

PISA: to what extent our students can apply their knowledge to real-life situation and be equipped for full participation in society



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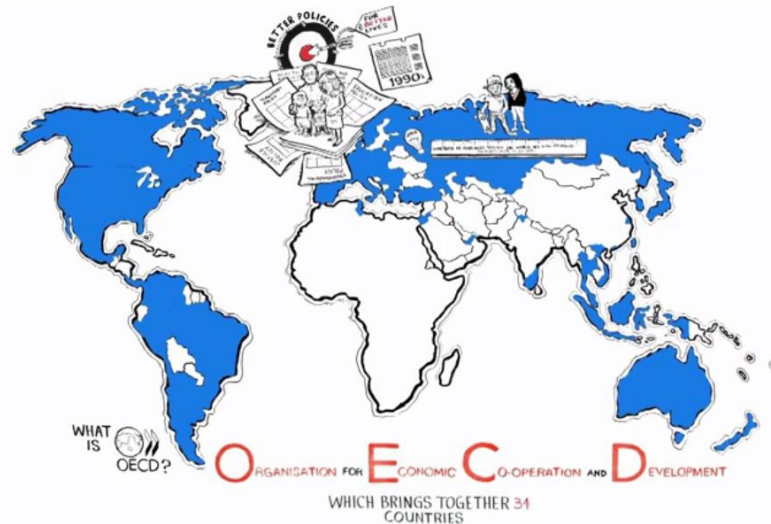
On the 1st -2nd of December, the Final of Mathematics Literacy Contest will be conducted in Jogjakarta. Mathematics Literacy Contest or Kontes Literasi Matematika (KLM) is one kind of Mathematics contest for junior high school students. The participants in this final round are the champion of the stage round which was held on September 29 at 12 cities all over Indonesia; Palembang, Medan, Jakarta, Yogyakarta, Surabaya, Makassar, Banjarmasin, Padang, Semarang, Singaraja, Malang, and Kupang.

Mathematics literacy contest aims to introduce one type of mathematics ability assessment, called PISA, to Indonesian teachers and students, even student's parents. Why should teachers and students be familiar with this contest? To answer this question, first, we must know what PISA is.

Indonesian people are not familiar enough to this term, PISA. Science Olympiad is far more well-known than this contest. PISA is an acronym stands for Program for International Students Assessment. It is a project of the Organization for Economic Co-operation and Development (OECD), launched in 1997 and takes place at three-year intervals.

Since the year 2000, every three years, a randomly selected group of fifteen-year-olds take tests in the key subjects: reading, mathematics and science, with focus given to one subject in each year of assessment. The students and their

school principals also fill in background questionnaires to provide information on the students' family background and the way their schools are run. Some countries and economies also choose to have parents fill in a questionnaire. Why 15 year olds? Because most 15 year old students about to complete the compulsory education.



In 2000 the focus of the assessment was reading, in 2003 mathematics and problem solving, in 2006 science and in 2009 reading again. The 2012 data collection focussing on mathematics is well under way and includes an optional computer-based assessment of mathematics and reading involving some 30 countries as well as an optional area of assessment: financial literacy, which 19 countries have taken up. Preparations for the PISA 2015 assessment began in September 2012 with the first meeting of the PISA 2015 National Project Managers.

PISA is unique because it develops tests which are not directly linked to the school curriculum and provides context through the background questionnaires which can help analysts interpret the results. The tests are designed to assess to what extent students at the end of compulsory education, can apply their knowledge to real-life situations and be equipped for full participation in society.

The point of PISA is not to tell each individual student, how well he or she has mastered a set of skills. Instead, PISA result is analyzed and it extracts the children national level. Picture one student sitting at the desk in a classroom

somewhere taking PISA test, and zoom out, we can see the entire country in which that student sitting. PISA shows country where it stands, in relation to other countries, and how effectively they educate their children.



PISA doesn't say that education policies or practice in a certain country cause this effect. PISA shows similarities and differences between education systems around the world. That helps government rethink their own policies and design the new one to improve their student's performance in school. It also helps government, educators and parents track their country's progress toward more successful education system. In fact, many countries now set national goals based on PISA result.



As stated in first paragraph, one of PISA assessment domain is mathematical literacy. According to PISA 2012, mathematical literacy is an individual's 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 to recognize the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged and reflective citizens.



Formulating in mathematical literacy means students can apply or use mathematics to understand and solve problem presented. It includes being able to understand the problem as presented and transform the problem into mathematical forms, structures and/or representations, identifying variables and making simplifying assumption to solve the problem. **Employing** mathematics involves applying mathematical reasoning and using mathematical concepts, procedures, facts and tools to get a mathematical solution. It includes performing calculations, manipulating algebraic expressions and equations or other mathematical models, analysing information in a mathematical manner from mathematical diagrams and graphs, developing mathematical descriptions and explanations and using mathematical tools to solve problems. **Interpreting** mathematics involves reflecting upon mathematical solutions or results and interpreting them into the context of a problem. It includes evaluating mathematical solutions or reasoning in relation to the context of the problem and determining whether the results are reasonable and make sense in the situation.

Resources:

- Organization for Economic Co-operation and Development (OECD). 2012. Program for International Students Assessment (PISA), online (<http://www.oecd.org/pisa/>), accessed on November 1, 2012
- PISA 2012 MATHEMATICS FRAMEWORK (page: 3-5).
- Shiel , Gerry , etc. 2007. PISA Mathematics: A Teacher’s Guide (page:1). Stationery Office, Dublin.