Educational assessments in Korea
Education in Korea: school system

Compulsory School Years (9 years)

- Middle School: 3 years
- Elementary School: 6 years

High School: 3 years

<table>
<thead>
<tr>
<th>General</th>
<th>Special Purpose</th>
<th>Autonomous</th>
<th>Vocational</th>
</tr>
</thead>
</table>

Organization of Educational Administration

**Central Level**
Ministry of Education

**Great - Sphere Level**
Metropolitan and Provincial Office of Education

**Metropolitan (8)**
Seoul, Pusan, Taegu, Incheon, Kwangju, Taejeon, Ulsan, Sejong

**Provincial (9)**
Gyunggi, Kangwon, Chungbuk, Chungnam, Chonbuk, Chonnam, Kyungbuk, Kyungnam, Jeju

**Base Level**
183 District Office of Education
Various education indexes in Korea

![Graph showing various education indexes in Korea.](image)
Current number of teacher 482,686 at 2013(↑)
Kindergarten 46,126
Elementary school 181,585
Middle school 112,707
High school 133,504
School for handicapped children 8,012,

etc. 752

Characteristics of Teachers

Youth indicates Secondary School Teacher as the most desired job
- 6,500 respondents showed high preference on the job which is stable, well-paying, and offers a good working environment (NVPI, 2010)

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Job Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Secondary School Teacher</td>
</tr>
<tr>
<td>2</td>
<td>Musician</td>
</tr>
<tr>
<td>3</td>
<td>Fashion Designer</td>
</tr>
<tr>
<td>4</td>
<td>Doctor</td>
</tr>
<tr>
<td>5</td>
<td>Primary School Teacher</td>
</tr>
<tr>
<td>6</td>
<td>Nurse</td>
</tr>
<tr>
<td>7</td>
<td>Police officer</td>
</tr>
<tr>
<td>8</td>
<td>Entertainer and Sports Manager</td>
</tr>
<tr>
<td>9</td>
<td>Mechanic Engineer</td>
</tr>
<tr>
<td>10</td>
<td>Kindergarten Teacher</td>
</tr>
</tbody>
</table>
Introduction of KICE

- Established on January 1, 1998 under the KICE Act
- Government-funded educational research institution
- Goal:

  To contribute to the qualitative improvement of primary and secondary education and the nation’s educational development through the research, development and implementation of curriculum and educational evaluations.

- Research carried out by KICE covers
  - the National Curriculum and educational evaluation,
  - the improvement of teaching and learning techniques,
  - development and authorization of textbooks, and
  - the implementation of national-level educational testing.
Management System

Leader of Public Education in Knowledge-based Society

Research & Development

Implementation & Management

Curriculum
Primary & Secondary Education
Teaching & Learning
Educational Evaluation

Textbook Authorisation
National Education Policy
Operating Central Teaching & Learning Centre
Achievement Test, CSAT, etc.

Adjusting Social Change & Reflecting User Requirements
Constructing Worldwide Education Network

Input
Feedback
Student Assessments in Korea

School level
- Teacher

Metropolitan/Provincial Offices of Education
- Pre-CSAT
- Learning Diagnostic Test

National level
- NAEA
- CSAT

International level
- PISA
- TIMSS
- ICILS
Types of Assessment

- whom: school, teacher, student, policy maker
- area: cognitive, emotional, behavioral
- function(time): diagnostic, formative, summative
- time limit: Power test or Speed Test
Purpose of Assessment

- Improving the educational objectives or teaching and learning method
- Finding strength and weakness of learners and reflecting in teaching and learning
- Learning/career counseling
- Selecting/Assigning data application
An accountability assessment intended to ensure the responsibility of schools for our students’ academic performance and monitor the quality of the K-12 education.

Conducted annually as a tool for quality management of school educational achievements at the national level.

Census test for all students in 6th, 9th, and 11th grades since 2008~2011.

