



# Between PISA and PIAAC

Relating PISA and PIAAC results –  
directions for Israel

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**PISA**

**PIAAC**

**Participating**

67 countries/economies

24 countries + 9 (2<sup>nd</sup> round)

**Population**

15-year old students

16-65-year olds (adults)

**Sample size**

Around 510,000 (6,000 in Israel)

About 200,000 (5,000 in Israel)

**Assessment domains**

Mathematics, reading, science, and problem solving (rotating major domain) + “guest domains”

Numeracy, literacy, problem solving in a technology rich environment and reading components

**Other components**

Background questionnaire and school questionnaire completed by school principle

Background questionnaire

**Number of languages**

47 (Hebrew and Arabic in Israel)

23 (Hebrew, Arabic and Russian in Israel)

**Local options**

Questions on educational careers and ICT questionnaire

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A decorative header featuring a row of light blue silhouettes of various people, including adults, children, and individuals with mobility aids like strollers and wheelchairs, set against a light blue background.

# Israel in PISA

- Israel participates in PISA since PISA 2000 cycle which was operated in Israel, in 2002.
- Israel did not participate in PISA 2003.
- since then, Israel participated in all PISA cycles : 2006, 2009, 2012 and participates in 2015
- Israel had joined the OECD in 2010
- RAMA (the national authority for measurement and evaluation in education) is responsible in Israel for the administration of PISA in Israel



# Coverage of the population

In Israel, in PISA, all the cohort of 15 years old participates in the research, including:

- The main educational streams (secular and religious; i.e. “Mamlachti” and “Mamlachti-dati”)
- The ultra-religious (Haredi) institution for girls
- A very small part of Haredi boys institution (non representative sample)
- “Apprentice Schools” that are ruled by the ministry of economy.
- The research covers more 90% of the relevant population.



# PISA research in Israel

After every cycle, RAMA publishes a detailed report to inform the public and policies about the main findings regarding the Israeli 15-years old students

later RAMA further investigates key issues for the Israeli system revealed by the data:

Example:

The effect of ESCS on PISA outcomes;

The influence of pre-primary education on PISA outcomes;

The gender gap in mathematics – what could be learned from the Israeli case?

The redshirt effect (“enchanted December”): The relationship between the age of entering school and PISA outcomes.

However:

Much more can be learned and the data is open and free so....

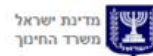
Researchers are most welcomed to use the PISA data base and continue to study the Israeli society and educational system with the results.



# PISA reports in Israel

- Includes analysis of educational outcomes according to:
- Ethnic groups: Arabic speaking vs. Hebrew speaking students.
- Educational stream: Secular vs. religious vs. ultra-religious
- gender
- ESCS (socio-economic-cultural background)
- Trends along years

האם נכון לחזור על ניתוחים אלו בפיאק ולנסות להשוות  
ו/או קשר בין הממצאים ?



