

**GLENCOE CORRELATION**  
**PRE-ALGEBRA**  
**OHIO**  
**Mathematics Benchmarks and Indicators**  
**Grade Eight**

BENCHMARKS AND INDICATORS	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: 186-190, 194 #64 TWE: DI 187 IE 187 OA 190
2. Recognize that natural numbers, whole numbers, integers, rational numbers and irrational numbers are subsets of the real number system.	SE: 441-445, 487 #1 TWE: DI 442 IE 442
<i>Meaning of Operations</i>	
3. Apply order of operations to simplify expressions and perform computations involving integer exponents and radicals.	SE: 153-157, 181-185 TWE: IE 154 OA 157
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: 12-16, 23-27, 49, 110, 115, 117, 121, 436 TWE: IE 24, 216
<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: 25-26, 29, 31, 82, 99, 127, 586, 684
6. Estimate, compute and solve problems involving rational numbers, including ratio, proportion and percent, and judge the reasonableness of solutions.	SE: 264-268, 270-274, 276-280 <i>Reading Mathematics</i> 269 <i>Algebra Activity</i> 275 TWE: IE 265, 271, 277
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: 436-440, 451 #1, 483 #11 TWE: IE 437 DI 437 OA 440
8. Add, subtract, multiply, divide and compare numbers written in scientific notation.	SE: 186-190, 194, 195 #26 TWE: DI 187 IE 187
<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.	SE: 214 #49-#53, 267 #40-#41, 397 #19, 718-719 TWE: DI 385

BENCHMARKS AND INDICATORS	PAGE REFERENCES
2. Use proportional relationships and formulas to convert units from one measurement system to another; e.g., degrees Fahrenheit to degrees Celsius.	SE: 118 #48, 168, 263, 272, 397 #19, 566 TWE: IE 272
<i>Use Measurement Techniques and Tools</i>	
3. Use appropriate levels of precision when calculating with measurements.	SE: 590-594, 598 <i>Reading Mathematics</i> 589 TWE: IE 591 DI 591 OA 594
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: 568, 570 #12, 571 #25, 573-575 <i>Geometry Activity</i> 562 TWE: DI 574, 580
5. Determine surface area for pyramids by analyzing their parts.	SE: 578, 580 TWE: DI 586
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: 264-268, 316, 321 #5 TWE: IE 265, 266
7. Apply proportional reasoning to solve problems involving indirect measurements or rates.	SE: 132-136, 472-473, 477-481, 539-543, 548, 520-525 <i>Spreadsheet Investigation</i> 137 <i>Algebra Activity</i> 518-519 <i>Geometry Activity</i> 583 TWE: IE 534-535, 540-541, 579-580
8. Find the sum of the interior and exterior angles of regular convex polygons with and without measuring the angles with a protractor.	SE: 528-531, 546 #19-#21, 547 #25-#27 TWE: IE 528, 529
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: 564, 567, 571, 575, 581 #20 TWE: IE 570, 575, 579
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: 563-567, 573-577 TWE: IE 564, 565, 574

BENCHMARKS AND INDICATORS	PAGE REFERENCES
<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: 445 #68, 453 e, 471-472, 500-504, 545 #15, 560 #2, 561 #26, 563 c, 587 #22 <i>Geometry Activity</i> 554-555, 583
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: 492-497 TWE: IE 493, 494 DI 496
3. Use proportions in several forms to solve problems involving similar figures (part-to-part, part-to-whole, corresponding sides between figures).	SE: 471-475, 486 TWE: DI 473 IE 472, 473
<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: 506, 508-510, 512, 686 TWE: IE 508
<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: 506-511, 512, 545-546, 686 #42, #43 <i>Algebra Activity</i> 532 TWE: DI 508
<i>Visualization and Geometric Models</i>	
6. Draw nets for a variety of prisms, pyramids, cylinders and cones.	SE: <i>Geometry Activity</i> 554-555, 574 Ex 2 TWE: DI 574 OA 582
<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: 387-391, 393-397, 398-401 <i>Algebra Activity</i> 386, 392 <i>Graphing Calculator Investigation</i> 402-403 TWE: IE 399
2. Generalize patterns and sequences by describing how to find the $n$ th term.	SE: 249-252, 258 #78-#81, 268 #54, #55 <i>Algebra Activity</i> 253 TWE: IE 250
3. Identify functions as linear or nonlinear based on information given in a table, graph or equation.	SE: 687-691, 700 #41-#43 TWE: DI 688 IE 688, 689
<i>Use Algebraic Representations</i>	
4. Extend the uses of variables to include covariants where $y$ depends on $x$ .	SE: 375-379, 394 TWE: IE 376, 394
5. Use physical models to add and subtract monomials and polynomials, and to multiply a polynomial by a monomial.	SE: 674-677, 683 <i>Algebra Activity</i> 673, 682 TWE: DI 684 OA 685