6th graders who take social studies and science are selected by random sampling in 2012.
Purposes of NAEA

- **DIAGNOSING**
  - Academic achievement

- **PROVIDING**
  - Data and information

- **ENHANCING**
  - School’s accountability

- **EXPLORING**
  - New research design and methods

- **IMPROVING**
  - Teaching and learning
The Purposes of NAEA

- To diagnose the educational achievements of elementary, middle and high school students and the trends of the achievements systematically and scientifically.

- To provide data and information for enhancement of curriculum

- To improve the teaching and learning, monitoring the quality of education

- To enhance the accountability of schools and support school education

- To guide the school towards better assessment methods and explore new research design and methods
Change of NAEA

Sample-based test 2008 Census test for all the students


Enforcement Decree of the Act (November 17, 2008)

- The nation should perform NAEA for all students compulsorily every year (except Elementary school)

- Individual schools should announce the results in public.

“Zero Below-Basic Plan (2008~2012)” “Upward Equalization”
---

**Assessment Framework**

- Assessing academic achievement based on national curriculum

<table>
<thead>
<tr>
<th>Grades</th>
<th>Subjects</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th grade</td>
<td>Korean language, Social Studies, Mathematics, Science, English, and Questionnaires</td>
<td>All the content covered from the 7th to the 9th grade, 1st semester</td>
</tr>
<tr>
<td>11th grade</td>
<td>Korean language, Mathematics, English, and Questionnaires</td>
<td>All the content covered in the 10th grade</td>
</tr>
</tbody>
</table>

* Social Studies and Science for 6th grade are assessed in a sample survey (since 2012)
Achievement Standards:
- Statements specifying the objectives and content of the national curriculum enough to guideline in teaching and learning
Steps of Developing NAEA test

- Reviewing, revising and supplementing achievement and assessment standards
- Setting a guideline for item development
- Appointing and training item writers
- Developing items by the item writers
- Reviewing, revising, and supplementing the item by reviewers
- Selecting the items, assembling tests and printing booklets
- Deciding upon the assessment tools for NAEA
Item type

MC items
- obtain a more adequate sampling of the content
- more effectively structure the problem
- efficiently scored
- objectively scored

Constructive response items
- less reliable in scoring of CRI and time-consuming

Online scoring (distributed scoring) since 2012
NAEA Survey

- Survey of educational contextual variables to analyze the relationship with academic achievement

**STUDENTS**
- Personal and Family Background
- Extracurricular Activities
- Learning Method and Attitude
- School Life
- Learning Related to Each Subject

**TEACHERS**
- Personal Background
- Teaching Activities Related to Each Subject
- Job’s Satisfaction

**SCHOOLS**
- School Features
- School Facilities
- School-Level Curriculum Management
- School Climate
Equating Design and Method

**EQUATING DESIGN**
A non-equivalent group design with external anchor items

**EQUATING METHOD**

**Item Response Theory: True Score Equating**
- Calibration Model
  - For Multiple-choice items: 3PL Model
  - For Construct Response items: GPC Model
- Scale Transformation Extended Stocking–Load Method
Standard Setting

- Cut-scores to divide achievement levels
- Performance Level Descriptions

Advanced level

Proficient level

Basic level

Below-Basic level

- Advanced cut-off score
- Proficient cut-off score
- Basic cut-off score
Scoring and reporting

- Produce scale score and achievement level
  - Raw Score $\rightarrow$ Scale Score $\rightarrow$ Performance Level

- Report the national card of educational achievement level for each subject in each grade

- No report of any of norm referenced interpretation such as rank, percentile, standard score, etc.
Achievement Levels of NAEA

- **ADVANCED Level**
  Superior academic performance of required knowledge and skills
  (Above 80% reached to the desired performance that must be achieved in each content and grade)

- **PROFICIENT Level**
  Solid academic performance of required knowledge and skills
  (50 – 80% reached to the desired performance that must be achieved in each content and grade)

- **BASIC Level**
  Partial mastery of required knowledge and skills
  (20 – 50% reached to the desired performance that must be achieved in each content and grade)

---

Base Line of basic academic achievement

**BELOW- BASIC**
Achievement Progress in Five Subjects: Grade 6 (2009 ~ 2012)

Percentage (%)
Achievement Progress in Five Subjects: Grade 9 (2009 ~ 2012)
Achievement Progress in Five Subjects: Grade 11 (2010 ~ 2012)

Percentage (%)
Main Strategy for SFI (Schools for Improvement)

- Administrative and financial supports are provided by designating schools where below-basic students are concentrated as SFI.

