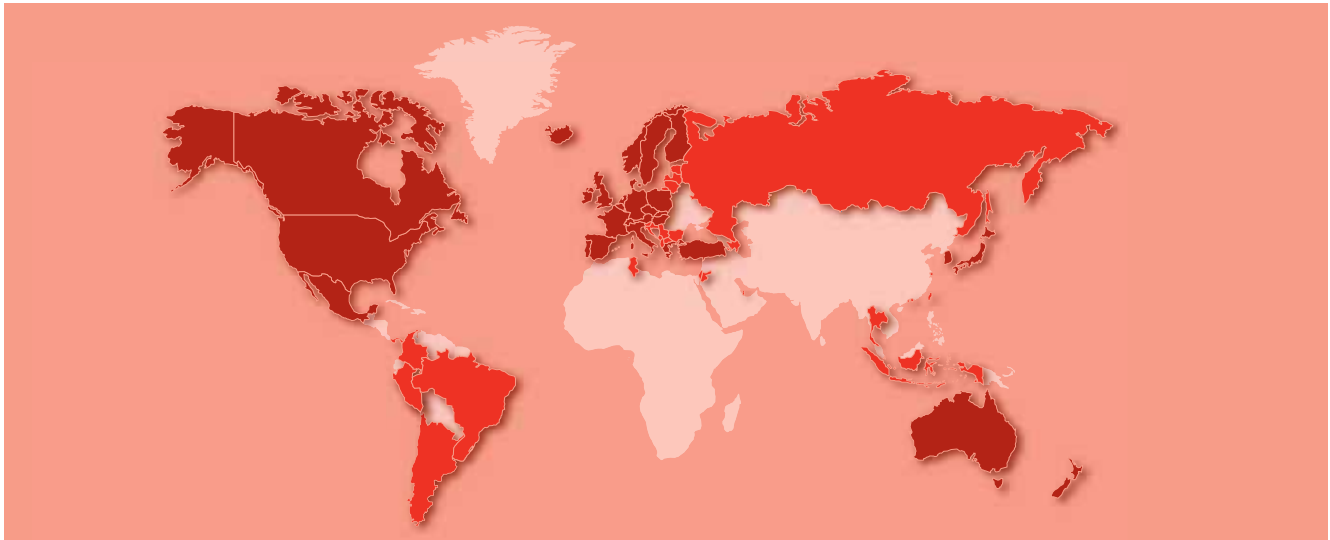


# PISA – THE OECD PROGRAMME FOR INTERNATIONAL STUDENT ASSESSMENT





### OECD countries

Australia	Hungary	Norway
Austria	Iceland	Poland
Belgium	Ireland	Portugal
Canada	Italy	Slovak Republic
Czech Republic	Japan	Spain
Denmark	Korea	Sweden
Finland	Luxembourg	Switzerland
France	Mexico	Turkey
Germany	Netherlands	United Kingdom
Greece	New Zealand	United States



### *PISA partner countries*

<i>Albania</i>	<i>Hong Kong-China</i>	<i>Peru</i>
<i>Argentina</i>	<i>Indonesia</i>	<i>Qatar</i>
<i>Azerbaijan</i>	<i>Israel</i>	<i>Republic of Montenegro</i>
<i>Brazil</i>	<i>Jordan</i>	<i>Republic of Serbia</i>
<i>Bulgaria</i>	<i>Kyrgyz Republic</i>	<i>Romania</i>
<i>Chile</i>	<i>Latvia</i>	<i>Russian Federation</i>
<i>China (Shanghai)</i>	<i>Liechtenstein</i>	<i>Singapore</i>
<i>Chinese Taipei</i>	<i>Lithuania</i>	<i>Slovenia</i>
<i>Colombia</i>	<i>Macao-China</i>	<i>Thailand</i>
<i>Croatia</i>	<i>Macedonia</i>	<i>Tunisia</i>
<i>Estonia</i>	<i>Panama</i>	<i>Uruguay</i>

“ Quality education is the most valuable asset for present and future generations. Achieving it requires a strong commitment from everyone, including governments, teachers, parents and students themselves. The OECD is contributing to this goal through PISA, which monitors results in education within an agreed framework, allowing for valid international comparisons. By showing that some countries succeed in providing both high quality and equitable learning outcomes, PISA sets ambitious goals for others. ”



**Angel Gurría**  
OECD Secretary-General

# Building on PISA'S Knowledge Base

**D**eveloped jointly by OECD member countries through the OECD's Directorate for Education, the Programme for International Student Assessment (PISA) aims to measure how far students approaching the end of compulsory education have acquired some of the knowledge and skills essential for full participation in the knowledge society. PISA is an important part of the work of the Directorate for Education, which collects data and provides comparative indicators of education systems in OECD member and partner countries.

