AzMERIT | Arizona's Statewide Achievement Assessment for English Language Arts and Mathematics

Math Item Specifications

GRADE 8

Arizona Department of Education with American Institutes for Research - 2016

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Introduction

The Arizona Statewide Achievement Assessment for English Language Arts and Mathematics (AzMERIT) is Arizona's statewide achievement test. AzMERIT assesses the Arizona College and Career Ready Standards (AzCCRS) adopted by the Arizona State Board of Education in 2010. AzMERIT will inform students, teachers, and parents about preparedness for college and careers upon graduating from high school. AzMERIT tests are computer-based, meaning that they can better assess students' critical thinking skills and provide them with opportunities to demonstrate a deeper understanding of the materials. Computer-based testing also allows for the use of a variety of innovative items types.

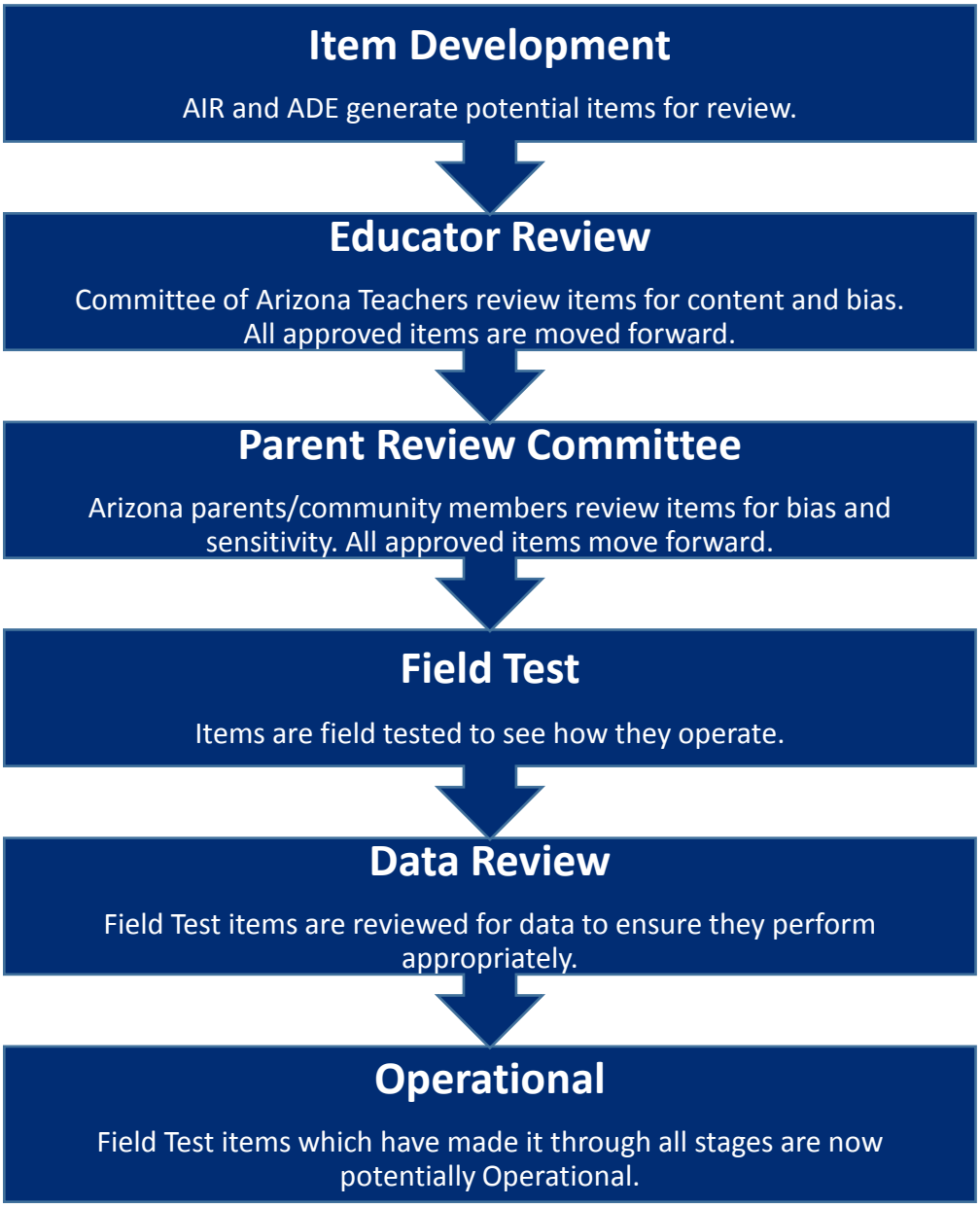
During the item-development process, all AzMERIT items are written in accordance with the Item Specifications and are reviewed and approved by a committee of Arizona educators to confirm alignment and appropriateness for inclusion in the test. AzMERIT items are generally representative of Arizona's geographic regions and culturally diverse population. Items are reviewed for the following kinds of bias: gender, racial, ethnic, linguistic, religious, geographic, and socioeconomic. Item reviews also include consideration of issues related to individuals with disabilities. Arizona community members also have an opportunity to review items for issues of potential concern to members of the community at large. Reviewers are asked to consider the variety of cultural, regional, philosophical, political, and religious backgrounds throughout Arizona, and then to determine whether the subject matter will be acceptable to Arizona students, families, and other members of Arizona communities.

