# Math 7 Honors: Year at a Glance

## First Semester

| **Unit** | **Let’s Get Real, Pythagoras ≈ 15 days** | **Ship Shape and Angles Away ≈ 26 days** | **Whose Line Is It, Anyway? ≈ 32 days** |
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| **TEKS** | 7.2, 8.2A, 8.2B, 8.2C, **8.2D**, 8.6C,**8.7C**, 8.7D | **7.5A**, **7.5C**, **8.3A**, 8.3B, **8.3C**, 8.8D, 8.10A, 8.10B, **8.10C**, 8.10D | 7.4C, **7.7**, **8.4A**, **8.4B**, **8.4C**, **8.5A**, **8.5B**, 8.5E, **8.5F**, **8.5H**, **8.5I** |
| **Stage**  **One**  **Snapshot** | * Convert between standard and Scientific Notation * Identify and group numbers according to their characteristics * Approximate irrational values with and without a number line * Compare and order rational and irrational numbers * Model and solve problems using the Pythagorean Theorem | * Identify critical attributes of similarity and find missing measurements given two similar figures * Translate, rotate, reflect, and dilate a figure on a coordinate plane * Write algebraic representations for transformations * Model the scale factor’s effect on linear measurements and area * Find missing angle measurements given parallel lines intersected by a transversal | * Represent linear proportional situations with tables, graphs and equations * Determine the constant of   proportionality, 𝑘 =   * Graph a linear relationship * Classify a linear relationship as proportional or non-proportional * Determine the rate of change, from a table, graph, context, and an equation * Identify the slope and *y*-intercept of a linear function from its table, graph, context or equation in the form 𝑦 = 𝑚𝑥 + 𝑏. |

## Second Semester

| **Unit** | **Uptown FUNction**  **≈ 22 days** | **What’s Trending**  **≈ 11 days** | **Wrapping and Filling**  **≈ 28 days** |
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| **TEKS** | 8.5G, **8.8A**, 8.8B, **8.8C**, 8.9 | 7.6F, 7.12B, 7.12C, 8.5C, **8.5D**, **8.11A**, 8.11B, 8.11C | 7.5B, 7.8A, 7.8B, 7.8C, **7.9A**, **7.9B**,**7.9C**, 7.9D, 8.6A, 8.6B, **8.7A**, **8.7B** |
| **Stage**  **One**  **Snapshot** | * Identify a function when given a mapping, set of ordered pairs, table, and graph * Write and solve equations with variables on both sides to represent problem situations * Write linear equations inequalities with variables on both sides * Find the point of intersection using a graph | * Use a data sample to make predictions about a population * Analyze data from a statistical representation * Make predictions in scatter plots using trend lines * Analyze a scatter plot & determine association * Calculate mean absolute deviation for up to 10 values. | * Calculate circumference and area of   circles   * Find the area of composite figures * Solve problems involving lateral and total surface area and lateral surface area of 3D figures, including nets * Find the volume of cones, cylinders, and spheres * Find missing measurements of 3Dfigures |

| **Unit** | **Financial Freedom**  **≈ 13 days** | **Take a Chance**  **≈ 11 days** |
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| **TEKS** | 7.13B, 7.13C, 7.13D, 7.13E, 8.12A,  8.12B, 8.12C, **8.12D**, 8.12 E, 8.12F, 8.12G | 7.6A**,** 7.6B, 7.6C, **7.6D**, 7.6E, **7.6H**,**7.6I** |
| **Stage**  **One**  **Snapshot** | * Calculate & compare simple interest and compound interest earnings * Create net worth statements/analyze personal budgets * Analyze loan terms to make smart financial decisions * Use online tools to determine the time it takes to pay off loan, financial aid, or credit cards | * Collect data and calculate experimental probability * Organize outcomes by listing the sample space using tree diagrams and organized lists * Determine theoretical probability, including compound events * Use probabilities to make predictions |

# Texas Essential Knowledge and Skills

**7th grade Standards:**

7.1 **Mathematical process standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

1. apply mathematics to problems arising in everyday life, society, and the workplace;
2. use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;
3. select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;

®**(D)** communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;

1. create and use representations to organize, record, and communicate mathematical ideas;
2. analyze mathematical relationships to connect and communicate mathematical ideas; and
3. display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

7.2 **Number and operations.** The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers.

