

High School Standards Key

National Science Education Standards Key

www.educationworld.com/standards/national/science/9_12.shtml

Standards

S1: Science as Inquiry

Abilities necessary to do scientific inquiry; understandings about scientific inquiry.

S2: Physical Science

Structure of atoms; structure and properties of matter; chemical reactions; motions and forces; conservation of energy and increase in disorder; interactions of energy and matter.

S3: Life Science

The cell; molecular basis of heredity; biological evolution; interdependence of organisms; matter, energy, and organization in living systems; behavior of organisms.

S4: Earth and Space Science

Energy in the earth system; geochemical cycles; origin and evolution of the earth system; origin and evolution of the universe.

S5: Science and Technology

Abilities of technological design; understandings about science and technology.

S6: Personal and Social Perspectives

Personal and community health; population growth; natural resources; environmental quality; natural and human-induced hazards; science and technology in local, national, and global challenges.

S7: History and Nature of Science

Science as a human endeavor; nature of scientific knowledge; historical perspective.

National Language Arts Education Standards Key

www.ncte.org/about/over/standards/110846.htm

Standards

LA1: Reading for Perspective

Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

LA2: Understanding the Human Experience

Students read a wide range of literature from many periods in many genres to build an understanding of the many dimensions (e.g., philosophical, ethical, aesthetic) of human experience.

LA3: Evaluation Strategies

Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics).

LA4: Communication Skills

Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.

LA5: Communication Strategies

Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

LA6: Applying Knowledge

Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and nonprint texts.

LA7: Evaluating Data

Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.

LA8: Developing Research Skills

Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

LA9: Multicultural Understanding

Students develop an understanding of and respect for diversity in language use, patterns, and dialects across cultures, ethnic groups, geographic regions, and social roles.

LA10: Applying Non-English Perspectives

Students whose first language is not English make use of their first language to develop competency in the English language arts and to develop understanding of content across the curriculum.

LA11: Participating in Society

Students participate as knowledgeable, reflective, creative, and critical members of a variety of literacy communities.

LA12: Applying Language Skills

Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

**National Language Arts
Education Standards Key**

www.nctm.org/uploadedFiles/Math_Standards/NCTMSECONStandards.pdf

Number and Operation

N1: Understand Numbers, Ways of

**Representing Numbers, Relationships
Among Numbers, and Number Systems**

- Develop a deeper understanding of very large and very small numbers and of various representations of them.
- Compare and contrast the properties of numbers and number systems.
- Understand vectors and matrices as systems that have some of the properties of the real-number system.
- Use number-theory arguments to justify relationships involving whole numbers.

**N2: Understand Meanings of Operations and
How They Relate to One Another**

- Judge the effects of such operations as multiplication, division, and computing powers and roots on the magnitudes of quantities.
- Develop an understanding of properties of, and representations for, the addition and multiplication of vectors and matrices.
- Develop an understanding of permutations and combinations as counting techniques.



N3: Compute Fluently and Make Reasonable Estimates

- Develop fluency in operations with real numbers, vectors, and matrices, using mental computation or paper-and-pencil calculations for simple cases and technology for more-complicated cases.
- Judge the reasonableness of numerical computations and their result.

Algebra

A1: Understand Patterns, Relations, and Functions

- Generalize patterns using explicitly defined and recursively defined functions.
- Understand relations and functions and select, convert flexibly among, and use various representations for them.
- Analyze functions of one variable by investigating rates of change, intercepts, zeros, asymptotes, and local and global behavior.
- Understand and perform transformations such as arithmetically combining, composing, and inverting commonly used functions, using technology to perform such operations on more-complicated symbolic expressions.
- Understand and compare the properties of classes of functions, including exponential, polynomial, rational, logarithmic, and periodic functions.
- Interpret representations of functions of two variables.

