

Mathematics

Students will explore Mathematics as both the language of science and as a way of reasoning about the world. Mathematics allows us to explore how things work, understand why things work a certain way, and investigate what makes things work better. Mathematics provides skills for reasoning that improve our understanding and our communication across all fields of human endeavor.

Topics and Themes

Discovery

Observe patterns, make conjectures, look for equivalences and connections, and test insights with technology tools.

Estimation

Develop rough guesses using intuition as a guide for what solutions and answers should look like.

Computational Thinking

Break down and organize a problem so it can be explored algorithmically.

Abstraction

Use Mathematics to move from specific observations to general truths. Use general methods to learn more about specific situations.

Data Representations

Assimilate strategies for representing and communicating information effectively, which facilitates understanding.

Predictions and Forecasting

Achieve familiarity with concepts like probability, expected value, and exponential growth to make informed decisions and avoid errors.

Decision Analysis

Understand how Mathematics offers decision-making tools, as well as predictions for how mathematical confusions can lead to bad decisions.

Logical Reasoning

Consider examples of valid arguments and also where arguments break down.

Standards Addressed

CCSS Content addressed includes:

HSS.ID, HSN.Q.A, HSS.CP, HSF.IF, HSB.BF, HSF.LE, HSA.CED, HSA.REI

Key Skills

Manipulate Properties of Units

Use properties of units carefully to assist in mathematical modeling and equation-building, eliminating the need for rote memorization.

Learn to “Speak” Mathematics

Express and analyze problems in science, engineering, health, and other fields using the language of Mathematics.

Construct Arguments & Reason Quantitatively

Construct mathematical arguments. Reason logically in a quantitative context. Justify conclusions and explain reasoning.

Make Mathematical Models

Create, simulate, analyze, and interpret mathematical models of real-world phenomena. Simplify and draw conclusions.

Use Technology Strategically

Use spreadsheets, graphing applications, and other mathematical tools.

Analyze and Interpret Data

Determine which statistics to compare, which graphs to use, and how to draw meaningful conclusions from a data set by making connections.

Solve Equations, Inequalities, and Systems

Develop the critical algebraic, graphical, and numerical understanding necessary to solve problems. Use traditional methods and modern tools to interpret solutions and draw conclusions about the world.

Mathematics

Featured Quests



9 Activities

Mathematics

One Giant Leap

How do you know that bungee jumping is safe?

Algebra 1, hands-on, linear, bungee, experiment

1 Artifact



A video of your experiment, including the model you used to make the prediction and a reflection on your model.



7 Activities

Mathematics

Race Against the Machine

How can you predict which mode of transportation would win in a race?

dimensional analysis

1 Artifact



When you changed things up for the second race, what did you change? What guidance might you give to future students?



6 Activities

Mathematics

How Big is a Tiny House?

How much space do you need to live?

minimalism, area, Volume, geometry

1 Artifact



Build a scale model house using the unit conversion technique built in the previous activity.



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