



OHIO
Mathematics Grade-Level Indicators
Grade Seven
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STANDARDS	PAGE REFERENCES
Number, Number Sense and Operations Standard	
<i>Number and Number Systems</i>	
1. Demonstrate an understanding of place value using powers of 10 and write large numbers in scientific notation.	SE: 153-157, 175, 178, 186-190, 194 #62, #64, 197 #21, 204, 733 TWE: A 190 DI 187 IE 187 OH14 #7
2. Explain the meaning of exponents that are negative or 0.	SE: 153-157, 181-185, 190 #49, 192, 194 #58-#65, 761 #10-#15 TWE: OH15 #3, #4
3. Describe differences between rational and irrational numbers; e.g., use technology to show that some numbers (rational) can be expressed as terminating or repeating decimals and others (irrational) as non-terminating and non-repeating decimals.	SE: 200-204, 205-209, 338, 441-445, 451, 484, 487 #1, 733, 745 <i>Algebra Activity</i> 465 <i>WebQuest</i> 145 TWE: A 204, 209, 445 DI 442 IE 442
<i>Meaning of Operations</i>	
4. Use order of operations and properties to simplify numerical expressions involving integers, fractions and decimals.	SE: 12-16, 23-27, 48, 52 #5, 147, 401, 464, 525 TWE: A 16, 157 IE 13, 154 OH12 #2, OH18 #1 PS 93
5. Explain the meaning and effect of adding, subtracting, multiplying and dividing integers; e.g., how adding two integers can result in a lesser value.	SE: 64-66, 70-74, 75-79, 80-84 <i>Algebra Activity</i> 62-63 TWE: OH10 #6
<i>Computation and Estimation</i>	
6. Simplify numerical expressions involving integers and use integers to solve real-life problems.	SE: 12-16, 21, 56, 60, 100 #10-#11, 155 #1 TWE: DI 18 OH13 #2
7. Solve problems using the appropriate form of a rational number (fraction, decimal or percent).	SE: 204 #49, 223 #49, 284 #51 <i>Algebra Activity</i> 237, 275 <i>Reading Mathematics</i> 269 <i>WebQuest</i> 144 TWE: IE 265, 271, 277, 294 OH8 #2, OH16 #1, OH17 #1, OH18 #1, OH19 #6, #7

STANDARDS	PAGE REFERENCES
8. Develop and analyze algorithms for computing with percents and integers, and demonstrate fluency in their use.	SE: 64-68, 70-74, 75-79, 80-84, 288-292, 293-297, 298-302 <i>Algebra Activity</i> 62-63, 286-287 <i>Spreadsheet Investigation</i> 303 <i>WebQuest</i> 144 TWE: OH19 #6, #7
9. Represent and solve problem situations that can be modeled by and solved using concepts of absolute value, exponents and square roots (for perfect squares).	SE: 56-61, 90, 143 #20, 153-157, 177 #12, 178 #41-#44, 186-190, 197 #21, 436-440, 451 #1, 483 TWE: A 440 DI 59, 437 IE 437 OH10 #5, OH13 #7, OH14 #7, OH15 #3, OH25 #7
Measurement Standard	
<i>Measurement Units</i>	
1. Select appropriate units for measuring derived measurements; e.g., miles per hour, revolutions per minute.	SE: 118 #48, 119 #50, 183 #13, 266-268, 378 #28 TWE: OH9 #2, OH12 #6, OH15 #6
2. Convert units of area and volume within the same measurement system using proportional reasoning and a reference table when appropriate; e.g., square feet to square yards, cubic meters to cubic centimeters.	SE: 397 #19, 566 #23-#25, 567 #28
<i>Use Measurement Techniques and Tools</i>	
3. Estimate a measurement to a greater degree of precision than the tool provides.	SE: 183 #13, 184 #44, 590-594, 598 <i>Reading Mathematics</i> 589 TWE: A 594 DI 591 IE 591
4. Solve problems involving proportional relationships and scale factors; e.g., scale models that require unit conversions within the same measurement system.	SE: 270-274, 276-280, 763 #13 <i>Algebra Activity</i> 275 TWE: A 280 GR 274 IE 271, 277 SC 277 OH20 #3
5. Analyze problem situations involving measurement concepts, select appropriate strategies, and use an organized approach to solve narrative and increasingly complex problems.	SE: 135 #35-#36, #42, 143 #20, 234 (eg.6) 276-280, 763 #6, 788 #7 <i>Geometry Activity</i> 583 <i>WebQuest</i> 433 TWE: DI 234, 278, 536, 540, 574, 580 OH14 #2, OH28 #2, #5, #6, OH29 #1, #4, #7
6. Use strategies to develop formulas for finding area of trapezoids and volume of cylinders and prisms.	SE: 520-525, 547, 563-567, 596, 767 #6 <i>Algebra Activity</i> 518-519 TWE: IE 522, 564, 565, 574 OH28 #6

