

FAQ

# PCAP-2010

Report on the Pan-Canadian Assessment of  
Mathematics, Science, and Reading



cmeC

Council of  
Ministers  
of Education,  
Canada

Conseil des  
ministres  
de l'Éducation  
(Canada)





## What is PCAP?

The Pan-Canadian Assessment Program (PCAP) is a survey of the knowledge and skills of Canadian students in three core learning areas — mathematics, science, and reading. It was developed and is administered by the Council of Ministers of Education, Canada (CMEC).

## Why was PCAP developed?

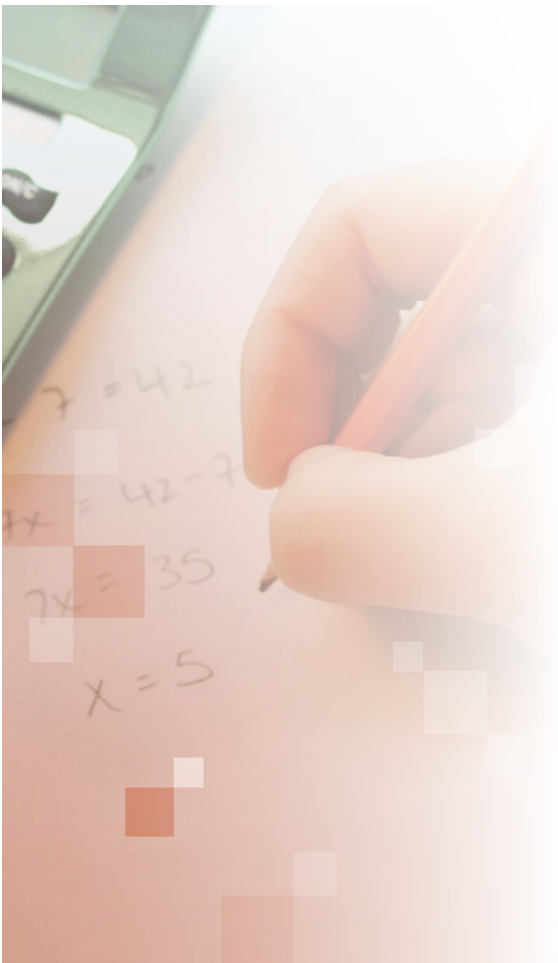
CMEC developed PCAP to ensure the availability of statistically valid, comparable data on student achievement in Canada. PCAP data will be used by education researchers, policy-makers, and government officials to understand and make improvements to provincial and territorial education systems.

## Which students are assessed in PCAP?

For PCAP 2010, close to 32,000 students in Grade 8 (Secondary II in Quebec) from over 1,600 schools across the country were tested. Math was the major focus of the assessment. Science and reading were also assessed. Approximately 24,000 students were tested in English and 8,000 in French. Students from all provinces and territories, with the exception of Northwest Territories and Nunavut, participated in PCAP.

## Who funds PCAP and how much does it cost?

PCAP is funded by provinces and territories through their long-standing intergovernmental body, the Council of Ministers of Education, Canada (CMEC). On average, PCAP costs approximately \$1.2 million annually.



## How often is PCAP administered?

PCAP is administered on a nine-year cycle that allows for comparison of results over time in all three domains — mathematics, science, and reading. These data help provinces and territories understand how the performance of their education systems may have changed over time.

2007	<b>Reading</b>	Math	Science
2010	Reading	<b>Math</b>	Science
2013	Reading	Math	<b>Science</b>
2016	<b>Reading</b>	Math	Science
2019	Reading	<b>Math</b>	Science
2022	Reading	Math	<b>Science</b>

Each PCAP assessment has a major domain or focus and two minor domains. The major domain (in green) changes every three years. At least one major domain assessment and one minor assessment are required in a particular subject before a comparison over time can be made.


## Why does PCAP have one major domain and two minor domains?

This particular structure was chosen to align PCAP with OECD's Programme for International Student Assessment (PISA). It is expected that a significant portion of the Grade-8 student cohort from PCAP 2010 will take the PISA 2012 assessment when they are 15 years old. Because PISA 2012 will also have mathematics as its major domain, it will be possible to compare performance patterns between the two assessments.