In 2006, PISA completed its first set of surveys of the knowledge and skills of 15-year-olds in OECD member countries and partner countries, covering 90% of the world economy. These PISA surveys examined the performance of students in key subject areas and also looked at a wider range of educational outcomes that include students' motivation to learn, their beliefs about themselves and their learning strategies. They examined how performance varies between the genders and between socio-economic groups. They also provided insights into some of the factors that influence the development of knowledge and skills at home and at school, how these factors interact and what the implications are for policy development. Most importantly, PISA has shed light on those countries that succeed in achieving high performance standards while at the same time providing an equitable distribution of learning opportunities. The first three

PISA surveys each focused on a particular subject area: reading (in 2000), mathematics (in 2003) and science (in 2006). The programme will now conduct a second set of surveys in 2009, 2012 and 2015.

In addition to monitoring student performance in the three main subject areas, PISA will seek to deepen policy insights by:

- > Developing better ways of tracking student progress, including exploring the possibility of comparing student progress between primary education and the age of 15 years
- > Allowing closer comparisons between performance and instruction, by extending the option of examining student performance within a single grade and gathering more data about classroom experiences
- > Making use of computer-based assessments, not only to measure Information and Communication Technology (ICT) literacy skills but also to allow for a wider range of dynamic and interactive tasks and to explore more efficient ways of carrying out the main tests of student knowledge and skills in reading, mathematics and science

These innovations will initially be explored by countries as a supplementary, optional component of PISA, but where appropriate may be integrated into the survey's core.

Assessment year	2000	2003	2006	2009	2012	2015
Subjects assessed	<b>Reading</b> Mathematics Science	Reading <b>Mathematics</b> <b>Science</b> Problem solving	Reading Mathematics <b>Science</b>	<b>Reading</b> Mathematics Science	Reading <b>Mathematics</b> Science	Reading <b>Mathematics</b> <b>Science</b>
Students' self-assessment	Approaches to learning, engagement with reading	Approaches to learning, attitudes to mathematics	Approaches to learning, attitudes to science	To be defined	To be defined	To be defined
				+ One developmental assessment per survey		

# The Story So Far: PISA 2000-2006

**P**ISA seeks to measure how well young adults, at age 15 and therefore approaching the end of compulsory schooling, are prepared to meet the challenges of today's knowledge societies – what PISA refers to as “literacy”. The assessment is forward looking, focusing on young people's ability to use their knowledge and skills to meet real-life challenges, rather than merely on the extent to which they have mastered a specific school curriculum. This orientation reflects a change in the goals and objectives of curricula themselves, which increasingly address what students can do with what they learn at school and not merely whether they can reproduce what they have learned.

Well over one million students have so far been assessed. In addition to paper-and-pencil tests measuring reading, mathematical and scientific literacy, students filled in questionnaires about themselves, while their principals completed questionnaires about their schools. This has produced an unprecedented comparative knowledge base of school systems and their outcomes, and allows these outcomes to be monitored over time.

**DID YOU KNOW** ... that more than 60 OECD member countries and partner countries have participated in PISA so far and that they cover roughly 90% of the world economy?



## PISA's key features

- > Its policy orientation, with design and reporting methods determined by the need of governments to draw policy lessons
- > Its innovative “literacy” concept, which is concerned with the capacity of students to apply knowledge and skills in key subject areas and to analyse, reason and communicate effectively as they pose, solve and interpret problems in a variety of situations
- > Its relevance to lifelong learning, which does not limit PISA to assessing students' curricular and cross-curricular competencies but also asks them to report on their own motivation to learn, their beliefs about themselves and their learning strategies



- > Its regularity, which will enable countries to monitor their progress in meeting key learning objectives
- > Its contextualisation within the system of OECD education indicators, which examine the quality of learning outcomes, the policy levers and contextual factors that shape these outcomes, and the broader private and social returns to investments in education
- > Its breadth of geographical coverage and collaborative nature, with more than 60 countries (covering roughly nine-tenths of the world economy) having participated in PISA assessments to date, including all 30 OECD countries



## Development of PISA

In its first three surveys, PISA has been characterised by

- > **The establishment of comprehensive frameworks for assessing reading, mathematics and science**
- > In each three-yearly PISA survey, one subject was chosen as a focus while two other subject areas have been assessed more briefly. This allowed, for each subject area, a detailed profile of what a country's students can do every nine years, and an update of their performance every three years. The assessment framework for each subject was finalised in the year that it featured as a focus. The development of these frameworks has been central to PISA, which takes an innovative approach to assessing knowledge, skills and attitudes, by identifying the key concepts and processes that underpin each subject, rather than merely examining curriculum content.



