

FINLAND



PISA Rankings

2006			2003			2000		
MATH	SCIENCE	READING	MATH	SCIENCE	READING	MATH	SCIENCE	READING
2	1	2	2	1	1	5	4	1

Population size:	5,288,719
Student enrollment:	570,689 in 2007
U.S. states with similar statistics:	Connecticut, Oregon

General description of K–12 education:

Compulsory education begins for all children at age seven and ends at age 16. The school year is 190 days long. Finland has a national curriculum called the National Core Curriculum for Basic Education. Teachers carry out assessment in their respective subjects based on objectives and assessment criteria written into the curriculum. There are two tracks for upper secondary education: general and vocational. General upper secondary schooling ends with a national matriculation examination, which include tests in Finnish, Swedish, a foreign language, and one test in either mathematics, humanities, or sciences.

Required subjects:

Finnish, Swedish, literature, foreign languages, environmental studies, civics, religion or ethics, history, social studies, mathematics, physics, chemistry, biology, geography, physical education, music, visual arts, craft, home economics and pupil counseling.

EXCERPTS

The documents included for Finland are excerpts from the national curriculum, obtained from the Finland National Board of Education:

- History—grades 5–6
- Music—grades 5–9
- Physics—grades 7–9
- Chemistry—grades 7–9

FINLAND

Excerpts

NATIONAL CORE CURRICULUM FOR BASIC EDUCATION

History • Grades 5–6

The purpose of history instruction in the fifth and sixth grades of basic education is to familiarize the pupil with the nature, acquisition, and basic concepts of historical knowledge; with their own roots; and with certain historical events and phenomena that have acquired importance, from prehistory to the French Revolution. Instruction in the content defined in the core curriculum underscores the functionality of history and the pupils' ability to place themselves in the past.

OBJECTIVES

The pupils will

- Come to understand that historical information consists of the interpretations of historians, which may change as new sources or methods of examination emerge
- Come to understand various ways of dividing history into eras; they will use the concepts of prehistory, history, antiquity, the Middle Ages, and the modern era correctly
- Learn to recognize changes in the history of their own families or home region, and to depict changes, such as the birth of farming, that are seen as having had a fundamental impact on life
- Learn to identify the continuity of history with the aid of examples
- Learn to present reasons for historical changes.

CORE CONTENT

Historical knowledge and one's own roots

- History of one's family and home region
- Interpreting the meanings of recollections, writings, objects, images, and the construction environment

Prehistoric and historic times and the first advanced cultures

- Living conditions of Stone Age people, and changes in those conditions as a result of the invention of bronze and iron
- Impacts on human life of the commencement of farming, emergence of states, and invention of writing.

Emergence of European civilization

- Society and culture of ancient Athens and Rome

- Reflections of the classical period in today's Europe

The Middle Ages

- Impacts of religion on human life; the unequal social status of people
- Sweden's annexation of Finland

The dawn of the modern era

- Changes in the European's values and conception of the world at the end of the Middle Ages: the Renaissance in art, the Reformation in religion, and science's expansion of the conception of the world.

Finland as part of the Kingdom of Sweden

- Life as a king's subjects, and as inhabitants of a great-power state
- Finnish culture takes shape

Liberty gains a foothold

- Impacts of the French Revolution

In addition, one of the following themes, whose development is examined from prehistory up until the 19th century:

- An advanced culture outside Europe
- Evolution of trade
- Evolution of culture
- Development of means of mobility and transport
- Demographic changes

ASSESSMENT CRITERIA

Acquiring information about the past

The pupils will

- Know how to distinguish fact from opinion
- Know how to distinguish a source from an interpretation of that source.

Understanding historical phenomena

The pupils will

- Know that the past can be divided into different eras (chronology); they will be able to name features characteristic of societies and eras
- Recognize the continuity of phenomena from one era to another and understand that change is not the same as progress, and does not mean the same thing from the perspectives of different people and groups, either
- Know how to place themselves in the position of a person from the past: they will know how to explain why people of different eras thought and acted in different ways, and will know the importance of the cause-and-effect relationship

Applying historical knowledge

The pupils will

- Know how to present an account of the matter under consideration so as to explain the event or phenomenon from the standpoint of some of the parties involved
- Know that some things can be interpreted different ways; they will be able to explain why that happens to be so

Music • Grades 5–9

In music instruction in the fifth through ninth grades, the musical world and musical experiences are analyzed and pupils learn to use musical concepts and notation in conjunction with listening to and playing music.

OBJECTIVES

The pupils will

- Maintain and improve their abilities in different areas of musical expression, acting as members of a music-making group
- Learn to examine and evaluate various sound environments critically, and to broaden and deepen their knowledge of different genres and styles of music
- Learn to understand the tasks of music's elements—rhythm, melody, harmony, dynamics, tonal color, and form—in the formulation of music; and to use the concepts and notations that express these elements
- Build their creative relationship with music and its expressive possibilities, by means of composing.

CORE CONTENT

- Exercises that develop voice control and vocal expression; single- and multiple-voiced repertoire representing different styles and genres, with part of the repertoire learned by heart
- Exercises that develop skills for playing instruments together; instrumental repertoire representing different musical cultures and styles in a varied way
- Diverse listening selections and their analysis in terms of time, locale, and culture
- Experimenting with one's own musical ideas by improvising, composing, and arranging, using sound, song, instruments, movement, and musical technology

ASSESSMENT CRITERIA

The pupils will

- Participate in group singing and know how to sing, follow a melody line and the correct rhythm
- Master, as individuals, the basic technique of some rhythm, melody, or harmony instrument so as to be able to play in an ensemble
- Know how to listen to music and make observations about it, and present justified opinions about what they have heard

- Know how to listen to both their own music and music produced by others, so as to be able to make music together with others
- Recognize, and know how to distinguish between, different genres of music and music of different eras and cultures
- Know the most important Finnish music and musical life
- Know how to use musical concepts in conjunction with making and listening to music
- Know how to use the elements of music as building materials in the development and realization of their own musical ideas and thoughts

Physics • Grades 7–9

The purpose of physics instruction in the seventh through ninth grades is to broaden the pupils' knowledge of physics and their conception of the nature of physics, and to strengthen skills in the experimental acquisition of information.

