

TEKS Mathematical Models with Applications

| Unit 1: Data Collection and Analysis | | | |
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| Topic | Lesson # | Title | TEKS Standard |
| Topic A | Summarizing, Representing, and Interpreting Data | | |
| | 1.1 | Data Types and Visualizations | TEKS.MMA.9A |
| | 1.2 | Comparing Different Data Sets | TEKS.MMA.9A TEKS.MMA.9B |
| | 1.3 | Interpreting Data and Recognizing Outliers | TEKS.MMA.9A TEKS.MMA.9B |
| Topic B | The Normal Curve | | |
| | 1.4 | The Normal Curve | TEKS.MMA.9B |
| Topic C | Identifying Surveys, Experiments, and Observational Studies | | |
| | 1.5 | Identifying Surveys, Experiments, and Observational Studies | TEKS.MMA.9C |
| Unit 2: Mathematical Models in Research | | | |
| Topic | Lesson # | Title | TEKS Standard |
| Topic A | Populations Versus Random Samples, Random Sampling, and Bias | | |
| | 2.1 | Differences Between Populations and Samples | TEKS.MMA.9D |
| | 2.2 | Simple Random Sampling | TEKS.MMA.9D |
| | 2.3 | Sampling Methods and Sources of Bias | TEKS.MMA.9D |
| Topic B | Evaluating the Significance of Sample Statistics | | |
| | 2.4 | Confidence in Sample Statistics | TEKS.MMA.9D |
| | 2.5 | Estimating with Confidence | TEKS.MMA.9D TEKS.MMA.9E |
| | 2.6 | Reading Reports | TEKS.MMA.9E |
| Topic C | Line of Best Fit | | |
| | 2.7 | Solving Problems Given Functions Fitted to Data | TEKS.MMA.9F |
| | 2.8 | Analyzing Residuals | TEKS.MMA.9F |
| | 2.9 | Fitting Linear Functions to Data | TEKS.MMA.9F |
| | 2.10 | Fitting Exponential Functions to Data | TEKS.MMA.9F |
| Topic D | Interpreting Statistical Models | | |
| | 2.11 | Interpreting Fitted Functions | TEKS.MMA.9F |
| | 2.12 | Calculating and Interpreting the Correlation Coefficient | TEKS.MMA.9F |
| | 2.13 | Distinguishing Between Correlation and Causation | TEKS.MMA.9F |
| Performance Task | | Mathematical Models in Research | TEKS.MMA.10A TEKS.MMA.10B |

TEKS Mathematical Models with Applications

| Unit 3: Mathematical Models in Science and Engineering | | | |
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| Topic | Lesson # | Title | TEKS Standard |
| Topic A | Direct and Inverse Variation | | |
| | 3.1 | <i>Ramp-up: Rearranging Formulas</i> | TEKS.A1.12E |
| | 3.2 | Direct and Inverse Variation | TEKS.MMA.5A |
| Topic B | <i>Ramp-up Topic: Identifying Key Features of Exponential Graphs</i> | | |
| | 3.3 | <i>Ramp-up Lesson: Identifying Key Features of Exponential Graphs</i> | TEKS.A1.9B TEK. A1.9D |
| Topic C | Modeling with Exponential Equations | | |
| | 3.4 | Exponential Regression in Science | TEKS.MMA.5B TEKS.MMA.9F |
| | 3.5 | Exponential Functions as Models | TEKS.MMA.5B |
| Topic D | <i>Ramp-up Topic: Interpreting Structure in Expressions</i> | | |
| | 3.6 | <i>Ramp-up Lesson: Identifying Terms, Factors, and Coefficients</i> | TEKS.6.7B |
| | 3.7 | <i>Ramp-up Lesson: Interpreting Complicated Expressions</i> | TEKS.A1.7B |
| Topic E | <i>Ramp-up Topic: Factoring</i> | | |
| | 3.8 | <i>Ramp-up Lesson: Factoring Expressions by the Greatest Common Factor</i> | TEKS.A1.10E |
| | 3.9 | <i>Ramp-up Lesson: Factoring Expressions with $a = 1$</i> | TEKS.A1.10E |
| | 3.10 | <i>Ramp-up Lesson: Factoring Expressions with $a > 1$</i> | TEKS.A1.10E |
| Topic F | Modeling with Quadratics | | |
| | 3.11 | <i>Ramp-Up: Converting Quadratic Equations to Different Forms</i> | TEKS.A1.6B TEKS. A1.6C TEKS.A1. 7A |
| | 3.12 | Building Quadratic Equations from Context | TEKS.MMA.5C |
| Performance Task | | Mathematical Models in Science and Engineering | TEKS.MMA.9B TEKS.MMA.9F |

