

FOCUSING ON THE ESSENTIALS

TO SUPPORT A PASSION AND COMMITMENT FOR EDUCATIONAL EXCELLENCE

Book 3:
MATH
Edition



KNOWING THE TARGET:
Teachers Teaching & Formatively Assessing and Each Student
Learning & Applying a Guaranteed and Viable Curriculum

Prepared for the Collaborative Learning Team Members of
AVONDALE ELEMENTARY SCHOOL DISTRICT

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OVERVIEW:

What We Teach: This simply means a decent, coherent curriculum, with topics and standards collectively selected by a team of teachers from the school district - **that is actually taught**.

▪ Why is this so important? Because such “guaranteed and viable curriculum” (Marzano, 2003, p. 22) is perhaps the most significant school factor that affects learning. But such a curriculum is found in very few schools (Berliner, 1984; Marzano, 2003; Schmidt, 2008) .

NOTE: The following pages represent a sample of vertically articulated essential knowledge, skills, processes and vocabulary that must be taught and formatively assessed by each teacher and understood and applied by each student.

ARIZONA HIGHLY-PROFICIENT STUDENT-ENGAGEMENT VERBS

STUDENTS AS PROBLEM SOLVERS				
ANALYZE	DERIVE	DISCOVER	EVALUATE	EXPLORE
INVESTIGATE	PREDICT	SOLVE	SURVEY	VERIFY

STUDENTS REASONING AS THINKERS				
CATEGORIZE	CLASSIFY	COMPARE	CONTRAST	DIFFERENTIATE
DESCRIBE	ESTIMATE	EXPLAIN	GENERALIZE	INTERPRET
JUSTIFY	ORDER	HYPOTHESIZE	PREDICT	INFER
PRIORITIZE	RANK	VALIDATE	SUMMARIZE	CITE EVIDENCE

STUDENTS AS COMMUNICATORS				
CLARIFY	CORRESPOND	DESCRIBE	DISCUSS	DEMONSTRATE
EXHIBIT	EXPLAIN	EXPRESS	PERSUADE	PORTRAY
RESTATE	SHOW	SPEAK	STATE	WRITE
COLLABORATE				

Charting My Progress - with **Math Geometry**

Standard	Emerging 1	Developing 2	Proficient 3	Distinguished 4	Where am I?
3.G.A [1 to 2]	<p>I can identify examples of quadrilaterals, recognize that examples of quadrilaterals have shared attributes, and that the shared attributes can define a larger category.</p> <p>I can partition shapes into parts with equal areas and express the area as a unit fraction of the whole (limited to halves and quarters).</p>	<p>I can understand the properties of quadrilaterals and the subcategories of quadrilaterals.</p> <p>I can partition shapes into parts with equal areas and express the area as a unit fraction of the whole (limited to halves, quarters, and eighths).</p>	<p>I can recognize and sort examples of quadrilaterals that have shared attributes and that the shared attributes can define a larger category.</p> <p>I can draw examples of quadrilaterals that don't belong to the categories of rhombuses, rectangles, and squares.</p> <p>I can partition shapes into parts with equal areas and express the area as a unit fraction (with denominators of 2, 3, 4, 6, or 8) of the whole.</p>	<p>I can recognize and sort examples of quadrilaterals that have shared attributes and that the shared attributes can define a larger category.</p> <p>I can draw examples and non-examples of quadrilaterals that are not rhombuses, rectangles, or squares.</p> <p>I can partition shapes into parts with equal areas and express the area as a unit fraction of the whole.</p>	

Standard	Emerging 1	Developing 2	Proficient 3	Distinguished 4	Where am I?
4.G.A [1 to 3]	<p>I can identify points, lines, line segments, rays, perpendicular, and parallel lines, two-dimensional figures, including right triangles, and line symmetric regular figures.</p> <p>I can classify angles (right, acute, obtuse).</p>	<p>I can identify and draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular, and parallel lines.</p> <p>I can classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines.</p> <p>I can identify triangles.</p> <p>I can draw lines of symmetry for regular two-dimensional figures.</p>	<p>I can draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular, and parallel lines.</p> <p>I can identify the above in two-dimensional figure.</p> <p>I can classify two-dimensional figures based on the presence or absence of angles of specific size.</p> <p>I can draw lines of symmetry for any two-dimensional figures.</p>	<p>I can create a two-dimensional shape when given specific attributes, including the presence or absence of parallel or perpendicular lines, the presence or absence of angles or specified size, and particular lines of symmetry.</p>	

