



**SOUTH DAKOTA**  
**Mathematics Standards Grade 8**  
***Mathematics: Applications and Concepts Course 3* © 2004**

| STANDARDS  | PAGE REFERENCES   |
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| <b>EIGHTH GRADE ALGEBRA STANDARDS</b>  |   |
| 1. apply properties of equalities and inequalities using algebraic techniques.                   | SE: 50-53, 56 #46-#58, 92-95, 110 #45-#49, 496-499, 500-504<br>TWE: A 53<br>DI 51, 500  |
| 2. use equalities and inequalities to life-related situations.                                   | SE: 48 #40-#41, 49 #42-#43, 51 ex 3, 53 #40-#44, 57 #29, 93 ex 5, 94 #9-#10, 110 #49, 497 ex 4, 499 #47                       |
| 3. use properties to justify the steps to expand, combine, or simplify polynomial expressions.   | SE: 570-573, 574-577, 578 #10-#17, 580-583, 587 #52-#54, 594 #12-#17<br>TWE: A 573, 577, 583<br>B 574                         |
| 4. analyze products of binomials using area models, e.g., $(x + 3)(x - 2)$ .                     | This objective is covered in Glencoe's <i>Algebra: Concepts and Applications</i> © 2004 on pages 399-404.                     |
| 5. analyze linear equations to create generalizations.   | SE: 517-520, 522-525<br><i>Hands-On Lab</i> 521<br>TWE: A 519<br>B 517<br>DI 518  |
| 6. solve and graph equations and inequalities.   | SE: 50-53, 56 #46-#58, 92-95, 110 #45-#49, 496-499, 500-504<br>TWE: A 53<br>DI 51, 500  |
| 7. represent solutions to open sentences and inequalities graphically.                           | SE: 493 ex 7-ex 8, 494 #24-#33, 495 #45, 498 #34-#45, 501 ex 2, 502 ex 4, 503 #12-#29, 506 #27-#28, 507 #14-#19<br>TWE: A 495 |
| 8. describe and represent relations from collected data using tables, graphs, and rules.         | SE: 517-520, 522-525<br><i>Hands-On Lab</i> 521<br>TWE: A 519<br>B 517<br>DI 518  |
| 9. solve multi-step linear equations using strategies involving inverse operations and integers. | SE: 474-477, 478-481, 484-487, 490 #10-#15<br><i>Hands-On Lab</i> 482-483<br>TWE: A 477<br>B 474, 484<br>DI 475, 485          |
| 10. determine slope from a graph, ordered pairs, or an equation.                                 | SE: 166-169, 173 #47, 174 #9-#11, 182 #23-#25, 199 #13-#15, 201 #7-#8, 526-529, 530 #11-#13<br>TWE: A 169<br>B 166            |

| STANDARDS  | PAGE REFERENCES   |
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| 11. identify x and y intercepts from an equation or graph.   | SE: 523 ex 2, 525 #27, 530 #14, 532 #7, 533 ex 1-ex 2, 535 #4-#6, 542 #25-#27, 553 #29-#34<br>TWE: A 525<br>DI 534                                  |
| 12. generalize the impact of coefficients and constants of linear equations.   | SE: 533-536<br><i>Graphing Calculator Investigation</i> 532<br>TWE: A 536   |
| 13. identify various phenomena that represents different families of graphs.   | SE: 533-536<br><i>Graphing Calculator Investigation</i> 532<br>TWE: A 536   |
| 14. solve word problems involving direct and inverse variation.  | This objective is covered in Glencoe's <i>Algebra: Concepts and Applications</i> © 2004 on pages 264-275.   |
| <b>EIGHTH GRADE GEOMETRY STANDARDS</b>   |   |
| 1. use given assumptions to determine properties of figures and relationships between figures.                         | SE: 279-282, 286-289, 294 #33-#37, 299 #20, 303 #22-#23, 307 #21-#24, 308 #25-#28<br>TWE: A 289<br>DI 280, 287                                      |
| 2. use visual perspectives to analyze geometric problems.  | SE: 332 ex 3, 333 #11-#12<br><i>Hands-On Lab</i> 346<br><i>Hands-On Mini Lab</i> 342  |
| 3. describe, classify, and construct plane and solid figures, e.g., prisms, pyramids, cylinders, and cones.            | SE: 272-275, 282 #27-#29, 284 #1-#2, 307 #19-#20, 308 #8-#10<br><i>The Game Zone</i> 285<br><i>Key Concept</i> 263<br>TWE: A 275<br>B 272<br>DI 273 |
| 4. use the Pythagorean Theorem to solve problems.  | SE: 132-136, 137-140, 145 #28-#30, 147 #31-#36, 148 #39-#41, 149 #12-#13, 150 #7<br>TWE: A 136<br>B 137<br>DI 138                                   |
| 5. use various geometric properties, formulas, and relationships to solve problems involving three-dimensional shapes. | SE: 335-339, 340 #9-#10, 342-345, 347-351, 352-355, 365 #24-#26<br>TWE: A 338, 344, 350<br>DI 343   |
| 6. use given top, side, or bottom views of objects to construct three-dimensional models.                              | SE: 332 ex 3, 333 #11-#12   |
| 7. construct three-dimensional figures from two-dimensional views.   | SE: <i>Hands-On Lab</i> 346<br><i>Hands-On Mini Lab</i> 342   |
| 8. develop two-dimensional representations that demonstrate various perspectives of three-dimensional objects.         | SE: 332 ex 3, 333 #11-#12<br><i>Hands-On Lab</i> 346<br><i>Hands-On Mini Lab</i> 342  |
| 9. determine volume and surface area of three-dimensional models.  | SE: 335-339, 340 #9-#10, 342-345, 347-351, 352-355, 365 #24-#26<br>TWE: A 338, 344, 350<br>DI 343   |

