Indiana Tutorials are designed specifically for the Indiana Academic Standards to prepare students for the Indiana Statewide Testing for Educational Progress-Plus (ISTEP+) End-of-Course Assessments (ECAs).

Math Tutorials offer targeted instruction, practice and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. They automatically identify and address learning gaps down to elementary-level content, using adaptive remediation to bring students to grade-level no matter where they start. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing the ability to apply their knowledge in abstract and real world scenarios, students build the depth of knowledge and higher order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, modeled logic and process, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

Unit 1: Addition and Subtraction of Rational Numbers

- **ADDING RATIONAL NUMBERS**
  - 7.NS.1: Show on a number line that a number and its opposite have a sum of 0 (are additive inverses). Find and interpret sums of rational numbers in real-world contexts.
  - 7.NS.2: Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
- **SUBTRACTING RATIONAL NUMBERS**
  - 7.NS.2: Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
- **USING PROPERTIES TO ADD AND SUBTRACT RATIONAL NUMBERS**
  - 7.NS.3: Use the properties of operations, particularly the distributive property, leading to products such as (1)(1) = 1 and the rules for multiplying signed numbers. (E)
  - 7.NS.7: Compute fluently with rational numbers using an algorithmic approach. (E)

Unit 2: Multiplication and Division of Rational Numbers

- **MULTIPLYING RATIONAL NUMBERS**

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- 7.NS.3: Use the properties of operations, particularly the distributive property, leading to products such as (1)(1) = 1 and the rules for multiplying signed numbers. (E)

- **DIVIDING RATIONAL NUMBERS**
  - 7.NS.4: Explain that if p and q are integers, then (p/q) = (p)/q = p/(q) for all nonzero integers. (E)
- **USING PROPERTIES TO MULTIPLY AND DIVIDE RATIONAL NUMBERS**
  - 7.NS.3: Use the properties of operations, particularly the distributive property, leading to products such as (1)(1) = 1 and the rules for multiplying signed numbers. (E)
  - 7.NS.7: Compute fluently with rational numbers using an algorithmic approach. (E)
- **USING OPERATIONS ON RATIONAL NUMBERS TO SOLVE PROBLEMS**
  - 7.NS.7: Compute fluently with rational numbers using an algorithmic approach. (E)

Unit 3: Rate, Ratio, and Proportions

- **UNIT RATES**
  - 7.RP.1: Identify the unit rate or constant of proportionality in tables, graphs, equations, and verbal descriptions of proportional relationships.
  - 7.RP.3: Represent real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent these proportional relationships. Apply the definition of unit rate to y = mx. (E)
- **USING PROPORTIONS TO SOLVE PROBLEMS**
  - 7.RP.2: Use proportional relationships to solve ratio and percent problems with multiple operations (e.g., simple interest, tax, markups, markdowns, gratuities, conversions within and across measurement systems, and percent increase and decrease). (E)
- **SOLVING PERCENT PROBLEMS**
  - 7.RP.2: Use proportional relationships to solve ratio and percent problems with multiple operations (e.g., simple interest, tax, markups, markdowns, gratuities, conversions within and across measurement systems, and percent increase and decrease). (E)

Unit 4: Proportional Reasoning

- **IDENTIFYING PROPORTIONAL RELATIONSHIPS**
  - 7.RP.3: Represent real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent these proportional relationships. Apply the definition of unit rate to y = mx. (E)
- **ANALYZING PROPORTIONAL RELATIONSHIPS**
  - 7.RP.3: Represent real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent these proportional relationships. Apply the definition of unit rate to y = mx. (E)
- **REPRESENTING PROPORTIONAL RELATIONSHIPS**

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- 7.RP.3: Represent real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent these proportional relationships. Apply the definition of unit rate to y = mx. (E)

- **SCALE DRAWINGS**
  - 7.GM.1: Solve real-world and other mathematical problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing. Create a scale drawing by using proportional reasoning.

Unit 5: Algebraic Expressions and Equations

- **EXPONENTS**
  - 7.NS.5: Find the prime factorization of whole numbers and write the results using exponents.
- **SOLVING EQUATIONS USING ROOTS**
  - 7.NS.6: Apply the inverse relationship between squaring and finding the square root of a perfect square whole number. Find square roots of perfect square whole numbers.
- **SIMPLIFYING AND REWRITING ALGEBRAIC EXPRESSIONS**
  - 7.AF.1: Apply the properties of operations (e.g., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions, including situations that involve factoring out a common number (e.g., given 2x 10, create an equivalent expression 2(x 5)). Justify each step in the process. (E)
- **EQUIVALENT EXPRESSIONS**
  - 7.AF.1: Apply the properties of operations (e.g., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions, including situations that involve factoring out a common number (e.g., given 2x 10, create an equivalent expression 2(x 5)). Justify each step in the process. (E)

