

**GLENCOE CORRELATION**  
**MATHEMATICS: APPLICATIONS AND CONCEPTS COURSE 3**  
**OHIO**  
**Mathematics Grade-Level Indicators**  
**Grade Eight**

STANDARDS	PAGE REFERENCES
<b>Number, Number Sense and Operations Standard</b>	
<i>Number and Number Systems</i>	
1. Use scientific notation to express large numbers and small numbers between 0 and 1.	SE: 104-107 TWE: ICE 105
2. Recognize that natural numbers, whole numbers, integers, rational numbers and irrational numbers are subsets of the real number system.	SE: 125-129 TWE: B 125 ICE 126 OEA 129
<i>Meaning of Operations</i>	
3. Apply order of operations to simplify expressions and perform computations involving integer exponents and radicals.	SE: 11-15, 36-38, 99-100 TWE: ICE 12, 36, 99
4. Explain and use the inverse and identity properties and use inverse relationships (addition/subtraction, multiplication/division, squaring/square roots) in problem solving situations.	SE: 13-15, 25-26, 45-49, 50-53 TWE: ICE 13, 46, 51 OEA 49
<i>Computation and Estimation</i>	
5. Determine when an estimate is sufficient and when an exact answer is needed in problem situations, and evaluate estimates in relation to actual answers; e.g., very close, less than, greater than.	SE: 120-122, 226-227, 228-229, 320-323 TWE: ICE 226, 229 NS 230 OEA 227
6. Estimate, compute and solve problems involving rational numbers, including ratio, proportion and percent, and judge the reasonableness of solutions.	SE: 210-214, 216-219, 220-223, 226-227, 228-231, 232-235, 236-240, 241-244 TWE: ICE 217, 229
7. Find the square root of perfect squares, and approximate the square root of non-perfect squares as consecutive integers between which the root lies; e.g., $\sqrt{130}$ is between 11 and 12.	SE: 116-119, 120-122, 125-129 TWE: ICE 117, 121, 126-127
8. Add, subtract, multiply, divide and compare numbers written in scientific notation.	SE: 104-105 TWE: DI 105 ICE 105
<b>Measurement Standard</b>	
<i>Measurement Units</i>	
1. Compare and order the relative size of common U.S. customary units and metric units; e.g., mile and kilometer, gallon and liter, pound and kilogram.	Measurements are converted within the U.S. Customary System or Metric System. SE: <i>Prerequisite Skills</i> 604-605, 606-607

STANDARDS	PAGE REFERENCES
2. Use proportional relationships and formulas to convert units from one measurement system to another; e.g., degrees Fahrenheit to degrees Celsius.	Measurements are converted within the U.S. Customary System or Metric System. SE: <i>Prerequisite Skills</i> 604-605, 606-607
<i>Use Measurement Techniques and Tools</i>	
3. Use appropriate levels of precision when calculating with measurements.	SE: 358-362 TWE: ICE 359 TNT 360
4. Derive formulas for surface area and volume and justify them using geometric models and common materials. For example, find: a. the surface area of a cylinder as a function of its height and radius; b. that the volume of a pyramid (or cone) is one-third of the volume of a prism (or cylinder) with the same base area and height.	SE: 335-339, 342-345, 347-351, 352-355 TWE: B 335, 347 ICE 350
5. Determine surface area for pyramids by analyzing their parts.	SE: 352-355, 367 #11
6. Solve and determine the reasonableness of the results for problems involving rates and derived measurements, such as velocity and density, using formulas, models and graphs.	SE: 156-159, 160-164, 166-169 TWE: B 160 ICE 157, 167 TNT 157
7. Apply proportional reasoning to solve problems involving indirect measurements or rates.	SE: 160-164, 170-173, 178-182, 184-187, 188-191, 194-197 TWE: ICE 171, 179-180, 185, 189
8. Find the sum of the interior and exterior angles of regular convex polygons with and without measuring the angles with a protractor.	SE: 262-265, 272-275 <i>Hands-On Lab</i> 278 TWE: ICE 263, 273
9. Demonstrate understanding of the concepts of perimeter, circumference and area by using established formulas for triangles, quadrilaterals, and circles to determine the surface area and volume of prisms, pyramids, cylinders, spheres and cones. (Note: Only volume should be calculated for spheres and cones.)	SE: 101 #43, 180, 314-318, 319-323, 326-329, 335-339, 342-345, 347-351, 352-355 <i>Prerequisite Skills</i> 613
10. Use conventional formulas to find the surface area and volume of prisms, pyramids and cylinders and the volume of spheres and cones to a specified level of precision.	SE: 101 #43, 335-339, 342-345, 347-351, 352-355 TWE: A 344 ICE 336-337, 343, 348-349, 353
<b>Geometry and Spatial Sense Standard</b>	
<i>Characteristics and Properties</i>	
1. Make and test conjectures about characteristics and properties (e.g., sides, angles, symmetry) of two-dimensional figures and three-dimensional objects.	SE: 178-182, 256-260, 262-265, 272-275, 286-289 <i>Hands-On Lab</i> 261, 278

