

Correlation of

***Bridges to Algebra and Geometry:
Mathematics in Context,***
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to

**Michigan Grade Level Content Expectations (GLCEs):
Mathematics — Eighth Grade**

| CONTENT STANDARDS | CORD LESSONS |
|---|-----------------------------------|
| NUMBERS AND OPERATIONS | |
| Understand real number concepts | |
| N.ME.08.01 Understand the meaning of a square root of a number and its connection to the square whose area is the number; understand the meaning of a cube root and its connection to the volume of a cube. | 10.5, 11.5, 12.4, 12.5 |
| N.ME.08.02 Understand meanings for zero and negative integer exponents. | 10.2 |
| N.ME.08.03 Understand that in decimal form, rational numbers either terminate or eventually repeat, and that calculators truncate or round repeating decimals; locate rational numbers on the number on the number line; know fraction forms of common repeating decimals, e.g., $0.\overline{1} = \frac{1}{9}$; $0.\overline{3} = \frac{1}{3}$. | 10.5 |
| N.ME.08.04 Understand that irrational numbers are those that cannot be expressed as the quotient of two integers, and cannot be represented by terminating or repeating decimals; approximate the position of familiar irrational numbers, (e.g., $\sqrt{2}$, $\sqrt{3}$, π) on the number line. | 10.5 |
| N.FL.08.05 Estimate and solve problems with square roots and cube roots using calculators. | 10.5 |
| N.FL.08.06 Find square roots of perfect squares and approximate the square roots of non-perfect squares by locating between consecutive integers, e.g., $\sqrt{130}$ is between 11 and 12. | 10.5 |
| Solve problems | |
| N.MR.08.07 Understand percent increase and percent decrease in both sum and product form, e.g., 3% increase of a quantity x is $x + .03x = 1.03x$. | 7.5 |
| N.MR.08.08 Solve problems involving percent increases and decreases. | 7.5 |
| N.FL.08.09 Solve problems involving compound interest or multiple discounts. | 7.6 |
| N.MR.08.10 Calculate weighted averages such as course grades, consumer price indices, and sports ratings. | Chapter 7 Activity 3 (p. 393-395) |
| N.MR.08.11 Solve problems involving ratio units such as miles per hour, dollars per pound, or persons per square mile. | 6.1, 6.2, 6.3 |

| CONTENT STANDARDS | CORD LESSONS |
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| ALGEBRA | |
| Understand the concept of non-linear functions using basic examples | |
| A.RP.08.01 Identify and represent linear functions, quadratic functions, and other simple functions including inverse functions ($y = k/x$), cubics ($y = ax^3$) roots, ($y = \sqrt{x}$), and exponentials ($y = a^x, a > 0$), using tables, graphs, and equations. | 8.2 (linear functions) Non linear functions are covered in Cord Algebra |
| A.PA.08.02 For basic functions, e.g., simple quadratics, direct and indirect variation, and population growth, describe how changes in one variable affect the others. | Covered in Cord Algebra |
| A.PA.08.03 Recognize basic functions in problem context, e.g., area of a circle is πr^2 , volume of a sphere is $\frac{4}{3}\pi r^3$, and represent them using tables, graphs, and formulas. | 8.2, 8.3, 8.4, 8.7, Chapter 8 Activity 1 |
| A.PA.08.04 Use the vertical line test to determine if a graph represents a function in one variable. | 8.7 |
| Understand and represent quadratic functions | |
| A.RP.08.05 Relate quadratic functions in factored form and vertex form to their graphs and vice versa; in particular, note that solutions of a quadratic equation are the x-intercepts of the corresponding quadratic function. | Covered in Cord Algebra |
| A.RP.08.06 Graph factorable quadratic functions, finding where the graph intersects x axis and the coordinates of the vertex; use words “parabola” and “roots”; include functions in vertex form and those with leading coefficient -1 , e.g., $y = x^2 - 36, y = (x - 2)^2 - 9; y = -x^2; y = -(x - 3)^2$. | Covered in Cord Algebra |

