# PA Core Standards For Mathematics
# Curriculum Framework
# Grade Level 7

| Grade | Big Idea | Essential Questions | Concepts | Competencies | Standard | Eligible Content | Vocabulary |
|---|---|---|---|---|---|---|---|
| 7 | Mathematical relationships among numbers can be represented, compared, and communicated.<br><br>Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.<br><br>Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.<br><br>Patterns exhibit relationships that can be extended, described, and generalized. | How is mathematics used to quantify, compare, represent, and model numbers?<br><br>How can mathematics support effective communication?<br><br>How are relationships represented mathematically?<br><br>How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations?<br><br>What does it mean to estimate or analyze numerical quantities?<br><br>What makes a tool and/or strategy appropriate for a given task?<br><br>How can recognizing repetition or regularity assist in solving problems more efficiently? | Ratios, Proportions, and Percent | Compute unit rates associated with ratios of fractions.<br><br>Recognize and represent proportional relationships between quantities.<br><br>Use proportional relationships to solve multistep ratio and percent problems. | CC.2.1.7.D.1 | M07.A-R.1.1.1<br>M07.A-R.1.1.2<br>M07.A-R.1.1.3<br>M07.A-R.1.1.4<br>M07.A-R.1.1.5<br>M07.A-R.1.1.6 | Acute triangle<br>Adjacent angles<br>Alternate exterior angles<br>Alternate interior angles<br>Chance event<br>Circumference<br>Complementary angles<br>Compound event<br>Corresponding angles<br>Data distribution<br>decrease<br>Equally likely<br>Equilateral triangle<br>Independent event<br>Isosceles triangle<br>Likely event<br>Linear expression<br>Obtuse triangle<br>Outcome<br>Percent increase and<br>Population<br>Probability<br>Process of chance<br>Proportion<br>Random sample<br>Relative frequency<br>Repeating decimal<br>Scale drawing<br>Scalene triangle |
| 7 | Mathematical relationships among numbers can be represented, compared, and communicated.<br><br>Mathematical relationships can be represented as | How can mathematics support effective communication?<br><br>How are relationships represented mathematically?<br><br>How can expressions, equations and | Rational Numbers | Solve real-world and mathematical problems involving the four operations with rational numbers. | CC.2.1.7.E.1 | M07.A-N.1.1.1<br>M07.A-N.1.1.2<br>M07.A-N.1.1.3 | |

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| | expressions, equations and inequalities in mathematical situations.<br><br>Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.<br><br>Patterns exhibit relationships that can be extended, described, and generalized. | inequalities be used to quantify, solve, model and/or analyze mathematical situations?<br><br>What does it mean to estimate or analyze numerical quantities?<br><br>What makes a tool and/or strategy appropriate for a given task?<br><br>How can recognizing repetition or regularity assist in solving problems more efficiently? | | | | | |
| **7** | Mathematical relationships among numbers can be represented, compared, and communicated.<br><br>Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.<br><br>Patterns exhibit relationships that can be extended, described, and generalized. | How is mathematics used to quantify, compare, represent, and model numbers?<br><br>How are relationships represented mathematically?<br><br>How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?<br><br>How can recognizing repetition or regularity assist in solving problems more efficiently? | Algebraic Expressions | Apply properties of operations to generate equivalent expressions. | CC.2.2.7.B.1 | M07.B-E.1.1.1 | |
| **7** | Mathematical relationships among numbers can be represented, compared, and communicated.<br><br>Mathematical relationships can be represented as expressions, equations and | How is mathematics used to quantify, compare, represent, and model numbers?<br><br>How can mathematics support effective communication?<br><br>How are relationships represented | Algebraic Equations | Model and solve real world and mathematical problems using multiple representations such as algebraic, graphical and using tables.<br><br>Solve multi-step equations or inequalities with one variable. | CC.2.2.7.B.3 | M07.B-E.2.1.1<br>M07.B-E.2.2.1<br>M07.B-E.2.2.2<br>M07.B-E.2.3.1 | |