STANDARDS	PAGE REFERENCES
2. Recognize the angles formed and the relationship between the angles when two lines intersect and when parallel lines are cut by a transversal.	SE: 257-260 TWE: A 259 ICE 258
3. Use proportions in several forms to solve problems involving similar figures (part-to-part, part-to-whole, corresponding sides between figures).	SE: 178-182, 184-187, 188-191 <i>Spreadsheet Investigation</i> 356-357 TWE: ICE 180, 185, 189
<i>Spatial Relationships</i>	
4. Represent and analyze shapes using coordinate geometry; e.g., given three vertices and the type of quadrilateral, find the coordinates of the fourth vertex.	SE: 194-197, 290-294, 296-299, 301-303 TWE: ICE 195, 291, 297, 301
<i>Transformations and Symmetry</i>	
5. Draw the results of translations, reflections, rotations and dilations of objects in the coordinate plane, and determine properties that remain fixed; e.g., lengths of sides remain the same under translations.	SE: 194-197, 290-294, 296-299, 301-303 TWE: B 194, 290 ICE 195, 291, 297, 301
<i>Visualization and Geometric Models</i>	
6. Draw nets for a variety of prisms, pyramids, cylinders and cones.	SE: 194-197, 290-294, 296-299, 301-303 TWE: B 194, 290 ICE 195, 291, 297, 301
<b>Patterns, Functions and Algebra Standard</b>	
<i>Use Patterns, Relations and Functions</i>	
1. Relate the various representations of a relationship; i.e., relate a table to graph, description and symbolic form.	SE: 517-520, 522-525, 526-529, 533-536, 544-547, 560-563, 565-568 TWE: ICE 518, 523, 534
2. Generalize patterns and sequences by describing how to find the $n$ th term.	Patterns and sequences are recognized and extended. SE: 512-515 <i>Hands-On Lab</i> 516 TWE: B 512 ICE 513
3. Identify functions as linear or nonlinear based on information given in a table, graph or equation.	SE: 517-520, 522-525, 526-529, 560-563, 565-568 TWE: A 563 B 560 DI 560 ICE 523, 561, 566-567
<i>Use Algebraic Representations</i>	
4. Extend the uses of variables to include covariants where $y$ depends on $x$ .	TWE: B 517 DI 565
5. Use physical models to add and subtract monomials and polynomials, and to multiply a polynomial by a monomial.	SE: 570-573, 574-577, 580-583, 590-592 TWE: OEA 573

