The OECD Programme for International Student Assessment, or PISA, assesses the extent to which 15-year-old students, near the end of their compulsory education, have acquired key knowledge and skills that are essential for full participation in modern societies. The assessment focuses on the core school subjects of science, reading and mathematics. Students’ proficiency in an innovative domain is also assessed (in 2015, this domain is collaborative problem solving). The assessment does not just ascertain whether students can reproduce knowledge; it also examines how well students can extrapolate from what they have learned and can apply that knowledge in unfamiliar settings, both in and outside of school. This approach reflects the fact that modern economies reward individuals not for what they know, but for what they can do with what they know.

The findings from PISA allow policy makers around the world to gauge the knowledge and skills of students in their own countries in comparison with those in other countries, set policy targets against measurable goals achieved by other education systems, and learn from policies and practices applied elsewhere.

The latest results, from PISA 2015, focus on students performance in and attitudes towards science. Some 540 000 students (representing about 29 million 15-year-olds) in 72 participating countries and economies sat the test.

http://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf page 3

The most interesting findings from 2015 report are that:

- Singapore outperforms all other participating countries/economies in science. Japan, Estonia, Finland and Canada are the four highest-performing OECD countries.

- Nearly 20% of students in OECD countries, on average, do not attain the baseline level of proficiency in reading. This proportion has remained stable since 2009.

http://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf page 4

The PISA 2015 Assessment and Analytical Framework (OECD, 2016b) presents definitions and more detailed descriptions of the domains assessed in PISA 2015:

• Science literacy is defined as 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.

• Reading literacy is defined as students’ ability to understand, use, reflect on and engage with written texts in order to achieve one’s goals, develop one’s knowledge and potential, and participate in society.

• Mathematical literacy is defined as 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. It assists individuals in recognising the role that mathematics plays in the world and to make the well-founded judgements and decisions needed by constructive, engaged and reflective citizens.

http://www.oecd.org/pisa/PISA-2015-United-States.pdf, page 12

to calculate the average pise result for a given country use formala (2\*science + math+read)/4, because in 2015 Students spent one hour on the science assessment (one cluster each of trends and new science items) plus one hour on one or two other subjects – reading, mathematics or collaborative problem solving.

http://www.oecd.org/pisa/PISA-2015-United-States.pdf, page 13

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

http://www.oecd.org/pisa/PISA-2015-United-States.pdf, page 14

What is the exam:

The OECD Programme for International Student Assessment (PISA) examines not just what students know in science, reading and mathematics, but what they can do with what they know. Results from PISA show educators and policy makers the quality and equity of learning outcomes achieved elsewhere, and allow them to learn from the policies and practices applied in other countries.

http://www.oecd-ilibrary.org/education/pisa-2015-results-volume-i\_9789264266490-en

Reading performance, for PISA, measures the capacity to understand, use and reflect on written texts in order to achieve goals, develop knowledge and potential, and participate in society. The mean score is the measure.

OECD (2017), Reading performance (PISA) (indicator). doi: 10.1787/79913c69-en (Accessed on 11 September 2017)

Mathematical performance, for PISA, measures the mathematical literacy of a 15 year-old to formulate, employ and interpret mathematics in a variety of contexts to describe, predict and explain phenomena, recognising the role that mathematics plays in the world. The mean score is the measure. A mathematically literate student recognises the role that mathematics plays in the world in order to make well-founded judgments and decisions needed by constructive, engaged and reflective citizens.

OECD (2017), Mathematics performance (PISA) (indicator). doi: 10.1787/04711c74-en (Accessed on 11 September 2017)

Scientific performance, for PISA, measures the scientific literacy of a 15 year-old in the use of scientific knowledge to identify questions, acquire new knowledge, explain scientific phenomena, and draw evidence-based conclusions about science-related issues. The mean score is the measure.

OECD (2017), Science performance (PISA) (indicator). doi: 10.1787/91952204-en (Accessed on 11 September 2017)

http://www.keepeek.com/Digital-Asset-Management/oecd/education/pisa-2015-results-volume-i/executive-summary\_9789264266490-2-en#.WbZUMT6g\_IU#page2

Getting GDP data:

- from World bank API (GDP PPP $, GDP US$ )

- for the second part of analysis from

http://data.uis.unesco.org/

Government expenditure on education as a percentage of GDP (z podzialem na poziomy edukacji)

Government expenditure on education in PPP$ (z podzialem na poziomy edukacji)

Government expenditure on education in US$ (z podzialem na poziomy edukacji)

explaining levels of education http://www.unesco.org/education/information/nfsunesco/doc/isced\_1997.htm

Analiza wydatkow na edukacje dla Taiwanu nie jest mozliwa, poniewaz Unesco oraz Bank Swiatowy nie uznaja takiego panstwa

getting country ISO codes https://unstats.un.org/unsd/methodology/m49/overview/

methodology:

All the students takes the test at the age of 15, so including pre-primary education, they have around 12 years of education passed