Japan

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Introduction

Overview of Education System

The Fundamental Law of Education, the basis for post-World War II education in Japan, was enacted in 1947 and amended in 2006.[1] This law establishes the basic principles of Japanese education and provides students with equal opportunities to receive free compulsory education for 9 years. It is the foundation of all education-related laws in Japan, including the School Education Law and the Social Education Law.[2,3]

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) is the administrative body responsible for school education. Local bodies establish and maintain virtually all public primary and lower secondary schools and are accountable to a prefectural or municipal board of education.

Both public and private institutions exist at all levels of the academic hierarchy. The government bears most of the expenses for national schools, while municipal and prefectural schools are supported locally, with some assistance from the government. As a rule, private schools are self-supporting through tuition, donations, and contributions from businesses. However, national and prefectural governments do provide financial assistance for maintaining and improving private schools. Throughout Japan, 87.8% of kindergarten students, 1.3% of primary school students, 7.8% of lower secondary school students, and 34.7% of upper secondary school students were enrolled in private schools in 2023.[4]

Three types of institutions provide public preprimary education: kindergartens (*Yochien*), day care centers (*Hoikusho*), and integrated centers for early childhood education and care (*Yohorenkeigata-Nintei-Kodomo-En*). Kindergartens enroll children ages 3 to 6 and are supervised by MEXT. In many cases, kindergarten education programs last from 1 to 3 years. Day care centers enroll children ages 0 to 6 and are under the jurisdiction of the Ministry of Health, Labour and Welfare. Integrated centers for early childhood education and care are a new type of preprimary institution designed to promote cooperation between kindergartens and day care centers. The government authorized these centers in 2006, and MEXT has collaborated with the Ministry of Health, Labour and Welfare to improve the new system.

Education in Japan follows a 6-3-3 pattern: 6 years of primary school, 3 years of lower secondary school, and 3 years of upper secondary school. Some students attend 6-year secondary schools that combine lower secondary education with both general and

specialized upper secondary education. Introduced into the school system in April 1999, these comprehensive secondary schools are designed to focus on the diverse needs of secondary school students. Of students attending these comprehensive schools, 21.5% were enrolled in private 6-year secondary schools in 2023.[5]

Compulsory education consists of 6 years of primary education and 3 years of lower secondary education, and almost all children ages 6 to 15 are enrolled in school. In 2020, 98.8% of this age cohort went on to upper secondary school, and 55.8% entered a university.[6] In upper secondary schools, education can be full time, part time, or by correspondence. Full-time students complete upper secondary school in 3 years, and part-time and correspondence students can take longer. In 2022, about 97.6% of students in upper secondary schools were enrolled full time.[7]

In public primary and lower secondary schools, there is no official policy on within-school streaming, and students are not tracked. From primary to the end of lower secondary school, a compulsory program of mathematics and science is taught to all students in mixed-ability classes. The same curriculum is prescribed for all students. However, upper secondary schools try to offer courses geared toward differing abilities and interests. In Grades 11 and 12, schools offer several different curriculum options in mathematics and science.

Upper secondary education is divided into two main streams: general secondary education and specialized secondary education. In 2022, 73.6% of students in upper secondary schools were enrolled in the general stream,[8] which provides general academic preparation. The specialized stream provides vocational and other classes for students who are preparing for a specific career, with subjects such as agriculture, business, fisheries, home economics, nursing, information technology, social work, physical education, music, art, science, mathematics, and English.

Under Japan's curricular reform, the national curricula, called Courses of Study, have been revised seven times since their implementation in 1947, with the goal of keeping up with societal changes over the years and the needs of each age group. Also, in general, there have been changes in the number of class hours. The eighth revised Course of Study for Elementary Schools was fully implemented in April 2020.[9] Similarly, the revised Course of Study for Lower Secondary Schools was fully implemented in April 2021.[10]

The GIGA School Program has been implemented since 2019. GIGA, which stands for Global and Innovation Gateway for All, provides one device to each student with the goal of enriching learning by combining past practices with information and communications technology (ICT). Although this program was implemented prior to the COVID-19 pandemic, the necessity of digital devices during the pandemic sped up the process of this digital transformation. MEXT's aims include optimizing the learning environment, providing individualized learning, fostering creativity, and preparing for future emergencies that may require remote learning. Currently, the majority of devices used across the country are iPads, Windows computers, and Google Chromebooks.[11]