A2: Represent and Analyze Mathematical Situations and Structures Using Algebraic Symbols

- Understand the meaning of equivalent forms of expressions, equations, inequalities, and relations.
- Write equivalent forms of equations, inequalities, and systems of equations and solve them with fluency – mentally or with paper and pencil in simple cases and using technology in all cases.
- Use symbolic algebra to represent and explain mathematical relationships.
- Use a variety of symbolic representations, including recursive and parametric equations, for functions and relations.
- Judge the meaning, utility, and reasonableness of the results of symbol manipulations, including those carried out by technology.

A3: Use Mathematical Models to Represent and Understand Quantitative Relationships

- Identify essential quantitative relationships in a situation and determine the class or classes of functions that might model the relationships.
- Use symbolic expressions, including iterative and recursive forms, to represent relationships arising from various contexts.
- Draw reasonable conclusions about a situation being modeled.

A4: Analyze Change in Various Contexts

- Approximate and interpret rates of change from graphical and numerical data.

Geometry

GM1: Analyze Characteristics and Properties of Two- and Three-Dimensional Geometric Shapes and Develop Mathematical Arguments About Geometric Relationships

- Analyze properties and determine attributes of two- and three-dimensional objects.
- Explore relationships (including congruence and similarity) among classes of two- and three-dimensional geometric objects, make and test conjectures about them, and solve problems involving them.
- Establish the validity of geometric conjectures using deduction, prove theorems, and critique arguments made by others.
- Use trigonometric relationships to determine lengths and angle measures.

GM2: Specify Locations and Describe Spatial Relationships Using Coordinate Geometry and Other Representational Systems

- Use Cartesian coordinates and other coordinate systems, such as navigational, polar, or spherical systems, to analyze geometric situations.
- Investigate conjectures and solve problems involving two- and three-dimensional objects represented with Cartesian coordinates.

GM3: Apply Transformations and Use Symmetry to Analyze Mathematical Situations

- Understand and represent translations, reflections, rotations, and dilations of objects in the plane by using sketches, coordinates, vectors, function notation, and matrices.
- Use various representations to help understand the effects of simple transformations and their compositions.

GM4: Use Visualization, Spatial Reasoning, and Geometric Modeling to Solve Problems

- Draw and construct representations of two- and three-dimensional geometric objects using a variety of tools.
- Visualize three-dimensional objects and spaces from different perspectives and analyze their cross sections.
- Use vertex-edge graphs to model and solve problems.
- Use geometric models to gain insights into, and answer questions in, other areas of mathematics.
- Use geometric ideas to solve problems in, and gain insights into, other disciplines and other areas of interest such as art and architecture.

M2: Apply Appropriate Techniques, Tools, and Formulas to Determine Measurements

- Analyze precision, accuracy, and approximate error in measurement situations.
- Understand and use formulas for the area, surface area, and volume of geometric figures, including cones, spheres, and cylinders.
- Apply informal concepts of successive approximation, upper and lower bounds, and limit in measurement situations.
- Use unit analysis to check measurement computations.

Measurement

M1: Understand Measurable Attributes of Objects and the Units, Systems, and Processes of Measurement

- Make decisions about units and scales that are appropriate for problem situations involving measurement.

Data Analysis and Probability

DA1: Formulate Questions That can be Addressed with Data and Collect, Organize, and Display Relevant Data to Answer

- Understand the differences among various kinds of studies and which types of inferences can legitimately be drawn from each.
- Know the characteristics of well-designed studies, including the role of randomization in surveys and experiments.
- Understand the meaning of measurement data and categorical data, of univariate and bivariate data, and of the term variable.
- Understand histograms, parallel box plots, and scatterplots and use them to display data.
- Compute basic statistics and understand the distinction between a statistic and a parameter.

DA2: Select and Use Appropriate Statistical Methods to Analyze Data

- For univariate measurement data, be able to display the distribution, describe its shape, and select and calculate summary statistics.
- For bivariate measurement data, be able to display a scatterplot, describe its shape, and determine regression coefficients, regression equations, and correlation coefficients using technological tools.
- Display and discuss bivariate data where at least one variable is categorical.
- Recognize how linear transformations of univariate data affect shape, center, and spread.
- Identify trends in bivariate data and find functions that model the data or transform the data so that they can be modeled.