# פיזה 2006

PISA - Programme for International Student Assessment

אוריינות תלמידים בני 15  
במדעים, בקריאה ובמתמטיקה



## מבט ישראלי

# פיזה 2012

PISA – Programme for International Student Assessment

אוריינות תלמידים בני 15  
במדעים, בקריאה ובמתמטיקה



מבט ישראלי

גרסה I - 3.12.2013

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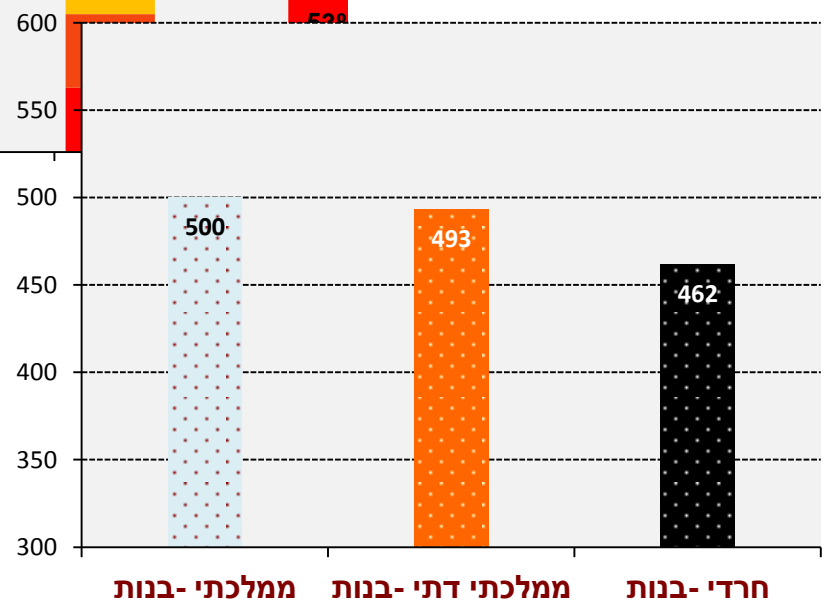
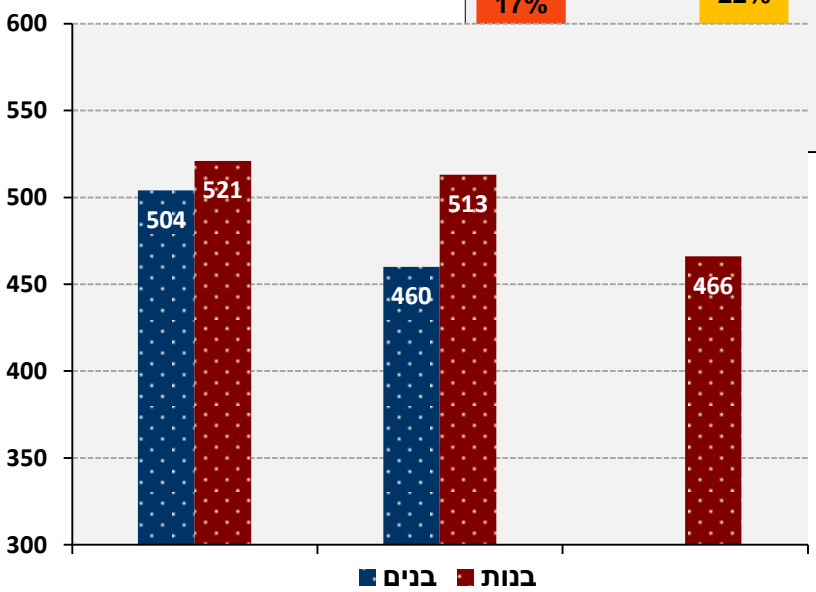
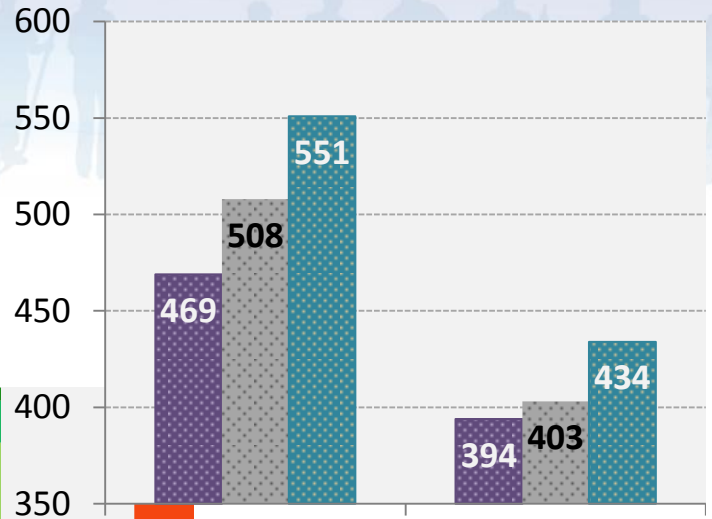
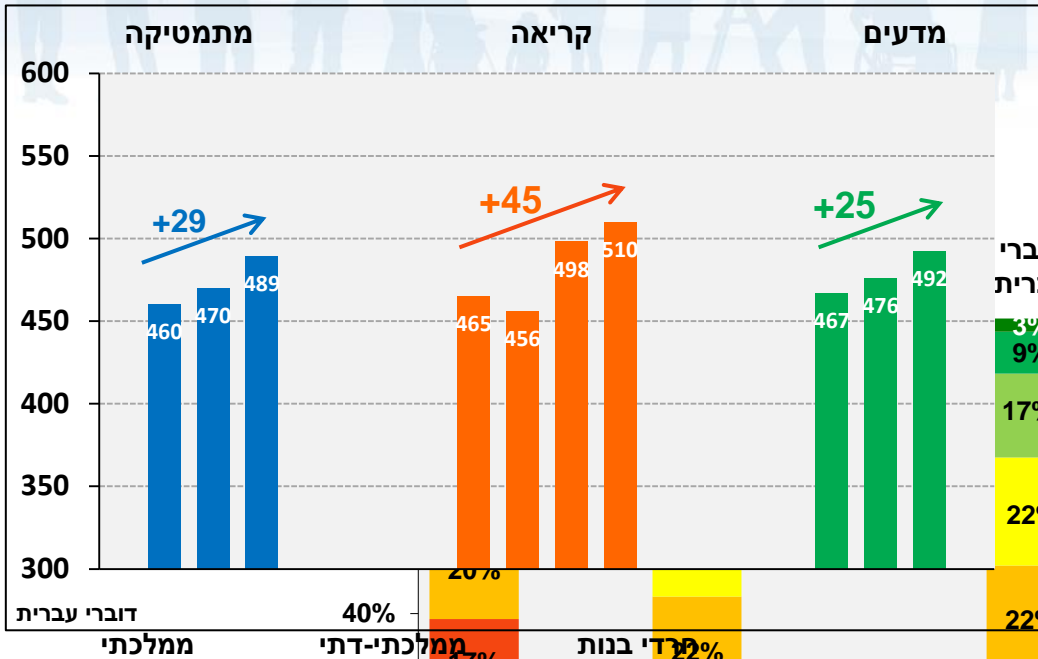
# פיזה 2009