<b>BENCHMARKS AND INDICATORS</b>	<b>PAGE REFERENCES</b>
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: 387-391, 393-397, 429 #10 <i>Algebra Activity 286</i> TWE: DI 388 IE 389
7. Use symbolic algebra (equations and inequalities), graphs and tables to represent situations and solve problems.	SE: 98-99, 118, 358-359 TWE: IE 99, 111
8. Write, simplify and evaluate algebraic expressions (including formulas) to generalize situations and solve problems.	SE: 17-21, 32, 38, 213 <i>Spreadsheet Investigation 22</i> TWE: IE 18
9. Solve linear equations and inequalities graphically, symbolically and using technology.	SE: 419-422 <i>Graphing Calculator Investigation 423</i> TWE: DI 420 IE 420
10. Solve 2 by 2 systems of linear equations graphically and by simple substitution.	SE: 414-418, 422 #37-#39, 428 #47-#52 TWE: IE 415, 416
11. Interpret the meaning of the solution of a 2 by 2 system of equations; i.e., point, line, no solution.	SE: 414-418, 428 #47-#52 TWE: IE 415, 416
12. Solve simple quadratic equations graphically; e.g., $y = x^2 - 16$ .	SE: 692-696, 700 #44-#49 <i>Graphing Calculator Investigation 697</i> TWE: IE 693, 694 DI 695
13. Compute and interpret slope, midpoint and distance given a set of ordered pairs.	SE: 466-470, 485, 387-391 TWE: IE 388, 467, 468
<b>Analyze Change</b>	
14. Differentiate and explain types of changes in mathematical relationships, such as linear vs. nonlinear, continuous vs. noncontinuous, direct variation vs. inverse variation.	SE: 687-691, 700 TWE: IE 688, 689 DI 688
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: 393-397, 398-401 <i>Graphing Calculator Investigation 402-403</i>
16. Use graphing calculators or computers to analyze change; e.g., interest compounded over time as a nonlinear growth pattern.	SE: 396 #13 <i>Spreadsheet Investigation 137, 303</i> <i>Graphing Calculator Investigation 374, 402, 403, 697</i>
<b>Data Analysis and Probability Standard</b>	
<b>Data Collection</b>	
1. Use, create and interpret scatterplots and other types of graphs as appropriate.	SE: 40-44, 708, 722-723 <i>Graphing Calculator Investigation 45-46</i> TWE: IE 41-42, 607-608

<b>BENCHMARKS AND INDICATORS</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: 40-44, 409-413, 722-723 <i>Algebra Activity</i> 237, 309 <i>Spreadsheet Investigation</i> 452 <i>WebQuest</i> 696
3. Differentiate between discrete and continuous data and appropriate ways to represent each.	TWE: TT 385
<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: 82, 238-242, 606-611, 735 <i>Graphing Calculator Investigation</i> 243 TWE: IE 239-240
5. Explain the mean's sensitivity to extremes and its use in comparison with the median and mode.	SE: 239, 241 #7, 261 #23 <i>Graphing Calculator Investigation</i> 243 TWE: IE 239
6. Make conjectures about possible relationship in a scatterplot and approximate line of best fit.	SE: 409-413, 427 #45-#46 TWE: IE 410 DI 412
7. Identify different ways of selecting samples, such as survey response, random sample, representative sample and convenience sample.	SE: 650-655 <i>Algebra Activity</i> 39, 237, 253, 656-657
8. Describe how the relative size of a sample compared to the target population affects the validity of predictions.	SE: 310-314, 635-636, 646-647 TWE: IE 311
9. Construct convincing arguments based on analysis of data and interpretation of graphs.	SE: <i>Algebra Activity</i> 180, 275, 386, 392, 640
<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: 310-311, 635-639, 646-648 TWE: IE 636, 647
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: 650-655, 662 #28-#30 <i>Algebra Activity</i> 656-657 TWE: IE 651, 652 DI 652 OA 655

### Codes Used for TWE Pages

DI	Daily Intervention
IE	In-Class Examples
OA	Open-Ended Assessment
TT	Teaching Tip