### > Exploration of student abilities and characteristics beyond school subjects

- > From its outset, PISA has assessed student performance beyond the confines of reading, mathematics and science, as cross-curricular competencies like ICT skills, communication and problem-solving will be important to students' futures. The surveys asked students about their characteristics as learners, including their learning habits, their motivation levels, their attitudes to learning in general and to reading, science and mathematics in particular, and their habits and competence in using ICT. This has allowed analysis of student approaches to learning and of self-assessed cross-curricular competencies such as computer proficiency. In addition, the direct assessment in 2003 of student performance in solving problems, outside the context of a single curriculum area, was a first step in describing such competencies through external testing rather than self-reporting.

#### DID YOU KNOW

*...that each PISA cycle has produced more than 10 OECD publications and numerous national reports in the participating countries?*



> **Analysis of students, schools and school systems' characteristics, set alongside performance data**

> PISA's database provides an unprecedented array of information, based on questionnaires, from which to analyse potential influences on student performance across countries. Although it does not track individual students and cannot therefore establish causal links, this analysis can compare the degree of association with educational outcomes of various factors in different countries. At the individual level, such factors include socio-economic background, immigration status and cultural possessions in the home. At the school level, they include student perceptions of instructional practices, disciplinary environment and, importantly, the collective socio-economic background of students at each school. At the school system level, the extent of school autonomy and the structural organisation of students in secondary education can be compared to the overall performance and distribution of the performance of students aged 15.



# Taking Forward a Global Collaboration to Monitor Education Systems



**P**ISA is a collaborative effort, bringing together scientific expertise from the participating countries, steered jointly by their governments on the basis of shared, policy-driven interests. The project's Governing Board, on which all participating countries are represented, decided in 2005 to take forward this partnership into a new phase lasting from 2009 to 2015. As in the first phase, PISA will aim to better assist countries in understanding the processes that shape quality and equity in learning outcomes within the educational, social and cultural contexts in which education systems operate.

## Maintaining the knowledge base: PISA 2009-2015

The central part of the PISA survey will continue to be a two-hour assessment of 15-year-olds' knowledge and skills, focused on reading, mathematics and science, combined with questionnaires filled out by students and school principals. However, this core activity will continue to be strengthened and developed, with the potential for adding new elements, either permanently or as one-off components. Specifically, the core of PISA will:

- > Remain focused on assessing the cumulative yield of education at the age of 15 years, the highest age at which participation in formal education in OECD countries is still largely universal. This will allow the impact of educational change to be tracked and compared across countries for at least the first 15 years of this century.
  - > Continue to assess the extent to which students have acquired key competencies and dispositions needed for further learning and for adult life, and therefore focus on proficiency in applying knowledge acquired at school to a wider context, rather than in just reproducing it.
  - > Build on existing assessment frameworks in order to improve their efficiency in assessing desired outcomes, but without compromising comparability of results over time.
- > Include in each survey one developmental assessment area to be selected by participating countries. This could be a component involving test performance, like the assessment of problem-solving skills in 2003, or it could rely on student self-assessments, as with self-reported attitudes to science in 2006.
  - > Continue to contextualise performance by administering questionnaires to students and principals, and extend the analytical power of PISA by adding an optional parent questionnaire.
  - > Provide the opportunity for countries to further describe students' instructional settings by linking PISA to other surveys, e.g. teacher surveys.



## Extending our understanding: three new areas of enquiry

With the core programme of work, PISA places the emphasis on cross-national comparisons of the cumulative yield of education towards the end of compulsory education. It assesses to what extent education systems succeed in ensuring that young adults acquire the key competencies and dispositions to learning believed to contribute to the foundations for further learning and a successful transition into adult life; as well as what individual, systemic and contextual factors contribute to this success. Because of the ongoing nature of PISA, the core programme will also provide trend indicators that will allow countries to measure improvements in educational outcomes.



