

PISA 2018 Results
Programme for International Student Assessment

PISA 2018: A Sneak Preview







PISA 2018





600 000 students

representing about **32 million** 15-year-olds in the schools of the **79 participating countries and economies** sat the **2-hour** PISA test in 2018



Key issues:

Are schools adequately preparing young people for adult life?

What kind of learning environments do we find in high performing systems?

Can schools improve the futures of students from disadvantaged backgrounds?



What is unique about PISA?



Policy orientation

PISA links data on performance with key factors that shape their learning, in and outside of school

and identifies the characteristics of students, schools and education systems that perform well



Innovative concept of "literacy"

students' capacity to apply their knowledge and skills in key areas, and to analyse, reason and communicate effectively as they identify, interpret and solve problems in a variety of situations



Relevance to lifelong learning

PISA asks students to report on their motivation to learn, their beliefs about themselves, and their learning strategies



Regularity

enables countries to monitor their progress in meeting key learning objectives



Breadth of coverage

PISA 2018, encompassed all 37 OECD countries and 42 partner countries and economies



Participating countries and economies in PISA 2018

































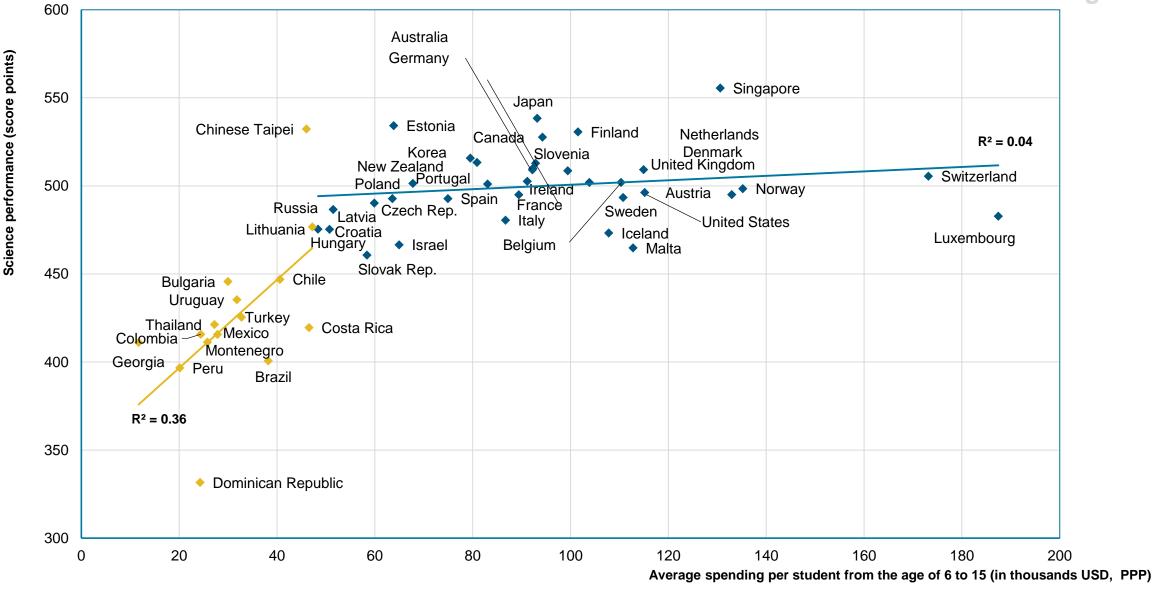
Some findings from previous PISA assessments



