

Programme for International Student Assessment (PISA)

A Pocket Guide to the OECD's PISA tests

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Part A What is PISA?

Section 1 What is PISA

The Programme for International Student Assessment is run by the Organisation for Economic Co-operation and Development (OECD). The aim of the tests is to provide a mechanism for countries around the world to compare their students abilities in English, maths and science in an equal way. This allows countries to track how well their young people are doing in comparison with their peers around the world at regular intervals.

There are 30 member countries in the OECD (see Annex A for full list) and more than 60 countries have taken part in the PISA programme since the first tests. The additional non-OECD test countries that take part are referred to as partner countries for each test series.

Work began on the PISA tests in the mid 1990s, PISA was officially launched in 1997 and in 2000 the first PISA tests were sat.

PISA is run by a Board made up of one representative from each of the OECD countries. The representative is appointed by ministry of education in that country. Together, the members of the board elect a Chair. In addition to the Board members, each non-OECD country that participates in the survey has an observer on the Board. Like full Board members, the observer is elected by the education ministry in that country.

Section 2 Who participates?

In 2009, 66 countries participated in the PISA tests. This number has grown from the 41 who took part in 2003.

Countries that would like to participate in PISA are required to contact the OECD at least two years in advance of the test year. It is up to the PISA governing Board to accept countries' applications, assuming that they meet the appropriate criteria for running the tests. Criteria includes having the technical expertise to administer the tests.

Part B PISA test details

Section 1 What do the tests show?

The PISA tests give results for reading, maths and science 'literacy'. By this, PISA mean that learners are able to apply knowledge and skills to the test stimulus and that they can analyse, reason and communicate effectively by examining, interpreting and solving problems. They also measure students' interest, attitudes and motivation to learning.

Crucially, the tests are designed in such a way that they are not a test of an individual country's curriculum. Therefore, students can not be trained in how to respond to the questions which prevents accusations of standards inflation over time.

The tests are able to rank countries according to their results within a 2 place variance. For example, in 2003, Finland was ranked between 1st and 3rd of the OECD countries in the 2003 tests. The rankings list is published the year after the tests are sat. The cause of this delay is that the results data has to be collected from all member countries before being sent to the PISA secretariat around May of the following year. The data is then analysed and a final report written (containing the rankings list) which is released in the December of the year after the tests are sat.

As the tests are taken at 3-yearly intervals, it is possible to compare individual countries against themselves over time as well as against each other over time.

Section 2 How are the tests designed and managed?

PISA has a group of subject experts for each of the three areas: reading, maths and science. There is also a questionnaire expert group that leads on the development of the PISA context questionnaires which ask about attitudes and motivation to learn. The subject experts who are in different countries design assessment frameworks and then questions that represent these frameworks. The questions are then submitted to an international contractor, who may also write some questions, for checking and agreement.

The first question review is to check for cultural bias. This is done by the international contractor and member countries to ensure questions do not discriminate across countries either positively or negatively. Only once questions are unanimously approved, may they be used in the PISA tests. Questions are then piloted in all participating countries before being included in a final paper. If questions appear too easy or too difficult in certain countries, they are removed from the real test in all countries. A final test is then constructed which is appropriate for all countries that will be taking part.

The tests are sat by students in a random sample of schools in each country. In an average country, there will usually be between 4,500 and 40,000 students who sit the tests. The results are then scaled-up so as to represent the full country.

The tests are managed in each country by the project managers. In the UK, there is a manager for England, Wales and NI and a separate manager for Scotland (for details see Annex B).

Within each country, tests are marked by the country's National Project Manager. The tests are marked according to the guide developed by the international contractor and agreed by the subject experts. The corrections are then cross-checked before the final results are sent to the international contractor who sends the final results to the PISA secretariat.

Section 3 What is in the tests?

The questions in the test appear as units (Annex C of this paper contains sample units from each subject area). Each unit consists of stimulus material which may take the form of text, a graph or a diagram which is then followed by a series of questions based on that stimulus material. The questions could be short answer, longer answer, or multiple choice. Two hours are allowed for completion of the paper.

In addition, students receive a questionnaire which includes questions about their family, aspects of their learning and questions about their attitudes and aspirations. These background questionnaires, enable PISA and participating countries to explore connections between how students perform in the tests and factors such as:

- Socio-economic background
- Migration
- Gender
- Attitudes to school
- Attitudes to learning

Each PISA test has approximately seven hours worth of test materials. From this, each student takes a two-hour test with a wide variety of combinations being used.