Programme for International Student Assessment

אוריינות תלמידים בני  
במתמטיקה ובקריאה



## מבט ישראלי







PISA

PIAAC

PISA measures the knowledge and skills that have been cumulatively acquired by 15-year olds and compares them to global standards.

Are there gaps within the country between students from different cultural groups ?

Israel is a special case in which PISA results are relatively low on the one hand but on the other hand Israel is a world country leader in high technology industry, science and innovations.

Skills measured by PIAAC are considered to be “foundational” skills, in that they form the basis for mastering other, higher-level skills that are necessary to functioning at home, school, and work, and in the community.

Are there gaps within the country between cultural groups or other sections of the population, in terms of their average skill levels?

Does the high proficiency of Israeli scientist and academics, and of the Israeli “start up” nation will be reflected in the skills necessary to thrive in today’s economy?

# Israeli “Education Enigma No. 1”

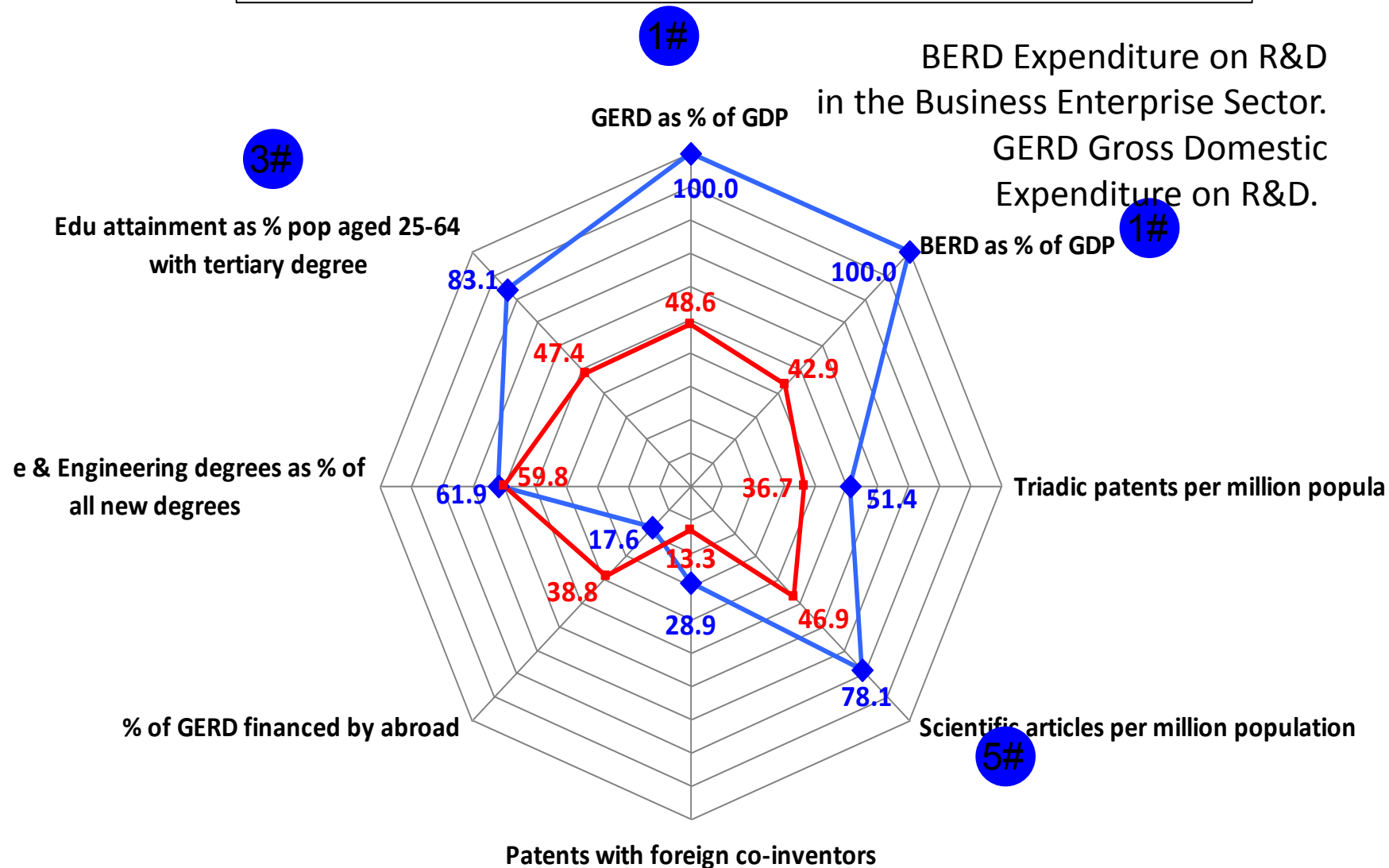
- ההישגים של ילדי ישראל במבחנים הבינלאומיים – מתחת לכל רמה סבירה
- חמור מכך – השיעור הנמוך של מצטיינים בישראל וחמור עוד יותר – ישראל מובילה בגובה הפערים
- מיתוס - לא באמת היינו בעשירייה הראשונה בשנות ה-60; ההישגים מאז 1999 ועד היום דומים (ונמוכים)
- השיעור הגבוה של מסיימי י"ב כיתות
- ישראל מס' 2 בעולם בשיעור האקדמאים בקרב גילאי 25-34
- התרבות והאמנות בישראל – סיפור הצלחה עולמי
- האוניברסיטאות הישראליות – בצמרת הדירוגים העולמית
- הפרופיל של ישראל במדע ובחדשנות – מהמצטיינים בעולם

Source: “Beller, M., general Director of RAMA (the national institute for Measurement and evaluation in education). The annual Tel Aviv meeting for advance education, May 12<sup>th</sup> 2009”.