This *AzMERIT Item Specifications* is a resource document that defines the content and format of the test and test items for item writers and reviewers. Each *Item Specifications* document indicates the alignment of items with the AzCCRS. It also serves to provide all stakeholders with information about the scope and function of assessment items. This document can also serve to assist educators to understand how assessment items are developed in alignment with the standards for English language arts and math. These item specifications for AzMERIT are intended to provide information regarding standards, item formats and response types. The descriptions of math practices, blueprints, and depth of knowledge in this document are meant to provide an overview of the test. Item specifications are meant for the purposes of assessment, not instruction. They are not intended to be tools for instruction or the basis for curricula. AzMERIT has a test blueprint that was developed by Arizona and is different from any other state or consortium test blueprint.

For the math portion of AzMERIT, all of the test questions are aligned to the mathematic content standards for these subject areas. Similarly, each item assesses a single domain and aligns to one or more of the eight Math Practices. Any item specifications that are absent for standards listed in this document may be under development. This document does not endorse the exclusion of the instruction of any grade-level content standards. The test will ask questions that check a student's conceptual understanding of math as well as their procedural skills. These items have been written to be free from bias and sensitivity, and widely vary in their degree of difficulty.

Item Development Process

AzMERIT items go through a rigorous review before they are operational. When an item is "operational" it means it is used to determine a student's score on the assessment. This is a description of the process every item must go through before it is operational on AzMERIT.



Sample tests are available online for the math portion of AzMERIT. For more information view the Guide to the Sample Tests at http://azmeritportal.org/.

Test Construction Guidelines

The construction of the AzMERIT assessment is guided by the depth and rigor of the Arizona College and Career Ready Standards. Items are created to address key components of the standards and assess a range of important skills. The AzMERIT Blueprint provides an overview of the distribution of items on the AzMERIT according to the standards. The standards for Math Practices are embedded within all AzMERIT items. Further, the AzMERIT blueprint outlines the Depth of Knowledge distribution of items.

Math Practices

The standards for Mathematical Practice highlight the knowledge, skills and abilities that should be developed in students at all grades. The Mathematical Practices are a part of each course description for Grades 3 through 8, Algebra I, Geometry, and Algebra 2. These practices are a vital part of the curriculum. These skills are often difficult to measure, and as a result, every item created for AzMERIT aligns to one or more of the following eight Mathematical Practices.

Math Practice (MP)	Description
Math Practice 1	**Make sense of problems and persevere in solving them.** Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Math Practice (MP)	Description
Math Practice 2	**Reason abstractly and quantitatively**. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.
Math Practice 3	**Construct viable arguments and critique the reasoning of others.** Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

Math Practice (MP)	Description
Math Practice 4	**Model with mathematics.** Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.
Math Practice 5	**Use appropriate tools strategically.** Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

Math Practice (MP)	Description
Math Practice 6	**Attend to precision.** Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.
Math Practice 7	**Look for and make use of structure.** Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well-remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.
Math Practice 8	**Look for and express regularity in repeated reasoning.** Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Blueprint

The AzMERIT blueprints detail specific information in regard to the domains tested at each grade level. The blueprint outlines the percentage of points aligned to each domain.

Grade 8		
Domain	**Minimum**	**Maximum**
Expressions and Equations	32%	36%
Functions	21%	25%
Geometry	23%	27%
Statistics, Probability & the Number System	15%	19%

Approximately 70% of the assessment for Grade 8 will be on major content.

Depth of Knowledge (DOK)

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 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 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 8	DOK Level 1	DOK Level 2	DOK Level 3
	10% - 20%	60% - 70%	12% - 30%

For more information on DOK go to www.azed.gov/AzMERIT.