Each year, there is a focus topic in the test paper on which more detailed questions are asked. The focus topic rotates through reading, maths and science each series. Therefore, a detailed assessment of each topic area happens every nine years.

Heads of each centre are given a 20 minute questionnaire to complete about their schools.

Section 4 How are the results reported?

PISA develops scales for each question along which each student's results are then reported. The scales are divided up into levels with level 1 being the most basic level. All student's results in each subject within a given country are averaged which provides an overall average score for the country for each subject area. The average score among OECD countries is 500 points with a standard deviation of 100 points.

Occasionally, some national results are not reported. This is usually because there is a problem with the data which means it doesn't meet the PISA requirements set out in the technical standards. For example, a country may not have had a big enough sample of learners following vocational programmes sit the test which could skew the results. Alternatively, if there are not enough students taking the tests in a given country, the results may not be reported.

Part C What do the results mean for the UK and Pearson?

PISA is the only mechanism by which countries around the globe can compare their results with each other fairly. The results are unaffected by curriculum design and changes around the world.

Each time the PISA rankings are published, countries around the world use them to compare how well their young people compare with those in other countries. PISA will announce the results of the 2009 tests in early December 2010. The results of the last PISA tests (reported in 2007) showed that the UK had fallen further down the rankings over the timeframe. Therefore, the UK will be looking for an improvement in 2010. Each August, DCSF states that year on year improvement in exam results is a sign of learners working harder not that the tests are getting easier. Each year the standards debate is the same as played out across the national media. The OECD results are designed to be factor out influences from each country's curriculum and therefore give a 'true' reflection of 15-year olds' ability.

An opportunity

To date, the PISA tests have all been carried out using pencil and paper. PISA are investigating using computer-based tests. This may be an opportunity for Pearson as we already have we have 3915 computer-based Pearson VUE Testing Centres worldwide.

Annex A OECD countries

List of OECD countries and the date they became members.

[AUSTRALIA](#): 7 June 1971
[AUSTRIA](#): 29 September 1961
[BELGIUM](#): 13 September 1961
[CANADA](#): 10 April 1961
[CZECH REPUBLIC](#): 21 December 1995
[DENMARK](#): 30 May 1961
[FINLAND](#): 28 January 1969
[FRANCE](#): 7 August 1961
[GERMANY](#): 27 September 1961
[GREECE](#): 27 September 1961
[HUNGARY](#): 7 May 1996
[ICELAND](#): 5 June 1961
[IRELAND](#): 17 August 1961
[ITALY](#): 29 March 1962
[JAPAN](#): 28 April 1964
[KOREA](#): 12 December 1996
[LUXEMBOURG](#): 7 December 1961
[MEXICO](#): 18 May 1994
[NETHERLANDS](#): 13 November 1961
[NEW ZEALAND](#): 29 May 1973
[NORWAY](#): 4 July 1961
[POLAND](#): 22 November 1996
[PORTUGAL](#): 4 August 1961
[SLOVAK REPUBLIC](#): 14 December 2000
[SPAIN](#): 3 August 1961
[SWEDEN](#): 28 September 1961
[SWITZERLAND](#): 28 September 1961
[TURKEY](#): 2 August 1961
[UNITED KINGDOM](#): 2 May 1961
[UNITED STATES](#): 12 April 1961

Annex B PISA contacts

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Annex C PISA Sample Questions

The following questions are taken from: TAKE THE TEST: SAMPLE QUESTIONS FROM OECD'S PISA ASSESSMENTS - ISBN 978-92-64-05080-8 - © OECD 2009

Reading unit 3 : Graffiti

I'm simmering with anger as the school wall is cleaned and repainted for the fourth time to get rid of graffiti. Creativity is admirable but people should find ways to express themselves that do not inflict extra costs upon society. Why do you spoil the reputation of young people by painting graffiti where it's forbidden? Professional artists do not hang their paintings in the streets, do they? Instead they seek funding and gain fame through legal exhibitions. In my opinion buildings, fences and park benches are works of art in themselves. It's really pathetic to spoil this architecture with graffiti and what's more, the method destroys the ozone layer. Really, I can't understand why these criminal artists bother as their "artistic works" are just removed from sight over and over again.
Helga

There is no accounting for taste. Society is full of communication and advertising. Company logos, shop names. Large intrusive posters on the streets. Are they acceptable? Yes, mostly. Is graffiti acceptable? Some people say yes, some no.
Who pays the price for graffiti? Who is ultimately paying the price for advertisements? Correct. The consumer.
Have the people who put up billboards asked your permission? No. Should graffiti painters do so then? Isn't it all just a question of communication - your own name, the names of gangs and large works of art in the street? Think about the striped and chequered clothes that appeared in the stores a few years ago. And ski wear. The patterns and colours were stolen directly from the flowery concrete walls. It's quite amusing that these patterns and colours are accepted and admired but that graffiti in the same style is considered dreadful.
Times are hard for art.
Sophia

The two letters above come from the Internet and are about graffiti. Graffiti is illegal painting and writing on walls and elsewhere. Refer to the letters to answer the questions below.

