; 222)
===========================================================================
Note:                                          *p<0.1; **p<0.05; ***p<0.01
```

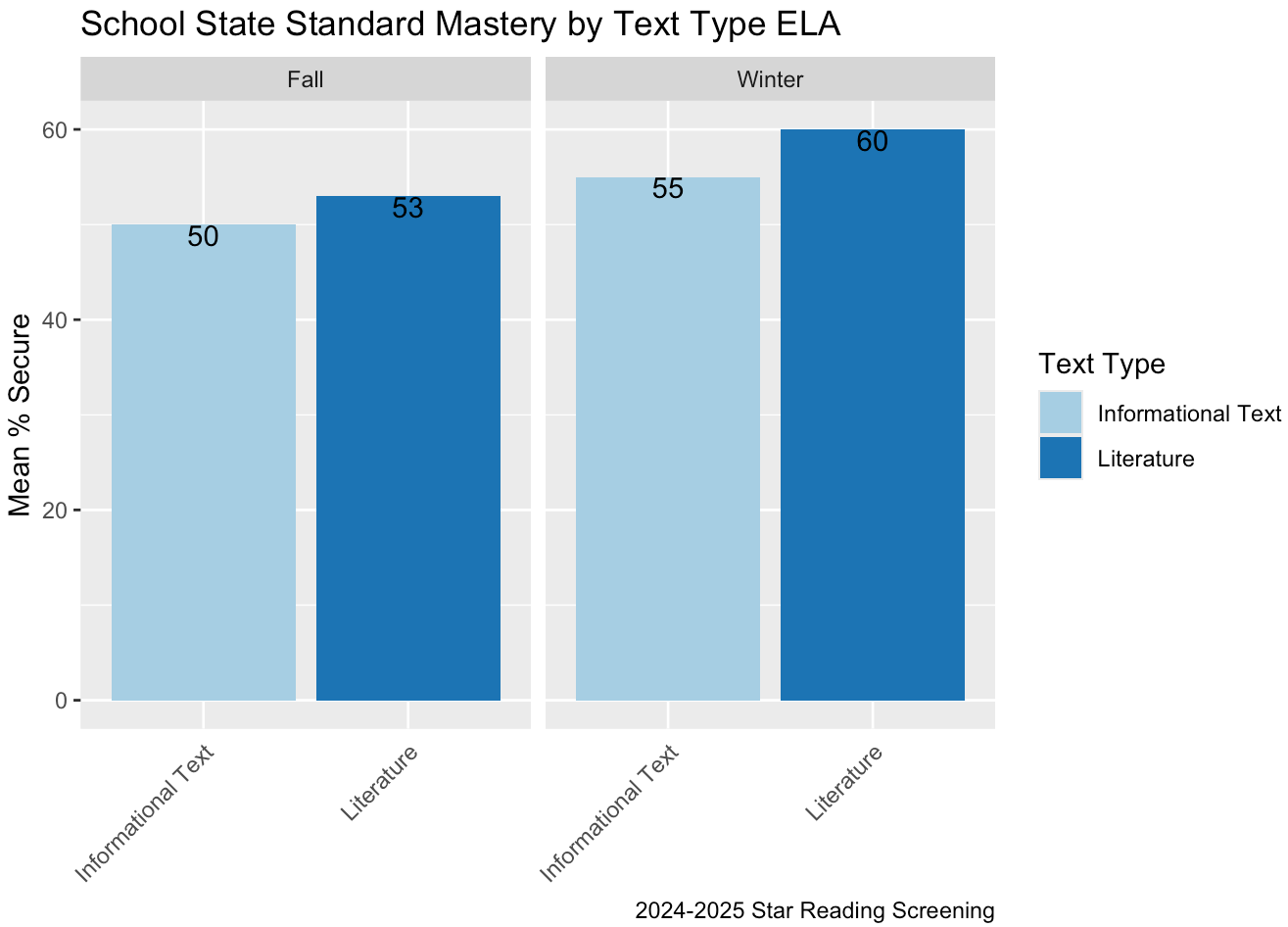
▶ Code

```
===========================================================================
                                                  Dependent variable:
                                              ---------------------------
                                                        `% Secure`
---------------------------------------------------------------------------