Calculators

Calculators are permitted for the first session only on both the paper-based or computer-based assessment for Math Grade 8.

Item Formats

The AzMERIT Assessments are composed of item formats that include traditional multiple-choice response items and technology-enhanced response items (TEI). TEIs are computer-delivered response items that require students to interact with test content to select, construct, and/or support their responses. TEIs are better able to assess a deeper level of understanding.

Currently, there are nine types of TEIs that may appear on the Math Grade 8 computer based assessment for AzMERIT:

- Editing Tasks (ET)
- Editing Task Choice (ETC)
- Equation Editor (EQ)
- Graphic Response Item Display (GRID)
- Hot Text (HT)
    - Selectable Hot Text
    - Drag-and-Drop Hot Text
- Matching Item (MI)
- Multi-Select (MS)
- Open Response
- Table Item (TI)

For paper based assessments (including those for students with an IEP or 504 plan that specifies a paper based accommodation), TEIs will be modified so that they can be scanned and scored electronically or hand-scored.

See the table below for a description of each TEI. In addition, for examples of each response item format described, see the AzMERIT Training Tests at http://azmeritportal.org/.

Item Format	Description
Editing Task (ET)	The student clicks on a highlighted word or phrase that may be incorrect, which reveals a text box. The directions in the text box direct the student to replace the highlighted word or phrase with the correct word or phrase. For paper-based assessments, this item type may be replaced with another item type that assesses the same standard and can be scanned and scored electronically.
Editing Task Choice (ETC)	The student clicks a highlighted word or phrase, which reveals a drop-down menu containing options for correcting an error as well as the highlighted word or phrase as it is shown in the sentence to indicate that no correction is needed. The student then selects the correct word or phrase from the drop-down menu. For paper-based assessments, the item is modified so that it can be scanned and scored electronically. The student fills in a circle to indicate the correct word or phrase.

Item Format	Description
Equation Editor (EQ)	The student is presented with a toolbar that includes a variety of mathematical symbols that can be used to create a response. Responses may be in the form of a number, variable, expression, or equation, as appropriate to the test item. For paper-based assessments, this item type may be replaced with a modified version of the item that can be scanned and scored electronically or replaced with another item type that assesses the same standard and can be scanned and scored electronically.
Graphic Response Item Display (GRID)	The student selects numbers, words, phrases, or images and uses the drag-and-drop feature to place them into a graphic. This item type may also require the student to use the point, line, or arrow tools to create a response on a graph. For paper-based assessments, this item type may be replaced with another item type that assesses the same standard and can be scanned and scored electronically.
Hot Text (HT)	**Selectable Hot Text -** Excerpted sentences from the text are presented in this item type. When the student hovers over certain words, phrases, or sentences, the options highlight. This indicates that the text is selectable ("hot"). The student can then click on an option to select it. For paper- based assessments, a "selectable" hot text item is modified so that it can be scanned and scored electronically. In this version, the student fills in a circle to indicate a selection.
	Drag-and-Drop Hot Text - Certain numbers, words, phrases, or sentences may be designated "draggable" in this item type. When the student hovers over these areas, the text highlights. The student can then click on the option, hold down the mouse button, and drag it to a graphic or other format. For paper-based assessments, drag-and-drop hot text items will be replaced with another item type that assesses the same standard and can be scanned and scored electronically.
Matching Item (MI)	The student checks a box to indicate if information from a column header matches information from a row. For paper-based assessments, this item type may be replaced with another item type that assesses the same standard and can be scanned and scored electronically.
Multi-Select (MS)	The student is directed to select all of the correct answers from among a number of options. These items are different from multiple-choice items, which allow the student to select only one correct answer. These items appear in the online and paper-based assessments.
Open Response	The student uses the keyboard to enter a response into a text field. These items can usually be answered in a sentence or two. For paper-based assessments, this item type may be replaced with another item type that assesses the same standard and can be scanned and scored electronically.

Item Format	Description
Table Item (TI)	The student types numeric values into a given table. The student may complete the entire table or portions of the table depending on what is being asked. For paper-based assessments, this item type may be replaced with another item type that assesses the same standard and can be scanned and scored electronically.

Arizona's College and Career Ready Standards (AzCCRS)

Expressions and Equations (EE)

8.EE.A – Expressions and Equations Work with radical and integer exponents.

8.EE.B – Understand the connections between proportional relationships, lines, and linear equations.