Use and Impact of TIMSS

Japan has previously participated in TIMSS 1995, 1999, 2003, 2007, 2011, 2015, and 2019. Japan's participation in TIMSS, as well as in the Organisation for Economic Co-operation and Development's Programme for International Student Assessment, is governed by the education policies of MEXT and is implemented by the National Institute for Educational Policy Research (NIER). Several research studies have used TIMSS results to discuss improvements in teaching and learning.[12] Moreover, TIMSS results have been used as reference materials for discussions about education reforms. The fact that TIMSS's National Study Center is located at NIER facilitates further sharing of results with policymakers. In particular, NIER curriculum specialists in mathematics and science can easily access the results.

The Mathematics Curriculum in Primary and Lower Secondary Grades

The national mathematics standards, objectives, and content for primary, lower secondary, and upper secondary education are presented in the Courses of Study.[13,14,15]

Mathematics is a required subject in primary, lower secondary, and the first year of upper secondary school. Beginning with the 1998 revision of the mathematics curriculum, mathematics activities have been part of the objectives of the curriculum for every grade. In addition, enjoying mathematics is an objective at the primary and lower secondary level, while fostering creativity in mathematics is an objective at the upper secondary level.

The mathematics curriculum consists of three parts: overall objectives for the level (primary, lower secondary, or upper secondary), objectives and content for each grade, and syllabus design. Methods and materials also are specified to some extent in the objectives and contents for each grade, as well as in the construction of teaching plans and remarks about content. In addition, the primary school curriculum prescribes the standard number of class periods per year for mathematics. All schools are obliged to address all points relating to mathematics content. Each school must formulate an overall plan for mathematics that includes descriptions of the following: objectives and content; qualities, abilities, and attitudes to be fostered; learning activities; teaching methodology and teaching framework; and a plan for the evaluation of learning.

Fourth-Grade Mathematics Curriculum

Per the 2017 revision of the curriculum, the mathematics content in Grades 1 to 6 comprises four areas: Numbers and Calculations, Geometric Figures, Changes and Relationships, and Use of Data.[16] The overall objectives for mathematics at the primary school level (Grades 1 to 6) are to develop the following competencies to think mathematically using mathematical perspectives and thinking through mathematical activities: (1) cultivate an understanding of the basic and fundamental concepts and properties of numbers, quantities, and geometric figures and acquire skills to handle aspects of everyday life mathematically; (2) cultivate the ability

to view aspects of everyday life using mathematical principles and consider them with good perspectives and logic; develop the ability to discover the basic and fundamental properties of numbers, quantities, and geometric figures and think progressively by integrating them; and use mathematical representation to express aspects in a simple, clear, exact, and flexible manner according to the objectives; and (3) cultivate an attitude of finding pleasure in mathematical activities, appreciate the value of mathematics, reflect on learning, solve problems better, and apply mathematical learning in students' daily lives and in students' learning in general. Exhibit 1 presents the objectives and content for mathematics in fourth grade.[17,18]

Exhibit 1: Mathematics Objectives and Content, Grade 4 (announced in 2017)[a]

Content Area	Objectives and Content
Numbers and Calculations	understand decimal numbers and fractions and that integers can be expressed using the decimal system and apply them in everyday life; understand round numbers and appropriate contexts for using them; understand division and extend the ability to divide integers accurately; consolidate the ability to calculate integers and extend the ability to use these calculations; deepen understanding of decimal numbers, including adding, subtracting, multiplying, and dividing decimal numbers and using these calculations; deepen understanding of fractions, including adding and subtracting fractions with the same denominators and using these calculations; understand the algebraic expressions that represent the relationships between numbers or quantities and use these expressions; deepen understanding of the properties of the four basic operations; add and subtract using a soroban (Japanese abacus)
Geometric Figures	understand plane figures (e.g., parallelograms, rhombuses) and solid figures (e.g., rectangular parallelepiped) by observing their elements and exploring the relationships among those elements; recognize the elements and positional relationships of two-dimensional and three-dimensional geometrical figures through activities such as observing and drawing these figures; understand the meaning of units of measurement for area and use calculations to determine areas of geometrical figures; understand the meaning of units and measurements for angles and measure angles
Changes and Relationships	represent how numbers or quantities change using tables, algebraic expressions, and line graphs and interpret the features of their variation; find two numbers or quantities that vary simultaneously and use tables and algebraic expressions to discuss the features of changes and correspondence by focusing on their relationships; understand that ratios may be used when comparing the relationship between two numbers or quantities in simple cases; use figures, diagrams, algebraic equations, and the like to compare the relationship between two numbers or quantities and to understand their relationship by relating them to everyday aspects

a See https://www.mext.go.jp/content/20230120-mxt_kyoiku02-100002604_01.pdf for the Japanese version of the fourth-grade mathematics curriculum.