TEKS Mathematical Models with Applications

| Unit 4: Probability | | | |
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| Topic | Lesson # | Title | TEKS Standard |
| Topic A | Representing Sample Spaces and Events | | |
| | 4.1 | Drawing and Interpreting Venn and Tree Diagrams | TEKS.MMA.8A TEKS.MMA.9A |
| | 4.2 | Identifying Sample Spaces | TEKS.MMA.8A TEKS.MMA.9A |
| | 4.3 | Identifying Events | TEKS.MMA.8A TEKS.MMA.9A |
| | 4.4 | Describing Events | TEKS.MMA.8A TEKS.MMA.9A |
| | 4.5 | Combinations and Permutations | TEKS.MMA.8A |
| Topic B | Calculating Probabilities | | |
| | 4.6 | Calculating Probabilities and Expressing them in Equivalent Forms Using Fractions, Decimals, and Percents | TEKS.MMA.8A |
| | 4.7 | Probability with Combinatorics | TEKS.MMA.8A |
| Topic C | Theoretical and Empirical Probability | | |
| | 4.8 | Comparing Theoretical to Empirical Probability | TEKS.MMA.8B |
| | 4.9 | Assessing Theoretical Probability Models | TEKS.MMA.8C |
| Unit 5: Personal Finance: Income, Taxes, and Budgeting | | | |
| Topic | Lesson # | Title | TEKS Standard |
| Topic A | Income | | |
| | 5.1 | Creating Equations and Inequalities—Gross Pay | TEKS.MMA.2A |
| | 5.2 | Creating Equations in Context—Net Pay | TEKS.MMA.2A |
| Topic B | Taxation | | |
| | 5.3 | Creating and Solving Equations in Two Variables—Tax Brackets | TEKS.MMA.2B |
| Topic C | Budgeting | | |
| | 5.4 | Functions, Systems, and Budgets | TEKS.MMA.2A |
| Performance Task | | Independent Living: Taxes | TEKS.MMA.2B |

TEKS Mathematical Models with Applications

Unit 6: Personal Finance: Credit, Loans, and Insurance

| Topic | Lesson # | Title | TEKS Standard |
|------------------|------------------------------|---|---|
| Topic A | Credit | | |
| | 6.1 | Solving Linear Equations—Simple Interest | TEKS.MMA.3B |
| | 6.2 | Analyzing Credit Offers with Linear and Exponential Equations | TEKS.MMA.3B |
| Topic B | Loans and Financed Purchases | | |
| | 6.3 | Recursion and Sequences—Payment Plans | TEKS.MMA.3A TEKS.MMA.3C TEKS.MMA.3D |
| | 6.4 | Finite Geometric Series—Amortized Loans | TEKS.MMA.3A TEKS.MMA.3C TEKS.MMA.3D |
| Topic C | Insurance | | |
| | 6.5 | Insurance | TEKS.MMA.4A |
| Performance Task | | Automobile Ownership | TEKS.MMA.3D |

Unit 7: Personal Finance: Savings and Investment

| Topic | Lesson # | Title | TEKS Standard |
|------------------|-------------------------|---|----------------------------|
| Topic A | Banking | | |
| | 7.1 | Interpreting Complicated Expressions—Bank Statements and Savings Accounts | TEKS.MMA.2C TEKS.MMA.4C |
| | 7.2 | Analyzing Savings Account Options Using Equations and Inequalities | TEKS.MMA.2C TEKS.MMA.4C |
| Topic B | Investing | | |
| | 7.3 | Interpreting Expressions and Equations—Stocks and Shares | TEKS.MMA.4B |
| | 7.4 | Interpreting Stock Parameters | TEKS.MMA.4B |
| | 7.5 | Reading Stock Reports | TEKS.MMA.4B |
| Topic C | Planning for Retirement | | |
| | 7.6 | Planning for Retirement | TEKS.MMA.4B |
| Performance Task | | Banking | TEKS.MMA.2C TEKS.MMA.4C |