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| | inequalities in mathematical situations.<br><br>Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.<br><br>Data can be modeled and used to make inferences. | mathematically?<br><br>How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?<br><br>How can data be organized and represented to provide insight into the relationship between quantities?<br><br>How does the type of data influence the choice of display?<br><br>How can probability and data analysis be used to make predictions? | | Solve and interpret multi-step real life and mathematical problems posed with positive and negative rational numbers. | | | |
| **7** | Patterns exhibit relationships that can be extended, described, and generalized.<br><br>Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization. | How can patterns be used to describe relationships in mathematical situations?<br><br>How can recognizing repetition or regularity assist in solving problems more efficiently?<br><br>How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?<br><br>How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving?<br><br>How can geometric properties and theorems be used to describe, model, | Area, Volume, Angles, and Circumferenc e | Use properties of angle types and properties of angles formed when two parallel lines are cut by a transversal line to solve problems.<br><br>Solve problems involving area and circumference of a circle(s).<br><br>Solve mathematical problems involving area, volume and surface area of two- and three-dimensional objects. | CC.2.3.7.A.1 | M07.C-G.2.1.1<br>M07.C-G.2.1.2<br>M07.C-G.2.2.1<br>M07.C-G.2.2.2 | |

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| | | and analyze situations? | | | | | |
| 7 | Patterns exhibit relationships that can be extended, described, and generalized.<br><br>Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization. | How can patterns be used to describe relationships in mathematical situations?<br><br>How can recognizing repetition or regularity assist in solving problems more efficiently?<br><br>How are spatial relationships, including shape and dimension, used to draw, construct, model, and represent real situations or solve problems?<br><br>How can the application of the attributes of geometric shapes support mathematical reasoning and problem solving?<br><br>How can geometric properties and theorems be used to describe, model, and analyze situations? | Geometric Figures | Solve problems involving scale drawings of geometric figures.<br><br>Apply the properties of all types of triangles based on angle and side measure including the triangle inequality theorem.<br><br>Describe the two-dimensional figures that result from slicing three-dimensional figures. | CC.2.3.7.A.2 | M07.C-G.1.1.1<br>M07.C-G.1.1.2<br>M07.C-G.1.1.3<br>M07.C-G.1.1.4 | |
| 7 | Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.<br><br>Mathematical relations and functions can be modeled | What does it mean to estimate or analyze numerical quantities?<br><br>What makes a tool and/or strategy appropriate for a given task?<br><br>How can data be organized and represented to provide insight into the relationship between quantities? | Data, Distributions, and Random Sampling | Draw inferences about two populations based on random sampling concepts.<br><br>Determine and approximate relative frequencies and probabilities of events. | CC.2.4.7.B.1<br>CC.2.4.7.B.2 | M07.D-S.1.1.1<br>M07.D-S.1.1.2<br>M07.D-S.2.1.1 | |

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| | through multiple representations and analyzed to raise and answer questions.<br><br>Data can be modeled and used to make inferences. | How does the type of data influence the choice of display?<br><br>How can probability and data analysis be used to make predictions? | | Draw informal comparative inferences about two populations using measures of center and measures of variability. | | | |
| **7** | Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.<br><br>Measurement attributes can be quantified, and estimated using customary and non-customary units of measure.<br><br>Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.<br><br>Data can be modeled and used to make inferences. | What makes a tool and/or strategy appropriate for a given task?<br><br>In what ways are the mathematical attributes of objects or processes measured, calculated and/or interpreted?<br><br>How can data be organized and represented to provide insight into the relationship between quantities?<br><br>How can probability and data analysis be used to make predictions? | Probability | Find probabilities of independent compound events.<br><br>Predict the approximate relative frequency given the probability.<br><br>Find the probability of a simple event, including the probability of a simple event not occurring. | CC.2.4.7.B.3 | M07.D-S.3.1.1<br>M07.D-S.3.2.1<br>M07.D-S.3.2.2<br>M07.D-S.3.2.3 | |

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