

Figures for
CMAS Technical Report
2017–2018

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Figure 1. CMAS Blueprint-Grade 4

| TEST BLUEPRINT CMAS Social Studies Grade 4 | | SRs | 3pt CRs | Total Points | Total Items | Total PE Points | % of Score Points |
|--|-----------|-----------|-----------|-----------------|----------------|--------------------|-------------------------|
| 1 | History | 7 | 4 | 19 | 11 | 10-14 | 25% |
| | PGC 1 | | | 9-10 | | | |
| | GLE 1 | 3-4 | 2 | 9-10 | | | |
| | PGC 2 | | | 9-10 | | | |
| | GLE 2 | 3-4 | 2 | 9-10 | | | |
| 2 | Geography | 14 | 2 | 20 | 16 | 9-14 | 27% |
| | PGC 1 | | | 10-11 | | | |
| | GLE 1 | 7-8 | 1 | 10-11 | | | |
| | PGC 2 | | | 9-10 | | | |
| | GLE 2 | 6-7 | 1 | 9-10 | | | |
| 3 | Economics | 11 | 2 | 17 | 13 | 0-4 | 23% |
| | PGC 1 | | | 8-9 | | | |
| | GLE 1 | 5-9 | 0-1 | 8-9 | | | |
| | PGC 2 | | | 8-9 | | | |
| | GLE 2 | 3-6 | 1-2 | 8-9 | | | |
| 4 | Civics | 7 | 4 | 19 | 11 | 0-6 | 25% |
| | PGC 1 | | | 8-9 | | | |
| | GLE 1 | 2-6 | 1-2 | 8-9 | | | |
| | PGC 2 | | | 10-11 | | | |
| | GLE 2 | 2-5 | 2-3 | 10-11 | | | |
| TOTAL | | 39 | 12 | 75 | 51 | 24 | 100% |

Operational form target ranges:

DOK as a total percentage of test points:

DOK 1=15%-20%

DOK 2= <55%

DOK 3=25%-30%

Number of TEIs as a percentage of total items:

Year 1 (2014) 20% of total items

Years 2-5 25% of total items

Figure 2. CMAS Blueprint-Grade 5

| | TEST BLUEPRINT CMAS Science Grade 5 | SRs | 2 pt CRs | 3 pt CRs | Total CRs | Total CR points | Total Points | Total Items | Total SI/NS Points | Total Sim Points | % of Score Points |
|--|--|---|-------------|-------------|--------------|-----------------------|-----------------|----------------|--------------------------|------------------------|-------------------------|
| 1 | Physical Science | 9 | 4 | 1 | 5 | 11 | 20 | 14 | 8 | 5-8 | 25% |
| | PGC 2 | | | | | | 20 | | | | |
| | GLE 1 | 9 | 4 | 1 | 5 | 11 | 20 | 14 | | | |
| 2 | Life Science | 17 | 5 | 1 | 6 | 13 | 30 | 23 | 10 | 10-15 | 38% |
| | PGC 3 | | | | | | 12-15 | | | | |
| | GLE 1 | 7 | 2-4 | 0-1 | 2-4 | 5-8 | 12-15 | 9-11 | | | |
| | PGC 1 | | | | | | 15-18 | | | | |
| | GLE 2 | 10 | 2-4 | 0-1 | 2-4 | 5-8 | 15-18 | 12-14 | | | |
| 3 | Earth Systems Science | 17 | 5 | 1 | 6 | 13 | 30 | 23 | 12 | 10-15 | 38% |
| | PGC 3 | | | | | | 9-12 | | | | |
| | GLE 1 | 6 | 0-3 | 0-1 | 1-3 | 3-6 | 9-12 | 7-9 | | | |
| | PGC 2 | | | | | | 18-21 | | | | |
| | GLE 2 | 5 | 0-3 | 0-1 | 1-3 | 3-6 | 8-11 | 7-9 | | | |
| | GLE 3 | 6 | 0-3 | 0-1 | 1-3 | 3-6 | 9-12 | 7-9 | | | |
| TOTAL | | 43 | 14 | 3 | 17 | 37 | 80 | 60 | 30 | 30 | 100% |
| 4 | Scientific Investigations and the Nature of Science (SI/NS) | 30 Points for SI/NS will be distributed among the 3 Standards | | | | | | | | 38% | |
| <p>Operational form target ranges:</p> <p>DOK as a total percentage of test points:</p> <p>DOK 1 20-25%</p> <p>DOK 2 45-50%</p> <p>DOK 3 25-30%</p> <p>Number of TEIs as percentage of total items:</p> <p>Year 1 (2014) 20% of total items</p> <p>Years 2-5 25% of total items</p> | | | | | | | | | | | |

Figure 3. CMAS Blueprint-Grade 7

| TEST BLUEPRINT CMAS Social Studies Grade 7 | | SRs | 3pt CRs | Total Points | Total Items | Total PE Points | % of Score Points |
|--|-----------|-----------|-----------|-----------------|----------------|--------------------|-------------------------|
| 1 | History | 8 | 4 | 20 | 12 | 8-14 | 28% |
| | PGC 1 | | | 8 | | | |
| | GLE 1 | 2-5 | 1-2 | 8 | | | |
| | PGC 2 | | | 12 | | | |
| | GLE 2 | 3-6 | 2-3 | 12 | | | |
| 2 | Geography | 9 | 3 | 18 | 12 | 8-12 | 25% |
| | PGC 1 | | | 8-10 | | | |
| | GLE 1 | 3-6 | 1-2 | 8-10 | | | |
| | PGC 2 | | | 8-10 | | | |
| | GLE 2 | 3-6 | 1-2 | 8-10 | | | |
| 3 | Economics | 10 | 2 | 16 | 12 | 0-4 | 22% |
| | PGC 1 | | | 8 | | | |
| | GLE 1 | 5-8 | 0-1 | 8 | | | |
| | PGC 2 | | | 8 | | | |
| | GLE 2 | 2-5 | 1-2 | 8 | | | |
| 4 | Civics | 9 | 3 | 18 | 12 | 0-6 | 25% |
| | PGC 2 | | | 9 | | | |
| | GLE 1 | 6 | 1 | 9 | | | |
| | PGC 1 | | | 9 | | | |
| | GLE 2 | 3 | 2 | 9 | | | |
| TOTAL | | 36 | 12 | 72 | 48 | 24 | 100% |
| <p>Operational form target ranges:</p> <p>DOK as a total percentage of test points:</p> <p>DOK 1= 15%-20%</p> <p>DOK 2= <50%</p> <p>DOK 3= 30%-35%</p> <p>Number of TEIs as a percentage of total items:</p> <p>Year 1 (2014) 20% of total items</p> <p>Years 2-5 25% of total items</p> | | | | | | | |