Charting My Progress - with **Math Geometry**

Standard	Emerging 1	Developing 2	Proficient 3	Distinguished 4	Where am I?
5.G.A [1 to 2]	<p>I can identify the key components of the coordinate plane (x-axis, y-axis, x-coordinate, y-coordinate, and origin).</p> <p>I can locate given points in the first quadrant of the coordinate plane.</p>	<p>I can interpret coordinate values of points in the first quadrant (e.g., reading line graphs), in context.</p>	<p>I can represent real-world and mathematical problems by locating and graphing points in the first quadrant of the coordinate plane.</p>	<p>I can use real-world data, create a representation and draw conclusions based on the data presented.</p>	
5.G.B [3 to 4]	<p>I can identify two-dimensional figures based on properties limited to sides and angles.</p>	<p>I can classify some two-dimensional figures into categories based on their properties (sides and angles).</p>	<p>I can understand that attributes belonging to a category of two-dimensional figures also belongs to all subcategories of that category.</p> <p>I can classify two-dimensional figures in the hierarchy based on their properties.</p>	<p>I can draw or construct specific two-dimensional figures according to the definitions provided, attributes described, or categories given.</p>	

Charting My Progress - with **Math Geometry**

Standard	Emerging 1	Developing 2	Proficient 3	Distinguished 4	Where am I?
6.G.A [1 to 3]	<p>I can find the area given all the measurements for triangles or polygons decomposed into rectangles and triangles.</p> <p>I can find the volume of a right rectangular prism with whole number edges.</p> <p>I can create polygons in the coordinate plane given coordinates for the vertices.</p>	<p>I can find the area given some measures for triangles or polygons by decomposing into rectangles and triangles.</p> <p>I can find the volume of a right rectangular prism with one fractional edge.</p> <p>I can use coordinates to find the length of a side joining points with the same first or second coordinate.</p>	<p>I can solve a real-world context by finding the area given some measures for triangles or polygons by decomposing into rectangles and triangles.</p> <p>I can solve real-world problems by finding the volume of a right rectangular prism with fractional edges.</p> <p>I can solve real-world problems by finding area using coordinates for vertices of a polygon.</p>	<p>I can solve real-world multistep geometric problems including decimal and fractional measurements.</p> <p>I can solve real-world problems by finding a missing side length of a right rectangular prism given a volume and fractional side lengths.</p> <p>I can solve real-world problems by finding a missing vertex of a polygon given other vertices.</p>	
6.G.A [4]	I can represent three-dimensional figures using nets comprised of rectangles and triangles.	I can find surface area for three-dimensional figures using nets.	I can solve real-world problems by finding surface area for three-dimensional figures using nets with whole number edges.	I can solve real-world problems by finding surface area for three-dimensional figures using nets with fractional edges.	