DA3: Develop and Evaluate Inferences and Predictions that are Based on Data

- Use simulations to explore the variability of sample statistics from a known population and to construct sampling distributions.
- Understand how sample statistics reflect the values of population parameters and use sampling distributions as the basis for informal inference.
- Evaluate published reports that are based on data by examining the design of the study, the appropriateness of the data analysis, and the validity of conclusions.
- Understand how basic statistical techniques are used to monitor process characteristics in the workplace.

DA4: Understand and Apply Basic Concepts of Probability

- Understand the concepts of sample space and probability distribution and construct sample spaces and distributions in simple cases.
- Use simulations to construct empirical probability distributions.
- Compute and interpret the expected value of random variables in simple cases.
- Understand the concepts of conditional probability and independent events.
- Understand how to compute the probability of a compound event.

Problem Solving

PS1: Build New Mathematical Knowledge Through Problem Solving

PS2: Solve Problems That Arise in Mathematics and in Other Contexts

PS3: Apply and Adapt a Variety of Appropriate Strategies to Solve Problems

PS4: Monitor and Reflect on the Process of Mathematical Problem Solving



Reasoning and Proof

- RP1:** Recognize Reasoning and Proof as Fundamental Aspects of Mathematics
- RP2:** Make and Investigate Mathematical Conjectures
- RP3:** Develop and Evaluate Mathematical Arguments and Proofs
- RP4:** Select and Use Various Types of Reasoning and Methods of Proof

Communication

- COM1:** Organize and Consolidate Their Mathematical Thinking Through Communication
- COM2:** Communicate Their Mathematical Thinking Coherently and Clearly to Peers, Teachers, and Others
- COM3:** Analyze and Evaluate the Mathematical Thinking and Strategies of Others
- COM4:** Use the Language of Mathematics to Express Mathematical Ideas

Connections

- CN1:** Recognize and Use Connections Among Mathematical Ideas
- CN2:** Understand How Mathematical Ideas Interconnect and Build on One Another to Produce a Coherent Whole
- CN3:** Recognize and Apply Mathematics in Contexts Outside of Mathematics

Representation

- R1:** Create and Use Representations to Organize, Record, and Communicate Mathematical Ideas
- R2:** Select, Apply, and Translate Among Mathematical Representations to Solve Problems
- R3:** Use Representations to Model and Interpret Physical, Social, and Mathematical Phenomena

National Social Sciences
Education Standards Key

www.education-world.com/standards

Civics

- C1: Civic Life, Politics and Government**
What is civic life? What is politics? What is government? Why are government and politics necessary? What purposes should government serve? What are the essential characteristics of limited and unlimited government? What are the nature and purposes of constitutions? What are alternative ways of organizing constitutional governments?
- C2: Foundations of the Political System**
What is the American idea of constitutional government? What are the distinctive characteristics of American Society? What is American political culture? What values and principles are basic to American constitutional democracy?

C3: Principles of Democracy

How are the power and responsibility distributed, shared, and limited in the government established by the U.S. Constitution? How is the national government organized and what does it do? How are state and local governments organized and what do they do? What is the place of law in the American constitutional system?

C4: Other Nations and World Affairs

How is the world organized politically? How do the domestic politics and constitutional principles of the U.S. affect its relations with the world? How has the U.S. influenced other nations, and how have other nations influenced American politics and society?

C5: Roles of the Citizen

What is citizenship? What are the rights of citizens? What are the responsibilities of citizens? What civic dispositions or traits of private and public character are important to the preservation and improvement of American constitutional democracy? How can citizens take part in civic life?

Economics

E1: Scarcity

Productive resources are limited. Therefore, people cannot have all the goods and services they want; as a result, they must choose some things and give up others.

E2: Marginal Cost/Benefit

Effective decision making requires comparing the additional costs of alternatives with the additional benefits. Most choices involve doing a little more or a little less of something; few choices are “all or nothing” decisions.

E3: Allocation of Goods and Services

Different methods can be used to allocate goods and services. People acting individually or collectively through government, must choose which methods to use to allocate different kinds of goods and services.