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| <b>EIGHTH GRADE MEASUREMENT STANDARDS</b>  |   |
| 1. apply proportional reasoning to solve measurement problems.   | SE: 156-159, 170-173, 174 #12-#14, 182 #22, 184-187, 191 #21-#24, 197 #29<br>TWE: A 173, 187<br>DI 185                      |
| 2. design procedures for measuring various attributes of complex figures.  | SE: 326-329, 337 ex 5, 338 #18-#21, 339 #39, 340 #5-#6, 345 #32, 364 #18-#21, 367 #8<br>TWE: A 329<br>DI 326                |
| 3. develop and use standard formulas for surface area and volume.  | SE: 335-339, 340 #9-#10, 342-345, 347-351, 352-355, 365 #24-#26<br>TWE: A 338, 344, 350<br>DI 343                           |
| 4. estimate and determine volume using standard and nonstandard units.   | SE: 335-339, 340 #9-#10, 342-345, 351 #35-#36, 355 #28, 362 #46, 365 #24-#29<br>TWE: A 344<br>B 335, 342                    |
| 5. use degrees as a unit of measure for angles and circle problems.  | SE: 256-260, 615  |
| 6. develop rules to use when converting between different measurement systems.   | SE: 604-605, 606-607, 648   |
| 7. use the most appropriate tool to measure volume in customary and metric systems.  | SE: 358-362, 366 #38-#45<br>TWE: B 358<br>DI 359  |
| 8. determine precision, accuracy, and measurement errors in a variety of situations.   | SE: 358-362, 366 #38-#45, 367 #13-#15, 377 #33-#36, 383 #31<br><i>Extra Practice Lesson 7-9 635</i><br>TWE: B 358<br>DI 359 |
| 9. apply mathematical techniques in situations that defy direct measurement, e.g., measuring the height of a tree, distance to the moon. | SE: 188-191, 197 #28, 200 #28-#29, 201 #16, 203 #15, 209 #52<br>TWE: A 191<br>B 188   |
| 10. solve problems involving two- and three-dimensional measurement situations in everyday contexts.                                     | SE: 339 #33-#36, 344 #1, 345 #24, 351 #23<br><i>Spreadsheet Investigation 356-357</i><br>TWE: A 338                         |
| 11. use volume and surface area formulas to solve problems.  | SE: 335-339, 340 #9-#10, 342-345, 347-351, 352-355, 365 #24-#26<br>TWE: A 338, 344, 350<br>DI 343                           |
| <b>EIGHTH GRADE NUMBER SENSE STANDARDS</b>   |   |
| 1. represent numbers in a variety of equivalent forms, e.g., radicals, absolute value.   | SE: 19-21, 62-66, 206-209, 210-215, 219 #42-#46<br>TWE: A 66, 209<br>B 62, 210<br>DI 206, 211                               |