`Text Type`Literature                                      8.840***
                                                           (2.806)

`Screening Window`Winter                                   4.947*
                                                           (2.791)

DomainIntegration of Knowledge and Ideas                   7.276*
                                                           (3.694)

DomainKey Ideas and Details                                1.708
                                                           (3.512)

DomainRange of Reading and Level of Text Complexity        3.417
                                                           (4.967)

Constant                                                   39.314***
                                                           (3.175)

---------------------------------------------------------------------------
Observations                                                    76
R2                                                             0.189
Adjusted R2                                                    0.131
Residual Std. Error                                      12.166 (df = 70)
F Statistic                                          3.255** (df = 5; 70)
===========================================================================
Note:                                          *p<0.1; **p<0.05; ***p<0.01
```

Visual Mastery by Text Type

SchoolWide

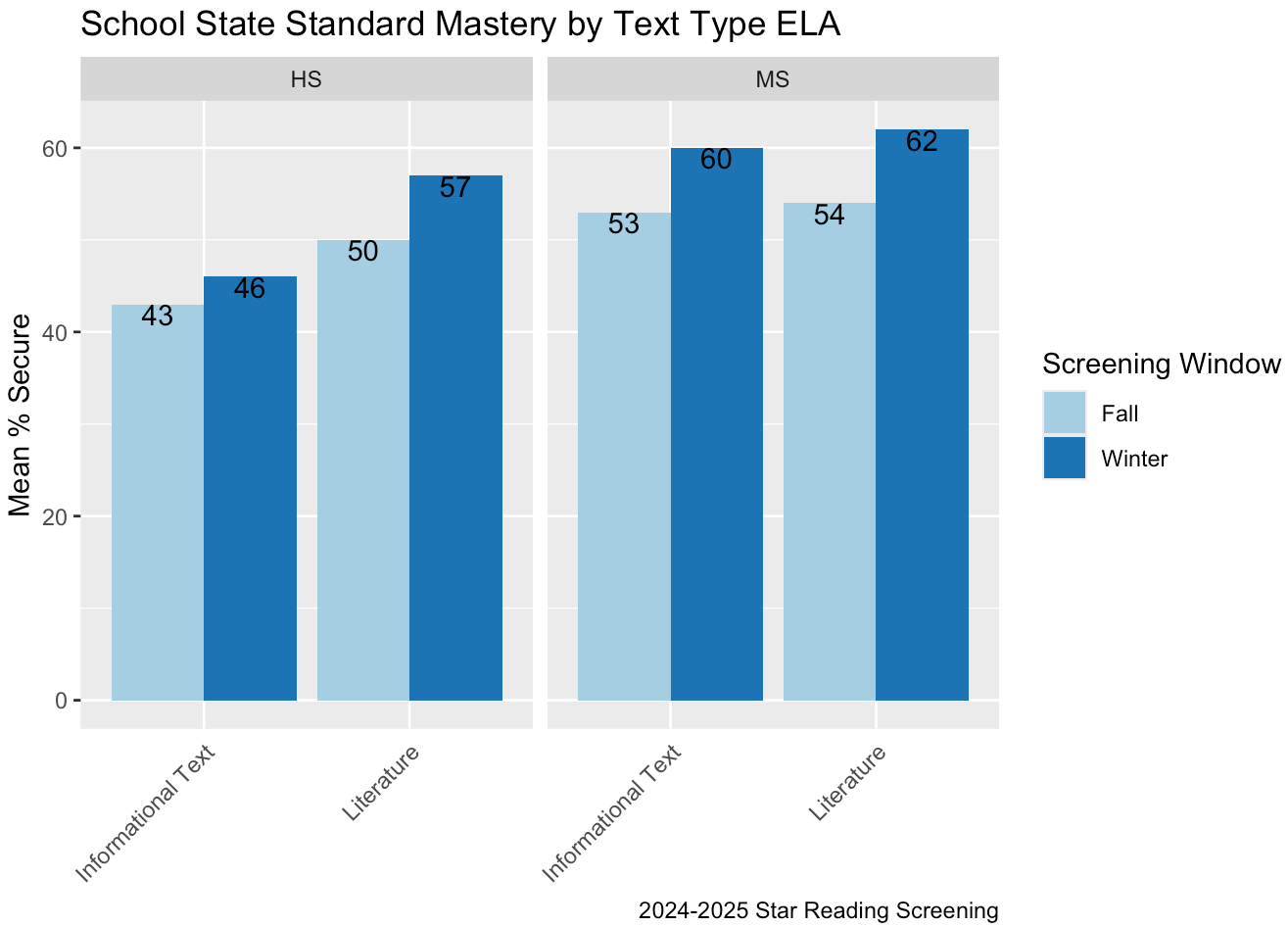
▶ Code



▶ Code

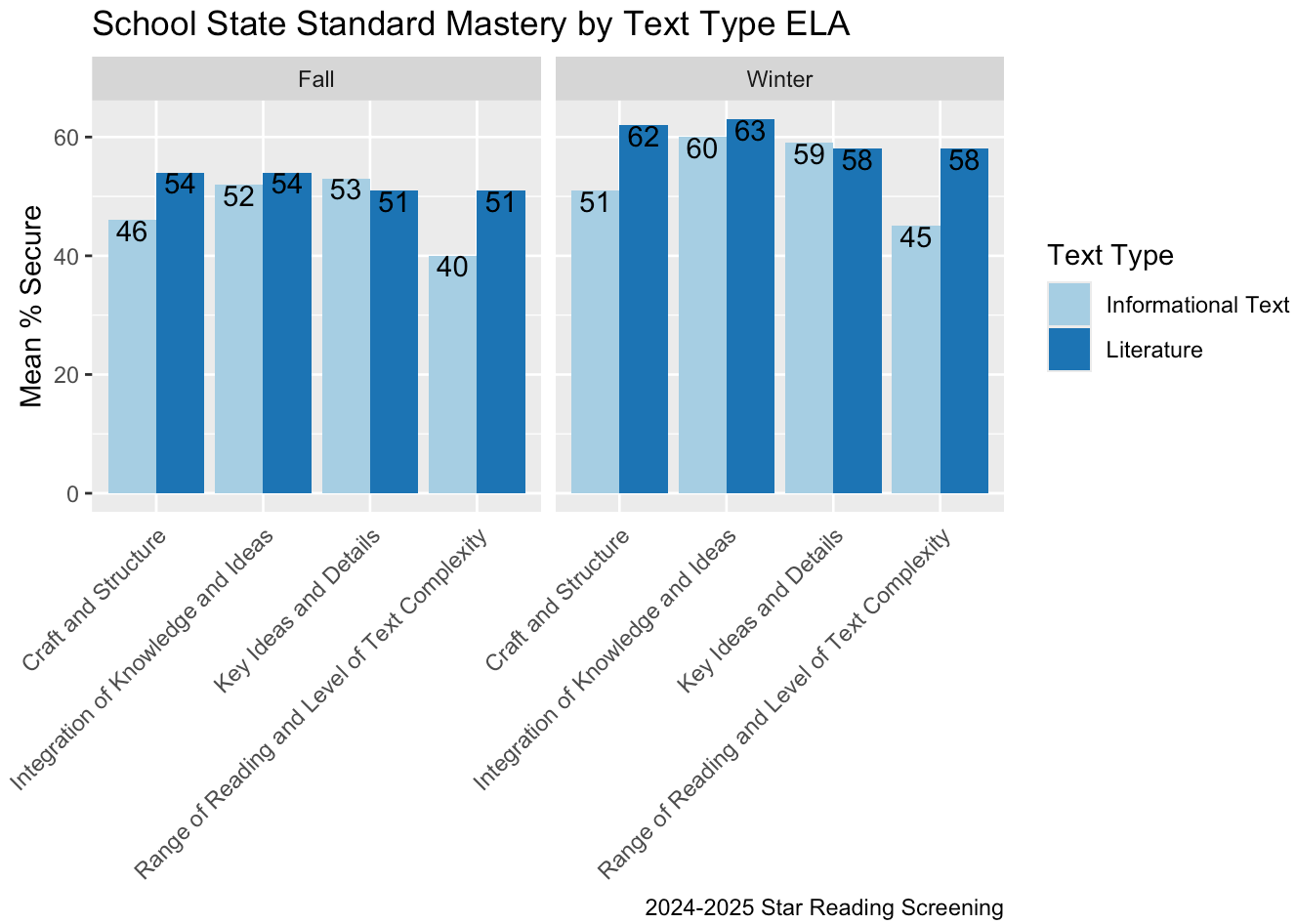
MS vs. HS

▶ Code



By Domain Cluster

▶ Code



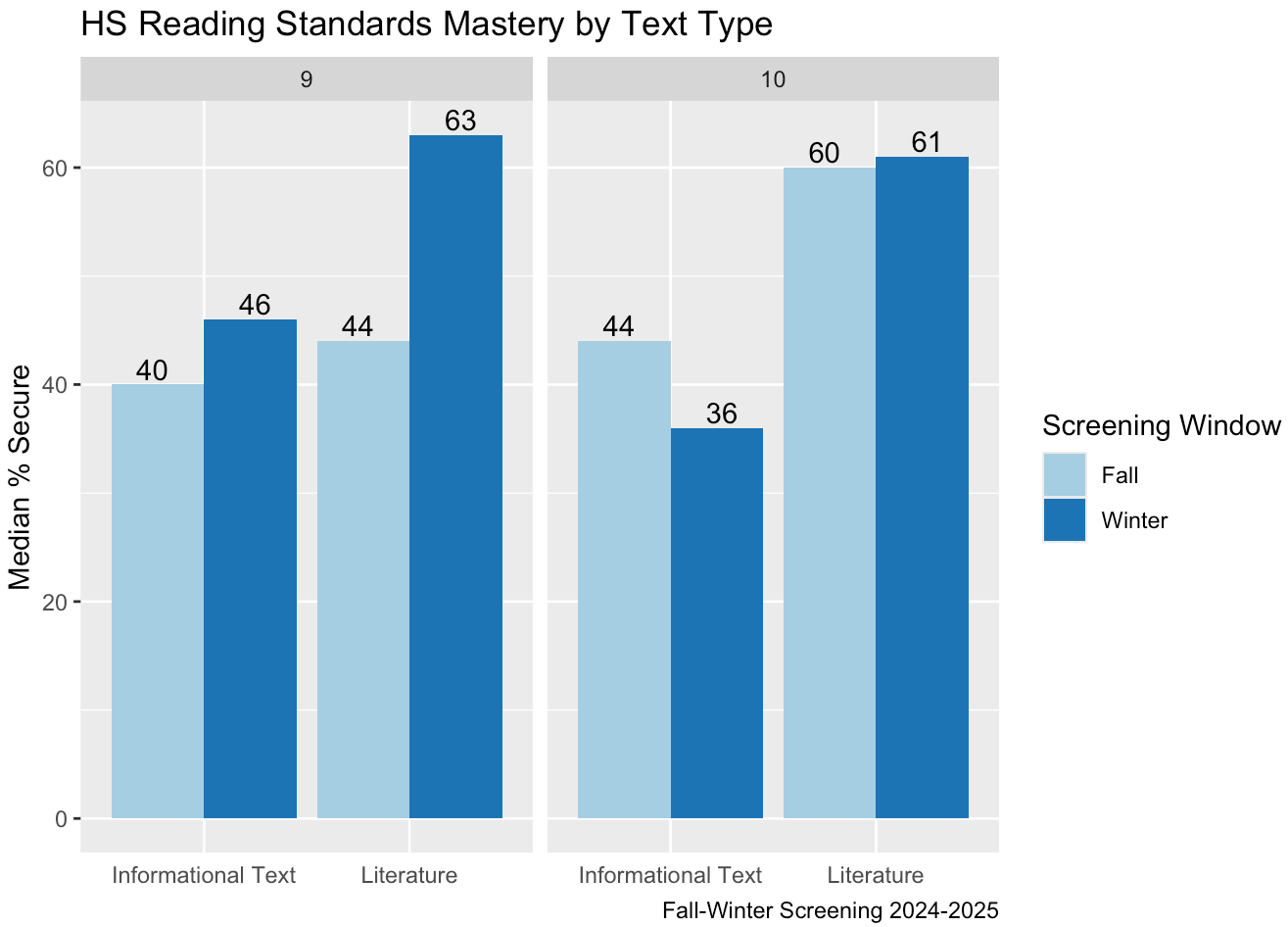
Visual: HS Informational Text vs. Literature Comparison

▶ Code

Year	Screening Window	Grade	Text Type	Reporting Category
<chr>	<fct>	<fct>	<fct>	<fct>
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	*NA*	Foundational Skills