7.4 **Proportionality**. The student applies mathematical process standards to represent and solve problems involving proportional relationships. The student is expected to:

(C) determine the constant of proportionality (*k = y/x*) within mathematical and real-world problems;

7.5 **Proportionality.** The student applies mathematical process standards to use geometry to describe or solve problems involving proportional relationships. The student is expected to:

1. generalize the critical attributes of similarity, including ratios within and between similar shapes;
2. describe π as the ratio of the circumference of a circle to its diameter; and

®**(C)** solve mathematical and real-world problems involving similar shape and scale drawings.

7.6 **Proportionality**. The student applies mathematical process standards to use probability and statistics to describe or solve problems involving proportional relationships. The student is expected to:

1. represent sample spaces for simple and compound events using lists and tree diagrams;
2. select and use different simulations to represent simple and compound events with and without technology;
3. make predictions and determine solutions using experimental data for simple and compound events;
4. make predictions and determine solutions using theoretical probability for simple and compound events;
5. find the probabilities of a simple event and its complement and describe the relationship between the two;
6. use data from a random sample to make inferences about a population;

®**(H)** solve problems using qualitative and quantitative predictions and comparisons from simple experiments; and

®**(I)** determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces.

* 1. **Expressions, equations, and relationships**. The student applies mathematical process standards to represent linear relationships using multiple representations. The student is expected to represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form *y = mx + b*.
  2. **Expressions, equations, and relationships**. The student applies mathematical process standards to develop geometric relationships with volume. The student is expected to:

1. model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas;
2. explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas; and
3. use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas.

7.9 **Expressions, equations, and relationships**. The student applies mathematical process standards to solve geometric problems. The student is expected to:

®**(A)** solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids;

®**(B)** determine the circumference and area of circles; and

®**(C)** determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles

1. solve problems involving the lateral and total surface area of a rectangular prism, rectangular pyramid, triangular prism, and triangular pyramid by determining the area of the shape's net.

7.12 **Measurement and data**. The student applies mathematical process standards to use statistical representations to analyze data. The student is expected to:

1. use data from a random sample to make inferences about a population; and
2. compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations.

7.13 **Personal financial literacy.** The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to: (B) identify the components of a personal budget, including income; planned savings for college, retirement, and emergencies; taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget;

(C) create and organize a financial assets and liabilities record and construct a net worth statement; (D) use a family budget estimator to determine the minimum household budget and average hourly wage

needed for a family to meet its basic needs in the student's city or another large city nearby; and (E) calculate and compare simple interest and compound interest earnings.

**8th grade Standards:**

8.2 **Number and operations**. The student applies mathematical process standards to represent and use real numbers in a variety of forms. The student is expected to:

1. extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of real numbers;
2. approximate the value of an irrational number, including π and square roots of numbers less than 225, and locate that rational number approximation on a number line;
3. convert between standard decimal notation and scientific notation; and

®**(D)** order a set of real numbers arising from mathematical and real-world contexts.

8.3 **Proportionality**. The student applies mathematical process standards to use proportional relationships to describe dilations. The student is expected to:

1. generalize that the ratio of corresponding sides of similar shapes are proportional, including a shape and its dilation;
2. compare and contrast the attributes of a shape and its dilation(s) on a coordinate plane; and

®**(C)** use an algebraic representation to explain the effect of a given positive rational scale factor applied to twodimensional figures on a coordinate plane with the origin as the center of dilation.

8.4 **Proportionality**. The student applies mathematical process standards to explain proportional and non-proportional relationships involving slope. The student is expected to:

**(A)** use similar right triangles to develop an understanding that slope, *m*, given as the rate comparing the change in *y*-values to the change in *x*-values, (y2 - y1)/ (x2 - x1), is the same for any two points (x1, y1) and (x2, y2) on the same line;

®**(B)** graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship; and

®**(C)** use data from a table or graph to determine the rate of change or slope and *y*-intercept in mathematical and real-world problems.

