

Technical Math

Mathematical Processes & Modeling MPM

Mathematical Processes & Modeling: Students use mathematical processes and models to acquire, demonstrate, and communicate mathematical understanding in real-world scenarios.

- 1 Apply mathematics to problems arising in everyday life, workplace, and society. TM.MPM.1
- 2 Use mathematical processes with algebraic formulas, numerical techniques, and graphs to solve real-world scenarios. TM.MPM.2
- 3 Create mathematical models and use problem-solving skills, independently and as a collaborative team, for real-world scenarios to: TM.MPM.3
 - 1 Analyze given information or data TM.MPM.3.1
 - 2 Identify patterns or relationships TM.MPM.3.2
 - 3 Formulate a plan or strategy TM.MPM.3.3
 - 4 Estimate solutions TM.MPM.3.4
 - 5 Determine a solution TM.MPM.3.5
 - 6 Justify a solution and its reasonableness TM.MPM.3.6
 - 7 Describe limitations TM.MPM.3.7
 - 8 Identify how results are affected by changing parameters TM.MPM.3.8
 - 9 Suggest improvements TM.MPM.3.9
- 4 Select appropriate tools and techniques to solve problems. TM.MPM.4
- 5 Demonstrate effective use of resources. TM.MPM.5
- 6 Use precise mathematical language and multiple representations to organize, record, and communicate mathematical ideas or solutions to solve real-world scenarios independently and collaboratively. TM.MPM.6

Numerical & Proportional Reasoning NPR

Model with Estimation: Students use estimation to solve real-world problems and assess the reasonableness of a solution.

- 1 Use estimation to identify the most reasonable mathematical solution. TM.NPR.1
- 2 Use estimation and precision in real-world scenarios. TM.NPR.2

Proportional Reasoning: Students understand and reason about relationships between quantities.

- 3 Solve real-world problems and interpret results involving calculations with percentages, decimals, and fractions. [TM.NPR.3](#)
 - 1 Calculations include: conversions, percent change, and percent of quantities [TM.NPR.3.1](#)
 - 4 Recognize, set up, and solve proportions from real-world scenarios. [TM.NPR.4](#)
 - 5 Utilize real-world scenarios requiring interpretation and comparison of various representations of rates, ratios, and proportions including scale drawings. [TM.NPR.5](#)
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Comparison: Students use number sense and proportional reasoning to draw conclusions and communicate results.

- 6 Compare magnitudes of numbers in context in different forms. [TM.NPR.6](#)
 - 7 Use dimensional analysis to solve problems involving multiple units of measurement. [TM.NPR.7](#)
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Algebraic Relationships [AR](#)

Model with Functions: Students use mathematical concepts of algebra to explain linear and nonlinear applications in real-world scenarios.

- 1 Analyze and apply rate of change in terms of real-world scenarios. [TM.AR.1](#)
 - 2 Use concepts of systems of equations and inequalities to model and solve real-world scenarios. [TM.AR.2](#)
 - 3 Use linear programming with or without the use of technology to: [TM.AR.3](#)
 - 1 Maximize or minimize (optimize) linear objective function in real-world scenarios. [TM.AR.3.1](#)
 - 2 Determine the reasonableness of solutions. [TM.AR.3.2](#)
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Model with Data: Students use data to make decisions and predictions.

- 4 Collect and organize data, independently and as a collaborative team, to create appropriate graphical representations of real-world scenarios. [TM.AR.4](#)
 - 1 Interpret graphical representations. [TM.AR.4.1](#)
 - 2 Make predictions and decisions based on representations. [TM.AR.4.2](#)
 - 3 Analyze results based on representations. [TM.AR.4.3](#)
 - 5 Create, interpret, and analyze best-fit models of linear and exponential functions to solve real-world scenarios. [TM.AR.5](#)
 - 1 Interpret the constants, coefficients, and bases in the context of the data. [TM.AR.5.1](#)
 - 2 Check the model for best fit and use the model, where appropriate, to draw conclusions or make predictions. [TM.AR.5.2](#)
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Measurement [MS](#)

Measurement & Measurement Tools: Students apply measurement and use measurement tools in real-world scenarios.

- 1 Convert between and within the metric system and the U.S. customary system in real-world scenarios. [TM.MS.1](#)

- 2 Demonstrate mastery of utilizing measuring devices: [TM.MS.2](#)
 - 1 Apply accurate readings of both metric and the U.S. customary measuring devices to a problem situation. [TM.MS.2.1](#)
 - 2 Select and use appropriate measuring devices and understand the limitations of such devices for realworld scenarios. [TM.MS.2.2](#)
 - 3 Determine and use appropriate unit labels for real-world scenarios. [TM.MS.3](#)
 - 1 Unit labels include: length, weight, capacity, distance, temperature, time, surface area, volume, area, and perimeter [TM.MS.3.1](#)
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Geometry [GEO](#)

Model with Geometric Figures: Students will extend geometric reasoning and model with geometric figures.

- 1 Identify common geometric figures in order to identify what formulas are needed to solve situational problems. [TM.GEO.1](#)
 - 2 Compute measurements of common geometric figures such as area, surface area, volume, perimeter, and circumference for real-world scenarios. [TM.GEO.2](#)
 - 3 Analyze how changing dimensions will affect the perimeter, circumference, area, surface area, or volume in real-world scenarios. [TM.GEO.3](#)
 - 4 Determine the role angles play in a situational problem. [TM.GEO.4](#)
 - 5 Draw and interpret technical drawings involving house plans, engineering drawings, or fashion design with or without the use of technology. [TM.GEO.5](#)
 - 1 Views include: auxiliary, orthographic, and isometric [TM.GEO.5.1](#)
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Model with Triangles: Students will apply geometric reasoning to triangles in real-world scenarios.

- 6 Use trigonometric ratios to calculate angles and lengths of sides in real-world scenarios. [TM.GEO.6](#)
 - 7 Apply right-triangle relationships using Pythagorean Theorem, special right triangles, and trigonometry in real world scenarios. [TM.GEO.7](#)
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Visualizing Solid Shapes: Students will extend understanding of solid figures with and without technology.

- 8 Demonstrate mastery of manipulating 2D and 3D figures. [TM.GEO.8](#)
 - 1 Use cross-sections of 3D shapes to relate to 2D figures. [TM.GEO.8.1](#)
 - 2 Use revolutions of 2D shapes to create a 3D object or space. [TM.GEO.8.2](#)
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Model with Transformations: Students will apply transformations to real-world scenarios.

- 9 Describe the transformation of polygons in the coordinate plane as they relate to real-world scenarios: [TM.GEO.9](#)
 - 1 Transformations include: translation, reflection, rotation, and dilation [TM.GEO.9.1](#)