STANDARDS	PAGE REFERENCES
7. Develop strategies to find the area of composite shapes using the areas of triangles, parallelograms, circles and sectors.	SE: 539-543, 548 <i>WebQuest</i> 433 TWE: DI 540 OH26 #1
8. Understand the difference between surface area and volume and demonstrate that two objects may have the same surface area, but different volumes or may have the same volume, but different surface areas.	SE: 157 #55-#57, 577 #24 <i>Geometry Activity</i> 583 TWE: DI 586 IE 575 OH29 #1
9. Describe what happens to the surface area and volume of a three- dimensional object when the measurements of the object are changed; e.g., length of sides are doubled.	SE: 572 #26, 577 #23 <i>Geometry Activity</i> 583 TWE: OH28 #2
Geometry and Spatial Sense Standard	
<i>Characteristics and Properties</i>	
1. Use proportional reasoning to describe and express relationships between parts and attributes of similar and congruent figures.	SE: 471-475, 486, 500-504, 545 <i>WebQuest</i> 433 TWE: DI 473 IE 472, 473, 501 OH29 #5 TT 475
2. Determine sufficient (not necessarily minimal) properties that define a specific two-dimensional figure or three-dimensional object. For example: a. Determine when one set of figures is a subset of another; e.g., all squares are rectangles. b. Develop a set of properties that eliminates all but the desired figure; e.g., only squares are quadrilaterals with all sides congruent and all angles congruent.	SE: 471-472, 500-504, 513-515, 556-561, 584-588 <i>Geometry Activity</i> 554-555, 583 TWE: DI 501, 502 ELL 490F OH27 #6 PS 599
3. Use and demonstrate understanding of the properties of triangles. For example: a. Use Pythagorean Theorem to solve problems involving right triangles. b. Use triangle angle sum relationships to solve problems.	SE: 460-464, 471-475, 500-504 <i>Algebra Activity</i> 458-459 TWE: IE 461 OH24 #1, OH26 #6
4. Determine necessary conditions for congruence of triangles.	SE: 500-504 TWE: DI 502 ELL 490F IE 501
5. Apply properties of congruent or similar triangles to solve problems involving missing lengths and angle measures.	SE: 453-547, 471-475, 477-481, 488 #11, 500-504, 551 #17 TWE: IE 472 OH29 #5, OH31 #2

STANDARDS	PAGE REFERENCES
<i>Spatial Relationships</i>	
6. Determine and use scale factors for similar figures to solve problems using proportional reasoning.	SE: 471-475, 486 #34-#35, 584-588 <i>Geometry Activity</i> 583 TWE: A 476 DI 472 IE 472 PS 599 OH31 #2
<i>Transformations and Symmetry</i>	
7. Identify the line and rotation symmetries of two-dimensional figures to solve problems.	SE: 506-511, 560 #26, 686 #42, #43 <i>Algebra Activity</i> 505 TWE: DI 472, 508 TNT 561
8. Perform translations, reflections, rotations and dilations of two-dimensional figures using a variety of methods (paper folding, tracing, graph paper).	SE: 506-511, 545, 546, 686 #42, #43 <i>Algebra Activity</i> 512, 532, 551 #20 TWE: DI 508 OH26 #5 TT 475
<i>Visualization and Geometric Models</i>	
9. Draw representations of three-dimensional geometric objects from different views.	SE: 560 #18-#21 <i>Geometry Activity</i> 554-555 <i>Online Research</i> 587 TWE: TNT 561
Patterns, Functions and Algebra Standard	
<i>Use Patterns, Relations and Functions</i>	
1. Represent and analyze patterns, rules and functions with words, tables, graphs and simple variable expressions.	SE: 9, 47, 75, 167 #53, 177 #1, 249-252, 369-373, 393-397, 398-401, 406 <i>Algebra Activity</i> 253, 368 <i>Graphing Calculator Investigation</i> 374, 402-403 TWE: DI 385 IE 35, 399 OH15 #3, OH17 #7, OH23 #4, OH32 #4
2. Generalize patterns by describing in words how to find the next term.	SE: 7, 9, 47, 52 #1, 249-252, 258 #78-#81, 268 #54, #55 <i>Algebra Activity</i> 253 TWE: DI 8 IE 7, 250 OH16 #1
3. Recognize and explain when numerical patterns are linear or nonlinear progressions; e.g., 1, 3, 5, 7... is linear and 1, 3, 4, 8, 16... is nonlinear.	Numerical patterns are presented on pages SE: 7, 9, 16, 21, 27 Linear and nonlinear references are used on pages SE: 687-691, 700 #41-#43, 757 TWE: DI 688 IE 688, 689
<i>Use Algebraic Representations</i>	
4. Create visual representations of equation-solving processes that model the use of inverse operations.	The following pages could all use a visual representation in the solving process. SE: 110-114, 121, 215, 258, 440 #61-#62