- The government’s school supporting policies, namely “School for Improvement (SFI)” turned out to be quite successful.
Outcomes of “School For Improvement” Policy (2009 ~ 2012)
Change of percentage of below-basic students - average % of all subjects

Provided by MOE(2013)
Student Report for high school student

### 국어
- 글의 내용이 되는 사회문화적 이념을 분석할 수 있고, 글을 읽고 주장의 타당성과 공정성을 평가할 수 있다.
- 쓰기 과제를 고려하여 글을 쓸 때 필요한 내용을 선정할 수 있고, 문단 구성, 문단 전제의 원리를 고려하여 내용을 조작할 수 있다.
- 표현의 대로에 따라 표현 방식의 차이를 알고 연어생활에 활용할 수 있다.
- 문학 작품의 객관적 이해와 원리를 설명할 수 있고, 문학 객관적 변천 과정과 그 변화의 깊은 의미를 파악할 수 있다.
- 서로 다른 해석 방법에 근거하여 문학 작품을 감상할 수 있고, 문학 비평을 통해 작품에 대한 새로운 가치를 발견할 수 있다.

### 보통학력
- 감성을 느끼고 표현과 전달의 효과성을 평가할 수 있다.
- 글을 읽고 글 전체에 나타난 정보를 주문할 수 있고, 주제를 파악할 수 있다.
- 글을 읽고 자료의 정확성과 적절성, 표현의 적절성과 효과, 구성의 논리성과 세 계성을 평가할 수 있다.
- 국어의 문법 범주들을 이해하고, 담화와 표현 원리를 이해하여 국어생활에 활용할 수 있다.
- 한국 문학의 수문과 생산 과정을 바탕으로 파악할 수 있고, 문학적 사고와 표현 능력을 일반적 인터넷에서 활용할 수 있다.

### 기초학력
- 감성을 느끼고 필요한 정보를 찾을 수 있고, 비유적 표현의 의미를 파악할 수 있다.
- 감성을 느끼고 현실과 현대의 입장을 종합적으로 이해할 수 있고, 자신의 경험과 관련시켜 감상할 수 있다.

### 기초학력 미달
- 내용을 정확하게 이해하는 능력, 자신의 생각을 틀로 표현하는 능력을 신장시키기 위한 노력이 필요하다.
- 작품의 주제 및 표현 효과를 파악하는 능력, 국어를 이해하고 적절히 활용하는 능력을 신장시키기 위한 노력이 필요하다.

### 영역

| 영역 | 내용 | 성과물
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>독기는</td>
<td>사설적 독기, 주제적 독기, 비판적 - 감정적 독기</td>
<td>100</td>
</tr>
<tr>
<td>읽기는</td>
<td>내용 확인, 추론, 평가와 감성</td>
<td>100</td>
</tr>
<tr>
<td>쓰기는</td>
<td>내용 생성, 내용 조작, 표현</td>
<td>100</td>
</tr>
<tr>
<td>문법은</td>
<td>언어적 언어 활용, 언어 변구</td>
<td>100</td>
</tr>
<tr>
<td>문학은</td>
<td>문학적, 문학적, 문학적, 문학적, 문학적</td>
<td>100</td>
</tr>
</tbody>
</table>
School Improvement Model based on Achievement

- **Idea of School Progress Index**
  - Developing School Progress Index (SPI) at 2011
  - Evaluating school's efforts by controlling prior achievement at the NAEA

