

Programme for International Student Assessment 2006

PISA 2006

Student performance in an
international comparison



On behalf of the cultural ministries of the German federal states and in
co-operation with the Federal Ministry of Education and Research



What is PISA?

PISA is an abbreviation for “Programme for International Student Assessment”. PISA surveys and compares student performance worldwide. The programme is a project of the OECD (Organisation for Economic Co-operation and Development).

The aim of the study is to survey the competencies of 15-year-olds in the participating countries. The competencies which are surveyed are important for life-long learning – not only in school but also for future careers and for everyday life.

PISA provides information on the results of teaching and learning in different educational systems.

PISA is a long-term project: In three year cycles, students are tested in different competency areas. One competency area is always focused upon and surveyed in more detail. The competency areas can be seen in the table below. The focus of each cycle is also shown.

In order to be able to relate test results to the conditions in the participating countries, so-called background variables are surveyed. These include characteristics of the parental home, lessons and the school.

In order to obtain meaningful results for the comparison of countries, it is very important that all students selected participate in the test.

2000	2003	2006
Reading	Reading	Reading
Mathematics	Mathematics	Mathematics
Science	Science	Science

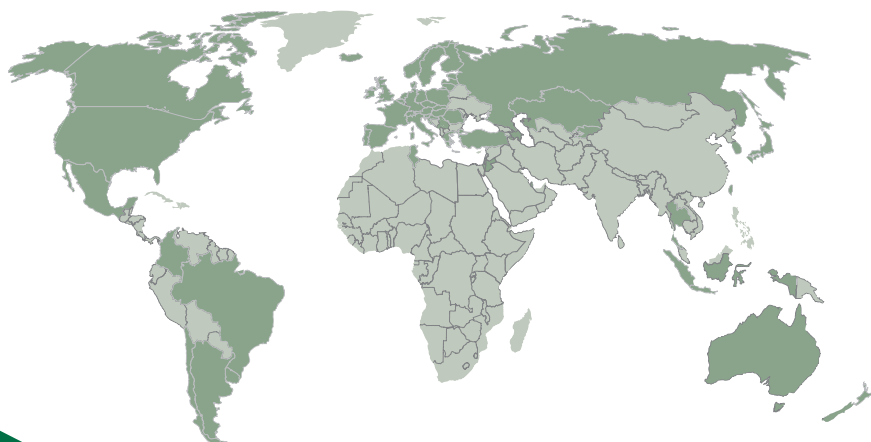
Participating countries

Argentina
Australia*
Austria*
Azerbaijan
Belgium*
Brasil
Canada*
Chile
Columbia
Croatia
Czech Republic*
Denmark*
Estonia
Finland*
France*
Germany*
Greece*
Hongkong-China
Hungary*
Iceland*

Indonesia
Ireland*
Israel
Italy*
Japan*
Jordan
Kasachstan
Korea*
Kyrgyzstan
Latvia
Liechtenstein
Lithuania
Luxembourg*
Macau-China
Mexico*
Netherlands*
New Zealand*
Norway*
Poland*
Portugal*

Qatar
Rumania
Russian Federation
Serbia and Montenegro
Slovak Republic*
Slovenia
Spain*
Sweden*
Switzerland*
Taiwan (R.O.C.)
Thailand
Tunisia
Turkey*
United Kingdom*
U.S.A. *
Uruguay

* Members of the OECD



Target group

The sampling procedure is carried out in the participating countries according to detailed specifications from the international project management. First of all, the schools were chosen in a random sampling process. Students are then chosen within the schools – also at random.

In total, there are three student samples that are tested in Germany. Some of them overlap.

(1) For the comparison on the international level, 230 schools with 25 15-year-olds in each school are tested. This produces a sample of 5,750 students at most.

(2) In addition to this, Germany is participating in the international option of class-based testing. For this purpose, two whole ninth grades will be tested in each of the 230 schools. This produces a sample of ca. 8,500 students (in addition to the students in (1)).

(3) In order to enable a comparison of the German federal states, a further supplementary national sample of roughly 1,500 schools is tested. 38 students are tested per school, i.e. a total of ca. 57,000 students.



Testing procedure at a school

There are a variety of test items in the PISA study. Each school names a so-called school co-ordinator who is the contact person for both students and parents and is responsible for preparing the implementation of the test.

The tests are carried out by trained test administrators. In the majority of schools there will only be one day of testing. In some schools there will be two days of testing. The time required to sit the test on both days of testing is about three school periods.

Questionnaires must be completed in all schools during the testing time. Furthermore, the students will receive questionnaires for their parents.

Schedule:

January 2006

Information on the schools chosen for PISA 2006

March 2006

Information on the students chosen as well as the teachers

April 2006

Implementation of the tests on the date arranged by the test administrator and the school co-ordinator.

Competency areas



Scientific literacy

In a world shaped by science and technology, everybody needs to have a basic understanding of scientific concepts and procedures. In particular, students should be able to appropriately apply the knowledge obtained according to specific situations.

The PISA questions on science survey important concepts from physics, chemistry, biology and the earth sciences. These concepts are not simply tested, rather they must be applied to realistic scientific problems.