8.EE.C – Analyze and solve linear equations and pairs of simultaneous linear equations.

Functions (F)

8.F.A – Define, evaluate, and compare functions.

8.F.B – Use functions to model relationships between quantities.

Geometry (G)

8.G.A – Understand congruence and similarity using physical models, transparencies, or geometry software.

8.G.B – Understand and apply the Pythagorean Theorem.

8.G.C – Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

The Number System (NS)

8.NS.A – Know that there are numbers that are not rational, and approximate them by rational numbers.

Statistics and Probability (SP)

8.SP.A – Investigate patterns of association in bivariate data.

Grade 8 Math Item Specifications

Expressions and Equations

Content Standards	AzCCRS.Math.Content.8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.		
Explanations	None		
Content Limits	Integer exponents Rational numbers for bases		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	2, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify equivalent numerical expressions using the properties of exponents.	• Equation Response • Graphic Response • Multiple Choice Response • Matching Item Response • Multi-Select Response	2, 5, 7
Students will be required to complete an equivalent expression using the properties of exponents.		2, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that the square root of 2 is irrational.		
Explanations	None		
Content Limits	Square roots and cube roots Rational and irrational numbers When evaluating roots, the base of a square root should be 100 or less and the base for a cube root should be 125 or less.		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	2, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify a square or cube root as the solution to a quadratic or cubic equation.	• Equation Response • Multiple Choice Response	2, 5, 7
Students will be required to find the value of a square or cube root.		2, 5, 6, 7
Students will be required to solve simple square or cube root equations.		2, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.		
Explanations	None		
Content Limits	None		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	2, 5, 6

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to convert between standard form and scientific notation.	• Equation Response • Multiple Choice Response	2, 5, 6
Students will be required to compare the magnitudes of different quantities given in scientific notation.		2, 5, 6

Content Standards	AzCCRS.Math.Content.8.EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.		
Explanations	Students can convert decimal forms to scientific notation and apply rules of exponents to simplify expressions. In working with calculators or spreadsheets, it is important that students recognize scientific notation. Students should recognize that the output of 2.45E+23 is 2.45 x 1023 and 3.5E-4 is 3.5 x 10-4. Students enter scientific notation using E or EE (scientific notation), * (multiplication), and ^ (exponent) symbols.		
Content Limits	For TD1, to distinguish from 8.EE.3, do not use single-digit leading terms		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	2, 5, 6

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to convert between standard form and scientific notation.	• Equation Response • Multiple Choice Response • Matching Item Response	2, 5, 6
Students will be required to perform operations with numbers expressed in scientific notation.		2, 5, 6

Content Standards	AzCCRS.Math.Content.8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.		
Explanations	Using graphs of experiences that are familiar to students increases accessibility and supports understanding and interpretation of proportional relationship. Students are expected to both sketch and interpret graphs.		
Content Limits	Rational numbers y-intercept is zero		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is required.	**Math Practices**	1, 2, 3, 4, 5, 6, 7, 8

Sample Task Demands	Common Item Formats	Recommended Math Practices
Students will be required to calculate unit rate given a graph of a proportional relationship.	• Graphic Response • Multiple Choice Response • Multi-Select Response • Table Response	1, 2, 4, 5, 6, 7, 8
Students will be required to graph proportional relationships, including comparisons to other proportional relationships.		1, 2, 4, 5, 6, 7, 8
Students will be required to compare two proportional relationships represented in two different ways.		1, 2, 4, 5, 7, 8
Students will be required to create a proportional relationship based on a comparison with another proportional relationship in a different representation.		1, 2, 3, 4, 5, 7, 8

Content Standards	AzCCRS.Math.Content.8.EE.B.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.		
Explanations	None		
Content Limits	None		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	1, 2, 3, 4, 5, 6, 7, 8
Sample Task Demands		**Common Item Formats**	**Recommended Math Practices**
Students will be required to given two points on a line, determine other points on the line.		• Equation Response • Graphic Response • Multiple Choice Response	1, 2, 4, 5, 7, 8
Students will be required to given three points on a line described abstractly, determine a parameter for a fourth point on the line.			1, 2, 3, 4, 5, 6, 7, 8

Content Standards	AzCCRS.Math.Content.8.EE.C.7 Solve linear equations in one variable. AzCCRS.Math.Content.8.EE.C.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers). AzCCRS.Math.Content.8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
Explanations	As students transform linear equations in one variable into simpler forms, they discover the equations can have one solution, infinitely many solutions, or no solutions. When the equation has one solution, the variable has one value that makes the equation true as in 12 - 4y = 16. The only value for y that makes this equation true is -1. When the equation has infinitely many solutions, the equation is true for all real numbers as in 7x + 14 = 7 (x+2). As this equation is simplified, the variable terms cancel leaving 14 = 14 or 0 = 0. Since the expressions are equivalent, the value for the When an equation has no solutions it is also called an inconsistent equation. This is the case when the two expressions are not equivalent as in 5x - 2 = 5(x+1). When simplifying this equation, students will find that the solution appears to be two number
Content Limits	Rational numbers
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.