E4: Role of Incentives

People respond predictably to positive and negative incentives.

E5: Gain From Trade

Voluntary exchange occurs only when all participating parties expect to gain.

This is true for trade among individuals or organizations within a nation, and usually among individuals or organizations in different nations.

E6: Specialization and Trade

When individuals, regions, and nations specialize in what they can produce at the lowest cost and then trade with others, both production and consumption increase.

E7: Markets-Price and Quantity Determination

Markets exist when buyers and sellers interact. This interaction determines market prices and thereby allocates scarce goods and services.

E8: Role of Price in Market System

Prices send signals and provide incentives to buyers and sellers. When supply or demand changes, market prices adjust, affecting incentives.

E9: Role of Competition

Competition among sellers lowers costs and prices, and encourages producers to produce more of what consumers are willing and able to buy. Competition among buyers increases prices and allocates goods and services to those people who are willing and able to pay the most for them.

E10: Role of Market Institutions

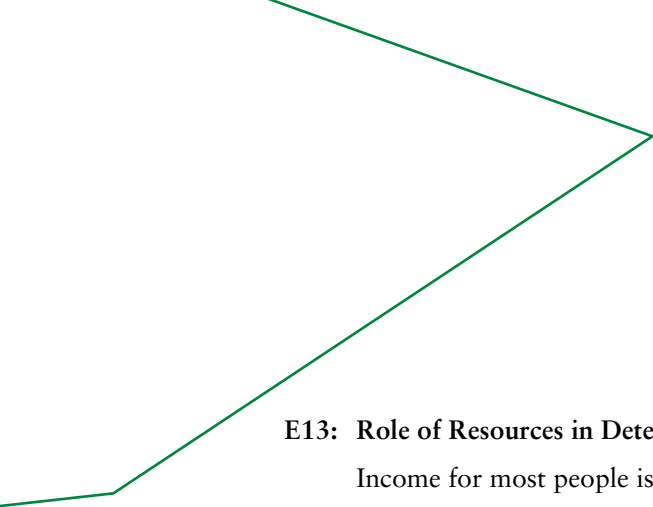
Institutions evolve in market economies to help individuals and groups accomplish their goals. Banks, labor unions, corporations, legal systems, and not-for-profit organizations are examples of important institutions. A different kind of institution, clearly defined and enforced property rights, are essential to a market economy.

E11: Role of Money

Money makes it easier to trade, borrow, save, invest, and compare the value of goods and services.

E12: Role of Interest Rates

Interest rates, adjusted for inflation, rise and fall to balance the amount saved with the amount borrowed, which affects the allocation of scarce resources between present and future uses.



E13: Role of Resources in Determining Income

Income for most people is determined by the market value of the productive resources they sell. What workers earn depends, primarily, on the market value of what they produce and how productive they are.

E14: Profit and the Entrepreneur

Entrepreneurs are people who take the risks of organizing productive resources to make goods and services. Profit is an important incentive that leads entrepreneurs to accept the risks of business failure.

E15: Growth

Investment in factories, machinery, new technology, and in the health, education, and training of people can raise future standards of living.

E16: Role of Government

There is an economic role for government in a market economy whenever the benefits of a government policy outweigh its costs. Governments often provide for national defense, address environmental concerns, define and protect property rights, and attempt to make markets more competitive. Most government policies also redistribute income.

E17: Using Cost/Benefit Analysis to Evaluate Government Programs

Costs of government policies sometimes exceed benefits. This may occur because of incentives facing voters, government officials, and government employees, because of actions by special interest groups that can impose costs on the general public, or because social goals other than economic efficiency are being pursued.

E18: Macroeconomy-Income/Employment Prices

A nation's overall levels of income, employment, and prices are determined by the interaction of spending and production decisions made by all households, firms, government agencies, and others in the economy.

E19: Unemployment and Inflation

Unemployment imposes costs on individuals and nations. Unexpected inflation imposes costs on many people and benefits some others because it arbitrarily redistributes purchasing power. Inflation can reduce the rate of growth of national living standards because individuals and organizations use resources to protect themselves against the uncertainty of future prices.