2024-2025	Fall	5	Informational Text	Reading
2024-2025	Fall	5	Informational Text	Reading
2024-2025	Fall	5	Informational Text	Reading
2024-2025	Fall	5	Informational Text	Reading

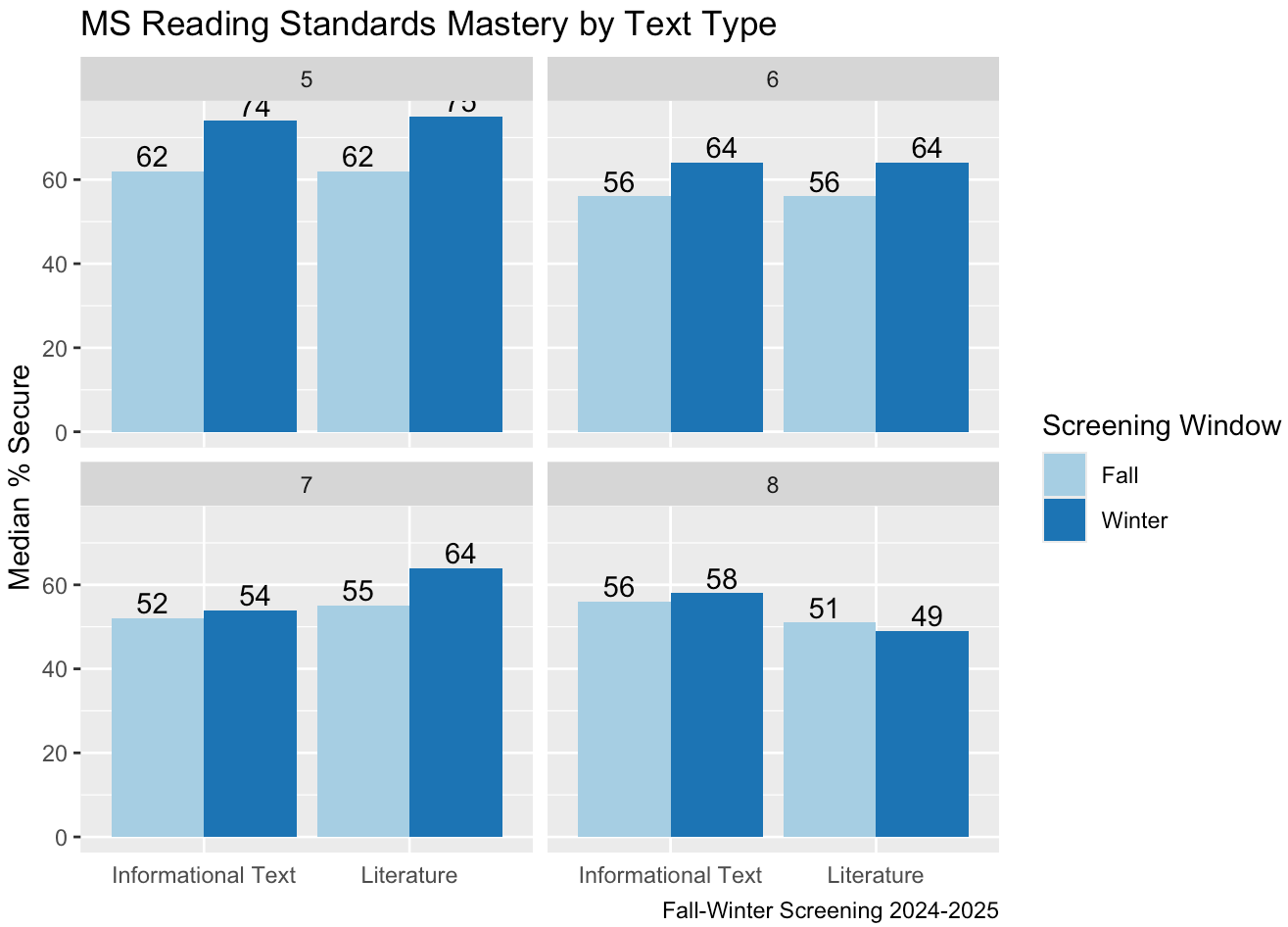
1-10 of 537 rows | 1-5 of 13 columns Previous **1** 2 3 4 5 6 … 54 Next

▶ Code



Visual: MS Informational Text vs. Literature Mastery: Fall-Winter

▶ Code


MS Reading Standards Mastery by Text Type
5
6
7
8
62
74
62
73
56
64
56
64
52
54
55
64
56
58
51
49
Median % Secure
0
20
40
60
Informational Text
Literature
Fall-Winter Screening 2024-2025
Screening Window
Fall
Winter