Charting My Progress - with **Math Geometry**

Standard	Emerging 1	Developing 2	Proficient 3	Distinguished 4	Where am I?
7.G.A[1]	I can find actual lengths given a geometric figure and a scale factor.	I can find actual lengths given two geometric figures with some unknown side measure when given the scale factor that relates the two figures.	I can compute actual lengths and areas from a scale drawing, create a scale drawing based on a context, and reproduce a scale drawing using a different scale.	I can explain the relationship between scale factors of length and scale factors of areas for geometric figures and reproduce a scale drawing using a different scale.	
7.G.A[2]	I can identify geometric shapes given conditions on the sides or angles.	I can construct geometric shapes given a combination of angle and side conditions and determine whether it makes a particular shape.	I notice when conditions determine a unique triangle, more than one triangle, or no triangle.	I can justify the conditions for a unique triangle, more than one triangle, or no triangle.	
7.G.A[3]	I can identify the 2-dimensional figure that results from a vertical or horizontal cut of a right rectangular prism.	I can identify the 2-dimensional figure that results from a vertical or horizontal cut of right rectangular pyramids.	I can describe the 2-dimensional figure that results from a vertical, horizontal, or angled slice of a right rectangular prism.	I can draw the 2-dimensional figure that results from a vertical, horizontal, or angled slice of a right prism or pyramid.	
7.G.B[4]	I can recognize the formulas for area and circumference of a circle.	I can calculate area and circumference given radius or diameter. I can calculate radius or diameter given the circumference.	I can determine the area given the circumference or vice versa. I can solve real-world problems involving area and circumference. I can give an informal derivation of the relationship between circumference and area of a circle.	I understand how and why the formulas for the area and circumference of a circle work. I can explain the relationship between area of a circle and area of a parallelogram.	
7.G.B[5]	I can identify supplementary, complementary, vertical and adjacent angles.	I find the unknown angle given another angle and their relationship.	I can find any of the unknown angles formed by two intersecting lines when measures are given algebraic expressions.	I can create and solve multi-step equations to find unknown angle measures given a figure with intersecting lines.	

Charting My Progress - with **Math Geometry**

Standard	Minimally Proficient 1	Partially Proficient 2	Proficient 3	Highly Proficient 4	Where am I?
7.G.B[6]	<p>I can the area of triangles, quadrilaterals, and regular polygons.</p> <p>I can find the volume of cubes and right prisms.</p>	<p>I can solve real-world problems involving surface area of 2-dimensional figures.</p> <p>I can solve real-world volume problems for cubes and right prisms.</p>	<p>I can solve real-world problems involving surface area of composite 2-dimensional figures.</p> <p>I can solve real-world problems involving volume of 3-dimensional objects.</p>	<p>I can use relationships between volume and surface area of 3-dimensional shapes to solve real-world problems.</p>	

Charting My Progress - with Math Geometry

Standard	Emerging 1	Developing 2	Proficient 3	Distinguished 4	Where am I?
8.G.A [1a to 4]	<p>I can identify visual representations and congruent figures that result from transformations.</p> <p>I can recognize that it takes a combination of transformations and dilations to produce a similar figure.</p>	<p>I can identify the angles that correspond after a transformation.</p> <p>I can identify a transformation between two congruent figures.</p> <p>I can describe the effect of reflections and translations on two-dimensional figures using coordinates and coordinate notation.</p> <p>I can identify dilations of figures by a given scale factor and transformations.</p>	<p>I can verify experimentally the properties of rotations, reflections, and translations.</p> <p>I can describe the effect of transformations on two-dimensional figures using coordinates and coordinate notation, including whether the transformations lead to similar or congruent figures.</p>	<p>I can recognize and explain the properties of transformations in real-world graphic illustrations and visual representations, including whether the transformations lead to similar or congruent figures.</p>	
8.G.A [5]	<p>I know that the sum of angles of a triangle equals 180 degrees.</p> <p>I can identify angle pairs when parallel lines are cut by a transversal.</p>	<p>I can find unknown angle measures in a triangle.</p> <p>I can find unknown angle measures for angle pairs when parallel lines are cut by a transversal.</p>	<p>I can give an informal argument for the sum of angles of a triangle.</p> <p>I can give an informal argument for the measure of an exterior angle of a triangle.</p> <p>I can give an informal argument for the congruent angle relationship when parallel lines are cut by a transversal.</p>	<p>I can give an informal argument that a triangle can only have one 90 degree angle.</p> <p>I can give an informal argument for pairs of angles that are supplementary when parallel lines are cut by a transversal.</p>	

