

Proposed Mathematics Standard, Content Strands, Process Strands, Bands within the Content Strands, and Grade-By-Grade Performance Indicators

Mathematics, Science, and Technology - Standard 3

Students will:

- understand the concepts of and become proficient with the skills of mathematics;
- communicate and reason mathematically;
- become problem solvers by using appropriate tools and strategies;

through the integrated study of number sense and operations, algebra, geometry, measurement, and statistics and probability.

The Five Content Strands

Number Sense and Operations Strand

Students will:

- understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems;
- understand meanings of operations and procedures, and how they relate to one another;
- compute accurately and make reasonable estimates.

Algebra Strand

Students will:

- represent and analyze algebraically a wide variety of problem solving situations;
- perform algebraic procedures accurately;
- recognize, use, and represent algebraically patterns, relations, and functions.

Geometry Strand

Students will:

- use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes;
- identify and justify geometric relationships, formally and informally;
- apply transformations and symmetry to analyze problem solving situations;
- apply coordinate geometry to analyze problem solving situations.

Measurement Strand

Students will:

- determine what can be measured and how, using appropriate methods and formulas;
- use units to give meaning to measurements;
- understand that all measurement contains error and be able to determine its significance;
- develop strategies for estimating measurements.

Statistics and Probability Strand

Students will:

- collect, organize, display, and analyze data;
- make predictions that are based upon data analysis;
- understand and apply concepts of probability.

The Five Process Strands

Problem Solving Strand

Students will:

- build new mathematical knowledge through problem solving;
- solve problems that arise in mathematics and in other contexts;
- apply and adapt a variety of appropriate strategies to solve problems;
- monitor and reflect on the process of mathematical problem solving.

Reasoning and Proof Strand

Students will:

- recognize reasoning and proof as fundamental aspects of mathematics;
- make and investigate mathematical conjectures;
- develop and evaluate mathematical arguments and proofs;
- select and use various types of reasoning and methods of proof.

Communication Strand

Students will:

- organize and consolidate their mathematical thinking through communication;
- communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
- analyze and evaluate the mathematical thinking and strategies of others;
- use the language of mathematics to express mathematical ideas precisely.

Connections Strand

Students will:

- recognize and use connections among mathematical ideas;
- understand how mathematical ideas interconnect and build on one another to produce a coherent whole;
- recognize and apply mathematics in contexts outside of mathematics.

Representation Strand

Students will:

- create and use representations to organize, record, and communicate mathematical ideas;
- select, apply, and translate among mathematical representations to solve problems;
- use representations to model and interpret physical, social, and mathematical phenomena.

Bands Within the Content Strands

Number Sense and Operations

- Number Systems
- Number Theory
- Operations
- Estimation

Algebra

- Variables and Expressions
- Equations and Inequalities
- Patterns, Relations, and Functions
- Coordinate Geometry
- Trigonometric Functions

Geometry

- Shapes
- Geometric Relationships
- Transformational Geometry
- Coordinate Geometry
- Constructions
- Locus
- Informal Proofs
- Formal Proofs

Measurement

- Units of Measurement
- Tools and Methods
- Units
- Error and Magnitude
- Estimation

Statistics and Probability

- Collection of Data
- Organization and Display of Data
- Analysis of Data
- Predictions from Data
- Probability