

Pennsylvania Tutorials are designed specifically for the Pennsylvania Core Standards and the Pennsylvania Academic Standards to prepare students for the Keystone Exams and the Pennsylvania System of School Assessment (PSSA).

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.

1. THE NUMBER SYSTEM

- **RATIONAL AND IRRATIONAL NUMBERS**
 - **CC.2.1.8.E.1** Distinguish between rational and irrational numbers using their properties.
 - **CC.2.2.8.B.1** Apply concepts of radicals and integer exponents to generate equivalent expressions.
- **APPROXIMATING IRRATIONAL NUMBERS**
 - **CC.2.1.8.E.4** Estimate irrational numbers by comparing them to rational numbers.
 - **CC.2.1.8.E.1** Distinguish between rational and irrational numbers using their properties.

2. EXPONENTS

- **PROPERTIES OF EXPONENTS**
 - **CC.2.2.8.B.1** Apply concepts of radicals and integer exponents to generate equivalent expressions.
- **POWERS OF 10**
 - **CC.2.2.8.B.1** Apply concepts of radicals and integer exponents to generate equivalent expressions.
- **SCIENTIFIC NOTATION**
 - **CC.2.2.8.B.1** Apply concepts of radicals and integer exponents to generate equivalent expressions.

3. PROPORTIONAL REASONING AND SLOPE

- **SLOPE**
 - **CC.2.2.8.B.2** Understand the connections between proportional relationships, lines, and linear equations.
- **MULTIPLE REPRESENTATIONS OF PROPORTIONS**
 - **CC.2.2.8.B.2** Understand the connections between proportional relationships, lines, and linear equations.

4. FUNCTIONS

- **RELATIONS AND FUNCTIONS**

- **CC.2.2.8.C.1** Define, evaluate, and compare functions.
- **CC.2.2.8.C.2** Use concepts of functions to model relationships between quantities.

- **COMPARING FUNCTIONS**

- **CC.2.2.8.C.1** Define, evaluate, and compare functions.

- **GRAPHS OF FUNCTIONS**

- **CC.2.2.8.C.2** Use concepts of functions to model relationships between quantities.

5. LINEAR FUNCTIONS

- **SLOPE-INTERCEPT FORM**

- **CC.2.2.8.C.1** Define, evaluate, and compare functions.

- **WRITING LINEAR FUNCTIONS**

- **CC.2.2.8.C.2** Use concepts of functions to model relationships between quantities.

6. SOLVING EQUATIONS

- **SOLVING LINEAR EQUATIONS**

- **CC.2.2.8.B.3** Analyze and solve linear equations and pairs of simultaneous linear equations.

- **SOLVING SYSTEMS OF LINEAR EQUATIONS**

- **CC.2.2.8.B.3** Analyze and solve linear equations and pairs of simultaneous linear equations.

- **SOLVING EQUATIONS USING ROOTS**

- **CC.2.2.8.B.1** Apply concepts of radicals and integer exponents to generate equivalent expressions.

7. THE PYTHAGOREAN THEOREM AND DISTANCE FORMULA

- **THE PYTHAGOREAN THEOREM**

- **CC.2.3.8.A.3** Understand and apply the Pythagorean Theorem to solve problems.

- **THE CONVERSE OF THE PYTHAGOREAN THEOREM**

- **CC.2.3.8.A.3** Understand and apply the Pythagorean Theorem to solve problems.

- **DISTANCE ON THE COORDINATE PLANE**

- **CC.2.3.8.A.3** Understand and apply the Pythagorean Theorem to solve problems.

8. THREE-DIMENSIONAL GEOMETRY

- **VOLUME OF CYLINDERS AND CONES**

- **CC.2.3.8.A.1** Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.

- **SPHERES**

- **CC.2.3.8.A.1** Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.

9. TRANSFORMATIONS, CONGRUENCE, AND SIMILARITY

- **BASICS OF TRANSFORMATIONS**

- **CC.2.3.8.A.2** Understand and apply congruence, similarity, and geometric transformations using various tools.

- **T TRANSFORMATIONS AND CONGRUENCE**

- **CC.2.3.8.A.2** Understand and apply congruence, similarity, and geometric transformations using various tools.

- **T TRANSFORMATIONS IN THE COORDINATE PLANE**

- **CC.2.3.8.A.2** Understand and apply congruence, similarity, and geometric transformations using various tools.

- **SIMILARITY AND DILATIONS**

- **CC.2.3.8.A.2** Understand and apply congruence, similarity, and geometric transformations using various tools.
- **CC.2.3.8.A.3** Understand and apply the Pythagorean Theorem to solve problems.

10. ANGLES AND ANGLE RELATIONSHIPS

- **PARALLEL LINES AND ANGLE RELATIONSHIPS**

- **CC.2.3.8.A.2** Understand and apply congruence, similarity, and geometric transformations using various tools.

- **ANGLE RELATIONSHIPS IN TRIANGLES**

- **CC.2.3.8.A.2** Understand and apply congruence, similarity, and geometric transformations using various tools.

11. DATA AND STATISTICS

- **SCATTERPLOTS**

- **CC.2.4.8.B.1** Analyze and/or interpret bivariate data displayed in multiple representations.

- **LINEAR MODELS IN DATA**

- **CC.2.4.8.B.1** Analyze and/or interpret bivariate data displayed in multiple representations.

- **FREQUENCY TABLES**

- **CC.2.4.8.B.1** Analyze and/or interpret bivariate data displayed in multiple representations.
- **CC.2.4.8.B.2** Understand that patterns of association can be seen in bivariate data utilizing frequencies.