Figure 4. CMAS Blueprint-Grade 8

| TEST BLUEPRINT CMAS Science Grade 8 | | SRs | 2pt CRs | 3pt CRs | Total CRs | Total CR points | Total Points | Total Items | Total SI/NS Points | Total Sim Points | % of Score Points |
|---|--|---|------------|------------|--------------|-----------------------|-----------------|----------------|--------------------------|---------------------|-------------------------|
| 1 | Physical Science | 16 | 5 | 1 | 6 | 13 | 29 | 22 | 7 | 5-7 or 10-14 | 36% |
| | PGC 1 | | | | | | 7-8 | | | | |
| | GLE 1 | 2-5 | 0-2 | 0-1 | 1-2 | 2-5 | 7-8 | 4-6 | | | |
| | PGC 3 | | | | | | 7-8 | | | | |
| | GLE 2 | 2-5 | 0-2 | 0-1 | 1-2 | 2-5 | 7-8 | 4-6 | | | |
| | PGC 2 | | | | | | 7-8 | | | | |
| | GLE 3 | 2-5 | 0-2 | 0-1 | 1-2 | 2-5 | 7-8 | 4-6 | | | |
| | PGC 3 | | | | | | 7-8 | | | | |
| | GLE 4 | 2-5 | 0-2 | 0-1 | 1-2 | 2-5 | 7-8 | 4-6 | | | |
| 2 | Life Science | 13 | 4 | 1 | 5 | 11 | 24 | 18 | 6 | 5-7 or 10-14 | 30% |
| | PGC 2 | | | | | | 11-13 | | | | |
| | GLE 1 | 5-8 | 1-3 | 0-1 | 2-3 | 4-7 | 11-13 | 8-10 | | | |
| | PGC 3 | | | | | | 11-13 | | | | |
| | GLE 2 | 5-8 | 1-3 | 0-1 | 2-3 | 4-7 | 11-13 | 8-10 | | | |
| 3 | Earth Systems Science | 14 | 5 | 1 | 6 | 13 | 27 | 20 | 7 | 5-7 or 10-14 | 34% |
| | PGC 2 | | | | | | 12-14 | | | | |
| | GLE 1 | 2-5 | 0-2 | 0-1 | 1-2 | 2-5 | 6-7 | 4-6 | | | |
| | GLE 2 | 2-5 | 0-2 | 0-1 | 1-2 | 2-5 | 6-7 | 4-6 | | | |
| | PGC 1 | | | | | | 12-15 | | | | |
| | GLE 3 | 2-5 | 0-2 | 0-1 | 1-2 | 2-5 | 6-8 | 4-6 | | | |
| | GLE 4 | 2-5 | 0-2 | 0-1 | 1-2 | 2-5 | 6-7 | 4-6 | | | |
| TOTAL | | 43 | 14 | 3 | 17 | 37 | 80 | 60 | 20 | 30 | 100% |
| 4 | Scientific Investigations and the Nature of Science (SI/NS) | 20 Points for SI/NS will be distributed among the 3 Standards | | | | | | | | | 25% |

* Simulation points are dependent on whether one or two simulations are associated with a particular standard.

Operational form target ranges:

DOK as a total percentage of test points:

- DOK 1 15%-20%
- DOK 2 <50%
- DOK 3 30%-35%

Number of TEIs as a percentage of total items

- Year 1 (2014) 15-20% of total items
- Years 2-5 25% of total items

Figure 5. CMAS Blueprint-HS Science

| | TEST BLUEPRINT CMAS Science High School | SRs | 2pt CRs | 3pt CRs | Total CRs | Total CR points | Total Points | Total Items | Total SI/NS Points | Total Sim Points | % of Score Points |
|--------------|--|--|------------|----------|--------------|--------------------|-----------------|----------------|--------------------------|------------------------|-------------------------|
| 1 | Physical Science | 13-15 | 4-5 | 1 | 5-6 | 11-13 | 26 | 19-20 | 6 | 5-13 | 33% |
| | PGC 1 | | | | | | 6-7 | | | | |
| | GLE1 | 1-4 | 1-2 | 0-1 | 1-2 | 2-5 | 6-7 | | | | |
| | PGC 2 | | | | | | 11-13 | | | | |
| | GLE2 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE3 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE4 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | PGC 3 | | | | | | 7-9 | | | | |
| | GLE5 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE6 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| 2 | Life Science | 14-16 | 4-5 | 1 | 5-6 | 11-13 | 27 | 20-21 | 7 | 5-13 | 34% |
| | PGC 2 | | | | | | 6-8 | | | | |
| | GLE1 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE2 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 2-4 | | | | |
| | PGC 1 | | | | | | 9-11 | | | | |
| | GLE3 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 2-4 | | | | |
| | GLE4 | 0-3 | 0-1 | 0-1 | 0-1 | 0-3 | 2-4 | | | | |
| | GLE5 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 2-4 | | | | |
| | GLE6 | 0-3 | 0-1 | 0-1 | 0-1 | 0-3 | 2-4 | | | | |
| | PGC 3 | | | | | | 5-7 | | | | |
| | GLE7 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE8 | 0-3 | 0-1 | 0-1 | 0-1 | 0-3 | 2-4 | | | | |
| | PGC 4 | | | | | | 3-5 | | | | |
| | GLE9 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| 3 | Earth Systems Science | 14-16 | 4-5 | 1 | 5-6 | 11-13 | 27 | 20-21 | 7 | 5-13 | 34% |
| | PGC 1 | | | | | | 6-8 | | | | |
| | GLE1 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE2 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 2-4 | | | | |
| | PGC 2 | | | | | | 13-15 | | | | |
| | GLE3 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE4 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE6 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 3-5 | | | | |
| | GLE7 | 0-3 | 0-1 | 0-1 | 0-1 | 0-3 | 2-4 | | | | |
| | PGC 3 | | | | | | 4-6 | | | | |
| | GLE5 | 1-4 | 0-1 | 0-1 | 0-1 | 0-3 | 4-6 | | | | |
| TOTAL | | 43 | 14 | 3 | 17 | 37 | 80 | 60 | 20 | 30 | 1 |
| 4 | Scientific Investigations & the Nature of Science (SI/NS) | 20 Points for SI/NS will be distributed among the 3 Standards | | | | | | | | | 25% |

Operational form target ranges:

DOK as a total percentage of test points:

- DOK 1 15%-20%
- DOK 2 <50%
- DOK 3 30%-35%

Number of TEs as a percent to total items

- Year 1 (2014) 20% of total items
- Years 2-5 25% of total items

Figure 6. Sample 2PL Item Characteristic Curve

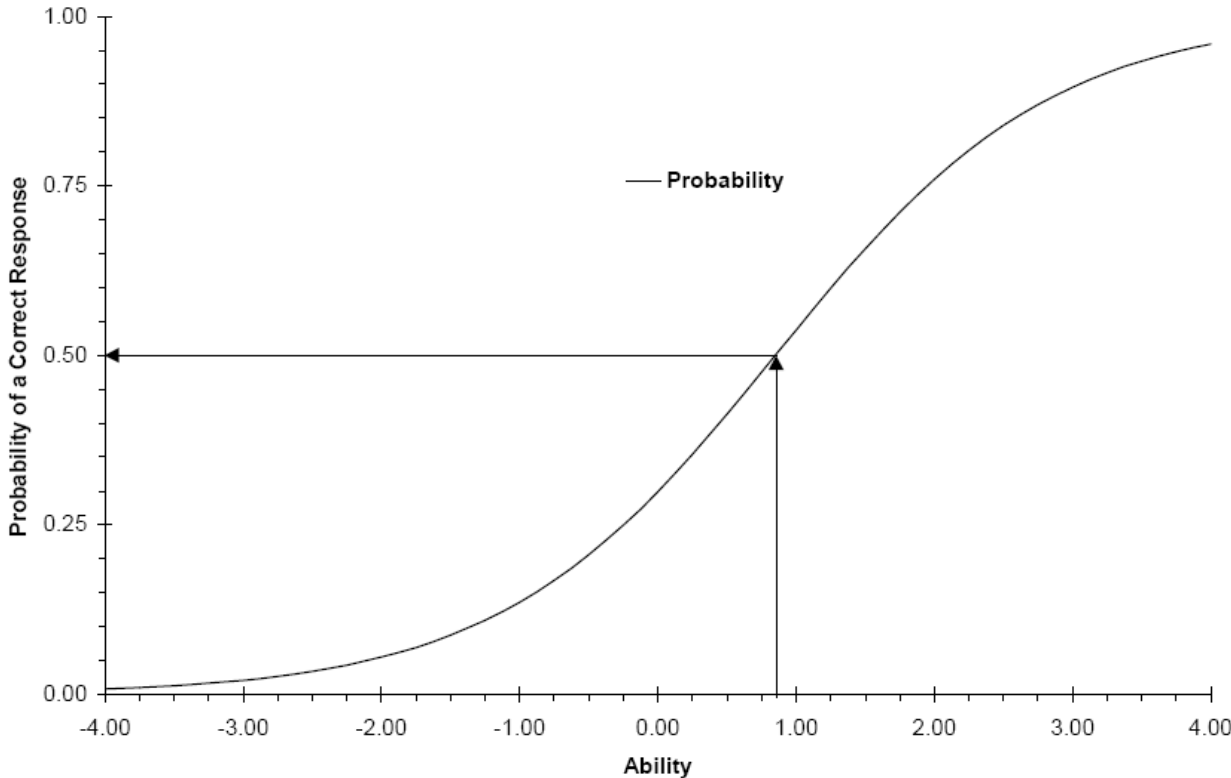


Figure 7. Sample 2PL Item Response Curves

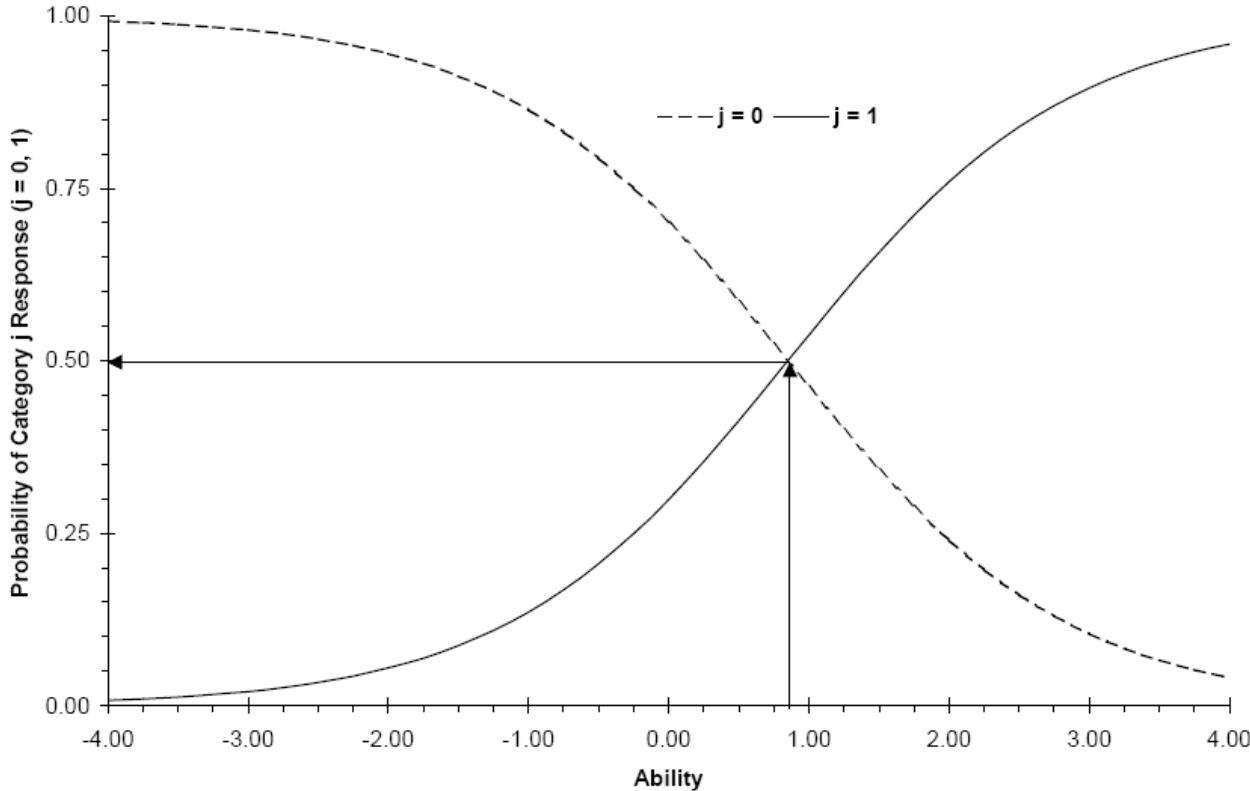


Figure 8. Item Response Curves for a 2-point Item

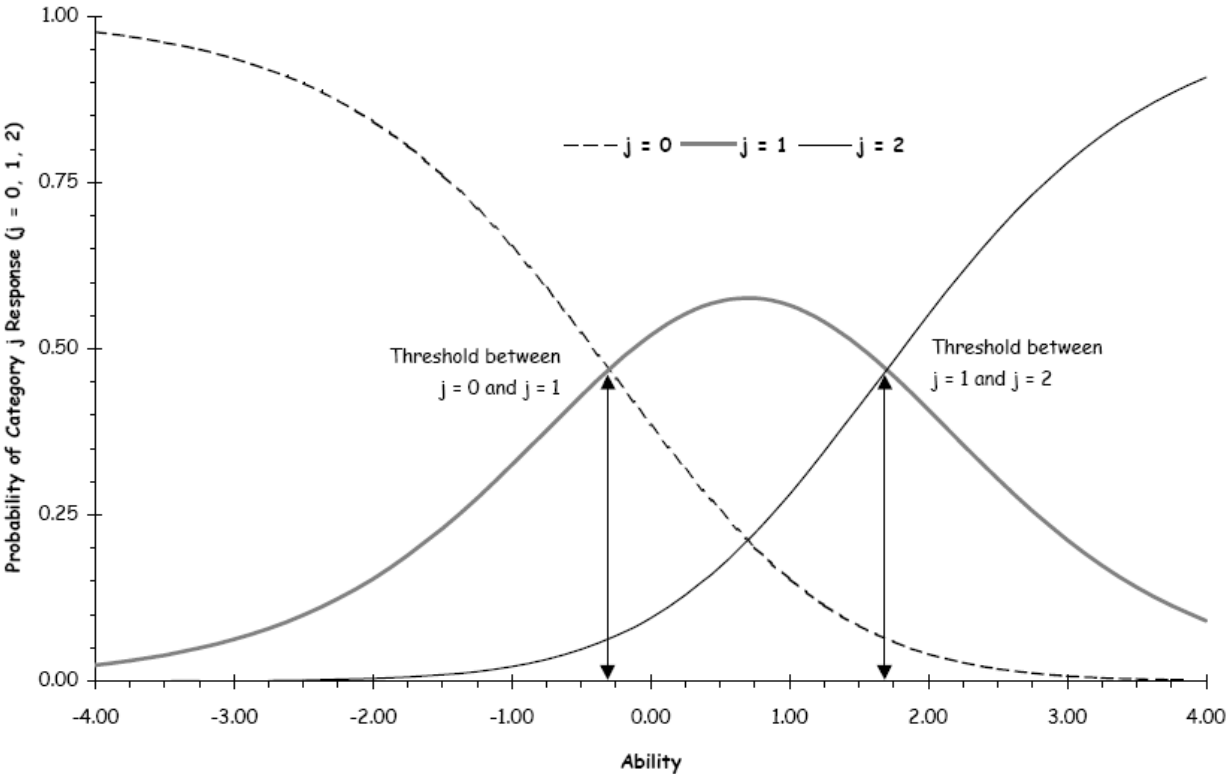


Figure 9. Sample TRIAN Report

| Item | Form | Key | Corr. | * | PV<15 | A% | * | B% | * | C% | * | D% | * | Omit% | Ncount |
|------|------|-----|-------|---|-------|----|---|----|---|----|---|----|---|-------|--------|
| 20 | A2 | A | 0.12 | * | | 16 | | 43 | * | 31 | | 11 | | 0 | 1809 |
| 26 | A2 | A | 0.28 | | | 34 | | 13 | | 49 | * | 4 | | 0 | 1809 |
| 29 | B3 | C | 0.26 | | | 5 | | 4 | | 41 | | 50 | * | 0 | 1794 |

Figure 10. Sample Adjudication Spreadsheet

| Form | ItemID | Response | Score | COUNT | PERCENT | Correct Response? |
|------|-----------|---|-------|-------|---------|-------------------|
| A1 | 123456789 | d_clouds b_bay1fd_cold b_bay2fd_snow b_bay3fd_rain b_bay4 | 0 | 27 | 0.7 | N |
| A1 | 123456789 | d_clouds b_bay1fd_cold b_bay2fd_snow b_bay4fd_rain b_bay3 | 0 | 19 | 0.5 | N |
| A1 | 123456789 | d_clouds b_bay1fd_cold b_bay3fd_snow b_bay2fd_rain b_bay4 | 0 | 9 | 0.2 | N |
| A1 | 123456789 | d_clouds b_bay1fd_cold b_bay3fd_snow b_bay4fd_rain b_bay2 | 0 | 10 | 0.3 | N |
| A1 | 123456789 | d_clouds b_bay1fd_cold b_bay4fd_snow b_bay2fd_rain b_bay3 | 0 | 20 | 0.5 | N |
| A1 | 123456789 | d_clouds b_bay1fd_cold b_bay4fd_snow b_bay3fd_rain b_bay2 | 0 | 30 | 0.8 | N |
| A1 | 123456789 | d_clouds b_bay2fd_cold b_bay1fd_snow b_bay3fd_rain b_bay4 | 0 | 29 | 0.7 | N |