Context	Context is allowed.	**Math Practices**	2, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to determine the number of solutions of an equation where no simplification is required. (a)	• Equation Response • Multiple Choice Response • Matching Item Response • Multi-Select Response	2, 7
Students will be required to determine the number of solutions of an equation where simplification is required.		2, 5, 7
Students will be required to find the solution of an equation. (b)		2, 5, 6, 7
Students will be required to construct an equation given parameters including the solution or number of solutions. (a)		2, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.EE.C.8 Analyze and solve pairs of simultaneous linear equations. AzCCRS.Math.Content.8.EE.C.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. AzCCRS.Math.Content.8.EE.C.8b Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. AzCCRS.Math.Content.8.EE.C.8c Solve real-world and mathematical problems leading to two linear equations in two variables.
Explanations	Systems of linear equations can also have one solution, infinitely many solutions or no solutions. Students will discover these cases as they graph systems of linear equations and solve them algebraically. A system of linear equations whose graphs meet at one point (intersecting lines) has only one solution, the ordered pair representing the point of intersection. A system of linear equations whose graphs do not meet (parallel lines) has no solutions and the slopes of these lines are the same. A system of linear equations whose graphs are coincident (the same line) has infinitely many solutions, the set of ordered pairs representing all the points on the line. By making connections between algebraic and graphical solutions and the context of the system of linear equations, students are able to make sense of their solutions. Students need opportunities to work with equations and context that include whole number
Content Limits	Rational numbers (8a) Should involve a graph
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.

Context	Context is subject to task demand.	**Math Practices**	1, 2, 3, 4, 5, 6, 7, 8

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify the integer solution of a system from a graph. (a) Context is not allowed.	• Equation Response • Graphic Response • Multiple Choice Response • Matching Item Response • Multi-Select Response	1, 2, 4, 5, 7, 8
Students will be required to identify the number of solutions of a system by inspection given the two equations. (b) Context is not allowed.		1, 2, 4, 5, 7, 8
Students will be required to solve a system of two equations. (b) Context is not allowed.		1, 2, 4, 5, 6, 7, 8

Students will be required to graph a system of equations and select an interval in which the x-or y-value of the solution lies. (b) Context is not allowed.		1, 2, 3, 4, 5, 6, 7, 8
Students will be required to solve a problem that can be modeled with a system of equations. (c) Context is required.		1, 2, 3, 4, 5, 6, 7, 8

Standards for Functions

Content Standards	AzCCRS.Math.Content.8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.		
Explanations	None		
Content Limits	Function notation is not permitted Graphs should be discrete points and not continuous Distractors for Task Demand 3 should focus on misunderstandings of a function and not on incorrect computations		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	2, 6
Sample Task Demands		**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify a function or a relation that is not a function, in table or graph form.		• Graphic Response • Multiple Choice Response • Matching Item Response • Table Response	2
Students will be required to create or complete a function or a relation that is not a function in table or graph form (item requires student to show both a function and a non-function).			2, 6
Students will be required to identify a graph of a function given a rule.			2, 6

Content Standards	AzCCRS.Math.Content.8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).		
Explanations	None		
Content Limits	Function notation is not permitted Only linear functions Only two functions Examples of properties are rate of change, starting point (y-intercept), and values at specific inputs		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	1, 2, 3, 4, 5, 6, 7, 8

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify correct statement(s) comparing properties of two functions presented using different representations.	• Multiple Choice Response • Matching Item Response	1, 2, 4, 5, 7, 8
Students will be required to identify a linear function that has certain properties when compared with a given function.		1, 2, 3, 4, 5, 6, 7, 8