Exhibit 1: Mathematics Objectives and Content, Grade 4 (announced in 2017) (Continued)

Content Area	Objectives and Content
Use of Data	understand how to organize and classify data from two perspectives; understand the features and use of line graphs; collect, organize, and classify data accordingly and select and determine appropriate graphs to solve problems and discuss the conclusions by noting the features and trends of the data

Eighth-Grade Mathematics Curriculum

Per the 2017 revision of the curriculum, the mathematics content at the lower secondary school level comprises four areas: Numbers and Algebraic Expressions, Geometric Figures, Functions, and Making Use of Data.[19] The overall objectives for mathematics at the lower secondary level (Grades 7 to 9) are to develop the following competencies to think mathematically using mathematical perspectives and thinking through mathematical activities: (1) help students understand fundamental concepts, principles, and rules regarding numbers, quantities, and geometric figures; acquire the skills to mathematize phenomena; and interpret, represent, and process them mathematically; (2) cultivate the ability to think logically using mathematics; determine the properties of numbers, quantities, and geometric figures and think progressively by integrating them; and represent phenomena in a simple, clear, and exact manner by using mathematical representation; and (3) cultivate an attitude of thinking tenaciously with appreciation and pleasure for mathematical activities and the value of mathematics and applying mathematics in students' daily lives and learning and reflecting on the problem-solving process to evaluate and improve on it.[20,21] Exhibit 2 presents the objectives and content for mathematics in the eighth grade.[22,23]

Exhibit 2: Mathematics Objectives and Content, Grade 8 (announced in 2017)[b]

Content Area	Objectives and Content
Numbers and Algebraic Expressions	develop the ability to discern algebraic relationships in concrete phenomena, represent these relationships in algebraic expressions using letters, and interpret these expressions; understand how to calculate the four fundamental operations with expressions using letters; solve and interpret simultaneous linear equations with two variables; apply algebraic expressions and simultaneous linear equations with two unknowns in concrete situations

b See https://www.mext.go.jp/component/a_menu/education/micro_detail/__icsFiles/afieldfile/2018/05/07/1384661_5_4.pdf for the Japanese version of the eighth-grade mathematics curriculum.

Exhibit 2: Mathematics Objectives and Content, Grade 8 (announced in 2017) (Continued)

Content Area	Objectives and Content
Geometric Figures	through activities such as observing, manipulating, and experimenting, discover the properties of basic plane figures and verify those properties based on the properties of parallel lines; understand the congruence of geometrical figures and verify the properties of geometrical figures based on the conditions for congruence of triangles; develop the ability to think and represent logically; apply basic properties of triangles and parallelograms in concrete situations
Functions	by exploring concrete phenomena, understand linear functions and develop the ability to discover, represent, and analyze functional relationships, and for two numbers/quantities that can be understood as linear functions, determine the features of change and correspondence and consider and represent them by interrelating their tables, algebraic expressions, and graphs; understand, determine, and represent concrete phenomena using linear functions
Making Use of Data	• statistics understand the necessity and meaning of interquartile ranges and box plots; organize data and represent them in box plots via computers or other means of information; use interquartile ranges and box plots to compare and interpret data distribution trends and critically evaluate and judge them • probabilities understand the necessity and meaning of probabilities obtained based on the number of cases in connection with probabilities obtained from multiple trials; consider and express how to obtain probabilities based on the number of cases by analyzing how they appear similarly probable; use probabilities to understand, consider, and represent uncertain events

The Science Curriculum in Primary and Lower Secondary Grades

The national science standards, objectives, and content for primary, lower secondary, and upper secondary education are presented in the Courses of Study.[24,25,26]

Science instruction begins in third grade and is a required subject throughout compulsory education. The science curriculum consists of three parts: overall objectives for the level (primary, lower secondary, or upper secondary); objectives and contents for each grade or section; and syllabus design. All schools are obliged to address all points relating to the content of science. Each school must formulate an overall plan for science that includes descriptions of the following: objectives and content; qualities, abilities, and attitudes to be fostered; learning activities; teaching methodology and teaching framework; and a plan for the evaluation of learning.