8.5 **Proportionality**. The student applies mathematical process standards to use proportional and non-proportional relationships to develop foundational concepts of functions. The student is expected to:

1. represent linear proportional situations with tables, graphs, and equations in the form of *y = kx*;
2. represent linear non-proportional situations with tables, graphs, and equations in the form of *y = mx + b*, where *b* ≠ 0;
3. contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation;

® **(D)** use a trend line that approximates the linear relationship between bivariate sets of data to make predictions; **(E)** solve problems involving direct variation;

**(F)** distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form *y = kx* or *y = mx + b*, where *b* ≠0;

® (G) identify functions using sets of ordered pairs, tables, mappings, and graphs;

**(H)** identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems; and

®**(I)** write an equation in the form *y = mx + b* to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations.

8.6 **Expressions, equations, and relationships**. The student applies mathematical process standards to develop mathematical relationships and make connections to geometric formulas. The student is expected to:

1. describe the volume formula *V = Bh* of a cylinder in terms of its base area and its height;
2. model the relationship between the volume of a cylinder and a cone having both congruent bases and heights and connect that relationship to the formulas; and
3. use models and diagrams to explain the Pythagorean theorem.

8.7 **Expressions, equations, and relationships**. The student applies mathematical process standards to use geometry to solve problems. The student is expected to:

®**(A)** solve problems involving the volume of cylinders, cones, and spheres;

®**(B)** use previous knowledge of surface area to make connections to the formulas for lateral and total surface area and determine solutions for problems involving rectangular prisms, triangular prisms, and cylinders;

®**(C)** use the Pythagorean Theorem and its converse to solve problems; and

1. determine the distance between two points on a coordinate plane using the Pythagorean Theorem.

8.8 **Expressions, equations, and relationships.** The student applies mathematical process standards to use one-variable equations or inequalities in problem situations. The student is expected to:

1. write one-variable equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants;
2. write a corresponding real-world problem when given a one-variable equation or inequality with variables on both sides of the equal sign using rational number coefficients and constants;

®**(C)** model and solve one-variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants; and

(D) use informal arguments to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

8.9 **Expressions, equations, and relationships**. The student applies mathematical process standards to use multiple representations to develop foundational concepts of simultaneous linear equations. The student is expected to identify and verify the values of *x* and *y* that simultaneously satisfy two linear equations in the form *y = mx + b* from the intersections of the graphed equations.

8.10 **Two-dimensional shapes.** The student applies mathematical process standards to develop transformational geometry concepts. The student is expected to:

1. generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane;
2. differentiate between transformations that preserve congruence and those that do not;

® (C) explain the effect of translations, reflections over the *x*- or *y*-axis, and rotations limited to 90°, 180°, 270°, and

360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation; and (D) model the effect on linear and area measurements of dilated two-dimensional shapes.

8.11 **Measurement and data.** The student applies mathematical process standards to use statistical procedures to describe data. The student is expected to:

1. construct a scatterplot and describe the observed data to address questions of association such as linear, nonlinear, and no association between bivariate data;
2. determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points; and
3. simulate generating random samples of the same size from a population with known characteristics to develop the notion of a random sample being representative of the population from which it was selected.

8.12 **Personal financial literacy**. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to:

1. solve real-world problems comparing how interest rate and loan length affect the cost of credit;
2. calculate the total cost of repaying a loan, including credit cards and easy access loans, under various rates of interest and over different periods using an online calculator;
3. explain how small amounts of money invested regularly, including money saved for college and retirement, grow over time;

®**(D)** calculate and compare simple interest and compound interest earnings;

1. identify and explain the advantages and disadvantages of different payment methods;
2. analyze situations to determine if they represent financially responsible decisions and identify the benefits of financial responsibility and the costs of financial irresponsibility; and
3. estimate the cost of a two-year and four-year college education, including family contribution, and devise a periodic savings plan for accumulating the money needed to contribute to the total cost of attendance for at least the first year of college.