PISA 2015: Money matters - up to a point

Spending per student from the age of 6 to 15 and science performance

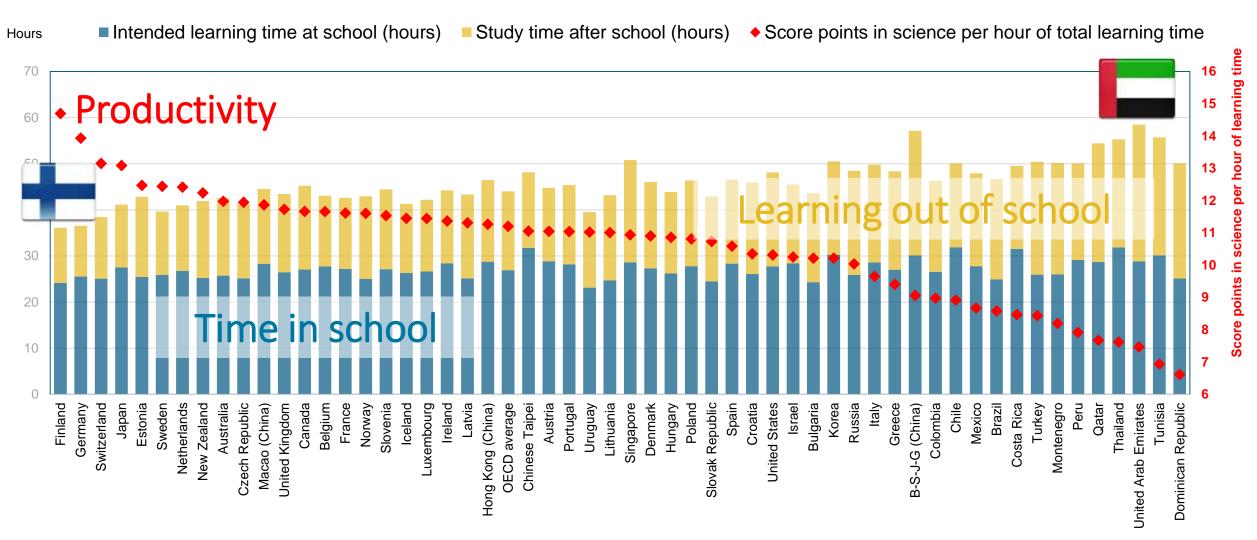






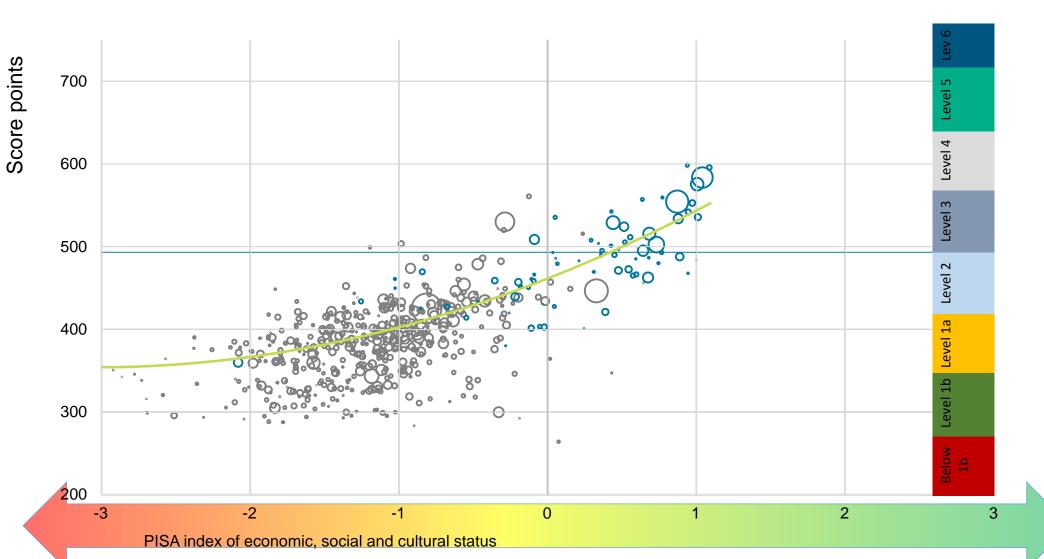
PISA 2015: Learning time ≠ learning outcomes