| CONTENT STANDARDS | |
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| Recognize, represent, and apply common formulas | |
| A.FO.08.07 Recognize and apply the common formulas: $(a + b)^2 = a^2 + 2ab + b^2$ $(a - b)^2 = a^2 - 2ab + b^2$ $(a + b)(a - b) = a^2 - b^2$; represent geometrically. | Covered in Cord Algebra |
| A.FO.08.08 Factor simple quadratic expressions with integer coefficients, e.g., $x^2 + 6x + 9$, $x^2 + 2x - 3$ and $x^2 - 4$; solve simple quadratic equations, e.g., $x^2 = 16$ or $x^2 = 5$ (by taking square roots); $x^2 - x - 6 = 0$, $x^2 - 2x = 15$ (by factoring); verify solutions by evaluation. | Covered in Cord Algebra |
| A.FO.08.09 Solve applied problems involving simple quadratic equations. | Covered in Cord Algebra |
| Understand solutions and solve equations, simultaneous equations, and linear inequalities | |
| A.FO.08.10 Understand that to solve the equation $f(x) = g(x)$ means to find all values of x for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of $3x^2 + 2 = 4x + 2$, but 1 is not a solution). | Covered in Cord Algebra |
| A.FO.08.11 Solve simultaneous linear equations in two variables by graphing, by substitution, and by linear combination; estimate solutions using graphs; include examples with no solutions and infinitely many solutions. | 8.5 |
| A.FO.08.12 Solve linear inequalities in one or two variables, and graph the solution sets. | 5.7, 5.8, 8.6 |
| A.FO.08.13 Set up and solve applied problems involving simultaneous linear equations and linear inequalities. | 8.5, 8.6 |

| CONTENT STANDARDS | CORD LESSONS |
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| III. GEOMETRY | |
| Understand and use the Pythagorean Theorem | |
| G.GS.08.01 Understand at least one proof of the Pythagorean Theorem; use the Pythagorean Theorem and its converse to solve applied problems including perimeter, area, and volume problems. | 10.6 |
| G. LO.08.02 Find the distance between two points on the coordinate plane using the distance formula; recognize that the distance formula is an application of the Pythagorean Theorem. | Covered in Cord Algebra |
| Solve problems about geometric figures | |
| G.SR.08.03 Understand the definition of a circle; know and use the formulas for circumference and area of a circle to solve problems. | 11.7 |
| G.SR.08.04 Find area and perimeter of complex figures by sub-dividing them into basic shapes (quadrilaterals, triangles, circles). | Covered in Cord Geometry |
| G.SR.08.05 Solve applied problems involving areas of triangles, quadrilaterals, and circles. | 9.3, 9.4, 9.5, 11.7 |
| Understand concepts of volume and surface area, and apply formulas | |
| G.SR.08.06 Know the volume formulas for generalized cylinders ((area of base) x height), generalized cones and pyramids ($\frac{1}{3}$ (area of a base) x height) and spheres ($\frac{4}{3} \pi$ (radius) ³) and apply them to solve problems. | 12.4, 12.5, 12.6 |
| G.SR.08.07 Understand the concept of surface area, and find the surface area of prisms, cones, spheres, pyramids, and cylinders. | 12.2, 12.3 |
| Visualize solids | |
| G.SR.08.08 Sketch a variety of two-dimensional representations of three-dimensional solids including orthogonal views (top, front, and side), picture views (projective or isometric), and nets, use such two-dimensional representations to help solve problems. | 12.1 |
| Understand and apply concepts of transformation and symmetry | |
| G.TR.08.09 Understand the definition of dilation from a point in the plane, and relate it to the definition of similar polygons. | 11.3 |
| G.TR.08.10 Understand and use reflective and rotational symmetries of two-dimensional shapes, and relate them to transformations to solve problems. | 9.7, 9.8 |

| CONTENT STANDARDS | CORD LESSONS |
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| DATA AND PROBABILITY | |
| Draw, explain, and justify conclusions based on data | |
| D.AN.08.01 Determine which measure of central tendency (mean, median, mode) best represents a data set, e.g., salaries, home prices for answering certain questions; justify the choice made. | 2.1 |
| D.AN.08.02 Recognize practices of collecting and displaying data that may bias the presentation or analysis. | 2.7 |
| Understand probability concepts for simple and compound events | |
| D.PR.08.03 Compute relative frequencies from a table of experimental results for a repeated event, and be able to answer questions about the result, using relationship of probability to relative frequency. | 6.7 |
| D.PR.08.04 Apply the Basic Counting Principle to find total number of outcomes possible for independent and dependent events, and calculate the probabilities using organized lists or tree diagrams. | 6.4, 6.5, 6.6 |
| D.PR.08.05 Understand the relationship of probability to relative frequency. | 6.7 |
| D.PR.08.06 Understand the difference between independent and dependent events, and recognize common misconceptions involving probability, e.g., Alice rolls a 6 on a die three times in a row; she is just as likely to roll a 6 on the fourth rolls as she was on any previous roll. | 6.6 |
| D.AN.08.07 Compute relative frequencies from a table of experimental results for a repeated event understand the relationship of experimental probability to relative frequency; answer questions regarding the results. | 6.7, 6.8 |