TEKS Mathematical Models with Applications

Unit 8: Mathematical Models in Architecture and Spatial Reasoning

| Topic | Lesson # | Title | TEKS Standard |
|---------|---|---|--|
| Topic A | <i>Ramp-up: Scale Factors and Dilations</i> | | |
| | 8.1 | <i>Ramp-up: Dilations and Parallel Lines</i> | TEKS.G.3B |
| | 8.2 | <i>Ramp-up: Finding and Using Scale Factors</i> | TEKS.G.3B |
| Topic B | <i>Ramp-up: Defining and Applying Similarity</i> | | |
| | 8.3 | <i>Ramp-up: Defining Similarity</i> | TEKS.G.7A |
| | 8.4 | <i>Ramp-up: Applying Similarity Using the Angle–Angle (AA) Criterion</i> | TEKS.G.7B |
| Topic C | <i>Ramp-up: Problem Solving Using Similarity and Congruence</i> | | |
| | 8.5 | <i>Ramp-up: Side-Angle-Side (SAS) and Side-Side-Side (SSS) Similarity</i> | TEKS.G.8A |
| | 8.6 | <i>Ramp-up: Ratios and Similarity</i> | TEKS.G.8A |
| | 8.7 | <i>Ramp-up: The Pythagorean Theorem and Similarity</i> | TEKS.G.6D TEKS.G.8A |
| | 8.8 | <i>Ramp-up: Solving Problems Using Similarity and Congruence</i> | TEKS.G.6D TEKS.G.8A |
| | 8.9 | <i>Ramp-up: 45°–45°–90° and 30°–60°–90° Triangles</i> | TEKS.G.9B |
| Topic D | Exploring and Applying Trigonometric Ratios | | |
| | 8.10 | Defining Sine, Cosine, and Tangent | TEKS.MMA.6D |
| | 8.11 | Calculating Sine, Cosine, and Tangent | TEKS.MMA.6D |
| | 8.12 | Problem Solving with the Pythagorean Theorem and Trigonometry | TEKS.MMA.6D TEKS.MMA.6C |
| Topic E | Creating and Using Geometric Models | | |
| | 8.13 | Scaling Across Dimensions | TEKS.MMA.6B TEKS.MMA.7D |
| | 8.14 | Modeling in Three Dimensions | TEKS.MMA.6A TEKS.MMA.6B TEKS.MMA.6C TEKS.MMA.6D |

TEKS Mathematical Models with Applications

Unit 9: Mathematical Models in the Fine Arts

| Topic | Lesson # | Title | TEKS Standard |
|------------------|---|---|----------------------------|
| Topic A | <i>Ramp-up: Introducing Trigonometric Functions</i> | | |
| | 9.1 | <i>Ramp-up: Radians</i> | TEKS.G.12D |
| | 9.2 | <i>Ramp-up: The Unit Circle</i> | TEKS.G.12D |
| | 9.3 | <i>Ramp-up: Special Angles in the Unit Circle</i> | TEKS.G.12D |
| | 9.4 | <i>Ramp-up: Evaluating Trigonometric Functions</i> | TEKS.G.9A |
| Topic B | Trigonometric Functions in Art and Music | | |
| | 9.5 | Periodic Phenomena and Amplitude, Frequency, and Midline | TEKS.MMA.7A TEKS.MMA.7C |
| | 9.6 | Using Trigonometric Functions to Model Periodic Phenomena | TEKS.MMA.7A TEKS.MMA.7C |
| Topic C | Math in Music | | |
| | 9.7 | Patterns and Symmetry in Music | TEKS.MMA.7C |
| | 9.8 | Applying Mathematics to Music | TEKS.MMA.7A TEKS.MMA.7C |
| Topic D | Scale and Dimension in Art | | |
| | 9.9 | Proportions and Perspective | TEKS.MMA.7B |
| | 9.10 | Dimension in Art | TEKS.MMA.7B TEKS.MMA.7D |
| Performance Task | | Origami | TEKS.MMA.7B TEKS.MMA.7D |