## Can performance among different provinces and territories really be compared?

Education systems and school programs can differ from one jurisdiction to another, so comparing results can be a complex task. PCAP allows a variety of education systems to be compared according to a set of common benchmarks in mathematics, science, and reading. The benchmarks have been established through extensive consultation among provinces and territories and with the guidance of statisticians, psychometricians, and education experts.

By agreeing to common benchmarks, provinces and territories are able to determine their relative performance in relation to each other, even if their approaches to education may differ.



## **Is the assessment fair to students in each province and territory?**

The assessment is not tied to the curriculum of a particular province or territory but is instead a fair measurement of students' abilities to use their learning skills to solve real-life situations. It measures how well students are doing; it does not attempt to assess approaches to learning.

Provinces and territories also work to ensure that the unique qualities of our country's education systems are taken into account. Factors such as linguistic differences, rural and urban school locations, and cultural influences are all considered in both the assessment itself and in related context questionnaires. In addition, the common curricular framework for each subject incorporated an agreed-upon perspective for all jurisdictions that was based upon the latest pedagogical research.

## **How are the results from PCAP determined?**

PCAP used four different versions of the test to ensure fairness and accuracy. To render the scores obtained from the various versions comparable, assessment experts developed a statistically valid "common language." This was done by converting the raw scores from the four versions of the test to a standard scale. Students' total scores in each subject area were transposed onto a common scale, ranging from 0 to 1,000, with the average for the pan-Canadian population set at 500. The resulting scores are called "scale scores."

As a result of this conversion, the scores of two-thirds of students participating in PCAP 2010 fell within the range of 400 to 600 points, which represents a "statistically normal distribution" of scores.



## How does PCAP define mathematics?

In PCAP 2010, mathematics was broadly defined as a conceptual tool that students can use to increase their capacity to calculate, describe, and solve problems; and as a discipline involving processes, connections, and conceptual understanding. The domain was divided into four strands or subdomains:

- numbers and operations (properties, equivalent representations, and magnitude);
- geometry and measurement (properties of 2-D figures and 3-D shapes, relative position, transformations, and measurement);
- patterns and relationships (patterns and algebraic expressions, linear relations, and equations); and
- data management and probability (data collection and analysis, experimental and theoretical probability).

Five processes were also considered: problem solving; communication; representation; reasoning and proof; and connections.

The four subdomains reflect traditional groupings of mathematics skills and knowledge; the five processes can apply to all subdomains.



## What do the performance levels in mathematics mean?

Performance levels represent how well students are doing based on the cognitive demand and degree of difficulty of the test items. Cognitive demand is defined by the level of reasoning required by the student to correctly answer an item, from high demand to low demand; degree of difficulty is defined by a statistical determination of the collective performance of the students on the assessment.

There were four levels of performance in the mathematics component of PCAP 2010:

Level 4	Students who scored above 668
Level 3	Students who scored between 514 and 668
Level 2	Students who scored between 358 and 513
Level 1	Students who scored below 358

Level 2 is the expected level of performance for Grade 8 students. Level 1 represents the performance of students at a level below that expected of students in their grade level group. Levels 3 and 4 represent higher levels of performance. The defined expected levels of performance were established by a panel of assessment and education experts from across Canada and confirmed by actual student test responses.



## What did we learn from PCAP 2010?

Some of the key findings about the performance of our students include the following:

- Over 90 per cent of Canadian students in Grade 8 are achieving at or above their expected level of performance in mathematics, that is to say, at Level 2 or above. Almost half are achieving above their expected level.
- In math, there was no significant difference in the performance of girls and boys at the national level. However, more boys than girls were able to demonstrate high-level math knowledge and skill proficiency.
- For Canada as a whole, girls performed better than boys in both science and reading. More variation was seen at the provincial and territorial level.
- In most provinces and territories, students attending minority-language school systems outperformed students in majority-language systems in mathematics. This was reversed, however, for reading, where students in majority-language school systems outperformed students attending minority-language systems. There was generally no significant difference by language in science performance.

## When will the next PCAP assessment take place?

PCAP will be administered again in 2013. PCAP 2013 will have science as its major focus; mathematics and reading will also be assessed as minor domains.