Fourth-Grade Science Curriculum

The overall objectives for science in Grades 3 to 6 are as follows: aim to develop students' competencies necessary to scientifically solve problems about natural objects and phenomena through familiarizing the students with nature, using approaches of science, and conducting observations and experiments with a comprehensive vision. Specifically, ensure that students (1) develop knowledge and understanding of natural objects and phenomena, and acquire fundamental skills for observations, experiments, and other scientific activities; (2) develop abilities of scientific problem-solving through conducting observations, experiments, and other scientific activities; and (3) nurture deep appreciation and love for nature, and develop attitudes toward active scientific problem-solving.[27]

The science curriculum at the primary level is divided into two fields: Matter and Energy, and Life and the Earth. The objectives for Matter and Energy at Grade 4 are to enable students to do the following:

- develop knowledge and understanding of properties of air, water, and metal and the function of electric currents, and acquire fundamental skills for observations, experiments, and other scientific activities
- develop abilities to generate evidence-based predictions and hypotheses based on previously learned content and life experience through investigating properties of air, water, and metal and the function of electric currents
- develop attitudes toward active scientific problem-solving through investigating properties of air, water, and metal and the function of electric currents[28]

The objectives for Life and the Earth at Grade 4 are to enable students to do the following:

- develop knowledge and understanding of the structure and movement of the human body, the relationship between the environment and the activities of animals or the growth of plants, the journey of rainwater and ground conditions, weather conditions, and the Moon and stars; acquire fundamental skills for observations, experiments, and other scientific activities
- develop abilities to generate evidence-based predictions and hypotheses based on previously learned content and life experience through investigating the structure and movement of the human body, the relationship between the environment and the activities of animals or the growth of plants, the journey of rainwater and ground conditions, weather conditions, and the Moon and stars
- develop attitudes to love and care for living things and attitudes toward active scientific problem-solving through investigating the structure and movement of the human body, the relationship between the environment and the activities of animals or the growth of plants, the journey of rainwater and ground conditions, weather conditions, and the Moon and stars

Exhibit 3 presents the content covered in the two science fields—Matter and Energy, and Life and the Earth—during fourth grade.[29]

Exhibit 3: Science Content, Grade 4 (announced in 2017)[c]

Content Area	Topic	Content
Matter and Energy	properties of air and water	help students develop their ideas about the properties of air and water by exploring changes in volume and pressure when air and water are compressed in a closed space
	metal, water, air, and their temperature	help students develop their ideas about the properties of metals, water, and air by exploring the changes that occur when metals, water, and air are heated and cooled
	function of electric currents	help students develop their ideas about electricity by exploring the functions of a battery when it is attached to small bulbs and motors
Life and the Earth	structure and movement of the human body	help students develop their ideas about the relationship between the structure and movement of the human body by exploring the movement of bones and muscles, by observing the movement of humans and other animals, and by using teaching materials
	seasons and living things	help students develop their ideas about the relationship between seasons and animal activities and plant growth by finding and raising familiar animals and plants and by exploring the activities of animals and the growth of plants in different seasons
	journey of rainwater and ground conditions	help students develop their ideas about the journey of rainwater and ground conditions by exploring the concept of rainwater flowing from high to low places and water permeation depending on the type of soil
	weather conditions	help students develop their ideas about weather conditions and the change of water in the natural world by observing temperature changes over the course of a day, the process of water changing to vapor, and by exploring changes in weather and temperature and the relationship between water and vapor
	the Moon and stars	help students develop their ideas about the characteristics and movement of the Moon and stars by observing them and by exploring the position of the Moon and the color, brightness, and position of stars

c See https://www.mext.go.jp/component/a_menu/education/micro_detail/__icsFiles/afieldfile/2019/03/18/1387017_005_1.pdf for the Japanese version of the fourth-grade science curriculum. See https://www.mext.go.jp/content/20220405-mxt_kyoiku02-000005241_003.pdf for the English version.