Figure II.6.23





PISA 2015: Brazil: School performance and schools' socio-economic profile

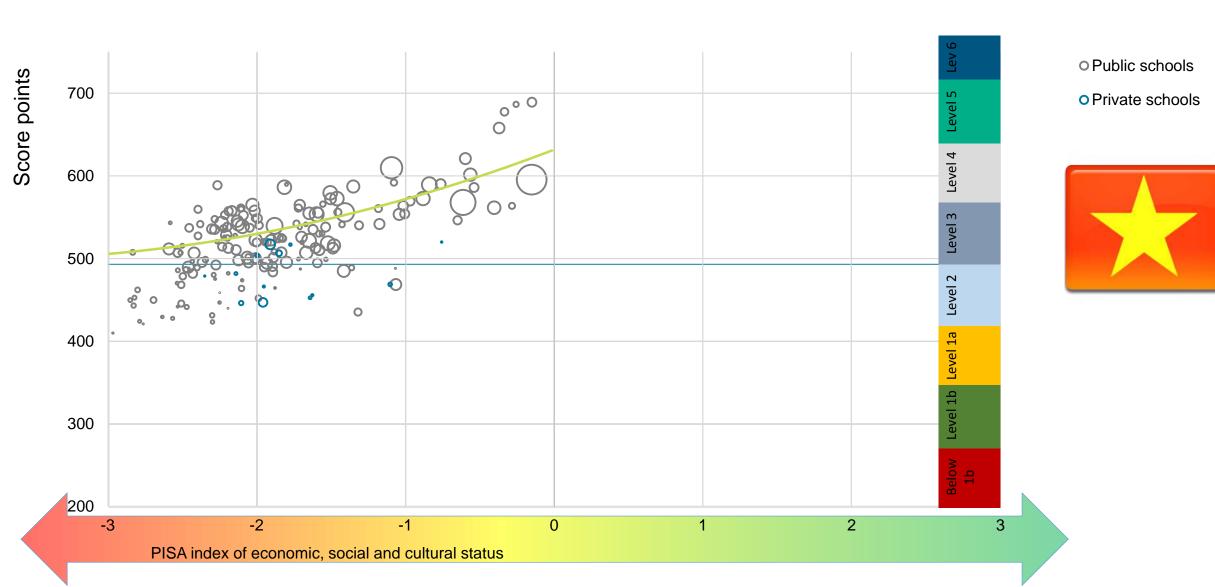


- Public schools
- Private schools



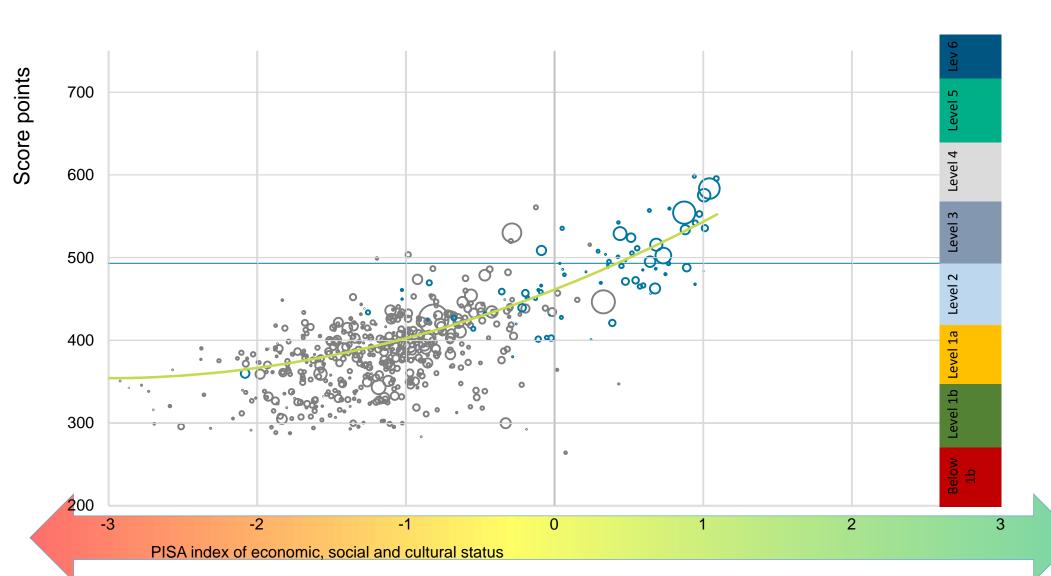


PISA 2015: Viet Nam: School performance and schools' socio-economic profile





PISA 2015: Brazil: School performance and schools' socio-economic profile

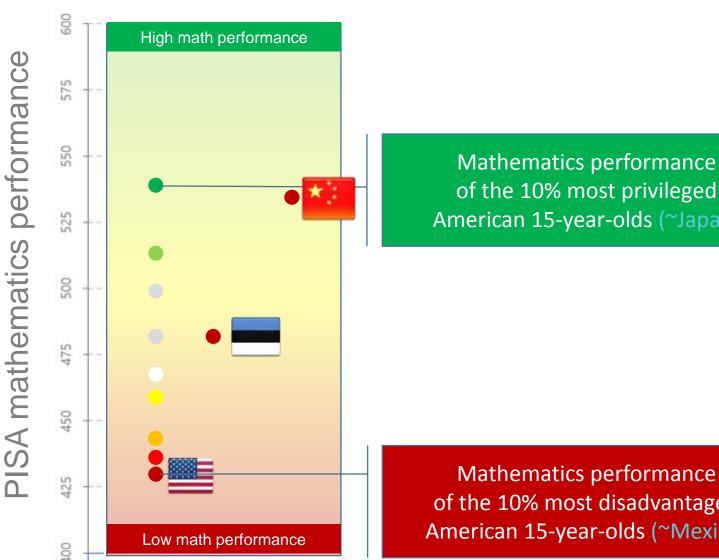


- Public schools
- Private schools





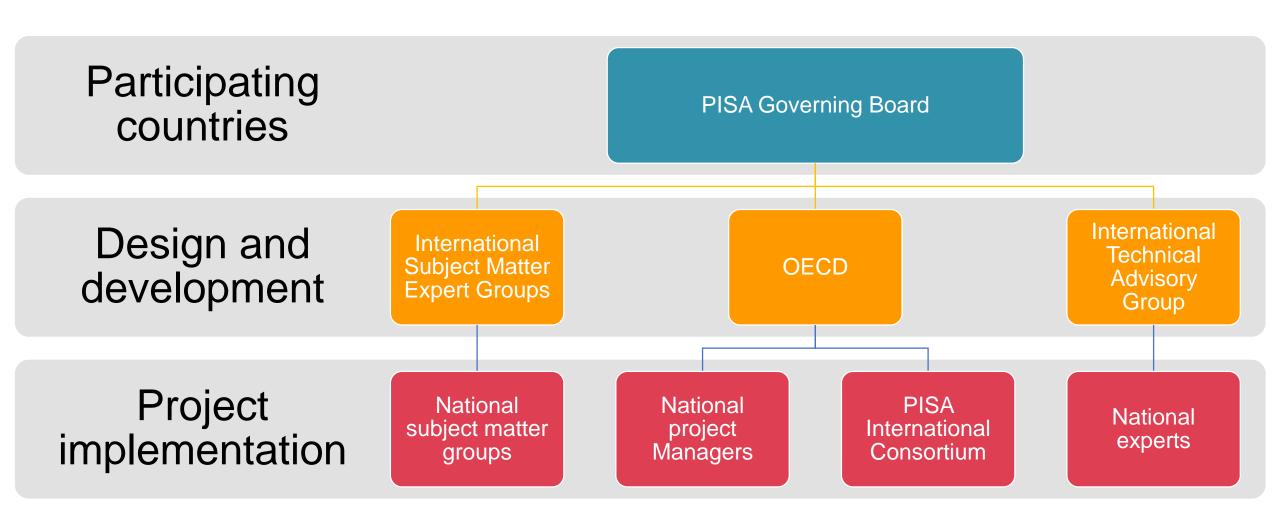
PISA 2012: POVERTY NEED NOT BE DESTINY: PISA math performance by decile of social background (2012)



of the 10% most privileged American 15-year-olds (~Japan)

Mathematics performance of the 10% most disadvantaged American 15-year-olds (~Mexico)

PISA in brief - Governance





Key features of PISA 2018



The assessment

Computer-based tests were used in most countries

Assessments lasting a total of **two hours**

Multi-stage adaptive approach in reading (students were assigned a block of test items based on their performance in preceding blocks)

Mixture of multiple-choice questions and questions requiring students to construct their own responses

The content

Focus on reading, with mathematics, science and global competence as minor areas of assessment

Optional assessment of young people's financial literacy



The students

Some 600 000 students completed the assessment in 2018, representing about 32 million 15-year-olds in the schools of the 79 participating countries and economies

Background questionnaires

Background questionnaire: information about the students themselves, their attitudes, dispositions and beliefs, their homes, and their school and learning experiences

School principals: school management and organisation, and the learning environment

Optional additional questionnaires for teachers (who are the teachers and teaching practices), parents (perceptions of and involvement in their child's school and learning) and students (familiarity with computers, expectations for further education, students' well-being)





What does the test measure?

Reading

students' capacity to understand, use, evaluate, reflect on and engage with texts in order to achieve one's goals, develop one's knowledge and potential, and participate in society





Science

the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen. A scientifically literate person is willing to engage in reasoned discourse about science and technology, which requires the competencies to explain phenomena scientifically, evaluate and design scientific enquiry, and interpret data and evidence scientifically





students' capacity to formulate, employ and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena



How were students tested?

- The computer based assessment was designed as a 2-hour test with 1 hour allocated to reading
- Students sat the test in 30 minute blocks
- The reading assessment was composed of a core stage followed by stage 1 and stage 2.

- At the beginning of stages 1 and 2, students were assigned blocks of items of either greater or lesser difficulty, depending on their performance in earlier blocks
- To measure trends in the subjects of mathematics and science, six clusters were included in each subject. In addition, four clusters of global competence items



Who are the PISA students: Why testing students of a specific age

Differences between countries in the nature and extent of pre-primary education and care, the age at entry into formal schooling, the structure of the education system, and the prevalence of grade repetition

School grade levels are often not good indicators of where students are in their cognitive development



To better compare student performance internationally, PISA targets students of a specific age



Allows PISA to consistently compare the knowledge and skills of individuals born in the same year who are still in school at age 15





Who are the PISA students: Target population



PISA target population

- PISA students are aged between 15 years 3
 months and 16 years 2 months at the time of the
 assessment
- They have completed at least 6 years of formal schooling



Enrolled in:

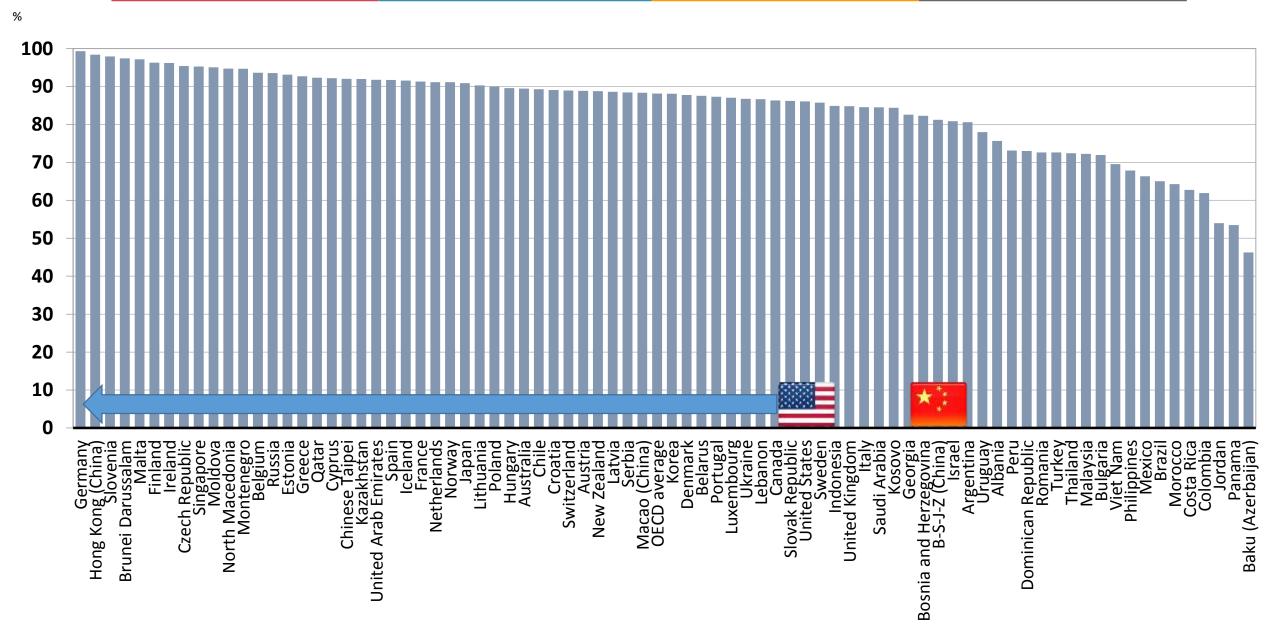
They can be **enrolled in any type of institution**

- full-time or part-time education
- academic or vocational programmes
- public or private schools or foreign schools within the country





Share of 15-year-olds covered by PISA





Who are the PISA students: technical standards

Strict technical standards on student exclusion

The **overall exclusion rate** within a country is required to **be below 5%**

Exclusion could take place either through the schools that participated or the students who participated within schools



In 31 of the 79 countries and economies that participated in PISA 2018, the percentage of school-level exclusions amounted to less than 1%; it was 4% or less in all except five countries

The overall exclusion rate remained below 2% in 28 participating countries and economies, below 5% in 63 participating countries and economies, and below 7% in all except 4 countries

Why a school or student could be excluded:

Schools situated in remote regions and are inaccessible, very small schools, because of organisational or operational factors that precluded participation

Students might be excluded because of intellectual disability or limited proficiency in the language of the assessment



Where can you find the results?

Published December 3, 2019

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

Volume I: What Students Know and Can Do

...provides a detailed examination of student performance in reading, mathematics and science

...describes how performance has changed over time

@WOECD





Volume II: Where All Students Can Succeed

- ...examines gender differences in student performance
- ...links students' socio-economic status and immigrant background, on the one hand, and their performance and other outcomes
- ...the relationship between all of these variables and students' well-being

Volume III: What School Life Means for Students' Lives

- ...focuses on the physical and emotional health of students, the role of teachers and parents in shaping the school climate, and the social life at school
- ...examines indicators of student well-being, and how these are related to school climate

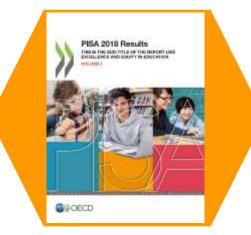


Where can you find the results?

Volume IV: Are Students Smart about Money?

- ...examines 15-year-old students' understanding about money matters in 21 countries and economies
- ...links financial literacy of 15-year-old students with their competencies in reading, mathematics and science, with their socioeconomic status, and with their previous experiences with money
- ...offers an overview of financial education in schools in the participating countries and economies, and provides case studies

Published in 2020

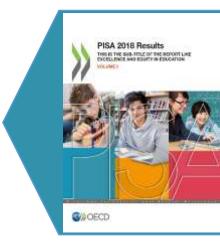


Volume V: Effective Policies, Successful Schools

- ...analyses schools and school systems and their relationship with education outcomes more generally
- ...covers school governance, selecting and grouping students, and the human, financial, educational and time resources allocated to teaching and learning

Volume VI: Are Students Ready to Thrive in Global Societies?

- ...examines students' ability to consider local, global and intercultural issues, understand and appreciate different perspectives and world views, interact respectfully with others, and take responsible action towards sustainability and collective well-being
- ...does so through both an assessment completed by students and questionnaires completed by students and school principals







PISA 2018 Results
Programme for International Student Assessment

PISA 2018 Results Released 3 December 2019



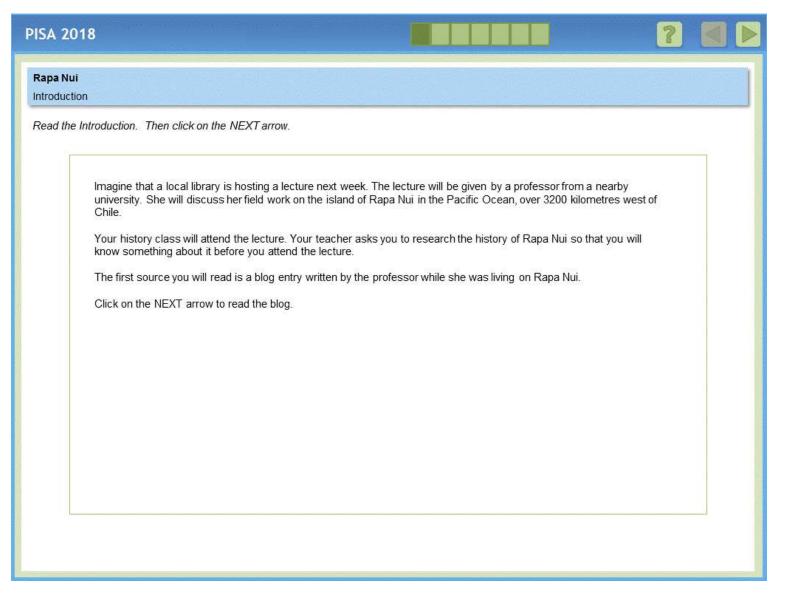




WHAT THE ASSESSMENT LOOKS LIKE: An example from the PISA 2018 reading test

- Items from the unit Rapa Nui from the PISA 2018 reading assessment, and some items used in the assessment of reading fluency were released
- Screenshots of the interface used in PISA 2018 are shown to give you an understanding of how students interacted with the assessment and its items
- Interactive versions of all of these units are also available at www.oecd.org/pisa