- **Estimating School Progress Index**
  - Applying Contextual Value-Added (CVA) Model to longitudinal data with two time points
  - Using a 2-level Hierarchical Linear Model for calculating school’s expected score at this year

\[
SPI(\%) = \frac{\text{Observed Score} - \text{Expected Score}}{\text{Expected score}}
\]
Reporting Of Results

- Uploading achievement levels and SPI on “School Reporter” for the public
  - School Reporter: [www.schoolinfo.go.kr](http://www.schoolinfo.go.kr)

- Achievement levels of all schools since 2010
  - Elementary, Middle, & High schools

- School Progress Index for all middle & high schools since 2011
## 학교를 보면
학생들의 미래가 보입니다

### 교과별 학성도 (%)

<table>
<thead>
<tr>
<th>과목</th>
<th>국어</th>
<th>수학</th>
<th>영어</th>
</tr>
</thead>
<tbody>
<tr>
<td>수학</td>
<td>91.7%</td>
<td>5.8%</td>
<td>2.5%</td>
</tr>
<tr>
<td>영어</td>
<td>80.4%</td>
<td>7.0%</td>
<td>2.6%</td>
</tr>
<tr>
<td>국어</td>
<td>89.7%</td>
<td>8.7%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

- 국어: 89.7% (96.6%)
- 수학: 91.7% (96.6%)
- 영어: 80.4% (96.6%)

보통학력 이상: 89.7

보통학력 이상建設일
Key findings from Achievement Results

- Academic Achievement of students in all levels have been improved for recently 4 years.

- Proportion of Below-Basic students tends to decrease dramatically every year for all subjects.

- Gender differences decreased in middle and high school.

- Regional differences among Advanced groups deepened in English.
Use of the results

Results of NAE

- Achievement Affirmation
- Improving Learning Methods
- Opportunity to Learn

Parents

Educators

NGOs

Students

- Plan-Based Education
- Request for Learning Support

Schools

- Plans for Improving Achievement
- Supplementary Plans and Programs
- Information Disclosure
- Managing Student’s Achievement

Government (MOE, KICE)

- Analyzing the Results
- Audits on Accountability
- Policies for Improving Ability
- Support Guidance

- Informing School’s Achievement
- Support Plans for Improving Achievements

Offices of Education

- Supplement Learning Plans for Improvement
- Self-Evaluation by Schools
- Programs by Schools and Financial Support

- Plans for Supporting Schools and Implementations
- Guidance and Supervision of School Performance

Provided by KICE
For Students

- Discover academic performance at the national level
- Understand the strengths and weaknesses of domains for each subject
- Ask for opportunity to learn

For Schools

- Discover the achievement differences among students and among subjects
- Improve methods of teaching and learning
- Calculate the indicators for input, process, and output for educational academic progress
For Publics (educators, researchers, etc)

- Research various themes and methodologies to reanalyze the data
- Analyze relationship among background variables affecting academic performance and compare with international results
- Contribute to academic findings and use important basic data for establishing educational policies
For Education Policy

- Discover academic achievement levels of each school within the district
- Investigate the differences in academic performance based on the characteristics of schools based on contextual variables
- Support schools via budgets and programs for improving academic achievement
- Examine the effectiveness of the support system
- Discover academic achievement levels of all students in the relevant school year
- Set up educational policies and plans for a support system including criteria, budget, and programs
- Inspect accountability of schools and offices of education
- Improve the national curriculum and methods of teaching and learning
Implications from NAEA

- Inspecting accountability of schools and offices of education
- Improving the national curriculum and methods of teaching and learning
- Research various themes and methodologies to reanalyze the data
- Analyzing relationship among background variables affecting academic performance and compare with international results
- Contributing to academic findings and use important basic data for establishing educational policies
College Scholastic Ability Test (CSAT)
What is the CSAT?