STANDARDS	PAGE REFERENCES
5. Represent linear equations by plotting points in the coordinate plane.	SE: 375-377, 381-385, 404-408, 428 TWE: IE 382, 405
6. Represent inequalities on a number line or a coordinate plane.	SE: 340-344, 347 #3, 348 #31-#42, 352, 355-356, 362, 419-422, 425, 428, 430 #9, 765 #15-#17 <i>Graphing Calculator Investigation</i> 423 TWE: IE 342, 351, 420 OH20 #2
7. Justify that two forms of an algebraic expression are equivalent, and recognize when an expression is simplified; e.g., $4m = m + m + m + m$ or $a \cdot 5 + 4 = 5a + 4$.	SE: 17-21, 32, 38, 98-102, 103-107, 760 #2 TWE: DI 105 IE 99 OH12 #2, OH13 #4, OH32 #1
8. Use formulas in problem-solving situations.	SE: 73 #54, 83 #34-#36, 131-134, 212 #12, 261 #15, 378 #28-#29, 445 #66, 760 #16-#17, 761 #3 <i>Algebra Activity</i> 458-459 TWE: OH25 #7
9. Recognize a variety of uses for variables; e.g., placeholder for an unknown quantity in an equation, generalization for a pattern, formula.	SE: 17-21, 28-32, 73 #54, 75, 82, 83 #34-#36, 116, 131-134 TWE: PS 321
Analyze Change	
10. Analyze linear and simple nonlinear relationships to explain how a change in one variable results in the change of another.	SE: 393-397, 414-418, 426, 687-691, 700, 701, 743, 757 <i>Algebra Activity</i> 392
11. Use graphing calculators or computers to analyze change; e.g., distance-time relationships.	SE: <i>Algebra Activity</i> 368 <i>Graphing Calculator Investigation</i> 374, 402-403 <i>Online Research</i> 396 TWE: A 403 ELL 366F
Data Analysis and Probability Standard	
Data Collection	
1. Read, create and interpret box-and-whisker plots, stem-and-leaf plots, and other types of graphs, when appropriate.	SE: 40-43, 50, 53 #18, 606-611, 617-621, 633 #15, 658, 659, 722-723 <i>Algebra Activity</i> 39 <i>Graphing Calculator Investigation</i> 45-46, 622, 629 <i>WebQuest</i> 603 TWE: DI 611 IE 607, 608 OH9 #1, OH10 #1
2. Analyze how decisions about graphing affect the graphical representation; e.g., scale, size of classes in a histogram, number of categories in a circle graph.	SE: 279 #8-#17, 430 #6, 447, 537 #32-#33, 451, 623-628, 660, 761 #6 <i>Algebra Activity</i> 308 <i>Online Research</i> 114 <i>WebQuest</i> 136, 325 TWE: OH19 #6, OH30 #1

STANDARDS	PAGE REFERENCES
<i>Statistical Methods</i>	
3. Analyze a set of data by using and comparing combinations of measures of center (mean, mode, median) and measures of spread (range, quartile, interquartile range), and describe how the inclusion or exclusion of outliers affects those measures.	SE: 82, 238-242, 261 #23, 612-616, 735, 788 #9 <i>Graphing Calculator Investigation</i> 243, 622 <i>WebQuest</i> 242 TWE: DI 613 IE 239-240 OH30 #4
4. Construct opposing arguments based on analysis of the same data, using different graphical representations.	SE: <i>Algebra Activity</i> 237, 309 <i>Online Research</i> 229 <i>WebQuest</i> 325, 412, 422
5. Compare data from two or more samples to determine how sample selection can influence results.	SE: <i>Algebra Activity</i> 309 <i>Online Research</i> 68, 114, 229, 267 <i>WebQuest</i> 3, 325, 603
6. Identify misuses of statistical data in articles, advertisements, and other media.	SE: 630-633 <i>Algebra Activity</i> 309 <i>Reading Mathematics</i> 634 <i>WebQuest</i> 3, 145 TWE: A 44, 633 DI 632 IE 631
<i>Probability</i>	
7. Compute probabilities of compound events; e.g., multiple coin tosses or multiple rolls of number cubes, using such methods as organized lists, tree diagrams and area models.	SE: 650-655, 662, 663, 665 #21 <i>Algebra Activity</i> 656-657 <i>Graphing Calculator Investigation</i> 315 TWE: IE 651
8. Make predictions based on theoretical probabilities, design and conduct an experiment to test the predictions, compare actual results to predicted results, and explain differences.	SE: 310-314, 320, 333 #42, 338 #45 TWE: OH18 #7, OH19 #1, OH23 #7

Codes Used for TWE Pages

A	Assess
DI	Daily Intervention
ELL	English Language Learners
IE	In-Class Example
GR	Getting Ready
OH	Ohio Countdown to OGT
PS	Portfolio Suggestion
SC	Skills Check
TNT	Tips for New Teachers
TT	Teacher to Teacher