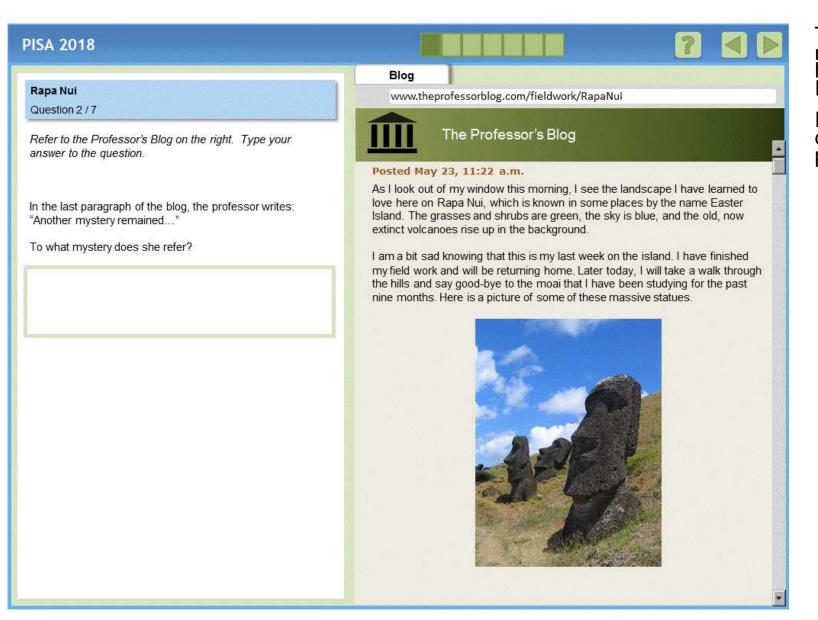


Rapa Nui is a multiple-source unit, consisting of three texts:

- a webpage from the professor's blog
- a book review
- a news article from an online science magazine

The blog is classified as a multiple-source text; dynamic (the webpage contains active links to the other texts in the unit); continuous; and narrative in style.





The student must understand that the second mystery mentioned in the blog post: what happened to the large trees that once grew on Rapa Nui and were used to move the moai?

For this item, the student could provide a direct quotation from the blog or an accurate paraphrase

What happened to these plants and large trees that had been used to move the moai? [Direct quotation]

There are no large trees left that could have moved the moai.

There are grasses, shrubs and some small trees, but no trees large enough to move the large statues.

Where are the large trees? [Minimal]

Where are the plants? [Minimal]

What happened to the resources that were needed to transport the statues?

She was referring to what moved the Moai because when she looked around there were no big trees or plants. She is also wondering what happened to them. [Although this response begins by referring to the wrong mystery, it contains the correct elements.]



PISA 2018

Blog Book Review

www.academicbookreview.com/Collapse





Rapa Nui

Question 3 / 7

Refer to the Review of Collapse on the right. Click on the choices in the table to answer the question.

Listed below are statements from the Review of *Collapse*. Are these statements facts or opinions? Click on either **Fact** or **Opinion** for each statement.

Is the statement a fact or an opinion?	Fact	Opinion
In the book, the author describes several civilizations that collapsed because of the choices they made and their impact on the environment.	0	0
One of the most disturbing examples in the book is Rapa Nui.	0	0
They carved the moai, the famous statues, and used the natural resources available to them to move these huge moai to different locations around the island.	0	0
When the first Europeans landed on Easter Island in 1722, the moai were still there, but the trees were gone.	0	0
The book is written well and deserves to be read by anyone who is concerned about the environment.	0	0

Review of Collapse

Jared Diamond's new book, *Collapse*, is a clear warning about the consequences of damaging our environment. In the book, the author describes several civilizations that collapsed because of the choices they made and their impact on the environment. One of the most disturbing examples in the book is Rapa Nui.

According to the author, Rapa Nui was settled by Polynesians sometime after 700 CE. They developed a thriving society of, perhaps, 15,000 people. They carved the moai, the famous statues, and used the natural resources available to them to move these huge moai to different locations around the island. When the first Europeans landed on Rapa Nui in 1722, the moai were still there, but the trees were gone. The population was down to a few thousand people who were struggling to survive. Mr. Diamond writes that the people of Rapa Nui cleared the land for farming and other purposes and that they over-hunted the numerous species of sea and land birds that had lived on the island. He speculates that the dwindling natural resources led to civil wars and the collapse of Rapa Nui's society.

The lesson of this wonderful but frightening book is that in the past, humans made the choice to destroy their environment by cutting down all the trees and hunting animal species to extinction. Optimistically, the author points out, we can choose **not** to make the same mistakes today. The book is written well and deserves to be read by anyone who is concerned about the environment.

The student is presented with the second text in the unit, a book review of *Collapse*

The question asks the student to identify whether each statement from the book review is a fact or an opinion

The student must complete a table by selecting "Fact" or "Opinion" for each row

The student must first understand the literal meaning of each statement and then decide if the content was factual or represented the perspective of the author of the review

focus on the content and how it is presented rather than just the meaning

To receive full credit for this item, the student was required to get all 5 rows correct. For partial credit, students were required to get 4 out of the 5 rows correct.

If students got fewer than 4 rows correct, they received no credit



PISA 2018 Book Review Science News Blog Rapa Nui www.sciencenews.com/Polynesian_rats_Easter_Island Question 4/7 SCIENCE NEWS Refer to the article "Did Polynesian Rats Destroy Rapa Nui's Trees?" on the right. Click on a choice to answer the Did Polynesian Rats Destroy Rapa Nui's Trees? auestion. By Michael Kimball, Science Reporter What do the scientists mentioned in the article and Jared In 2005, Jared Diamond published Collapse. In the book, he described Diamond agree on? the human settlement of Rapa Nui (also called Easter Island). o Humans settled Rapa Nui hundreds of years ago. The book caused a huge controversy soon after its publication. Many Large trees have disappeared from Rapa Nui. scientists questioned Diamond's theory of what happened on Rapa Polynesian rats ate the seeds of large trees on Rapa Nui. Nui. They agreed that the huge trees had disappeared by the time Europeans arrived on Rapa Nui in the 18th century. Europeans first arrived on the island in the 18th century, but they did not agree with Jared Diamond's theory about the cause of the disappearance. Now, two scientists, Carl Lipo and Terry Hunt, have published a new theory. They believe that the Polynesian rat ate the seeds of the trees, preventing new ones from growing. The rat, they believe, was brought over either accidentally or purposefully on the canoes that the first human settlers used to land on Rapa Nui. Studies have shown that a population of rats can double every 47 days. That's a lot of rats to feed. To support their theory, Lipo and Hunt point to the remains of palm nuts that show the gnaw marks made by rats. Of course, they acknowledge that humans did play a role in the destruction of the forests of Rapa Nui. But they believe that the Polynesian rat was an even greater culprit among a series of factors.