While the core of PISA allows countries to maintain a common and consistent approach to assessing student knowledge and skills over time, PISA seeks to remain open to methodological and substantive innovation. To this end, PISA will explore the development of optional modules which seek to extend policy insights into:

- > The measurement of learning progress over time and the comparison of progress across countries
- > The relationship between aspects of instruction and learning outcomes
- > The assessment of ICT competencies, as well as the use of technology as a means to capture a broader range of assessment tasks

### DID YOU KNOW

*...that the PISA survey is typically administered to between 4 500 and 50 000 students in each country? And that these students are selected from a random sample of both public and private schools and are chosen according to age (from 15 years and 3 months to 16 years and 2 months at the beginning of the assessment) as opposed to which grade they belong?*

### > **Assessment of student progress: How can we best measure the progress of students in acquiring knowledge and skills in the course of their education?**

The objective of this optional module would be to investigate the possibility of measuring learning progress within education systems, by linking assessments of student knowledge and skills at different stages of schooling.

PISA has so far given a snapshot of student performance at a single point of time, near the end of compulsory education. While this gives an indication of the cumulative yield of school systems, it does not show the extent to which students progress over time. This requires information on performance at different stages of education.

Although some countries have programmes of tracking the individual students assessed in PISA, it is not at present feasible for all the countries to do this. However, measuring the overall performance of students at different ages in different education systems does allow comparison across countries of the progress of whole student populations. Ideally, periodic surveys at different ages would be designed to ensure that a given cohort's performance is measured at different ages in successive surveys.

The integration of the assessment of a younger age cohort would, in particular:

- > Give an indicator of outcomes of the earlier years of education, and allow analysis of whether they are sustained through secondary school
- > Help link PISA outcomes more closely to what happens within schools and classrooms: a connection that is easier to measure in the more uniform organisation of primary schools, where each student generally has one main teacher
- > Be able to look at how factors other than cognitive performance develop over time – for example, whether students' levels of motivation change and how their learning styles evolve
- > Allow a common framework to be developed for monitoring the development of certain basic skills, which could be translated into estimates of the average yearly progress made by students in subjects such as reading

This option is a longer-term strategic objective for PISA but there are no plans for its implementation in the context of the PISA 2009 assessment.

## > **Instruction and outcomes: How can we improve our capacity to describe those aspects of instruction that influence student outcomes?**

The second optional module would facilitate analyses of instructional aspects that could lead to enhanced learning outcomes.

PISA is currently able to show the extent to which positive learning outcomes are associated with particular features of schooling. So far, the strongest effects have been noted at a fairly general level. For example, students in schools with a strong disciplinary climate do better on average. More precise links with the educational experiences of individuals have been limited by the scope of questionnaires administered and by the fact that 15-year-olds are not all in one grade or one class, making it hard to draw precise links with their experiences in the classroom.

This optional module seeks to enable countries to trial several extra components in the 2009 survey in order to permit better measurement of the links between students' instructional experiences and their performance. These will all be developed further in subsequent surveys.

This module would comprise three separate components:

- > A supplementary assessment of students in a single grade or class (in addition to the usual survey of a sample of 15-year-olds), allowing the characteristics of students' instructional experience to be described more precisely
- > A more comprehensive collection of information about students, schools and school systems, based on extra questions posed to students and principals, and a collection of more data about school systems as a whole
- > The exploration of links with the OECD's Teaching and Learning International Survey (TALIS), which will first take place in 2007 and which will enable extensive analysis of differences in national approaches to teaching and learning

### > Computers and PISA: How can ICT strengthen the assessment of students' knowledge and skills?

The third optional module would seek to develop computer-delivered assessments to facilitate better coverage of those aspects of the PISA frameworks that are very difficult to capture with static paper-and-pencil documents. In this way, the assessment process will become more efficient (*e.g.* via adaptive testing), with reductions both in operational costs and in student response time. In the longer term, these developments should improve the assessment's targeting across and within countries.

ICT forms an essential part of life in the modern world. Besides the computer's relevance for student assessment, ICT competencies

in themselves are also becoming a highly relevant subject for assessment.

In its first phase, PISA made a start in both areas. In 2003, it used a student questionnaire to survey the extent to which students used computers and felt comfortable using them. In 2005, 13 countries undertook a pilot computer-based assessment of science. The second phase will take this work further, and potentially lay the groundwork for introducing a computer-based assessment in the PISA core.