Content Standards	AzCCRS.Math.Content.8.F.A.3 Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.		
Explanations	None		
Content Limits	Function notation is not permitted		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	2, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to categorize functions represented as equations or graphs as linear or nonlinear.	• Multiple Choice Response • Matching Item Response	2, 4, 5, 6, 7
Students will be required to categorize functions represented as tables as linear or nonlinear.		2, 4, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.		
Explanations	None		
Content Limits	Function notation is not permitted Limit to linear functions Given equations should always have just the dependent variable on one side of the equation.		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is subject to task demand.	**Math Practices**	1, 2, 3, 4, 5, 6, 7, 8

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to determine the rate of change and/or initial value of a linear function from an equation. Context is allowed.	• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response • Proposition Response • Table Response	1, 2, 4, 5, 6, 7, 8
Students will be required to interpret the rate of change and initial value of a linear function in terms of its context. Context is required.		1, 2, 4, 5, 6, 7, 8
Students will be required to create a linear equation by interpreting a table, a graph, a description, or two ordered pairs of the function. Context is allowed.		1, 2, 4, 5, 6, 7, 8
Students will be required to determine the rate of change and/or initial value of a linear function from a table, a graph, a description, or two ordered pairs of the function. Context is allowed.		1, 2, 4, 5, 6, 7, 8
Students will be required to create a linear equation, graph, or table that has a different rate of change and/or initial value when compared with a given function. Context is allowed.		1, 2, 3, 4, 5, 6, 7, 8

Content Standards	AzCCRS.Math.Content.8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.		
Explanations	None		
Content Limits	Linear and/or nonlinear relationships Graph descriptions traditionally move from left to right Graphs may or may not refer to quantitative measures as well as qualitative, i.e. the axes of graphs may or may not have scales Types of qualitative descriptions can include increasing/decreasing, linear/nonlinear, constant/variable, comparing rates (faster/slower), initial values that depend on the context and axes label, etc.		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is subject to task demand.	**Math Practices**	2, 3, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify a qualitative description given a graph, or a graph given a qualitative description, with no context. Context is not allowed.	• Graphic Response • Multiple Choice Response	2, 4, 5, 7
Students will be required to identify a qualitative description given a graph, or a graph given a qualitative description, within a context. Context is allowed.		2, 4, 5, 7
Students will be required to construct the graph of a function that matches a given qualitative description. Context is required.		2, 3, 4, 5, 6, 7

Geometry

Content Standards	AzCCRS.Math.Content.8.G.A.1 Verify experimentally the properties of rotations, reflections, and translations: AzCCRS.Math.Content.8.G.A.1a Lines are taken to lines, and line segments to line segments of the same length. AzCCRS.Math.Content.8.G.A.1b Angles are taken to angles of the same measure. AzCCRS.Math.Content.8.G.A.1c Parallel lines are taken to parallel lines.
Explanations	Students need multiple opportunities to explore the transformation of figures so that they can appreciate that points stay the same distance apart and lines stay at the same angle after they have been rotated, reflected, and/or translated. Students are not expected to work formally with properties of dilations until high school.
Content Limits	The coordinate plane should not be used until 8.G.3. A pre-image and image should not include apostrophe-prime notation as this would give away the identification of similarity and congruence.
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.

Context	Context is not allowed.	**Math Practices**	4, 5, 6, 7, 8

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify congruent properties based on a transformation(s).	• Equation Response • Multiple Choice Response • Multi-Select Response	4, 7, 8
Students will be required to solve a problem based on comparing part of a given shape to the corresponding part of its transformation.		4, 5, 6, 7, 8

Content Standards	AzCCRS.Math.Content.8.G.A.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.		
Explanations	None		
Content Limits	The coordinate plane should not be used until 8.G.3. Simply stating "dilation" is not sufficient for identifying a transformation that does not maintain congruence, since dilation by a factor of 1 does maintain congruence		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	2, 4, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify a transformation or set of transformations that maintain congruence.	• Multiple Choice Response • Multi-Select Response • Proposition Response	2, 4, 7
Students will be required to describe a transformation given two congruent figures.		2, 4, 6, 7

Content Standards	AzCCRS.Math.Content.8.G.A.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
Explanations	Dilation: A dilation is a transformation that moves each point along a ray emanating from a fixed center, and multiplies distances from the center by a common scale factor. In dilated figures, the dilated figure is similar to its pre-image. Translation: A translation is a transformation of an object that moves the object so that every point of the object moves in the same direction as well as the same distance. In a translation, the translated object is congruent to its pre-image. Reflection: A reflection is a transformation that flips an object across a line of reflection (in a coordinate grid the line of reflection may be the x or y axis). In a rotation, the rotated object is congruent to its pre-image. When an object is reflected across the y axis, the reflected x coordinate is the opposite of the pre-image x coordinate. Rotation: A rotated figure is a figure that has been turned about a fixed point. This is called the center of rotation. A figure can be rotated up to 360˚. Rotated figures are congruent to their pre-image figures.
Content Limits	Limit coordinates to integer values of x and y Limit rotations to about the origin Limit dilations to about the centers of shapes, or about the vertices of shapes When a coordinate grid is given, all original figures and transformations, given or not given, should fit onto that coordinate grid.
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.