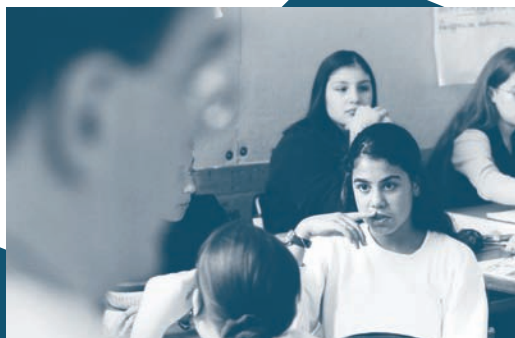


Mathematical literacy

PISA sees mathematics as an important tool for understanding and tackling the demands of life.

A basic understanding of mathematics and its importance in our cultural and technological world is therefore necessary.

The PISA tests require the students to apply their mathematical knowledge. The application situations range from private and school areas to simple scientific questions and issues.



Reading literacy

Reading literacy means more than being able to extract information from texts. In particular, PISA examines the ability to understand the content, intent and form of different types of written texts and to be able to fit them into a larger context.

Reading literacy is seen as a necessary requirement for successful participation in society and life.

Educational standards

In 2003 and 2004, the KMK (standing committee of education ministers of the federal states) determined educational standards for different school subjects that apply nationwide. Educational standards determine which competencies students should have achieved in a school subject by a certain grade.

In PISA 2006, some classes will do a test that relates to the educational standards for mathematics. On the basis of the results, a testing procedure will be developed which will help to judge the extent to which students have achieved the educational standards for the subject of mathematics.

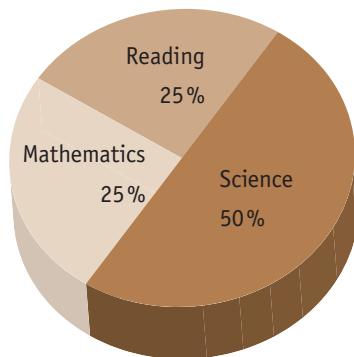


Information about the test questions

The focus of PISA 2006 is on the survey of scientific literacy. About half of the test items are therefore concerned with scientific problems from the areas of physics, chemistry, biology and the earth sciences. A quarter of the test items comes from the area of reading and a quarter from the area of mathematics.

A new feature in PISA 2006 is the survey of so-called motivational attitudes and orientations. After working on many test times, the students are asked about the extent to which they see the scientific area addressed as being important for them personally or as being interesting.

Distribution of items in PISA 2006



Here is a typical PISA item from the area of science. It is a sample item which will not be used in the real PISA test.

Sample item:

"Catching the killer"

Read the following newspaper article, and answer the questions that follow.

DNA TO FIND KILLER

Smithville, yesterday: A man died from multiple stab wounds in Smithville yesterday. Police say that there were signs of a struggle and that some of the blood found at the scene of the crime did not match the victim's blood. They suspect that this blood came from the killer.



To help find the killer, police scientists have prepared a DNA profile from the blood sample. When compared to DNA profiles of convicted criminals, kept on a computer database, no match was found.

Police are now asking all citizens of Smithville to come forward to have their DNA analysed.

Sergeant Brown of the Smithville police said, "We just need to take a harmless scraping from the inside of the cheek. From this scientists can extract DNA and form a DNA profile like the one pictured."

Except for identical twins, there is only a 1 in 100 million chance that two people will have the same DNA profile.

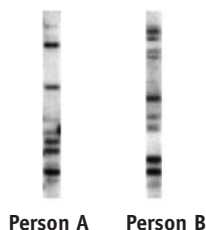


Photo of typical DNA profiles from two people. The bars are different fragments of each person's DNA. Each person has a different pattern of bars. Like fingerprints, these patterns can identify a person.

This newspaper article refers to the substance DNA. What is DNA?

- A A substance in cell membranes that stops the cell contents leaking out.
- B A molecule that contains the instructions to build our bodies.
- C A protein found in the blood that helps carry oxygen to all the tissues.
- D A hormone in blood that helps regulate glucose levels in the body cells.

Which one of the following questions cannot be answered by scientific evidence?

- A What was the medical or physiological cause of the victim's death?
- B Why was the victim stabbed many times?
- C Is taking cheek scrapings a safe way to collect DNA samples?
- D Do all identical twins have exactly the same DNA profile?

Solution:

Further sample items can be found in English here:

<http://www.pisa.oecd.org/>

Questionnaires

Students' questionnaire

The conditions under which students grow up, live and learn influence their learning within and outside of school. For this reason, PISA also collects information on the social background of the students. This information is necessary in order to be able to conduct fair national and international comparisons of students' competencies.

With the help of the students' questionnaire, social background characteristics are surveyed.

School questionnaire

Characteristics of the school, along with school and lesson organisation, also have an effect on the performance of students.

In the school questionnaire, the school principal is requested to give details about the general conditions in the school (size etc.) and the resources available (teachers, computer equipment etc.).