The student is presented with the third text in the unit – an article from an online science magazine

In this item, the student is required to locate the section of the article that contains the reference to the scientists and Jared Diamond (paragraph 2) and identify the sentence that contains the information agreed upon

While all texts are available to the student, this item is not classified with a cognitive process that reflects the use of multiple sources. This is because the student can find the answer within this text, and the item instructions on the upper left corner instruct the student to refer to this article only

The support from the item instructions eliminates the need to consider the other sources.

The difficulty of this item is likely driven by the existence of plausible (but incorrect) distracting information within the paragraph with respect to human settlement



PISA 2018 Book Review Science News Blog Rapa Nui www.sciencenews.com/Polynesian rats Easter Island Question 5 / 7 SCIENCE NEWS Refer to the article "Did Polynesian Rats Destroy Rapa Nui's Trees?" on the right. Click on a choice to answer the Did Polynesian Rats Destroy Rapa Nui's Trees? auestion. By Michael Kimball, Science Reporter In 2005, Jared Diamond published Collapse. In the book, he described What evidence do Carl Lipo and Terry Hunt present to the human settlement of Rapa Nui (also called Easter Island). support their theory of why the large trees of Rapa Nui disappeared? The book caused a huge controversy soon after its publication. Many scientists questioned Diamond's theory of what happened on Rapa The rats arrived on the island on settlers' canoes. Nui. They agreed that the huge trees had disappeared by the time The rats may have been brought by the settlers Europeans first arrived on the island in the 18th century, but they did not purposefully. agree with Jared Diamond's theory about the cause of the Rat populations can double every 47 days. disappearance. o The remains of palm nuts show gnaw marks made by rats. Now, two scientists, Carl Lipo and Terry Hunt, have published a new theory. They believe that the Polynesian rat ate the seeds of the trees, preventing new ones from growing. The rat, they believe, was brought over either accidentally or purposefully on the canoes that the first human settlers used to land on Rapa Nui. Studies have shown that a population of rats can double every 47 days. That's a lot of rats to feed. To support their theory, Lipo and Hunt point to the remains of palm nuts that show the gnaw marks made by rats. Of course, they acknowledge that humans did play a role in the

destruction of the forests of Rapa Nui. But they believe that the Polynesian rat was an even greater culprit among a series of factors.

The student is required to understand what information in the text supports, or corroborates, the theory put forward by the scientists

The remains of palm nuts show gnaw marks made by rats. Here, the student must go beyond an understanding of the text and identify which element of the text can be used as evidence to support a claim

Most items classified as detect and handle conflict require detecting a conflict between two sources or recognising that the information is in two or more sources and is corroborated

However, in discussing this item prior to the field trial, the experts felt that the act of identifying which piece of information supports the theory proposed by Carl Lipo and Terry Hunt was most appropriately identified by the cognitive process of detect and handle conflict



Rapa Nui, released Item #6

PISA 2018

Rapa Nui

Question 6/7

Refer to all three sources on the right by clicking on each of the tabs.

Drag and drop the causes, and the effect they have in common, into the correct places in the table about the theories.

The Theories

disappeared from

Rapa Nui.

Cause	Effect	Supporters of the Theory
		Jared Diamond
		Carl Lipo and Terry Hunt
The moai were carved in the same quarry.	Polynesian rats ate tree seeds and as a result no new trees could grow.	Settlers used canoes to bring Polynesian rats to Rapa Nui.
The large trees	Rapa Nui residents needed	Humans cut down trees to clear land

natural resources

to move the moai.

for agriculture and

other reasons.



Posted May 23, 11:22 a.m.

As I look out of my window this morning, I see the landscape I have learned to love here on Rapa Nui, which is known in some places by the name Easter Island. The grasses and shrubs are green, the sky is blue, and the old, now extinct volcanoes rise up in the background.

I am a bit sad knowing that this is my last week on the island. I have finished my field work and will be returning home. Later today, I will take a walk through the hills and say good-bye to the moai that I have been studying for the past nine months. Here is a picture of some of these massive statues.



Students must integrate information across the texts with respect to the differing theories put forward by Jared Diamond on the one hand and Carl Lipo and Terry Hunt on the other

The student must identify the shared effect (the disappearance of the large trees) by rejecting information presented in the blog post about where the moai were carved (in the same quarry)

Further, the student must understand what each scientist believes is the cause of the disappearance

To receive credit for this item, the student was required to get all three answers correct

The correct answers are:

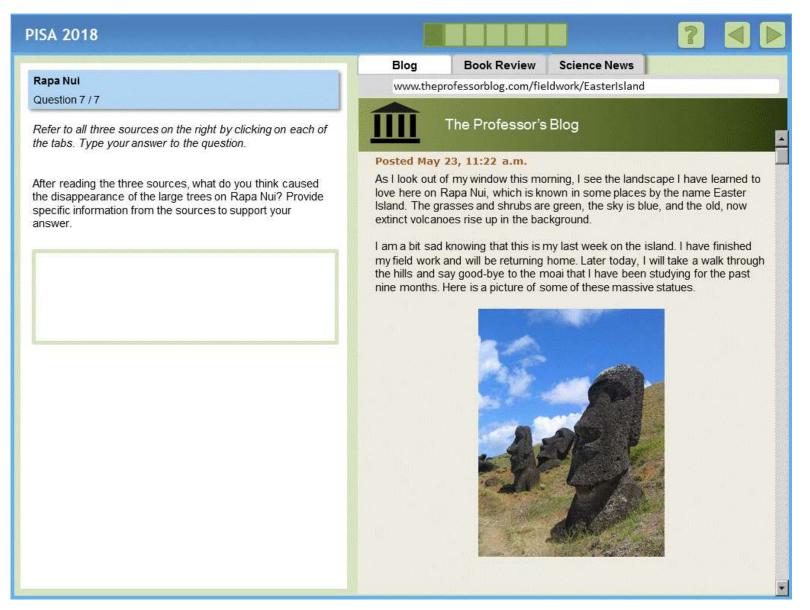
Cause (Jared Diamond) – Humans cut down trees to clear land for agriculture and other reasons

Cause (Carl Lipo and Terry hunt) – Polynesian rats ate tree seeds and as a result no new trees could grow

Effect (shared) – The large trees disappeared from Rapa Nui



Rapa Nui, released Item #7



The student must integrate information from across the texts and decide which theory to support

The student must understand the theories – and that they are at odds with one another – and must present a response that contains support from the texts.

To receive credit, a student could choose to support either theory or could choose neither theory as long as the explanation is focused on the need for additional research.