- **Key characteristics**
  - College Scholastic Ability Test
  - An assessment tool designed to measure students’ academic readiness for college education
  - An achievement test that also measures high-order thinking skills

- **Administration**
  - The CSAT is administered once a year (in Nov.).
  - Commissioned by the Ministry of Education, KICE develops and implements the test each year.
Test composition

- **5 Tests & 7 Areas of Study**

- Test-takers can select all or some of the 5 tests
# Tests & Subjects

<table>
<thead>
<tr>
<th>Test</th>
<th>Associated National Curriculum subjects</th>
<th>Number of Items</th>
<th>Testing Time (min)</th>
<th>Item type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korean Language</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type A</td>
<td>Speech &amp; Writing I, Reading &amp; Grammar I, Literature I</td>
<td>45</td>
<td>80</td>
<td>Multiple choice</td>
</tr>
<tr>
<td>Type B</td>
<td>Speech &amp; Writing II, Reading &amp; Grammar II, Literature II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type A</td>
<td>Mathematics I, Pre-Calculus and Pre-Statistics</td>
<td>30</td>
<td>100</td>
<td>Multiple choice (70%)</td>
</tr>
<tr>
<td>Type B</td>
<td>Mathematics I, Mathematics II, Integration and Statistics, Geometry and Vector</td>
<td></td>
<td></td>
<td>short answer (30%)</td>
</tr>
<tr>
<td>English</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>English, English I, English II,</td>
<td>45</td>
<td>70</td>
<td>Multiple choice</td>
</tr>
</tbody>
</table>

- The two tests types for Korean, Math, & English are newly introduced (CSAT 2014)
## Tests Subjects (cont.)

<table>
<thead>
<tr>
<th>Test</th>
<th>Subjects (NC)</th>
<th>Number of Items</th>
<th>Testing Time (min)</th>
<th>Item type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inquiries Social Studies</td>
<td>Life &amp; Ethics, Ethics &amp; Thought, Korean History, Korean Geography, World Geography, East Asian History, World History, Law &amp; Politics, Economics, Society &amp; Culture (up to 2 of the 10)</td>
<td>20 per subject</td>
<td>30 per subject</td>
<td>Multiple choice</td>
</tr>
<tr>
<td>Sciences</td>
<td>Physics I, Chemistry I, Life Science I, Earth Science I, Physics II, Chemistry II, Life Science II, Earth Science II (up to 2 of the 8)</td>
<td>20 per subject</td>
<td>30 per subject</td>
<td>Multiple choice</td>
</tr>
<tr>
<td>Vocational Education</td>
<td>Agricultural Bio Industry, Industry, Commerce &amp; Information, Fishery &amp; Shipping, Home Economics &amp; Business (1 of the 5)</td>
<td>20 per subject</td>
<td>30 per subject</td>
<td>Multiple choice</td>
</tr>
<tr>
<td>2nd Foreign Languages/Chinese Characters and Classics</td>
<td>German I, French I, Spanish I, Chinese I, Japanese I, Russian I, Arabic I, Basic Vietnamese, Chinese Characters and Classics (1 of the 9)</td>
<td>30 per subject</td>
<td>40 min</td>
<td>Multiple choice</td>
</tr>
</tbody>
</table>
Test Implementation

- **Annual events**
  - Mar.
    - Announcement of Annual Administration Plan
  - Jun.
    - June Mock Test
  - Sep.
    - September Mock Test
  - Nov.
    - Administration of the CSAT

- **Test Development & Administration**
  - Test Development
  - Printing
  - Administration
  - Scoring
  - Score Reporting
Future Challenges for CSAT

- Consistency with revision of the national curriculum and textbook
- Opening of the various test results to public
- Secondary analysis of the CSAT results
- Role of the CSAT results in recent changes of “Admission Officer” system for university/college admission
International Studies on Student Assessment

PISA (Programme for International Student Assessment)
- Coordinated by the Organisation for Economic Co-operation and Development (OECD).
- Assesses: Reading, Mathematics, and Science, Solving