Context	Context is not allowed.	**Math Practices**	3, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify the coordinates of a figure after a given transformation.	• Equation Response • Graphic Response • Multiple Choice Response • Table Response	4, 5, 7
Students will be required to given a figure and transformation, draw the image or pre-image.		4, 5, 7
Students will be required to identify the transformation that has occurred given an image and a pre-image or coordinates.		4, 5, 7
Students will be required to given a point (x, y), use coordinate rules to show how that point changes after a transformation or transformations.		3, 4, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.G.A.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.		
Explanations	None		
Content Limits	Items should not include the coordinate plane as the coordinate plane is needed in 8.G.3. Limited to polygons with up to 7 sides.		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	2, 4, 5, 6, 7
Sample Task Demands		**Common Item Formats**	**Recommended Math Practices**
Students will be required to describe a transformation given two similar figures.		• Multiple Choice Response • Multi-Select Response	2, 4, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.G.A.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.		
Explanations	Students can informally prove relationships with transversals. Students can informally conclude that the sum of a triangle is 180o (the angle-sum theorem) by applying their understanding of lines and alternate interior angles.		
Content Limits	Do not include shapes beyond triangles		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	3, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to use line-drawing tool to create angles of specified measure with respect to a given angle on a triangle.	• Equation Response • Graphic Response	4, 5, 6, 7
Students will be required to use the AA criteria for similar triangles.		3, 4, 5, 7
Students will be required to create expressions that represent relationships between angles.		4, 5, 7
Students will be required to drag/arrange text options to complete an argument/reasoning about angle measures of a triangle.		3, 5, 7

Content Standards	AzCCRS.Math.Content.8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.		
Explanations	Students should verify, using a model, that the sum of the squares of the legs is equal to the square of the hypotenuse in a right triangle. Students should also understand that if the sum of the squares of the 2 smaller legs of a triangle is equal to the square of the third leg, then the triangle is a right triangle.		
Content Limits	For the converse, use only perfect roots		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	3, 4, 6, 7
Sample Task Demands		**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify components of a sufficient/insufficient proof of the Pythagorean theorem.		• Graphic Response • HotText Response • Multiple Choice Response • Multi-Select Response • Proposition Response	3, 4, 7
Students will be required to explain or evaluate a proof of the Pythagorean theorem.			3, 4, 6, 7

Content Standards	AzCCRS.Math.Content.8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.		
Explanations	Through authentic experiences and exploration, students should use the Pythagorean Theorem to solve problems. Problems can include working in both two and three dimensions. Students should be familiar with the common Pythagorean triplets.		
Content Limits	Given measures should be integers, though answers can be rational		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is subject to task demand.	**Math Practices**	1, 2, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to find missing side lengths in a right triangle. Context is not allowed.	• Equation Response • Multiple Choice Response • Multi-Select Response	1, 2, 4, 5, 6, 7
Students will be required to solve simple real-world problems using the Pythagorean theorem. Context is required.		1, 2, 4, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.		
Explanations	None		
Content Limits	Points on the coordinate grid should be where grid lines intersect		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	1, 2, 4, 5, 6, 7
Sample Task Demands		**Common Item Formats**	**Recommended Math Practices**
Students will be required to determine the distance between two points on a coordinate grid.		• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response	1, 2, 4, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.		
Explanations	None		
Content Limits	Graphics of three-dimensional figures will be included in most items Dimensions are rational numbers Items should not require students to solve quadratic or cubic equations (i.e., find r given a volume) Rubrics should account for different estimations of pi (3.14, 22/7, the calculator button) if necessary		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	1, 2, 3, 4, 5, 6, 7, 8

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to use formulas to determine the volume of a cylinder, cone, or sphere.	• Equation Response • Multiple Choice Response • Multi-Select Response	1, 2, 4, 5, 6, 7, 8
Students will be required to use formulas to determine the volume of composite objects composed of cylinders, cones, and/or spheres, or parts of these objects.		1, 2, 4, 5, 6, 7, 8
Students will be required to compare the volumes/heights of cones and cylinders with the same base.		1, 2, 3, 4, 5, 6, 7, 8