# Science and Innovation Profile of Israel (2006)

◆ Israel

— Average



# Comparison of the Survey of Adult Skills (PIAAC) and PISA

<b>The Survey of Adult Skills (PIAAC )</b>	<b>PISA in Israel</b>
Literacy	Reading literacy (2002, 2006, 2009, 2012) Electronic reading (2012)
Numeracy	Mathematical literacy (2002, 2006, 2009, 2012)
Problem solving in technology-rich environments	Problem solving (2012)
	Scientific literacy (2002, 2006, 2009, 2012)
	Financial literacy (2012)

# PISA cohort in the target population of PIAAC (in Israel)

PISA Cycle	Age of PISA cohort in PIAAC 2014
PISA 2000 (2002)	27-28
PISA 2006	23-24
PISA 2009	20-21
PISA 2012	17-18

In PIAAC, most adults aged 27 and under ,were members of the cohorts assessed in PISA 2002, 2006, 2009 and 2012, when they were 15 years old. But it is important to note **these are not the same examinees**.

? Many Israelis have an immigration background, and they are not product of the Israeli education system



# matching between PISA and PIAAC Israeli society groups

Stream of education (PISA)	Sections in the general population
secular	secular + traditional?
religious	traditional + religious + Ultra religious
Ultra-religious (girls)	Religious + Ultra-religious (men and women)

Should we match according to the stream of education the person was following in his childhood or according to actual state ?

# Defining PISA reading, and PIAAC literacy and reading

	Survey of Adult Skills (PIAAC)	PISA
Definition	The ability to understand, evaluate, use and engage with <i>written texts</i> to participate in society, to achieve one's goals, and to develop one's knowledge and potential.	The capacity to understand, use, reflect on and engage with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society.
Content	<p>Different types of text. Texts are characterised by their medium (<i>print-based</i> or <i>digital</i>) and by their format:</p> <ul style="list-style-type: none"> <li>▪ <i>Continuous</i> or <i>prose texts</i>, which involve narration, argumentation or descriptions, for example</li> <li>▪ <i>Non-continuous</i> or <i>document texts</i>, for example, tables, lists and graphs</li> <li>▪ <i>Mixed texts</i>, which involve combinations of prose and document elements</li> <li>▪ <i>Multiple texts</i>, which consist of the juxtaposition or linking of independently generated elements</li> </ul>	<p>The form of reading materials:</p> <ul style="list-style-type: none"> <li>▪ Continuous texts, including different kinds of prose such as narration, exposition, argumentation</li> <li>▪ Non-continuous texts, including graphs, forms and lists</li> </ul>
Cognitive processes	<p>Access and identify</p> <p>Integrate and interpret (relating parts of text to one another)</p> <p>Evaluate and reflect</p>	<p>Retrieving information</p> <p>Interpreting texts</p> <p>Reflecting on and evaluating texts</p>
Contexts	<p>Personal</p> <p>Work</p> <p>Community</p> <p>Education</p>	<p>Personal (e.g. a personal letter)</p> <p>Occupational (e.g. a report)</p> <p>Public (e.g. an official document)</p> <p>Educational (e.g. school-related reading)</p>

Source: The Survey of Adult Skills, Reader's Companion, OECD 2013

# Defining PISA mathematics and PIAAC numeracy

	Survey of Adult Skills (PIAAC)	PISA
<b>Definition</b>	The ability to access, use, interpret and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life.	The capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgements and to use and engage with mathematics in ways that meet the needs of that individual's life as a constructive, concerned and reflective citizen.
<b>Content</b>	Quantity and number Dimension and shape Pattern, relationships, change Data and chance	Quantity Space and shape Change and relationships
<b>Cognitive processes</b>	Identify, locate or access Act upon and use (order, count, estimate, compute, measure, model) Interpret, evaluate and analyse Communicate	Reproduction (simple mathematical operations) Connections (bringing together ideas to solve straightforward problems) Reflection (wider mathematical thinking)
<b>Contexts</b>	Everyday life Work-related Community and society Education and training	Personal Educational and occupational Public Scientific