Target and Cycle
- Target: 15-year-old students
- Cycle: 3-year cycle

Korean Students’ Achievement in PISA 2012

- 65 Countries (34 OECD Countries)
- Reading: 1st-2nd
- Math: 1st
- Science: 2nd-4th
- Problem Solving: 1st-2nd
### Trends of Korean Students in PISA

<table>
<thead>
<tr>
<th></th>
<th>PISA 2000 (43 countries)</th>
<th>PISA 2003 (41 countries)</th>
<th>PISA 2006 (57 countries)</th>
<th>PISA 2009 (65 countries)</th>
<th>PISA 2012 (65 countries)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean score</td>
<td>525</td>
<td>534</td>
<td>556</td>
<td>539</td>
<td>536</td>
</tr>
<tr>
<td>Rank</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>2~4</td>
<td>3~5</td>
</tr>
<tr>
<td><strong>Math</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean score</td>
<td>547</td>
<td>542</td>
<td>547</td>
<td>546</td>
<td>554</td>
</tr>
<tr>
<td>Rank</td>
<td>2</td>
<td>3</td>
<td>1~4</td>
<td>3~6</td>
<td>3~5</td>
</tr>
<tr>
<td><strong>Science</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean score</td>
<td>552</td>
<td>538</td>
<td>522</td>
<td>538</td>
<td>538</td>
</tr>
<tr>
<td>Rank</td>
<td>1</td>
<td>4</td>
<td>7~13</td>
<td>4~7</td>
<td>5~8</td>
</tr>
</tbody>
</table>
Percentage of students at different levels
International Studies on Student Assessment

TIMSS (Trends in International Mathematics and Science Study)
- Coordinated by the International Association for the Evaluation of Educational Achievement (IEA).
- Assesses: Mathematics and Science

Target and Cycle
- Target: 4th and 8th graders
- Cycle: 4-year cycle

Korean Students’ Achievement in TIMSS 2011

4th Grade, 50 Countries
8th Grade, 42 Countries

Mathematics
4th Grade: 2nd
8th Grade: 1st

Science
4th Grade: 1st
8th Grade: 3rd
# Trends of Korean Students in TIMSS

<table>
<thead>
<tr>
<th>TIMSS</th>
<th>Mathematics</th>
<th></th>
<th>Science</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rank</td>
<td>Mean Score</td>
<td>Rank</td>
<td>Mean Score</td>
</tr>
<tr>
<td>4th Grades</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>2</td>
<td>581</td>
<td>1</td>
<td>576</td>
</tr>
<tr>
<td>2011</td>
<td>2</td>
<td>605</td>
<td>1</td>
<td>587</td>
</tr>
</tbody>
</table>

| 8th Grades |       |       |       |       |
| 1995      | 3    | 581   | 4    | 546   |
| 1999      | 2    | 587   | 5    | 549   |
| 2003      | 2    | 589   | 3    | 558   |
| 2007      | 2    | 597   | 4    | 553   |
| 2011      | 1    | 613   | 3    | 560   |
They are not high stakes assessments of a big influence in Korean society. Korea has generally achieved good results from international assessment such as PISA and TIMSS, so that its effect did not lead to an extensive educational reform.

Korea reflected part of the results on establishment of educational policies or improvement of curriculum, teaching and learning.

For example, decreased science performance in PISA 2006 has an impact of conducting a policy to strengthen science education to improve primary and secondary science and mathematics education.
Roles of PISA/TIMSS and Its Implication

- Continuously the performance of students has been standardized upward.
  - developing educational excellence program

Challenges on affective domain

- Reading (2009)
  - Lower affective properties such as reading enjoyment, the diversity reading materials

- Mathematics (2012)
  - Lower affective properties such as interest / Self-concept / Self-confidence/ Self-efficacy/ Motivation/ Anxiety

- Science (2006)
  - Lower affective properties such as interest / self-concept/ Motivation
Thank you very much!

Further Information
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