E20: Monetary and Fiscal Policy

Federal government budgetary policy and the Federal Reserve System's monetary policy influence the overall levels of employment, output, and prices.

Geography

G1: The World in Spatial Terms

Use of geographic representations, tools and technologies; organizing information in a spatial context; analyzing spatial organization of people, places and environments on Earth's surface.

G2: Places and Regions

Physical and human characteristics of places; influence of culture and experience on perception of places.

G3: Physical Systems

Physical processes that shape patterns on the Earth's surface, characteristics and spatial distribution of ecosystems.

G4: Human Systems

Migration of human populations, cultural mosaics, economic interdependence, processes and patterns of human settlement, influence of forces of cooperation and conflict on division and control of the Earth's surface.

G5: Environment and Society

Modification of the environment by human actions, relationship between physical and human systems, resource distribution.

G6: The Uses of Geography

Applications of geography to interpret the past, present and future.

U.S. History

USH1: Three Worlds Meet

(Beginnings to 1620)

Comparative characteristics of societies in Americas, Western Europe and Western Africa; European exploration and colonization.

USH2: Colonization and Settlement

(1585-1763)

European attraction to the Americas, emergence of political, social and religious institutions, slavery.

USH3: Revolution and The New Nation

(1754 – 1820s)

Causes and impacts of the American Revolution, institutions and practices of government, American political system roots, U.S. Constitution and Bill of Rights.

USH4: Expansion and Reform

U.S. territorial expansion, Native Americans, immigration, westward movement, political democracy.

USH5: Civil War and Reconstruction

(1850 – 1877)

Causes and effects of the Civil War, reconstruction.

USH6: The Development of the Industrial United States

Rise of corporations, industry, mechanized farming; massive immigration, rise of the American labor movement, Federal Indian policy.

USH7: The Emergence of Modern America

(1890 – 1930)

Progressives, urbanization, political corruption, changing role of the U.S.

USH8: The Great Depression and WWII

(1929 – 1945)

Causes and effects of the Great Depression, New Deal, welfare state, causes and course of WWII.

USH9: Postwar United States

(1945 to early 1970s)

Economic boom and social transformation of postwar U.S., Cold War, domestic policies after WWII, racial and gender equality issues.

USH10: Contemporary United States

(1968 to present)

Recent developments in foreign and domestic policies; economic, social and cultural developments.

World History

WH1: The Beginnings of Human Society

Biological and cultural processes, early human communities, emergence of agricultural societies around the world.

WH2: Early Civilizations and the Emergence of Pastoral Peoples, 4000-1000 BCE

Major characterizations of civilization, agrarian societies, population movements, militarization in Eurasia, major trends in Eurasia and Africa.

WH3: Classical Traditions, Major Religions, and Giant Empires, 1000BCE – 300 BCE

Innovation and change, emergence of Aegean civilization, interrelationships among peoples, development of major religions and empires.

WH4: Expanding Zones of Exchange and Encounter, 300 – 1000 CE
Imperial crises, Islamic civilization, Tang dynasty, redefinition of Europe, global trends.

WH5: Intensified Hemispheric Interactions, 1000 – 1500 CE
Interregional systems of communication, trade and cultural exchange, expansion of states in the Americas, patterns of crisis and recovery in Afro-Eurasia, global trends.

WH6: The Emergence of the First Global Age, 1450 – 1770
Global transformations, global intercommunication, territorial empires, major global trends.

WH7: An Age of Revolutions, 1750 – 1914
Causes and consequences of political, agricultural and industrial revolutions, transformation of Eurasian societies, patterns of nationalism, state-building and social reform, major global trends.

WH8: A Half-Century of Crisis and Achievement, 1900 – 1945
Reform, revolution and change of world economy, WWI, WWII, global trends beyond WWII.

WH9: The 20th Century Since 1945: Promises and Paradoxes
Post WWII reconstruction, international power relationships, interdependent world, major global trends.

