

Connecticut State Department of Education

Mathematics Curriculum Framework

High School – Grades 9 – 12

Essential Questions

Algebraic Reasoning: Patterns And Functions

How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?

Numerical and Proportional

How are quantitative relationships represented by numbers?

Geometry and Measurement

How do geometric relationships and measurements help us to solve problems and make sense of our world?

Working with Data

How can collecting, organizing and displaying data help us analyze information and make reasonable predictions and informed decisions?

Math Standards

Algebraic Reasoning: Patterns And Functions – Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

1.1 Students should understand and describe patterns and functional relationships.

Core

1.1a Students should describe relationships and make generalizations about patterns and functions.

Extended

1.1a Students should model real world situations and make generalizations about mathematical relationships using a variety of patterns and functions.

1.2 Students should represent and analyze quantitative relationships in a variety of ways.

Core

1.2a Students should represent and analyze linear and non-linear functions and relations symbolically and with tables and graphs.

Extended

1.2a Students should relate the behavior of functions and relations to specific parameters and determine functions to model real world situations.

1.3 Students should use operations, properties, and algebraic symbols to determine equivalence and solve problems.

Core

1.3a Students should manipulate equations, inequalities, and functions to solve problems.

Extended

1.3a Students should use and extend algebraic concepts to include real and complex numbers, vectors, and matrices.

Numerical and Proportional Reasoning – Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

2.1 Students should understand that a variety of numerical representations can be used to describe quantitative relationships.

Core

2.1a Students should extend the understanding of number to include integers, rational numbers, and real numbers.

2.1b Students should interpret and represent large sets of numbers with the aid of technology.

Extended

2.1a Students should extend the understanding of number to include the set of complex numbers.

2.2 Students should use numbers and their properties to compute flexibly and fluently, and to reasonably estimate measures and quantities.

Core

2.2a Students should develop strategies for computation and estimation using properties of number systems to solve problems.

2.2b Students should solve proportional reasoning problems.

Extended

2.2a Students should investigate mathematical properties and operations related to objects that are not numbers.

Geometry and Measurement – Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

3.1 Students should use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.

Core

3.1a Students should investigate relationships among plane and solid geometric figures using geometric models, constructions and tools.

3.1b Students should develop and evaluate mathematical arguments using reasoning and proof.

Extended

3.1a Students should use methods of deductive and inductive reasoning to make, test, and validate geometric conjectures.

3.1b Students should explore non-Euclidean Geometries.

3.2 Students should use spatial reasoning, location and geometric relationships to solve problems.

Core

3.2a Students should verify geometric relationships using algebra, coordinate geometry, and transformations.

Extended

3.2a Students should use a variety of coordinate systems and transformations to solve geometric problems in two- and three-dimensions using appropriate tools and technology.

3.3 Students should develop and apply units, systems, formulas and appropriate tools to estimate and measure.

Core

3.3a Students should solve a variety of problems involving one- two- and three-dimensional measurements using geometric relationships and trigonometric ratios.

Extended

3.3a Students should approximate measurements that cannot be directly determined with some degree of precision using appropriate tools, techniques and strategies.

Working with Data: Probability and Statistics – Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

4.1 Students should collect, organize and display data using appropriate statistical and graphical methods.

Core

4.1a Students should create the appropriate visual or graphical representation of real data.

Extended

4.1a Students should model real data graphically using appropriate tools, technology and strategies.

4.2 Students should analyze data sets to form hypotheses and make predictions.

Core

4.2a Students should analyze real world problems using statistical techniques.

Extended

4.2a Students should describe and analyze sets of data using statistical models.

4.3 Students should understand and apply basic concepts of probability.

Core

4.3a Students should understand and apply the principles of probability in a variety of situations.

Extended

4.3a Students should solve problems using the methods of discrete mathematics

4.3b Students should make statistical inferences through the use of probability.