| STANDARDS   | PAGE REFERENCES   |
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| 2. describe relationships between the subsets of the real number system.                                    | SE: 125, 126 ex 1-ex 3, 128 #17-#28, 129 #51, 130 #18-#23<br>TWE: A 129<br>B 125<br>DI 126                                  |
| 3. explain the use of irrational numbers, e.g., pi.   | SE: 121 #1, 122 #32-#33, 126 ex 4, 127 ex 5-ex 6, 128 #12-#14, 129 #34-#48, 136 #38-#39, 140 #25<br>TWE: DI 120             |
| 4. use concrete representations of real numbers in daily situations.  | SE: 23-27, 28-31, 34-38, 42 #35-#38, 55 #25-#34, 125-129<br>TWE: A 27, 31, 38<br>DI 29                                      |
| 5. simplify numerical expressions involving exponents.  | SE: 11-12, 14 #9, 98-101, 107 #46, 110 #50-#57, 111 #21-#22, 112 #7, 113 #17-#18, 116-119<br>TWE: A 101                     |
| 6. use proportions to solve scale-model problems with fractions and decimals.                               | SE: 156-159, 170-173, 174 #12-#14, 182 #22, 184-187, 191 #21-#24, 197 #29<br>TWE: A 173, 187<br>DI 185                      |
| 7. determine a relative position of a square root on a number line.   | SE: 120-124, 129 #54, 130 #12-#17, 136 #42, 147 #16-#24, 149 #6-#8, 150 #5, 151 #11<br>TWE: A 122<br>DI 120                 |
| 8. read, write, and compute within any subset of real numbers.  | SE: 23-27, 28-31, 34-38, 42 #35-#38, 55 #25-#34, 125-129<br>TWE: A 27, 31, 38<br>DI 29                                      |
| 9. read, write, and explain exponential notation.   | SE: 11-12, 14 #9, 98-101, 107 #46, 110 #50-#57, 111 #21-#22, 112 #7, 113 #17-#18, 116-119<br>TWE: A 101                     |
| 10. use estimation strategies to predict results and help solve multi-step problems involving real numbers. | SE: 120-122, 130 #12-#17, 136 #42, 147 #16-#24, 228-231, 235 #33, 248 #45-#50, 249 #10-#11, 600-601<br><i>Study Tip</i> 321 |
| 11. formulate rules to solve practical problems involving real numbers.                                     | SE: 14 #40, 15 #41-#42, 39-42, 51 ex 3, 73 ex 5, 241 ex 1, 242 ex 3, 243 #15-#16, 652 #16<br>TWE: A 42                      |
| 12. use properties to justify steps when simplifying expressions.   | SE: 469-473, 476 #1, 486 #1<br>TWE: A 473<br>DI 470   |
| 13. create algorithms to determine solutions for equations and inequalities.                                | SE: <i>Hands-On Lab</i> 482-483<br>TWE: A 477<br>DI 475   |
| 14. formulate counter-examples to disclaim given assertions.  | SE: 13 ex 5, 15 #51-#54, 21 #59-#61, 27 #45, 31 #46-#47, 38 #62-#64, 57 #1, 128 #1, 182 #18-#19                             |

| STANDARDS   | PAGE REFERENCES   |
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| 15. explain the magnitude of radicals, numbers expressed with exponents, and the absolute values of numbers.  | SE: 98-101, 104-107, 110 #58-#65, 111 #21-#24<br>TWE: A 101, 107<br>B 104<br>DI 99, 105<br>TNT 99                                     |
| 16. associate mathematical symbols with word names of real numbers.   | This objective is covered in Glencoe's <i>Algebra: Concepts and Applications</i> © 2004 on pages 600-605.                             |
| 17. explain the effects of operations on the magnitude of real numbers.   | SE: 26 #2, 37 #1<br><i>Key Concept</i> 23, 24, 28, 34, 35, 36<br><i>Teaching Tip</i> 35<br>TWE: DI 35<br>NS 37                        |
| <b>EIGHTH GRADE PATTERNS, RELATIONS, AND FUNCTIONS STANDARDS</b>  |   |
| 1. construct problems involving dependent and independent variables.  | SE: <i>Study Tip</i> 518  |
| 2. represent and interpret quantitative relationships graphically.  | SE: 522-525, 529 #32-#35, 530 #8-#10, 537-538, 539-542<br><i>Graphing Calculator Investigation</i> 543<br><i>Hands-On Lab</i> 521     |
| 3. understand the relationship of solutions in one variable, the x-intercept of the related linear equation in two variables, and the related situations from which each arise. | SE: 166-169, 522-525, 529 #27-#29, 533-536, 547 #39-#41<br><i>Spreadsheet Investigation</i> 165<br>TWE: A 536<br>B 166<br>DI 167, 523 |
| 4. create rules to explain the relationship between numbers when a change in the first variable affects the second variable.  | SE: 517-520, 524 #22, 555 #1<br>TWE: B 517  |
| 5. represent situations with patterns and relations to find exact or approximate solutions to problems.   | SE: 518 ex 4-ex 5, 520 #23-#24, 525 #23-#24, 530 #7, 534 ex 4-ex 6, 535 #10-#12, 536 #34-#36, 555 #15-#17<br>TWE: A 519               |
| 6. investigate and describe functional relationships of geometric figures.  | SE: <i>Hands-On Lab</i> 278   |
| 7. describe and represent relations using tables, graphs, and rules.  | SE: 512-515, 520 #29-#31, 525 #32, 530 #4-#6, 537, 552 #9-#13<br><i>Hands-On Lab</i> 516, 521<br>TWE: A 515<br>B 512                  |
| 8. create and solve problems using proportions, formulas, and functions.  | SE: 156-159, 170-173, 174 #12-#14, 182 #22, 184-187, 191 #21-#24, 197 #29<br>TWE: A 173, 187<br>DI 185                                |
| 9. identify, describe, represent, extend, and create exponential patterns, e.g., the accumulation of a unit of money (penny) over time.   | SE: 100 #41, 101 #42, 560-563, 649 #17  |
| 10. identify the special characteristics of relationships including maximum and minimum values.   | SE: 568 #32-#34   |