Statistics and Probability & The Number System

Content Standards	AzCCRS.Math.Content.8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.		
Explanations	Students can use graphic organizers to show the relationship between the subsets of the real number system.		
Content Limits	All irrational numbers excluding e.		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	2, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify numbers that are irrational.	• Equation Response • Multiple Choice Response • Matching Item Response • Multi-Select Response • Proposition Response	2, 7
Students will be required to convert a repeating decimal into a fraction.		2, 6, 7
Students will be required to explain why a number is rational or irrational.		2, 7

Content Standards	AzCCRS.Math.Content.8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., pi²).		
Explanations	Students can approximate square roots by iterative processes.		
Content Limits	All real numbers excluding e. Irrational expressions should only use one operation		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is not allowed.	**Math Practices**	2, 4, 7, 8

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify the approximated value of an irrational number.	• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response	2, 7, 8
Students will be required to estimate values of expressions that include irrational values.		2, 4, 7, 8
Students will be required to plot irrational numbers on a number line.		2, 4, 7, 8

Content Standards	AzCCRS.Math.Content.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.		
Explanations	Students build on their previous knowledge of scatter plots examine relationships between variables. They analyze scatterplots to determine positive and negative associations, the degree of association, and type of association. Students examine outliers to determine if data points are valid or represent a recording or measurement error.		
Content Limits	Items at this standard should not require the student to perform calculations using values of data represented on a scatter plot. This will be reserved for High School statistics standards, when the appropriate technology is available. This standard shoul		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	2, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify patterns of association (clusters, outliers, positive/negative association, linear/nonlinear association) for a scatter plot.	• Graphic Response • Multiple Choice Response • Multi-Select Response	2, 4, 5, 7
Students will be required to interpret patterns of association found in scatter plots in terms of a given context.		2, 4, 5, 7
Students will be required to construct a scatter plot using given data points and interpret patterns therein.		2, 4, 5, 7
Students will be required to construct scatter plots given a verbal description of the association.		2, 4, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.SP.A.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.		
Explanations	None		
Content Limits	Rational numbers, trend/association – not based on numbers, only based on visual strength, linear association only For items where student identify/construct a line of best fit, a correct line should not go through the origin - it is a common misconception that lines of best fit must go through the origin, so scatterplots should be given so that a line that goes through the origin is clearly incorrect. For items where the student judges the closeness of the data, the line of best fit should be correct for that data - the student is just judging how close those points are to the line		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is allowed.	**Math Practices**	2, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to identify an approximate line of best fit for a given scatter plot.	• Graphic Response • Multiple Choice Response • Multi-Select Response	2, 4, 5, 7
Students will be required to construct an approximate line of best fit.		2, 4, 5, 7
Students will be required to compare the accuracy of a model by how closely the data follows the line of best fit for several models.		2, 4, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.		
Explanations	None		
Content Limits	Rational numbers Limit to linear equations Students should not be required to create an equation of a line of best fit; if a scatterplot/line of best fit is given, the parameter(s) of interest should also be given		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is required.	**Math Practices**	2, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to interpret the slope and intercept of a line of best fit, with slope and/or intercept parameter identified, in terms of the context.	• Equation Response • Multiple Choice Response • Multi-Select Response	2, 4, 5, 7
Students will be required to interpret the slope and intercept of a modeling equation in terms of the context.		2, 4, 5, 7
Students will be required to solve problems about the slope and intercept of a line of best fit in terms of the context.		2, 4, 5, 6, 7

Content Standards	AzCCRS.Math.Content.8.SP.A.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.		
Explanations	None		
Content Limits	Relate questions to grand total of survey Categorical variables Two columns (plus category and total) and two rows (plus category and total)		
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include but are not limited to those shown with the sample task demands.		
Context	Context is required.	**Math Practices**	2, 3, 4, 5, 6, 7

Sample Task Demands	**Common Item Formats**	**Recommended Math Practices**
Students will be required to interpret and/or compare values in a two-way frequency table.	• Equation Response • Multiple Choice Response • Table Response	2, 4, 5, 7
Students will be required to complete a two-way table based on given frequencies or relative frequencies.		2, 4, 5, 6, 7
Students will be required to relate a two-way relative frequency table to whether there is an association between two variables.		2, 3, 4, 5, 6, 7