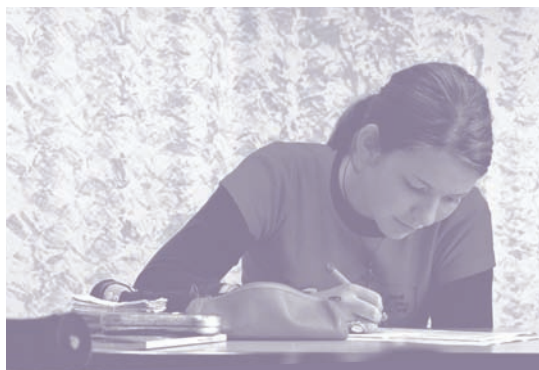
Parents' questionnaire

The parents' survey should provide information about the importance that is given to science for the students' future career or apprenticeship.

Further questions concern the parents' estimation of the school.

Teachers' questionnaire

As well as the school principal, teachers of scientific subjects and of mathematics are asked about their in-school training, the co-operation with colleagues and their lessons.



Data security

All reports on the study are based on summarised results. The results are not allocated to individual people.

The list of students selected does not leave the school at any point and is destroyed after data entry.

The test administrators send all test documents straight to the IEA Data Processing Center in Hamburg after the end of the test, where they are processed.

School staff will therefore not see the documents at any stage. The processing and publishing of the data only takes place in a manner which does not allow any connections to be made to individual people.

The data security representatives of the German federal states were informed about the procedure and their suggestions were followed.

Reports on the results

At the end of 2007, the first reports on the international comparison will be presented. The results of the federal state comparison will be published in the autumn of 2008.

Further information can be found on the following websites:

Website of the OECD
www.pisa.oecd.org

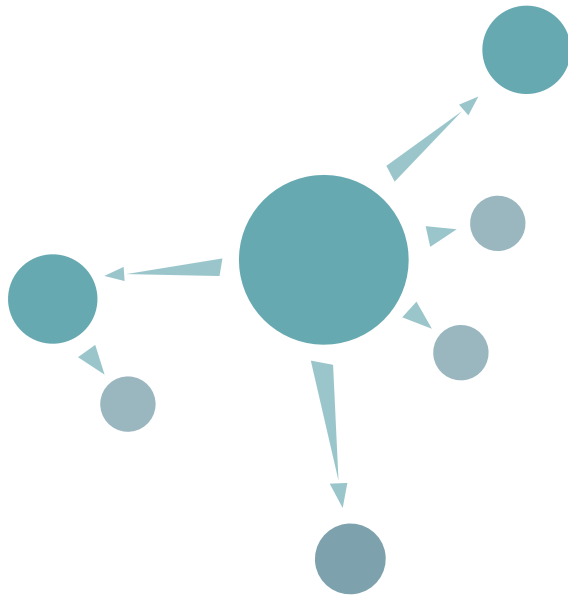
Website of the IPN in Kiel
<http://pisa.ipn.uni-kiel.de>



Responsible for the project

International organisation

PISA is a project of the OECD (Organisation for Economic Co-operation and Development). Important decisions are made by the “PISA Governing Board” (PGB), in which every participating country has one vote. Germany is represented in the PGB by representatives of the German *Bund und Länder*. The international co-ordination of the project is carried out by an international consortium under the management of ACER (Australian Council for Educational Research).

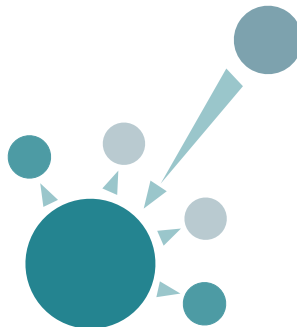


National organisation

PISA is carried out in Germany on behalf of the KMK. A national consortium under the management of Prof. Dr. Manfred Prenzel from the Leibniz Institute for Science Education at the University of Kiel is responsible for the implementation of the study.

The following experts are members of this national consortium:

- Prof. Dr. Jürgen Baumert, Max-Planck-Institute for Human Development, Berlin
- Prof. Dr. Werner Blum, University of Kassel
- Prof. Dr. Eckhard Klieme, German Institute for International Educational Research, Frankfurt am Main
- Prof. Dr. Reinhard Pekrun, Ludwig-Maximilians-University, Munich
- Prof. Dr. Jürgen Rost, IPN at the University of Kiel
- Prof. Dr. Cordula Artelt, University of Bamberg



Project co-ordination

Prof. Dr. Manfred Prenzel, Dr. Barbara Drechsel, Dr. Silke Rönnebeck, Dr. Andreas Frey, Gráinne Newcombe, Steffen Brandt and Päivi Taskinen are responsible for the project co-ordination at the Leibniz Institute for Science Education. Prof. Dr. Claus H. Carstensen manages the data analysis at the IPN.

The Data Processing Center of the International Association for the Evaluation of Educational Achievement (IEA DPC) is responsible for the organisation of the data collection and data processing.

School principals can provide information on the contact persons responsible for specific schools.



Addresses

International contact addresses

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Web pages

OECD PISA
PISA-Germany

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<http://pisa.ipn.uni-kiel.de>

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