Eighth-Grade Science Curriculum

The overall objectives for science at the lower secondary level (Grades 7 to 9) are as follows: aim to develop students' competencies necessary to conduct scientific inquiry into natural objects and phenomena through experiencing natural objects and phenomena, using discipline-based epistemological approaches of science, and conducting observations and experiments with a comprehensive vision. Specifically, ensure that students (1) deepen knowledge and understanding of natural objects and phenomena, and acquire fundamental skills for observations, experiments, and other scientific activities necessary to conduct scientific inquiry; (2) develop abilities to conduct scientific inquiry through conducting observations, experiments, and other scientific activities; and (3) develop attitudes toward conducting scientific inquiry through actively experiencing natural objects and phenomena.[30]

The science curriculum at the lower secondary level is divided into two fields: Physical Science, and Life and Earth Science. The objectives for Physical Science at Grade 8 are to enable students to do the following:[31]

- through conducting observations, experiments, and other scientific activities regarding objects and phenomena related to matter and energy, understand familiar physical phenomena; electric currents and their uses; motion and energy; familiar substances; chemical changes, atoms, and molecules; and chemical changes and ions, and at the same time deepen recognition regarding the relationship between human life and the development of science and technology; acquire fundamental skills for observations, experiments, and other scientific activities necessary to conduct scientific inquiry into the topics mentioned above
- through experiencing objects and phenomena related to matter and energy, develop abilities to discover regularities and to solve problems by conducting scientific inquiry activities that include generating questions and conducting observations, experiments, and other scientific activities with a comprehensive view, while at the same time analyzing and interpreting the results, and expressing them
- develop attitudes toward conducting scientific inquiry through actively experiencing objects and phenomena related to matter and energy, while at the same time developing holistic views on nature

The objectives for Life and Earth Science at Grade 8 are to enable students to do the following:

- through conducting observations, experiments, and other scientific activities regarding objects and phenomena related to life and Earth, understand structures and functions of the bodies of living organisms, continuity of life, composition and changes of Earth, weather and its changes, and Earth and space; acquire fundamental skills for observations, experiments, and other scientific activities necessary to conduct scientific inquiry into the topics mentioned above

- through experiencing objects and phenomena related to life and Earth, develop abilities to recognize diversity, discover regularities, and solve problems by conducting scientific inquiry activities that include generating questions and conducting observations, experiments, and other scientific activities with a comprehensive view, while at the same time analyzing and interpreting the results, and expressing them
- develop attitudes toward conducting scientific inquiry actively into objects and phenomena related to life and Earth, as well as attitudes toward respecting life and contributing to the conversation of the natural environment, and also develop holistic views on nature

Exhibit 4 presents the content covered in the two science fields—Physical Science, and Life and Earth Science—during eighth grade.[32]

Exhibit 4: Science Content, Grade 8 (announced in 2017)[d]

Content Area	Topic	Content
Physical Science	familiar physical phenomena	understand light and sound, and function of force
	familiar substances	understand characteristics of substances, aqueous solutions, and changes of state
	electric currents and their uses	understand electric currents and magnetic fields
	chemical changes, atoms, and molecules	understand composition of substances, chemical changes, and chemical changes and the mass of substances
	motion and energy	understand equilibrium of force and its composition and decomposition, regularities of motion, and mechanical energy
	chemical changes and ions	understand aqueous solutions and ions, and chemical changes and batteries
	science and technology and humans	understand energy and substances, conservation of the natural environment, and the use of science and technology

d See https://www.mext.go.jp/component/a_menu/education/micro_detail/__icsFiles/afieldfile/2019/03/18/1387018_005.pdf for the Japanese version of the eighth-grade science curriculum. See https://www.mext.go.jp/content/20220405-mxt_kyoiku02-000005242_003.pdf for the English version.