Question 3.1

The purpose of each of these letters is to

- A. explain what graffiti is.
- B. present an opinion about graffiti.
- C. demonstrate the popularity of graffiti.
- D. tell people how much is spent removing graffiti.

Question 3.2

Why does Sophia refer to advertising?

Question 3.3

Which of the two letter writers do you agree with? Explain your answer by using *your own words* to refer to what is said in one or both of the letters.

Question 3.4

We can talk about *what* a letter says (its content).

We can talk about *the way* a letter is written (its style).

Regardless of which letter you agree with, in your opinion, which do you think is the better letter?

Explain your answer by referring to *the way* one or both letters are written.

Mathematics Unit 12: unExchange Rate

Mei-Ling from Singapore was preparing to go to South Africa for 3 months as an exchange student. She needed to change some Singapore dollars (SGD) into South African rand (ZAR).

Question 12.1

Mei-Ling found out that the exchange rate between Singapore dollars and South African rand was:

$$1 \text{ SGD} = 4.2 \text{ ZAR}$$

Mei-Ling changed 3000 Singapore dollars into South African rand at this exchange rate.

How much money in South African rand did Mei-Ling get?

Answer:

Question 12.2

On returning to Singapore after 3 months, Mei-Ling had 3 900 ZAR left. She changed this back to

Singapore dollars, noting that the exchange rate had changed to:

$$1 \text{ SGD} = 4.0 \text{ ZAR}$$

How much money in Singapore dollars did Mei-Ling get?

Answer:

Question 12.3

During these 3 months the exchange rate had changed from 4.2 to 4.0 ZAR per SGD.

Was it in Mei-Ling's favour that the exchange rate now was 4.0 ZAR instead of 4.2 ZAR, when she

changed her South African rand back to Singapore dollars? Give an explanation to support your answer.

Science unit 4 : Cloning

Read the newspaper article and answer the questions that follow.

A copying machine for living beings?

Without any doubt, if there had been elections for the animal of the year 1997, Dolly would have been the winner!

Dolly is a Scottish sheep that you see in the photo. But Dolly is not just a simple sheep. She is a clone of another sheep.

A clone means: a copy. Cloning means copying 'from a single master copy'. Scientists succeeded in creating a sheep (Dolly) that is identical to a sheep that functioned as a 'master copy'.

It was the Scottish scientist Ian Wilmut who designed the 'copying machine' for sheep. He took a very small piece from

the udder of an adult sheep (sheep 1).

From that small piece he removed the nucleus, then he transferred the nucleus into the egg-cell of another (female) sheep (sheep 2). But first he removed from that egg-cell all the material that would have determined sheep 2 characteristics in a lamb produced from that egg-cell. Ian Wilmut implanted the manipulated egg-cell of sheep 2 into yet another (female) sheep (sheep 3). Sheep 3 became pregnant and had a lamb: Dolly. Some scientists think that within a few years it will be possible to clone people as well. But many governments have already decided to forbid cloning of people by law



Source: Tijdschrift van de Eenhoorn Educatief (Brussels Onderwijs Punt): March 1997.

Question 4.1

Which sheep is Dolly identical to?

- A. Sheep 1
- B. Sheep 2
- C. Sheep 3
- D. Dolly's father

Question 4.2

In line 14 the part of the udder that was used is described as "a very small piece". From the article text you can work out what is meant by "a very small piece".

That "very small piece" is

- A. a cell.
- B. a gene.
- C. a cell nucleus.
- D. a chromosome.

Question 4.3

In the last sentence of the article it is stated that many governments have already decided to forbid cloning of people by law.

Two possible reasons for this decision are mentioned below.

Are these reasons scientific reasons?

Circle either "Yes" or "No" for each.

| Reason: | Scientific? |
|---|-------------|
| Cloned people could be more sensitive to certain diseases than normal people. | Yes / No |
| People should not take over the role of a Creator. Yes / No | Yes / No |