# Defining PISA problem solving and PIAAC problem solving in technology-rich environment

	Survey of Adult Skills (PIAAC)	PISA
<b>Definition</b>	The ability to use digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks; the assessment focuses on the ability to solve problems for personal, work and civic purposes by setting up appropriate goals and plans, and accessing and making use of information through computers and computer networks.	An individual's capacity to use cognitive processes to confront and resolve real cross-disciplinary situations in which the solution path is not immediately obvious and where the literacy domains or curricular areas that might be applicable are within a single domain of science, mathematics or reading.
<b>Content</b>	<p>Technology:</p> <ul style="list-style-type: none"> <li>▪ Hardware devices</li> <li>▪ Software applications</li> <li>▪ Commands and functions</li> <li>▪ Representations (e.g. text, graphics, video)</li> </ul> <p>Nature of problems:</p> <ul style="list-style-type: none"> <li>▪ <i>Intrinsic complexity</i>, which includes the number of steps required for solution, the number of alternatives, complexity of computation and/or transformation, number of constraints</li> <li>▪ <i>Explicitness of the problem statement</i>, for example, largely unspecified or described in detail</li> </ul>	<p>Problem types:</p> <ul style="list-style-type: none"> <li>▪ Decision making</li> <li>▪ System analysis and design</li> <li>▪ Trouble shooting</li> </ul>
<b>Cognitive processes</b>	Setting goals and monitoring progress Planning Acquiring and evaluating information Using information	Understanding Characterising Representing Reflecting Solving Communicating
<b>Contexts</b>	Personal Work and occupation Civic	Personal life Work and leisure Community and society

- ***Exploring and understanding*** the information provided with the problem.
- ***Representing and formulating***: constructing graphical, tabular, symbolic or verbal representations of the problem situation and formulating hypotheses about the relevant factors and relationships between them.
- ***Planning and executing***: devising a plan by setting goals and sub-goals, and executing the sequential steps identified in the plan.
- ***Monitoring and reflecting***: monitoring progress, reacting to feedback, and reflecting on the solution, the information provided with the problem, or the strategy adopted.



Of the three domains assessed in PISA and PIAAC, **problem solving is the one where there is the least relationship between the constructs assessed**. In particular, the domain of problem solving in technology-rich environments (PIAAC) tend to be less updated to technology advancement and the problems in it seems to be partly represented in “electronic reading “in PISA . In addition, problem solving in PISA and PIAAC focuses on different aspects of the domain and conceive the dimension of their respective constructs in somewhat different ways.

# Sample questions PISA

## 5 Problem Solving – Sample Question 1

### TRAFFIC

Julio lives in Silver, Ma  
They want to meet in a  
for more than 15 minu  
Where could they mee

The  
pro 6

## 6 Problem Solving – Sample Question 2

### TICKETS

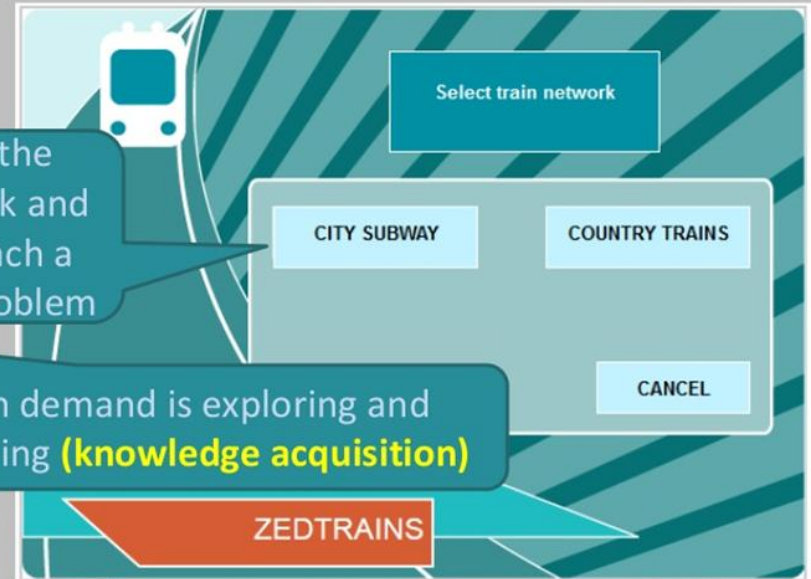
This is a harder item – **Level 5** on the problem-solving scale