| A1 | 123456789 | d_clouds b_bay2fd_cold b_bay1fd_snow b_bay4fd_rain b_bay3 | 0 | 11 | 0.3 | N |
| A1 | 123456789 | d_clouds b_bay2fd_cold b_bay3fd_snow b_bay1fd_rain b_bay4 | 0 | 448 | 11.5 | N |
| A1 | 123456789 | d_clouds b_bay2fd_cold b_bay3fd_snow b_bay4fd_rain b_bay1 | 0 | 11 | 0.3 | N |
| A1 | 123456789 | d_clouds b_bay2fd_cold b_bay4fd_snow b_bay1fd_rain b_bay3 | 0 | 619 | 15.9 | N |
| A1 | 123456789 | d_clouds b_bay2fd_cold b_bay4fd_snow b_bay3fd_rain b_bay1 | 0 | 46 | 1.2 | N |
| A1 | 123456789 | d_clouds b_bay3fd_cold b_bay1fd_snow b_bay2fd_rain b_bay4 | 0 | 8 | 0.2 | N |
| A1 | 123456789 | d_clouds b_bay3fd_cold b_bay1fd_snow b_bay4fd_rain b_bay2 | 0 | 11 | 0.3 | N |
| A1 | 123456789 | d_clouds b_bay3fd_cold b_bay2fd_snow b_bay1fd_rain b_bay4 | 0 | 579 | 14.9 | N |
| A1 | 123456789 | d_clouds b_bay3fd_cold b_bay2fd_snow b_bay4fd_rain b_bay1 | 0 | 25 | 0.6 | N |
| A1 | 123456789 | d_clouds b_bay3fd_cold b_bay4fd_snow b_bay1fd_rain b_bay2 | 0 | 183 | 4.7 | N |
| A1 | 123456789 | d_clouds b_bay3fd_cold b_bay4fd_snow b_bay2fd_rain b_bay1 | 0 | 29 | 0.7 | N |
| A1 | 123456789 | d_clouds b_bay4fd_cold b_bay1fd_snow b_bay2fd_rain b_bay3 | 0 | 7 | 0.2 | N |
| A1 | 123456789 | d_clouds b_bay4fd_cold b_bay1fd_snow b_bay3fd_rain b_bay2 | 0 | 12 | 0.3 | N |
| A1 | 123456789 | d_clouds b_bay4fd_cold b_bay2fd_snow b_bay3fd_rain b_bay1 | 0 | 33 | 0.8 | N |
| A1 | 123456789 | d_clouds b_bay4fd_cold b_bay3fd_snow b_bay1fd_rain b_bay2 | 0 | 129 | 3.3 | N |
| A1 | 123456789 | d_clouds b_bay4fd_cold b_bay3fd_snow b_bay2fd_rain b_bay1 | 0 | 7 | 0.2 | N |
| A1 | 123456789 | d_clouds b_bay4fd_snow b_bay1fd_rain b_bay3 | 0 | 1 | 0.0 | N |
| A1 | 123456789 | Omitted | 0 | 4 | 0.1 | N |
| A1 | 123456789 | d_clouds b_bay4fd_cold b_bay2fd_snow b_bay1fd_rain b_bay3 | 1 | 1586 | 40.7 | Y |