This is an open response/ human coded item



- For full credit, at least one of the following descriptions had to be included:
 - The people cut down or used the trees (to move the moai and/or cleared the land for agriculture)
 - The rats ate the seeds of the trees (so new trees could not grow)
 - It is not possible to say exactly what happened to the large trees until further research is conducted
- Sample responses that would receive full credit include:
 - I think the trees disappeared because people cut too many of them down to move the moai. [1]
 - People cleared the land for agriculture. [1]
 - Trees were used to move moai. [1]
 - People cut the trees down. [1]
 - It was the people's fault because they wanted to move the moai. [1 this response doesn't explicitly refer to cutting down the trees, but it is acceptable because they refer to people and one reason they cut down the trees (to move the moai)]
 - People's fault. They destroyed the environment. [1 this response doesn't explicitly refer to cutting down the trees, but it is an acceptable way of summarizing the results of cutting down the trees.]
 - I think the rats probably caused the most damage by eating the seeds of the trees. [2]
 - The rats ate the seeds. [2]
 - There is no proof that either one is correct, so we have to wait until there is more information. [3]
 - Both. The people cut down the big trees for farming, and then the rats ate the tree seeds! [1 and 2]

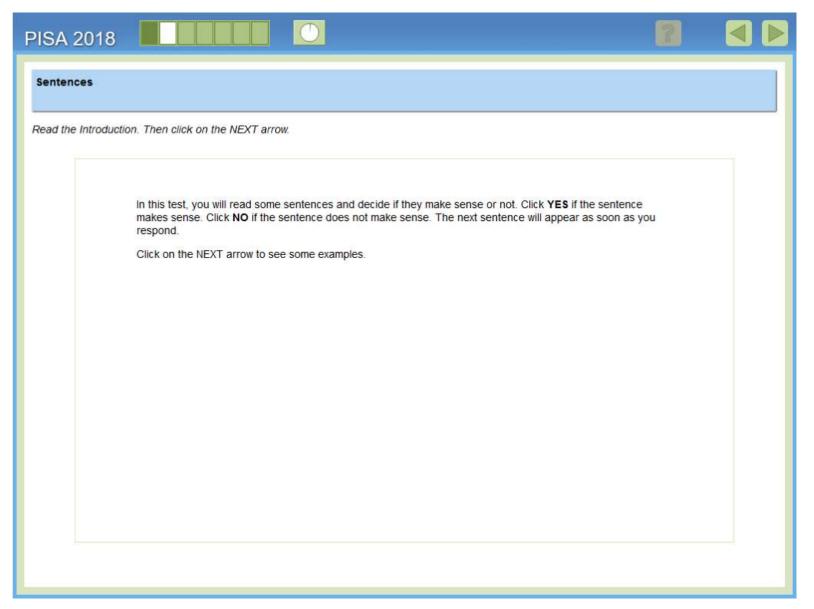


Reading fluency

- Measuring reading fluency to better assess and understand the reading skills of students in the lower proficiency levels
- Reading fluency defined as the ease and efficiency with which one can read and understand a piece of text
- Reading fluently requires that one can recognize words within a text accurately and automatically and can then parse and process the words into a coherent whole in order to comprehend the overall meaning of the text
- When these processes are done efficiently, students' cognitive resources are available for higher-level comprehension tasks, allowing students to engage with texts more deeply
- Students were given three minutes to evaluate the sensibility of as many sentences as they could (i.e. Does the sentence make sense Yes or No).
- The number of sentences was restricted to 21 or 22 sentences per student so that most students would be able to complete the task within the three minutes
- If a student reached the three minutes while viewing a sentence, the task ended after they
 completed that sentence's sensibility judgment (to maintain motivation for the remaining sections
 of the PISA assessment)
- Items in this task were the easiest items in the reading-literacy assessment in PISA 2018
- Items fell into **proficiency Level 1c and Level 1b**; one item was in **Level 1a**. Items that did not make sense and required a "No" response were more difficult than items that made sense and required a "Yes" response



Reading fluency: Introduction

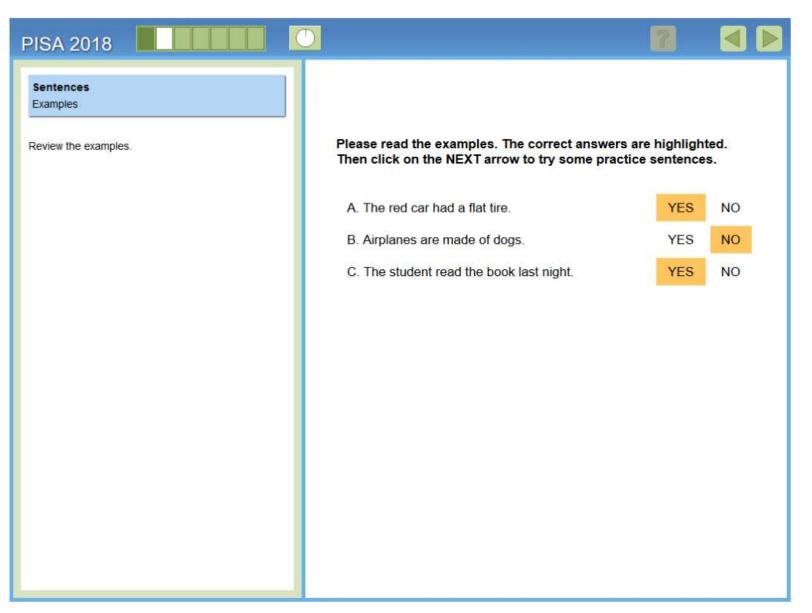


In this introduction, students are given the basic instructions for what they will do in the fluency task

Students are notified that the next sentence will appear as soon as they respond so that they are prepared for this style of presentation.



Reading fluency: Static examples

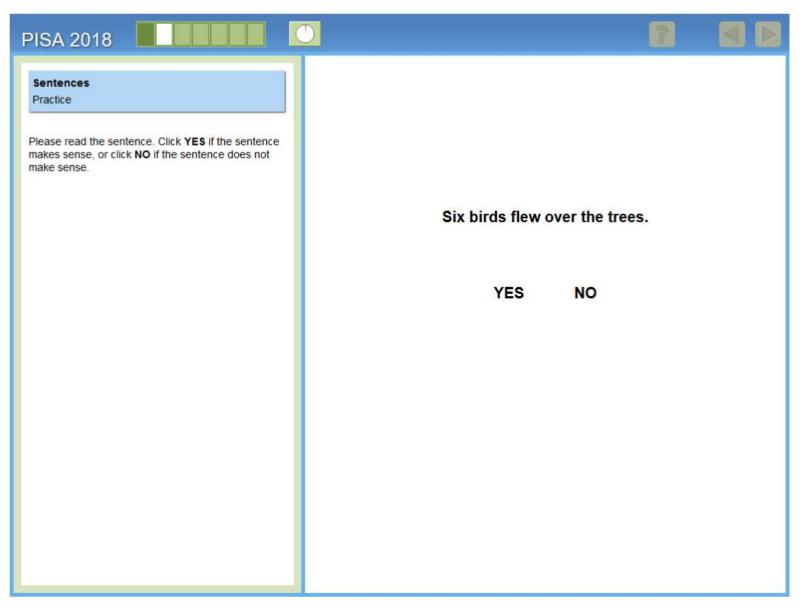


Students are given a set of static examples so that the sensibility judgements are understood prior to interacting with dynamic practice items.

