

**Look for and make use of structure.**

\*Routinely seek patterns or structures to model and solve problems.

\*Recognize patterns that exist in ratio tables making connections between the constant of proportionality in a table with the slope of a graph.

\*Apply properties to generate equivalent expressions

(i.e. 6 + 2x = 3 (2 + x) by distributive property).

\*Solve equations (i.e. 2c + 3 = 15, 2c = 12 by subtraction property of equality), c = 6 by division property of equality).

\*Compose and decompose two-and three-dimensional figures to solve real world problems involving scale drawings, surface area, and volume.

\*Examine tree diagrams or systematic lists to determine

the sample space for compound events and verify

that they have listed all possibilities.

**Model with Mathematics.**

\*Model problem situations symbolically, graphically, tabularly, and contextually.

\*Form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations.

\*Explore covariance and represent two quantities simultaneously.

\*Use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences, make comparisons and formulate predictions.

\*Use experiments or simulations to generate data sets and create probability models.

\*Connect and explain the connections between the different

 representations.

 \*Use all representations as appropriate to a problem

 context.

**Use appropriate tools**

**strategically.**

\*Consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful.

\*Decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data.

\*Use physical objects or applets to generate probability data.

\*Use graphing calculators or spreadsheets to manage and represent data in different forms.

 **Attend to precision.**

\*Continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning.

\*Define variables, specify units of measure, and label axes accurately.

\*Use appropriate terminology when referring to rates, ratios, probability models, geometric figures, data displays, and components of expressions, equations or inequalities.

 **Look for and**

 **express regularity in**

 **repeated reasoning**.

\*Use repeated reasoning to understand algorithms

and make generalizations about patterns.

\*Solve and model problems. They may notice that

a/b ÷c/d = ad/bc and construct other examples and models that confirm their generalization.

\*Extend their thinking to include complex fractions and rational numbers.

\*Formally begin to make connections between covariance, rates, and representations showing the relationships between quantities.

\*Create, explain, evaluate, and modify probability models to describe simple and compound events.

**Construct viable**

**arguments**

**and critique the reasoning of others.**

\*Construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.).

\*Refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students.

\*Pose questions like, “How did you get that?”, “Why is that true?”, “Does that always work?”

\*Explain their thinking to others and respond to others’ thinking.

**Reason abstractly and quantitatively.**

\*Represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities.

\*Contextualize to understand the meaning of the number or variable as related to the problem.

\*Decontextualize to manipulate symbolic representations by applying properties of operations.

**Make sense of problems**

**and persevere in solving them.**

\*Solve problems involving ratios and rates and discuss how they solved them.

\*Solve real world problems through the application of algebraic and geometric concepts.

\*Seek the meaning of a problem and look for efficient ways to represent and solve it.

\*Check their thinking by asking themselves, “What is the most efficient way to solve the

 problem?”, “Does this make sense?”, and

 “Can I solve the problem in a different

 way?”

**Grade 7**

**Grade Level Emphasis**

**PA Core Standards**

**Standards for Mathematical Practice**

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