Figure 11. Grade 4 Scale Score Distribution

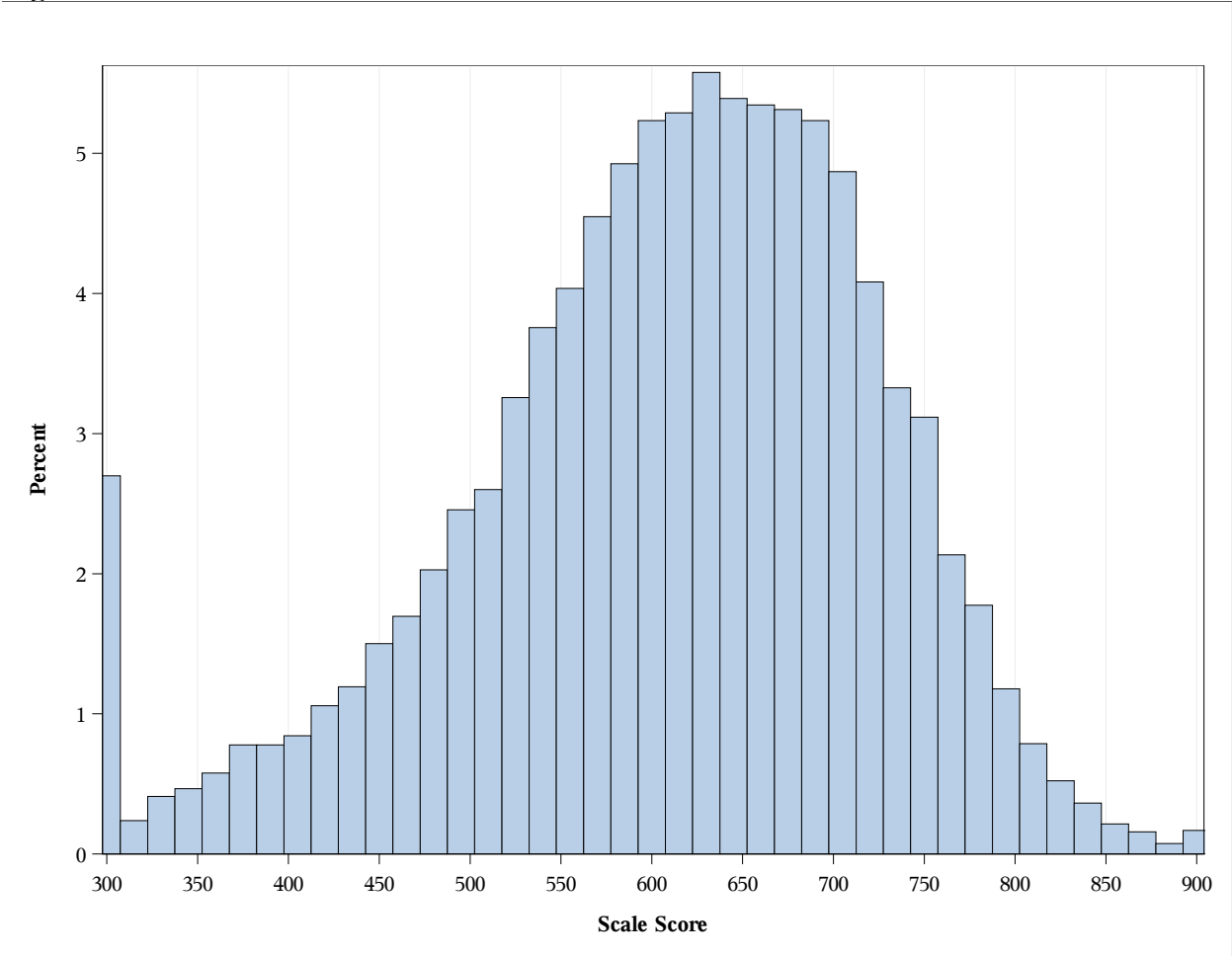


Figure 12. Grade 5 Scale Score Distribution

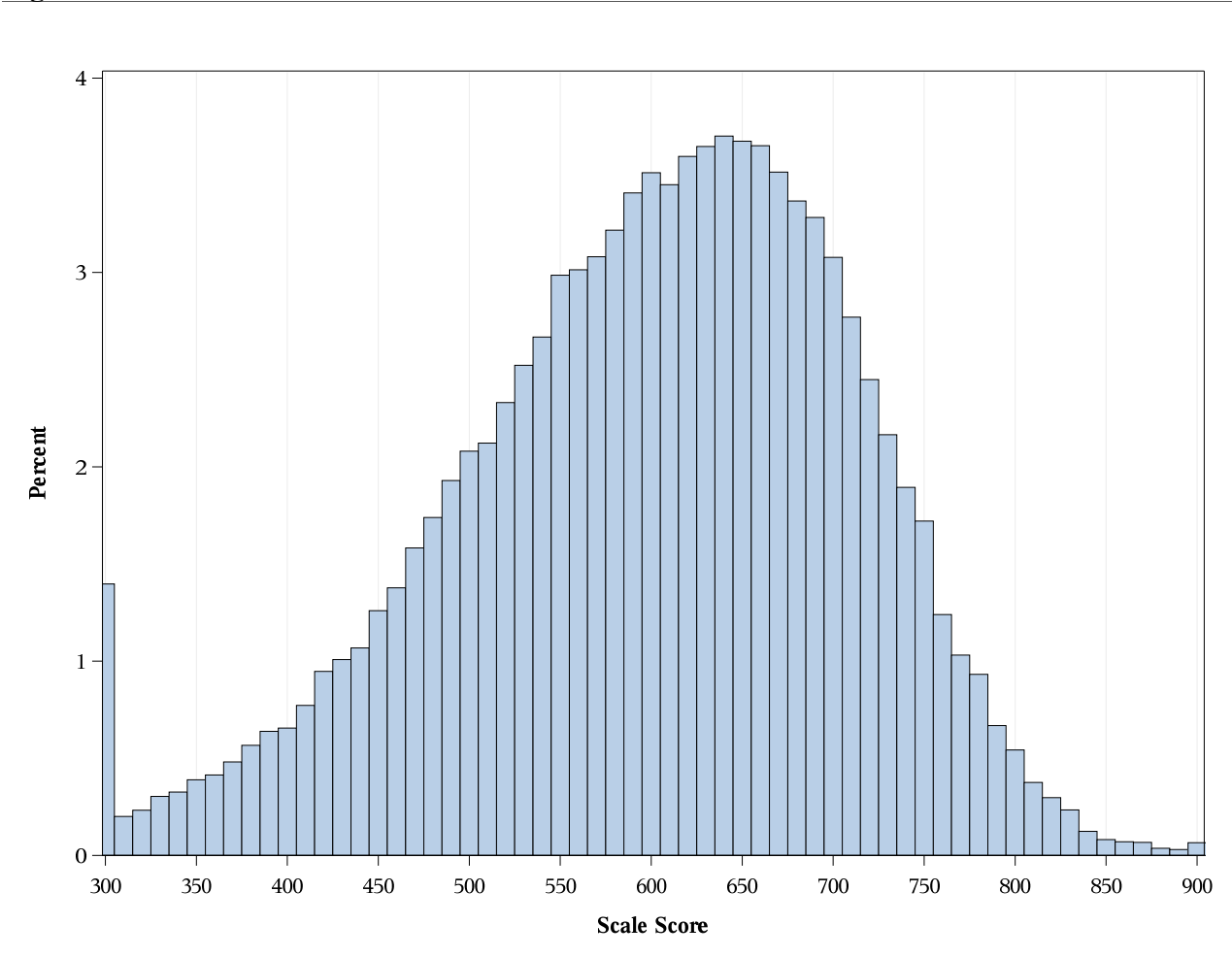