Here, three example sentences are provided, two that make sense (a Yes response is correct) and one that does not make sense (a No response is correct).



Reading fluency: Dynamic-practice item #1



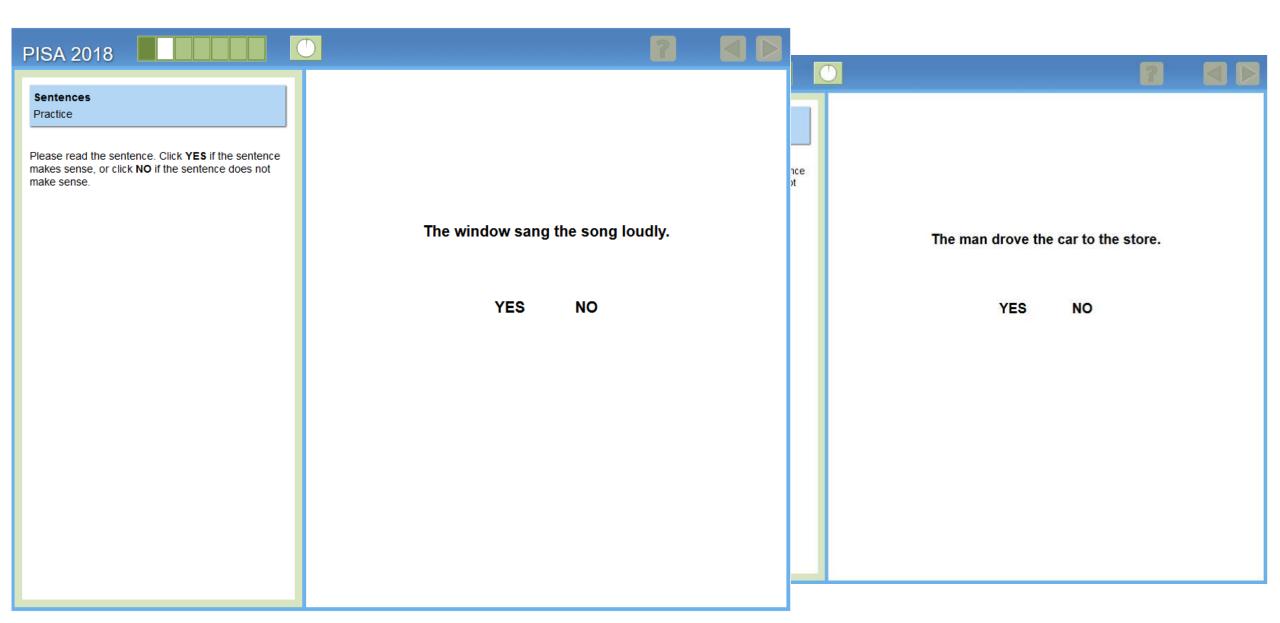
The next three images show three dynamicpractice items

Students complete these dynamic-practice items prior to receiving the first fluency item so that they understand the response mode for the item.

For each example, as soon as the student clicks on "Yes" or "No", the next item appears.

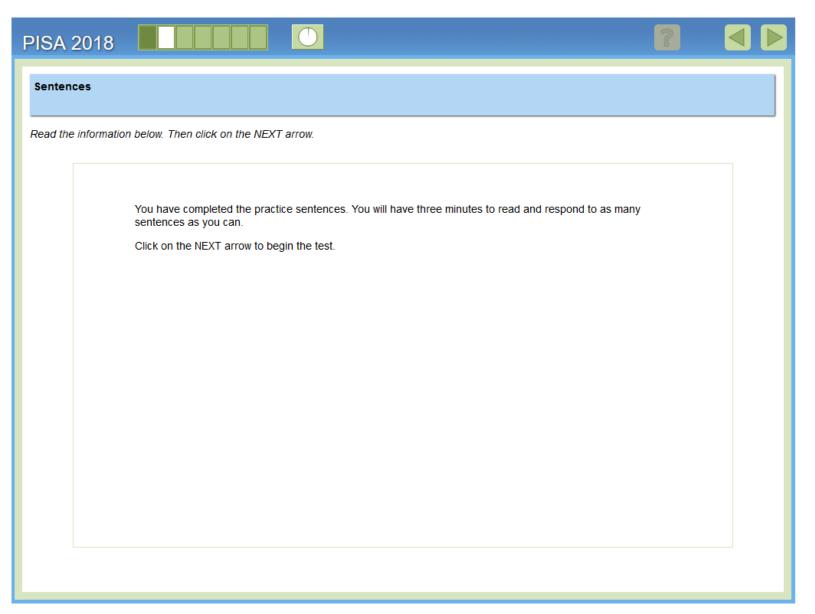


Reading fluency: Dynamic-practice item #2 and #3





Reading fluency: End of practice



Students are told that they have completed the practice sentences. They are also given the time limit for the task – three minutes – and they are told to complete as many sentences as they can within the time limit

Once the student clicks on the NEXT arrow, the task begins and is carried out in the same way as the dynamic-practice items.

Once students have completed the task, they are notified that the first section of the test is complete and the answers have been saved



"The top performers do well because they don't include all of their students"

OECD coverage of 15-year-olds: 89%, U.S. 84%

"It's all about culture"

Between 2000 and 2012, several education systems improved student performance by more than a school year

"The world is divided between rich and well-educated nations and poor and badly educated ones"

Less than a quarter of the performance variation among OECD countries is explained by GDP/capita

"Deprivation is destiny"

In 2012, the 10% most disadvantaged students in Shanghai reached similar math scores than the 10% most privileged American 15-year-olds

"Excellence is not compatible with equity"

In 2012, there were education systems in Asia, Europe and North America with high and equitable learning outcomes

"Excellence requires selection"

The highest-performing education systems are non-selective

"Educational quality and personalisation is all about class size"

The highest-performing education systems prioritize the quality of teachers over the size of classes