Exhibit 4: Science Content, Grade 8 (announced in 2017) (Continued)

Content Area	Topic	Content
Life and Earth Science	various living organisms and their similarities	understand methods for observing and classifying living organisms, and similarities and differences of the structures of living organisms
	composition and changes of Earth	understand observations of familiar terrain, strata, and rocks; strata and aspects from the past; volcanos and earthquakes; and prosperity brought by nature and disasters caused by volcanoes and earthquakes
	structures and functions of the bodies of living organisms	understand living organisms and cells, structure and functions of plants, and body structure and functions of animals
	weather and its changes	understand weather observations, weather changes, climate of Japan, and prosperity brought by nature and disasters caused by weather
	continuity of life	understand growth of living organisms and how they reproduce, genetic regularity and genes, and diversity and evolution of living organisms
	Earth and space	understand movements of celestial objects, the rotation and revolution of Earth, and the solar system and stars
	nature and humans	understand living organisms and the environment, conservation of the natural environment, and the uses of science and technology

Teacher Professional Development Requirements and Programs

In 2003, Japan instituted a new professional development system under which all teachers with 10 years of experience receive training, according to their individual abilities and aptitudes, in topics such as course instruction and student guidance. Local boards of education offer courses and workshops to improve teachers' instructional abilities and develop educational knowledge that is useful for instruction. Lesson study (*Jyugyou kenkyu*), which usually involves studying teaching materials and the course of study; a process called *Kyouzai Kenkyuu* (discussing lesson plans with other teachers before a lesson); the lesson itself; and a postlesson discussion focusing on how students responded to the lesson and how the course of study should be implemented are common types of training to improve teaching skills.[33,34]

Monitoring Student Progress in Mathematics and Science

Since the 1980s, three types of large-scale assessments have been held in Japan: the Assessment of Implementation of Curriculum, the Assessment of Specific Issues of Education, and the National Assessment of Academic Ability.[35] The National Assessment of Academic Ability has been held every year since 2007. Each assessment has different aims, as shown in Exhibit 5.

Exhibit 5: Assessment of Education for Primary and Secondary School Students Since the 1980s

Assessment	Aim	Grade, Survey Method	Subjects Assessed	Date
Assessment of Implementation of Curriculum	collect data for revising the curriculum and improving methods of instruction	Grades 5 to 9	all subjects, including Japanese/social studies/ mathematics/science	before revising the curriculum and after the revised curriculum is implemented
		sample of students	*English: only for lower secondary school	
Assessment of Specific Issues of Education	collect data about specific issues in education	depends on the subject	Japanese/mathematics (2005)	annually 2005–2012
			science (2006)	
			english (2005, 2010)	
			social studies/ technology and home economics (2007)	
		sample of students	music (2008–2009)	
			art (2009–2010)	
			logical thinking (2012)	
National Assessment of Academic Ability	review achievement and issues in education	Grades 6 and 9	Japanese/mathematics	every April since 2007 (except 2011 because of the Great East Japan Earthquake and 2020 because of the COVID-19 pandemic; in 2021, administered in May due to the COVID-19 pandemic)
		complete population (2007–2009, 2013–2019, 2021–present)	Science was added in 2012 and English was added in 2019. Both science and English are conducted every 3 years.	
		sample of students (2010 and 2012)		
	analyze changes over time	Grades 6 and 9	Japanese/mathematics (2013, 2016)	2013, 2016, 2021
			Japanese/mathematics/ English (2021)	
		sample of students	*English: only for lower secondary school	

In primary and lower secondary schools, student progress is reported to parents at the end of each school term in a report card that provides both norm-referenced and criterion-referenced evaluations. In mathematics and science, teachers use the following four aspects of

criterion-referenced evaluation: interest, eagerness, and attitude toward mathematics or natural phenomena; mathematical or scientific thinking; expression and processing; and knowledge and understanding.

Students in Japan also take entrance examinations for both upper secondary schools and universities. Almost all prefectural boards of education administer the entrance examination for prefectural and municipal upper secondary schools, which students enter in 10th grade. These entrance examinations cover several subjects, including mathematics and science.

To enter national, prefectural, municipal, and most private universities, applicants must take an entrance examination called the National Center Test for University Admissions. This test covers several subjects, including mathematics and science, and is administered by the National Center for University Entrance Examination, an incorporated administrative agency. Applicants must also pass specific entrance examinations administered by individual universities.

Assessments have been mainly paper based (PBT), but computer-based tests (CBT) are being implemented as well.

Special Initiatives in Mathematics and Science Education

Since 2002, MEXT has been designating Super Science High Schools (SSHs), which implement advanced science and mathematics education. By supporting these schools through the Japan Science and Technology Agency (JST), MEXT cultivates students' science ability and thinking and expands the development of international science and technology human resources for the future. In 2021, 217 out of 4,856 high schools in Japan promoted distinct initiatives for SSH.[36]

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