STANDARDS	PAGE REFERENCES
6. Describe the relationship between the graph of a line and its equation, including being able to explain the meaning of slope as a constant rate of change and $y$ -intercept in real-world problems.	SE: 166-169, 522-525, 526-529, 533-536 TWE: A 525 ICE 167, 523, 534
7. Use symbolic algebra (equations and inequalities), graphs and tables to represent situations and solve problems.	SE: 92-95, 188-191, 232-235, 478-481, 484-487, 492-495, 500-504, 522-525, 565-568 <i>Problem-Solving Strategy</i> 537-538
8. Write, simplify and evaluate algebraic expressions (including formulas) to generalize situations and solve problems.	SE: 11-15, 19-21, 29-31, 36-38, 39-42, 471-473 TWE: ICE 12, 19, 36, 40
9. Solve linear equations and inequalities graphically, symbolically and using technology.	SE: 534-536, 548-551 TWE: B 548 ICE 534, 549 OEA 551
10. Solve 2 by 2 systems of linear equations graphically and by simple substitution.	SE: 544-547 TWE: A 547 B 544 ICE 545
11. Interpret the meaning of the solution of a 2 by 2 system of equations; i.e., point, line, no solution.	SE: 544-545 TWE: B 544 ICE 545
12. Solve simple quadratic equations graphically; e.g., $y = x^2 - 16$ .	SE: 565-568 TWE: ICE 566-567 OEA 568
13. Compute and interpret slope, midpoint and distance given a set of ordered pairs.	SE: 142-145, 166-169, 526-529 TWE: ICE 143, 167, 527
<i>Analyze Change</i>	
14. Differentiate and explain types of changes in mathematical relationships, such as linear vs. nonlinear, continuous vs. noncontinuous, direct variation vs. inverse variation.	SE: 560-563, 565-568 TWE: ICE 561
15. Describe and compare how changes in an equation affects the related graphs; e.g., for a linear equation changing the coefficient of $x$ affects the slope and changing the constant affects the intercepts.	SE: <i>Graphing Calculator Investigation</i> 532, 564
16. Use graphing calculators or computers to analyze change; e.g., interest compounded over time as a nonlinear growth pattern.	SE: <i>Spreadsheet Investigation</i> 245
<b>Data Analysis and Probability Standard</b>	
<i>Data Collection</i>	
1. Use, create, and interpret scatterplots and other types of graphs as appropriate.	SE: 420-424, 426-429, 430-433, 446-449, 450-453, 539-542 <i>Graphing Calculator Investigation</i> 425 <i>Prerequisite Skills</i> 602-603 TWE: ICE 431, 540

<b>STANDARDS</b>	<b>PAGE REFERENCES</b>
2. Evaluate different graphical representations of the same data to determine which is the most appropriate representation for an identified purpose; e.g., line graph for change over time, circle graph for part-to-whole comparison, scatterplot for relationship between two variants.	SE: 430-433 <i>Prerequisite Skills</i> 602-603 TWE: A 433 B 430 ICE 431
3. Differentiate between discrete and continuous data and appropriate ways to represent each.	SE: 430-433 <i>Prerequisite Skills</i> 602-603
<i>Statistical Methods</i>	
4. Compare two sets of data using measures of center (mean, mode, median) and measures of spread (range, quartiles, interquartile range, percentiles).	SE: 435-438, 442-445, 447 TWE: ICE 436, 443
5. Explain the mean's sensitivity to extremes and its use in comparison with the median and mode.	SE: 435-438 TWE: ICE 436
6. Make conjectures about possible relationship in a scatterplot and approximate line of best fit.	SE: 539-542 TWE: DI 540 ICE 540
7. Identify different ways of selecting samples, such as survey response, random sample, representative sample and convenience sample.	SE: 406-409 TWE: ICE 407
8. Describe how the relative size of a sample compared to the target population affects the validity of predictions.	SE: 406-409
9. Construct convincing arguments based on analysis of data and interpretation of graphs.	SE: 420-424, 426-429, 450-453 TWE: ICE 421, 428, 451
<i>Probability</i>	
10. Calculate the number of possible outcomes for a situation, recognizing and accounting for when items may occur more than once or when order is important.	SE: 374-377, 378-379, 380-383, 384-387, 388-391 TWE: B 380 DI 385 ICE 375, 381, 385
11. Demonstrate an understanding that the probability of either of two disjoint events occurring can be found by adding the probabilities for each and that the probability of one independent event following another can be found by multiplying the probabilities.	SE: 396-399 TWE: A 399 ICE 397

### Codes Used for TWE Pages

A Assess  
B Bellringer  
DI Daily Intervention  
ICE In-Class Examples

NS Number Sense  
OEA Open-Ended Assessment  
TNT Tips for New Teachers