Unit 6: Solving Linear Equations

- **SOLVING LINEAR EQUATIONS**
  - 7.AF.2: Solve real-world problems with rational numbers by using one or two operations. (E)
- **SOLVING TWO-STEP EQUATIONS**
  - 7.AF.3: Solve equations of the formpx + q = r and p(x + q) = r fluently, where p, q, and r are specific rational numbers. Represent real-world problems using equations of these forms and solve such problems. (E)
- **SOLVING MULTI-STEP PROBLEMS WITH RATIONAL NUMBERS**
  - 7.AF.2: Solve real-world problems with rational numbers by using one or two operations. (E)

Unit 7: Solving Linear Inequalities

- **SOLVING INEQUALITIES**
  - 7.AF.4: Solve inequalities of the form px + q (or) r or px + q (or) r , where p, q, and r are specific rational numbers. Represent real-world problems using inequalities of these forms and solve such

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problems. Graph the solution set of the inequality and interpret it in the context of the problem.

- **SOLVING LINEAR INEQUALITIES**
  - 7.AF.4: Solve inequalities of the form px + q (or) r or px + q (or) r , where p, q, and r are specific rational numbers. Represent real-world problems using inequalities of these forms and solve such problems. Graph the solution set of the inequality and interpret it in the context of the problem.

Unit 8: Linear Functions

- **GRAPHS OF FUNCTIONS**
  - 7.AF.5: Define slope as vertical change for each unit of horizontal change, and apply that a constant rate of change or constant slope describes a linear function. Identify and describe situations with constant or varying rates of change.
- **SLOPE**
  - 7.AF.5: Define slope as vertical change for each unit of horizontal change, and apply that a constant rate of change or constant slope describes a linear function. Identify and describe situations with constant or varying rates of change.
  - 7.AF.6: Graph a line given its slope and a point on the line. Find the slope of a line given its graph. (E)
- **SLOPE INTERCEPT FORM**
  - 7.AF.6: Graph a line given its slope and a point on the line. Find the slope of a line given its graph. (E)

Unit 9: Geometry in Two and Three Dimensions

- **CIRCLES**
  - 7.GM.2: Understand the formulas for area and circumference of a circle and use them to solve real-world and other mathematical problems; give an informal derivation of the relationship between circumference and area of a circle.
- **AREA, VOLUME, AND SURFACE AREA**
  - 7.GM.3: Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms. (E)
- **VOLUME OF CYLINDERS AND CONES**
  - 7.GM.3: Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms. (E)
- **VOLUME OF PRISMS**
  - 7.GM.3: Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms. (E)

Unit 10: Statistics and Sampling

- **POPULATIONS AND SAMPLES**
  - 7.DSP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population. Understand that conclusions and generalizations about a population from a

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sample are valid only if the sample is representative of that population and that random sampling tends to produce representative samples and support valid inferences. (E)

- **USING STATISTICAL MEASURES TO COMPARE DATA SETS**
  - 7.DSP.2: Find, use, and interpret measures of central tendency (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation) for numerical data from random samples to draw comparative inferences about two populations. (E)
- **MEASURES OF CENTER AND VARIABILITY**
  - 7.DSP.2: Find, use, and interpret measures of central tendency (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation) for numerical data from random samples to draw comparative inferences about two populations. (E)

Unit 11: Statistical Measures

- **STATISTICAL MEASURES TO SUMMARIZE DATA SETS**
  - 7.DSP.2: Find, use, and interpret measures of central tendency (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation) for numerical data from random samples to draw comparative inferences about two populations. (E)
- **COMPARING DATA SETS VISUALLY**
  - 7.DSP.3: Make observations about the degree of visual overlap of two numerical data distributions represented in line plots or box plots. Describe how data, particularly outliers, added to a data set may affect the mean and/or median.
- **SUMMARIZING DATA USING MEASURES OF CENTER AND VARIABILITY**
  - 7.DSP.3: Make observations about the degree of visual overlap of two numerical data distributions represented in line plots or box plots. Describe how data, particularly outliers, added to a data set may affect the mean and/or median.

Unit 12: Probability

- **PROBABILITY**
  - 7.DSP.4: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Understand that a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. Understand that a probability of 1 indicates an event certain to occur and a probability of 0 indicates an event impossible to occur. Identify probabilities of events as impossible, unlikely, equally likely, likely, or certain. (E)
  - 7.DSP.5: Develop probability models that include the sample space and probabilities of outcomes to represent simple events with equally likely outcomes. Predict the approximate relative frequency of the event based on the model. Compare probabilities from the model to observed frequencies, evaluate the level of agreement, and explain possible sources of discrepancy. (E)
- **CALCULATING PROBABILITY**

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- 7.DSP.5: Develop probability models that include the sample space and probabilities of outcomes to represent simple events with equally likely outcomes. Predict the approximate relative frequency of the event based on the model. Compare probabilities from the model to observed frequencies, evaluate the level of agreement, and explain possible sources of discrepancy. (E)

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