You plan to take four trips around the city on the subway today. You are a

Students must engage with the machine, and use the feedback and information uncovered to reach a solution: it is an **interactive** problem

to find the cheapest ticket and press BUY. Once you have BUY, you cannot return to the question;

This main demand is exploring and understanding (**knowledge acquisition**)



Sample items can be tried at [cbasq.acer.edu.au](http://cbasq.acer.edu.au) and [www.oecd.org/pisa](http://www.oecd.org/pisa)

An **embedded calculator** ensures the item measures problem solving – not arithmetics

Total Time:  minutes

# Sample question PIAAC

## Unit 6

You ordered a desk lamp from KE-Lamps.com.

The desk lamp arrived, but it was not the color you ordered.

Using the company's website, arrange to exchange the lamp you received for the one you ordered.

Once you have finished, click Next to go on.



Web


File Edit Bookmark Help

URL:

## KE-Lamps.com

*The best way to light your life*

- Bedroom Lamps
- Desk Lamps
- Floor Lamps
- Table Lamps
- New Arrivals
- SALE!**



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Web Email

A decorative header featuring a row of light blue silhouettes of various people, including adults and children, some pushing strollers, set against a light blue background. The word "Summary" is centered over this image in a large, dark blue font.

# Summary

PIAAC and PISA share a similar broad approach to assessment and there is considerable commonality in the way in which the skills of literacy/reading literacy and numeracy/mathematical literacy are conceptualized in the two studies. The overlap is greater in the case of literacy and reading literacy. The differences between the two studies in these domains relate, at least in part, to the different target populations. At least in the domains of literacy/reading and numeracy/mathematics, **PIAAC and PISA can be regarded as measuring much the same skills** in much the same way. At the same time, different measures are used in the two studies. The literacy and the numeracy scales used in PIAAC are not the same as their counterparts in PISA. While it would be expected that a high performer in reading literacy in PISA would be a relatively high performer in PIAAC, it is not possible to identify with any accuracy where a 15-year-old with a particular reading literacy or mathematics score in PISA would be located on the literacy or numeracy scales of the Survey of Adult Skills. In the absence of evidence from a study linking the two assessments, **caution is advised in comparing the results of the two assessments.**



# דוגמאות לכיוונים אפשריים למחקר

- הקשר בין הישגים בבתי הספר ומיומנויות בוגרים בישראל? ביחס לעולם ופנימה במגזרים שונים בישראל
- באיזו מידה ניתן להשתמש בנתוני פיזה (בין אם לגבי המימדים הקוגניטיביים, או משתני רקע שונים) להבנת הסיבות להתפלגות כישורי המבוגרים שיימצאו בפיאק (זה קשור לשקף 13 עם השוואת הקוהורטות)? – מגבלות יכולת ההשוואה
- 
- אם יש קשר בין השניים, באיזו מידה חשוב לנו לדעת מה מצאי ההון האנושי שעומד/יעמוד לרשות המדינה בעוד 10-20 שנה ביחס לכלל האכלוסיה ומגזרים חשובים בתוכה כגון חרדים או ערבים?
- האם משתני רקע חשובים כגון מוצא הורים, השכלה, מצב כלכלי וכיוב' מסבירים התפלגות כישורי בוגרים באותו אופן שהם מסבירים כישורי תלמידים? וכו'.
- .....ועוד.....