Charting My Progress - with **Math Geometry**

Standard	Minimally Proficient 1	Partially Proficient 2	Proficient 3	Highly Proficient 4	Where am I?
8.G.B [6 to 8]	<p>I know the Pythagorean Theorem and that it applies to right triangles.</p> <p>I can calculate an unknown hypotenuse side length given the Pythagorean Theorem.</p> <p>I can apply the Pythagorean Theorem to find the distance between two points in a coordinate system with the right triangle drawn where the Pythagorean Theorem is given.</p>	<p>I can understand the proof of the Pythagorean Theorem and its converse.</p> <p>I can calculate unknown side lengths using the Pythagorean Theorem given at least two different side lengths of a right triangle.</p> <p>I can apply the Pythagorean Theorem to find the distance between two points in a coordinate system with the right triangle drawn where the Pythagorean Theorem is not given.</p>	<p>I can understand and explain the proof of the Pythagorean Theorem and its converse.</p> <p>I can apply the Pythagorean Theorem to a real-world situation in two and three dimensions to determine unknown side lengths.</p> <p>I can apply the Pythagorean Theorem to find the distance between two points in a coordinate system.</p>	<p>I can model a proof of the Pythagorean Theorem and its converse using a pictorial representation.</p> <p>I can recognize situations and apply the Pythagorean Theorem in multistep problems.</p> <p>I can find the coordinates of a point which is a given distance (non-vertical and non-horizontal) from another point.</p>	
8.G.C [9]	<p>I can find the volume of a cylinder.</p>	<p>I can find the volume of a cone, cylinder, or sphere.</p>	<p>I can know the formulas for the volumes of cones, cylinders, and spheres and use the, to solve real-world mathematical problems.</p>	<p>I can describe the relationship between the formulas for volumes of cones, cylinders, or spheres.</p> <p>I can explain the derivation of the formulas for cones, cylinders, and spheres.</p>	

Charting My Progress - with **Math Geometry**

Standard	Emerging 1	Developing 2	Proficient 3	Distinguished 4	Where am I?
Pre K					
Grade 1					
Grade 2					

MATH ITEM SPECIFICATION

DOK LEVEL OF MATH ITEMS

According to the Arizona Department of Education, “DOK refers to the level of rigor or sophistication of the task in a given item, designed to reflect the complexity of the AzCCRS.

- Items at **DOK level 1** focus on the recall of information, such as definitions, terms, and simple procedures.
- Items at **DOK level 2** require students to make decisions, solve problems, or recognize patterns; in general, they require a greater degree of engagement and cognitive processing than items at DOK 1.
- Items at **DOK level 3** feature higher-order cognitive tasks that assess students’ capacities to approach abstract or complex problems.

	PERCENTAGE OF POINTS BY DEPTH OF KNOWLEDGE (DOK) LEVEL		
Grade	DOK 1	DOK 2	DOK 3
3	10% to 20%	60% to 70%	12% to 30%
4	10% to 20%	60% to 70%	12% to 30%
5	10% to 20%	60% to 70%	12% to 30%
6	10% to 20%	60% to 70%	12% to 30%
7	10% to 20%	60% to 70%	12% to 30%
8	10% to 20%	60% to 70%	12% to 30%

PERCENT OF ITEMS BY STRAND

	STRAND MINIMUM & MAXIMUM PERCENT OF ITEMS				
Grade	Measurement and Data & Geometry	Numbers and Operations - Fractions	Numbers and Operations in Base Ten	Operations and Algebraic Thinking	
3	26% to 30%	18% to 22%	49% to 53%		
4	15% to 19%	29% to 33%	24% to 28%	22% to 26%	
5	26% to 35%	26% to 35%	38% to 42%		
Grade	Expressions and Equations	Geometry, Statistics & Probability	The Number System	Ratio and Proportional Relationships	
6	29% to 33%	17% to 21%	25% to 29%	19% to 23%	
Grade	Expressions and Equations	Geometry	The Number System	Ratio and Proportional Relationships	Statistics & Probability
7	23% to 27%	12% to 16%	19% to 23%	19% to 23%	15% to 19%
Grade	Expressions and Equations	Functions	Geometry	Statistics, Probability & the Number System	
8	32% to 36%	21% to 25%	23% to 27%	15% to 19%	