The starting points for physics instruction are the pupils' prior knowledge, skills, and experiences, and their observations and investigations of objects, substances, and phenomena in nature. From these, the instruction progresses towards the laws and fundamental principles of physics. The purpose of the experimental orientation is to help the pupils both to perceive the nature of science and to learn new scientific concepts, principles, and models; to develop skills in experimental work and cooperation; and to stimulate the pupils to study physics.

OBJECTIVES

The pupils will

- Learn to work and investigate natural phenomena safely, together with others
- Learn scientific skills, such as the formulation of questions and the perception of problems
- Learn to make, compare, and classify observations, measurements, and conclusions; to present and test a hypothesis; and to process, present, and interpret results, at the same time putting information and communication technology to good use
- Learn to plan and carry out a scientific investigation in which variables affecting natural phenomena are held constant and varied and correlations among the variables are found out
- Learn to formulate simple models, to use them in explaining phenomena, to make generalizations, and to evaluate the reliability of the research process and results
- Learn to use appropriate concepts, quantities, and units in describing physical phenomena and technological questions
- Learn to evaluate the reliability of the information they have obtained from different sources

- Learn to use various graphs and algebraic models in explaining natural phenomena, making predictions, and solving problems
- Learn about natural phenomena and processes and the transformations of energy that take place in them, know about various natural structures and the interactions of their components, and understand causal relationships between phenomena.

CORE CONTENT

Motion and force

- Interactions and the corresponding forces; motion and equilibrium phenomena that arise from those interactions; occurrence of those phenomena in nature
- Motion and models of uniform and uniformly accelerating motion
- Work done by a force; mechanical energy and power

Vibrations and wave motion

- Various basic phenomena of vibrations and wave motion; production, detection, observation, reflection, and refraction of wave motion; related properties, quantities, and laws
- Importance and applications of sound and light
- Functioning principles of optical instruments

Heat

- Phenomena associated with the heating and cooling of objects and substances; description of those phenomena with appropriate concepts and laws; importance and applications of thermal phenomena
- Conservation and degradation of energy; heat as a form of energy

Electricity

- Electric and magnetic forces between objects
- Direct-current circuits; basic phenomena of electric circuits; safe application of those phenomena in everyday life and technology
- Electromagnetic induction and its use in energy transmission; use of electricity at home

Nature structures

- Natural structures and proportions
- Interactions that keep structural components together; binding and release of energy in processes occurring between components
- Radioactive decay; fission and fusion; ionizing radiation and its effects on animate nature; protection from radiation

Chemistry • Grades 7–9

The purpose of chemistry instruction in the seventh through ninth grades are to expand the pupil's knowledge of chemistry and the nature of chemical information and guide the pupil in thinking characteristic of the (natural)

sciences, in acquiring knowledge, and in applying that knowledge in different life situations.

The instruction relies on an experimental approach in which the starting point is the observation and investigation of substances and phenomena associated with the living environment. The pupil progresses from that point to the interpretation, explanation, and description of phenomena, and to modeling both the structure of matter and chemical reactions with the symbolic language of chemistry. The experimental orientation must help the pupil to grasp the nature of science and to adopt new scientific concepts, principles, and models; it must develop manual skills and abilities for experimental work and cooperation and stimulate the pupil to study chemistry.

OBJECTIVES

The pupil will

- Learn to work safely, following instructions
- Learn to use research methods typical from the standpoint of acquiring scientific knowledge, including information and communication technology; and to evaluate the reliability and importance of the knowledge
- Learn to carry out scientific investigation and to interpret and present the results
- Learn about processes associated with the cycle of substances and the life-cycles of products, and the importance of those processes to nature and the environment
- Learn to know about the physical and chemical concepts that describe the properties of substances and learn to apply those concepts
- Learn to describe and model chemical reactions with the aid of reaction equations
- Learn to apply their knowledge to practical situations and choices
- Learn to know about the importance of chemical phenomena and applications to the individual and society.

CORE CONTENT

Air and Water

- Atmospheric substances and their importance to the individual and the equilibrium of nature
- Water and its properties, such as acidity and alkalinity
- Flammability of substances; the combustion reaction; its description with the symbolic language of chemistry; the properties of combustion products and effects on the environment

Raw material and products

- Key elements and compounds to be found in the earth's crust and their properties, and the manufacture, use, sufficiency, and recyclability of products
- Electrochemical phenomena, the electrochemical cell, and electrolysis, and their applications

- Symbolic designation, classification and distinction of elements and compounds; comparison of reaction rates
- Interpretation of reaction equations and the balancing of simple reaction equations
- Explanation of the properties and structures of elements and compounds with the aid of an atomic model or the periodic table

Living nature and society

- Photosynthesis and combustion; energy sources
- Oxidation reactions and reaction products of organic compounds such as alcohols and carboxylic acids, and the properties and uses of these products
- Hydrocarbons, the petroleum-refining industry, and its products
- Carbohydrates, proteins, and lipids; their composition and importance as nutritional substances and industrial raw materials
- Washing and cosmetic materials; textiles