| STANDARDS  | PAGE REFERENCES   |
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| 11. differentiate between continuous and discrete functions.   | This objective is covered in Glencoe's <i>Advanced Mathematical Concepts: Precalculus with Applications</i> © 2004 on pages 159-168.      |
| 12. use exponential growth or decay to explore exponential functions.  | SE: 100 #41, 101 #42, 560-563, 649 #17  |
| 13. explain the concept of limit using various representations, e.g., $1 + \frac{1}{2} + \frac{1}{4} + \dots$                    | This objective is covered in Glencoe's <i>Algebra 2</i> © 2003 on page 593.   |
| <b>EIGHTH GRADE STATISTICS &amp; PROBABILITY STANDARDS</b>   |   |
| 1. explain impact of sampling bias on data and describe procedures for selecting unbiased samples.                               | SE: 406-409, 412 #46-#49, 413 #2, 414 #7<br>TWE: A 409<br>DI 407  |
| 2. create and solve problems involving the mean, median, mode and range of a set of data.  | SE: 435-438, 442-445, 449 #24, 459 #15-#21, 461 #7-#9, 656 #6-#7<br><i>Spreadsheet Investigation</i> 439<br>TWE: A 437<br>B 435<br>DI 436 |
| 3. consider effects on reliability of sampling procedures and of missing or incorrect information.                               | SE: 406-409, 412 #46-#49, 413 #2, 414 #7<br>TWE: A 409<br>DI 407  |
| 4. use a variety of visual representations to display data to make comparisons, predictions, and inferences.                     | SE: 424 #3, 428 #3<br><i>Spreadsheet Investigation</i> 439<br>TWE: A 429, 433   |
| 5. evaluate the validity of claims based on statistical data.  | SE: 406-409, 412 #46-#49, 413 #2, 414 #7<br>TWE: A 409<br>DI 407  |
| 6. establish appropriate sample spaces to apply principles of probability for simple and compound chance events.                 | SE: 400-403, 406-409, 412 #42-#45, 413 #17-#19<br>TWE: A 377, 399, 403<br>DI 375  |
| 7. express theoretical probability of experimental outcomes.   | SE: 400-403, 406-409, 412 #42-#45, 413 #17-#19<br>TWE: A 377, 399, 403<br>DI 375  |
| 8. estimate probability of simple and compound events using a series of trials.  | SE: 400-403, 406-409, 412 #42-#45, 413 #17-#19<br>TWE: A 377, 399, 403<br>DI 375  |
| 9. explain the difference between independent and dependent events and the impact on results in specific probability situations. | SE: 396-397, 398 #1, 413 #1<br>TWE: B 396<br>DI 397   |
| 10. determine and interpret the probability of a given event occurring from a given sample space.                                | SE: 400-403, 415 #15<br><i>Graphing Calculator Investigation</i> 404-405<br>TWE: A 403<br>DI 400  |

## Codes Used for TWE Pages

|     |                            |
|-----|----------------------------|
| A   | Assess                     |
| B   | Bellringer                 |
| DI  | Differentiated Instruction |
| NS  | Number Sense               |
| TNT | Tips for New Teachers      |