### > Anticipated timeline for the computer-delivered assessment and the assessment of ICT literacy

Assessment year	2009	2012	2015
Development Activity	Test whether computerised assessment is compatible with pencil-and-paper tests; develop framework for assessing ICT literacy.	Develop "adaptive" assessment (see below)	
Assessment (see comments on previous diagram)	Assessment of reading electronic texts	Implement supplementary computer assessment in focus areas Assess ICT skills Pilot "adaptive" technology enabling students of different abilities to respond to different sets of questions	Continue implementation of all parts



Up to and including the 2009 survey, this work will focus on assessing the reading of electronic texts. It will only be possible to explore fuller assessments in each of the three subject areas and of students' ICT skills for the 2012 survey and onwards. This reflects the importance of developing instruments that are fully compatible with the rest of PISA, especially when using computers to assess reading, mathematics and science.



Over the longer term, there is potential for computer-based assessments to play a part in improving the delivery of the PISA core, bringing several advantages. In particular:

- > It may be possible to assess certain types of thinking in computer-based assessments that are difficult to assess in pencil-and-paper tests. A pilot in 2005 showed, for example, that it is possible to simulate the sequential steps taken in scientific experiments by this method.
- > A computer-delivered approach could, in the longer term, ensure that tests align better with the performance levels of individual students, giving them more challenging or more manageable tasks according to how they perform in early questions. This permits in particular a more fine-grained analysis of the most and least able students. It also provides a more useful profile of countries whose students are clustered in particularly high or low areas of performance.
- > Finally, computer delivery brings practical advantages, including lower data entry costs.

# PISA'S Future: Monitoring Change, Deepening Understanding

In 2009, the students who will be assessed in PISA will have entered primary school at about the time of the first PISA survey in 2000. As a result, countries will be able to gauge to what extent any changes in their education systems may have produced improved outcomes compared with the benchmarks set by the original 2000 survey. A central objective of PISA – providing a stable point of reference against which to monitor the evolution of education systems – will therefore have been achieved.

At the same time, PISA continues to seek a deepened understanding of strong student performances, to get better at measuring them and to examine links between outcomes and educational processes. In the first set of surveys from 2000 to 2006, preliminary steps were taken to measure a wider set of competencies than had been tested in international surveys, and to collect contextual data that would show which factors are linked to student performance. The new elements of PISA described here will take this process further, without compromising PISA's integrity as a stable instrument for monitoring student knowledge and skills.

Above all, this evolution is guided by the priorities of educational policy makers, who want to ensure that further changes in education systems are firmly rooted in good evidence. In the coming years, PISA will offer countries more elaborate instruments for making linkages between students' experiences at school and their knowledge and skills near the end of secondary education. By taking the developmental approach to innovations in student assessment described above, PISA will be able to test which methods work well enough to eventually be incorporated into its core.



**DID YOU KNOW** ...that you can try sample interactive questions from PISA and consult all publicly released test questions on the PISA website?

...that the micro-level PISA data, as well as their accompanying manuals, are available for further analysis on the PISA website?

[www.pisa.oecd.org](http://www.pisa.oecd.org)

[www.oecd.org/media](http://www.oecd.org/media)

[www.oecd.org/publications](http://www.oecd.org/publications)

[www.oecd.org/statistics](http://www.oecd.org/statistics)

## **ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)**

The OECD groups 30 member countries sharing a commitment to democratic government and the market economy and provides a unique forum for them to discuss, develop and refine economic and social policies. The OECD's mission is to promote policies designed to:

- > Achieve sustainable economic growth and employment and rising standards of living in member countries while maintaining financial stability, so contributing to the development of the world economy
- > Assist sound economic expansion in member countries and other countries in the process of economic development
- > Contribute to growth in world trade on a multilateral, non-discriminatory basis

The OECD also has active relationships with some 70 other countries, non-government organisations and civil society, and these help give its activities a global reach.

## **DIRECTORATE FOR EDUCATION**

The OECD views education in a “cradle-to-grave” lifelong learning framework, involving formal, informal and non-formal settings. Internationally comparable statistics and indicators underpin the work but it has a strong qualitative dimension as well. The ultimate outputs are policy recommendations designed to increase both the quality and equity of education systems. The OECD's work on education is relevant, not only for government and local authorities, but also for civil society, researchers, professional practitioners and an informed lay audience. The extent of the audience is evident in the public discussion and debate that OECD's publications on education often generate.

# PISA – Programme for International Student Assessment

[www.pisa.oecd.org](http://www.pisa.oecd.org)