Figure 13. Grade 7 Scale Score Distribution

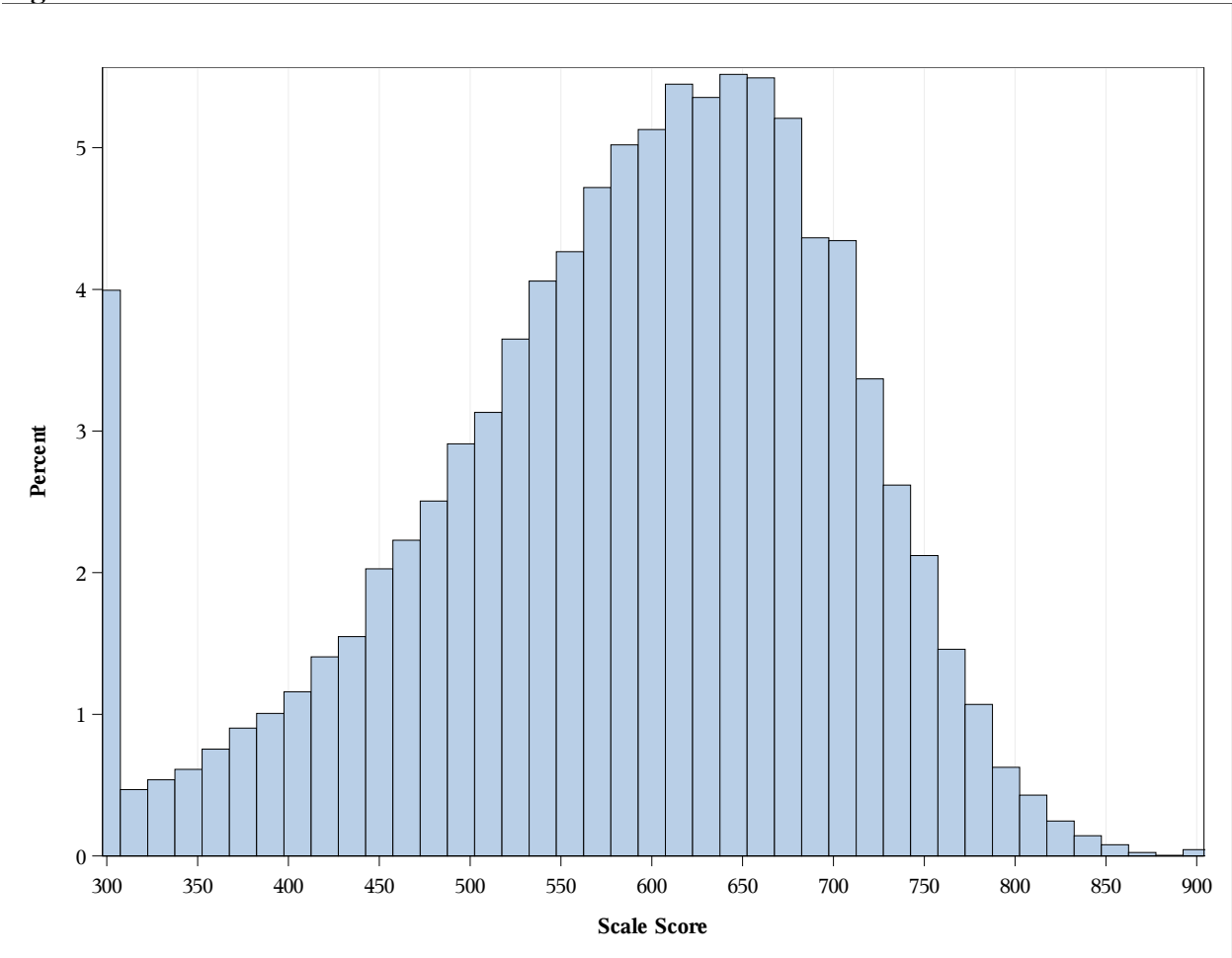


Figure 14. Grade 8 Scale Score Distribution

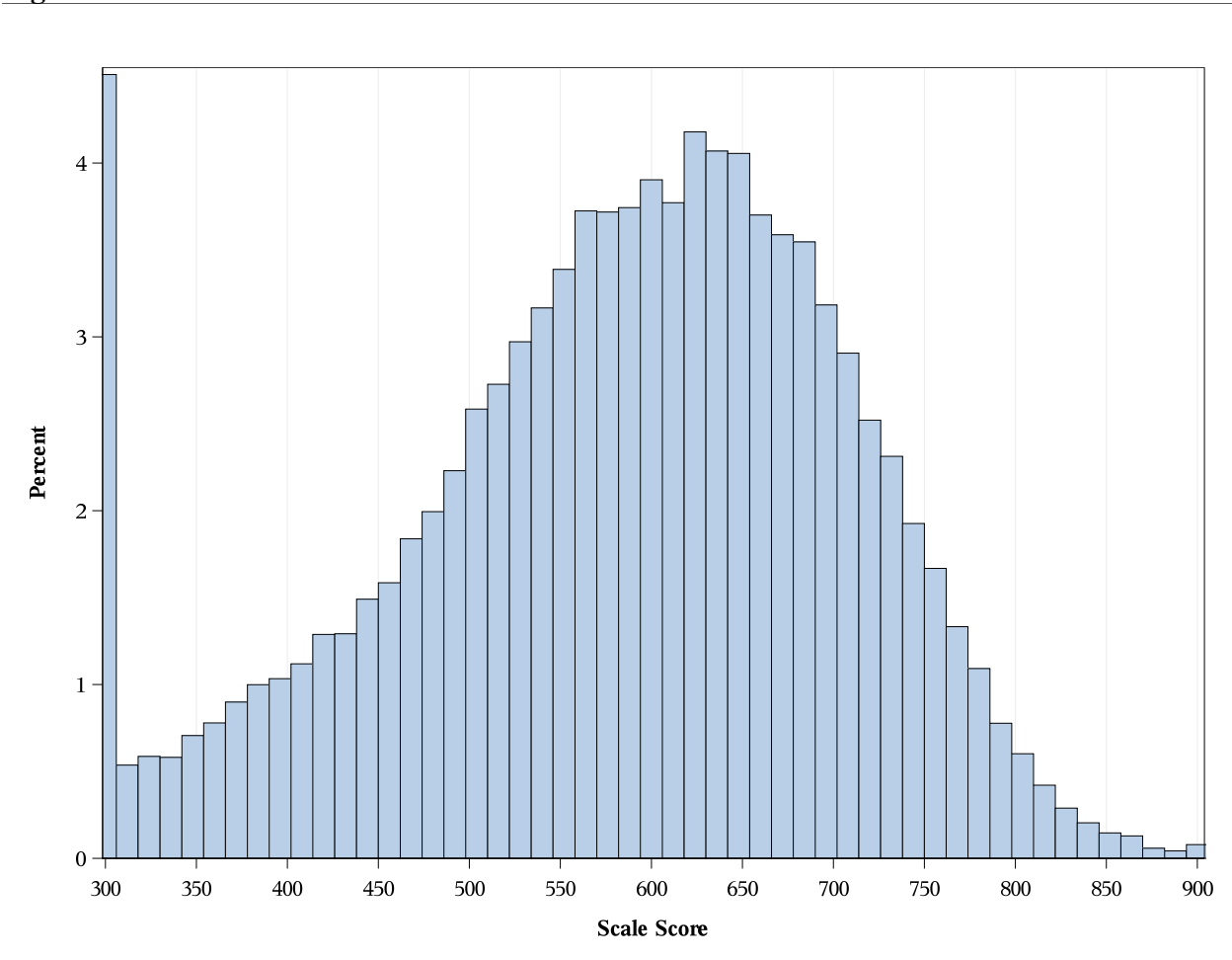


Figure 15. HS Science Scale Score Distribution

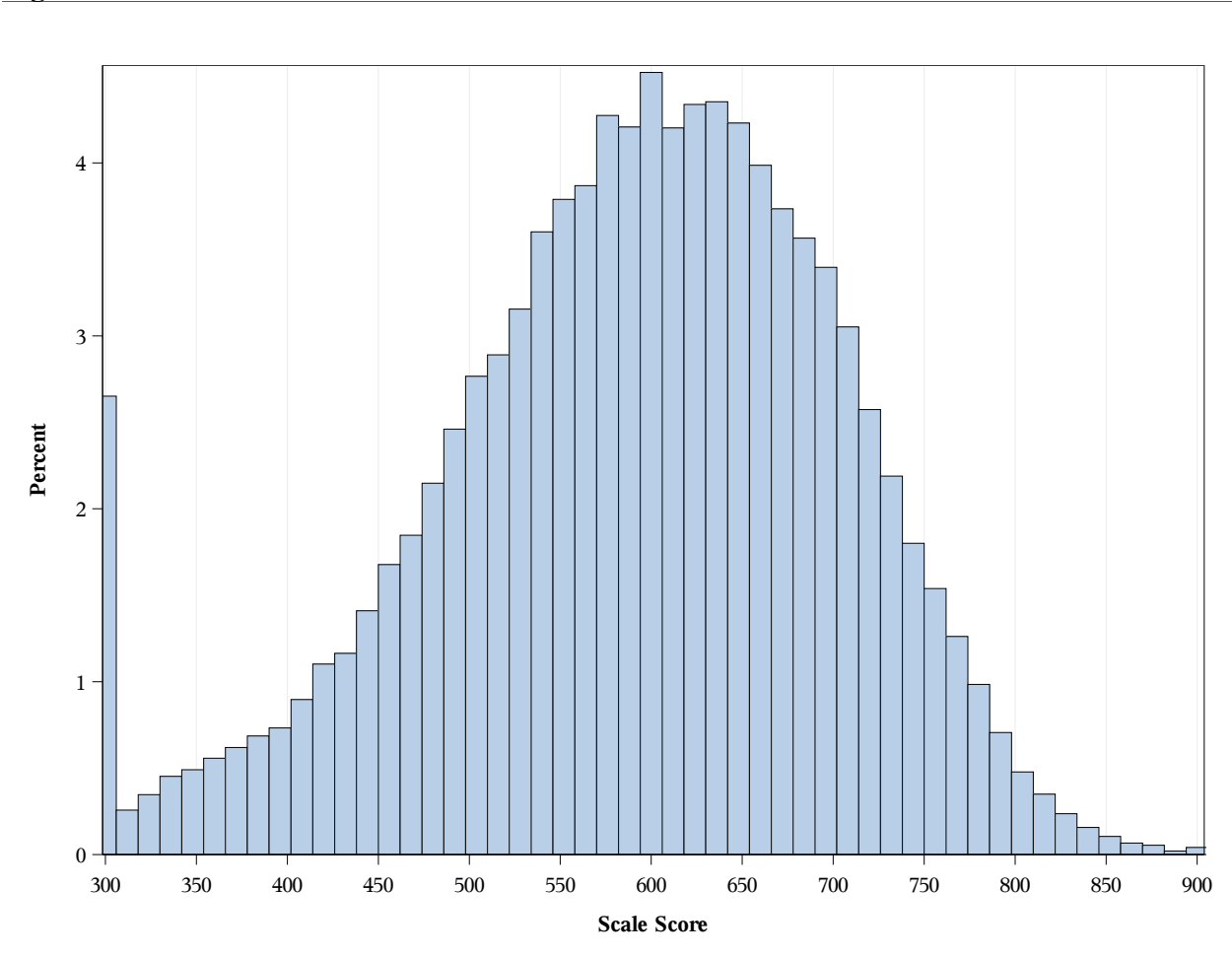


Figure 16. Grade 4 Scree Plot

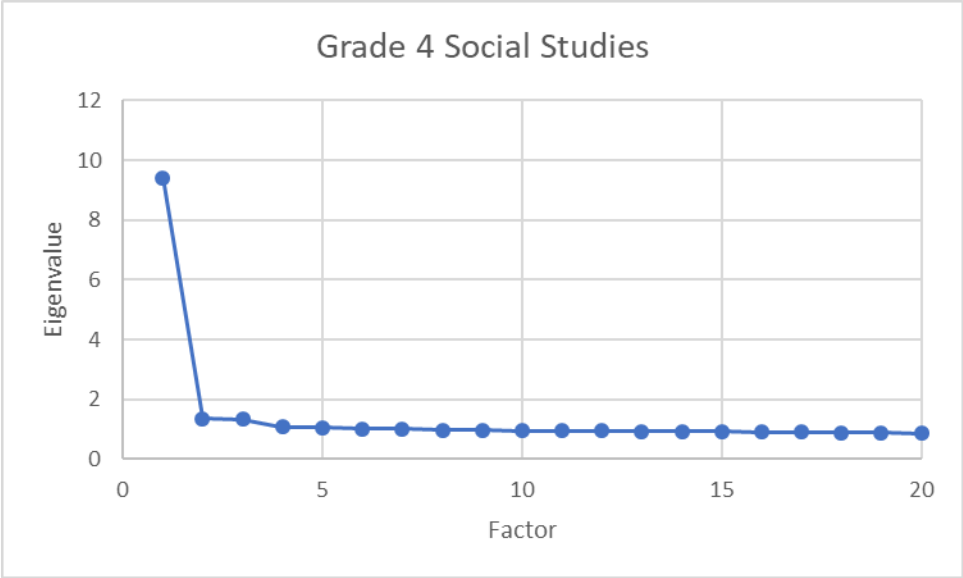


Figure 17. Grade 5 Scree Plot

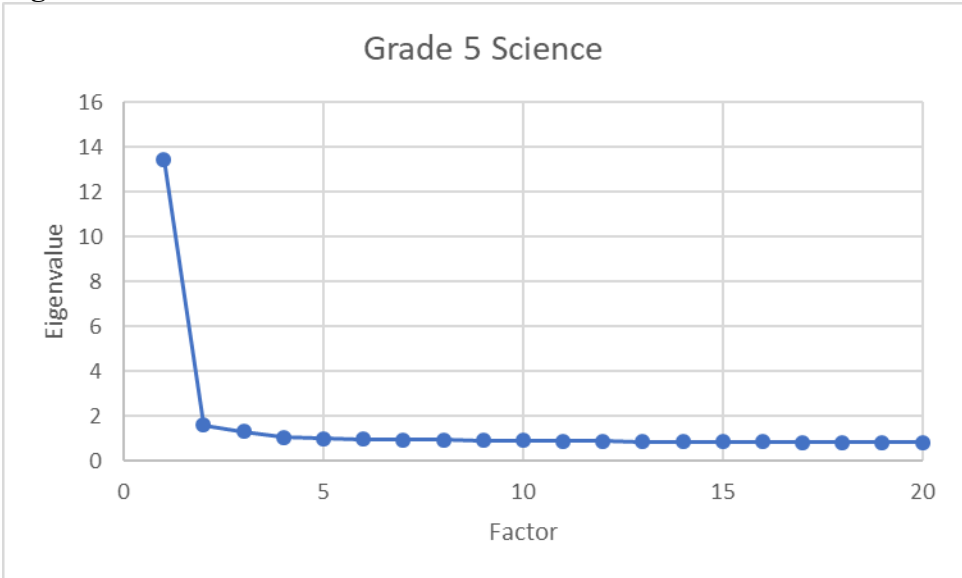


Figure 18. Grade 7 Scree Plot

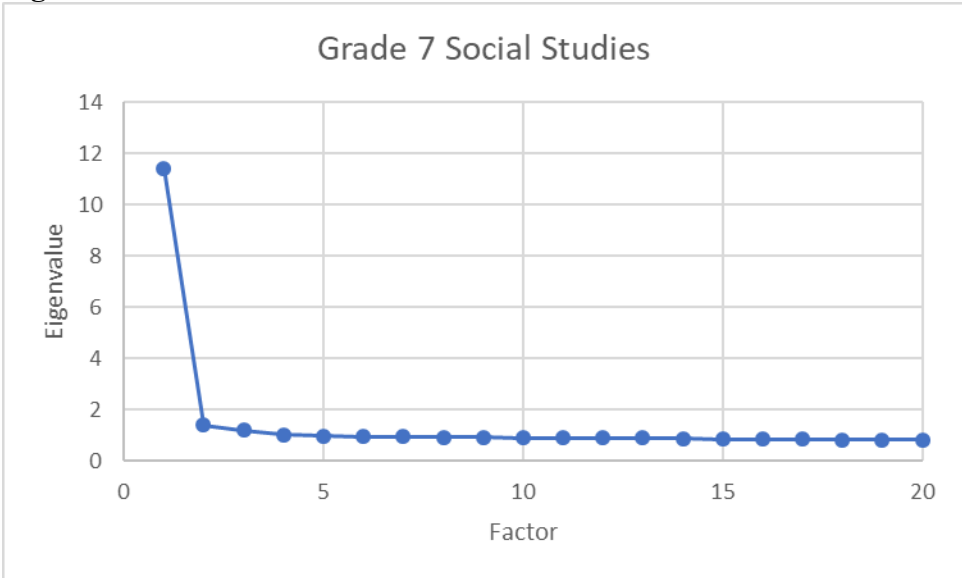


Figure 19. Grade 8 Scree Plot

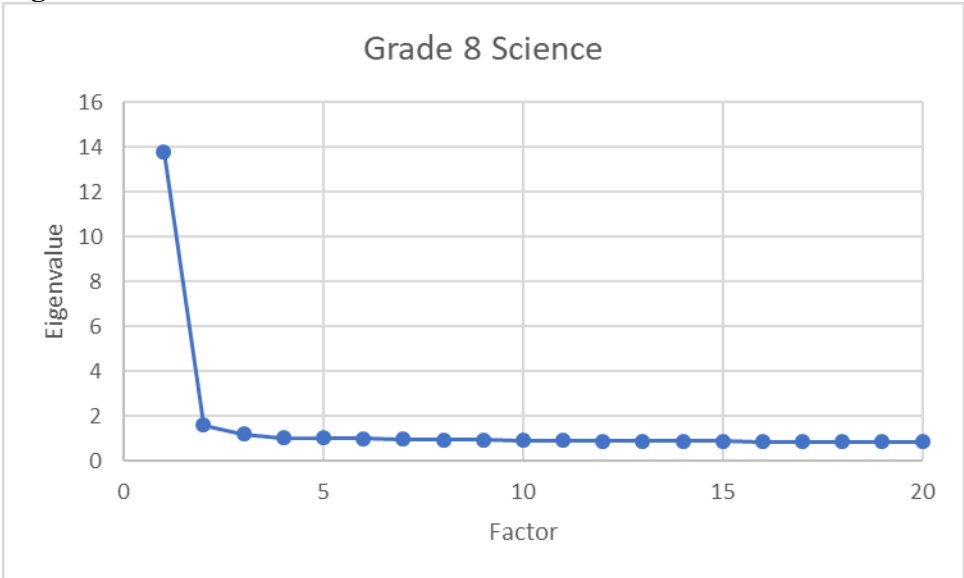


Figure 20. HS Science Scree Plot

