

# Transition From Elementary to Secondary School

Mathematical concepts and processes



**February 2020**

Direction de la formation générale des jeunes  
Ministère de l'Éducation et de l'Enseignement supérieur

Québec 



# The presenters

## ***Geneviève Dupré***

Person in charge of Mathematics curriculum  
Direction de la formation générale des jeunes  
Ministère de l'Éducation et de l'Enseignement supérieur

## ***Raymond Nolin***

Elementary school teacher at the Commission scolaire de Montréal  
seconded to the Ministère for the elementary school mathematics curriculum

## ***Annie Dubois***

Secondary school mathematics teacher at the Commission scolaire des Découvreurs  
seconded to the Ministère for the secondary school mathematics curriculum



# Participants

*Elementary school  
teachers*

*Secondary school  
teachers*

*Elementary school  
education consultants*

*Secondary school  
education consultants*

*Elem.-Sec.  
ECs*

*Others*



## **Presentation outline**

1. Objectives
2. Methodology for gathering information
3. Presentation of results
4. Thoughts and ideas

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# Objectives

The goal of the questionnaire and of this presentation

“ . . . identify the mathematical concepts and processes that students find the most difficult at the end of Elementary Cycle Three. . . . support teachers in their professional practices so they can help students transition from elementary to secondary school . . . ”

**Mathematics curriculum team 2019, *Questionnaire Arrimage primaire-secondaire, Concepts et processus mathématiques* (Transition From Elementary to Secondary School: Mathematical Concepts and Processes), Introduction**



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# Methodology for gathering information

Process

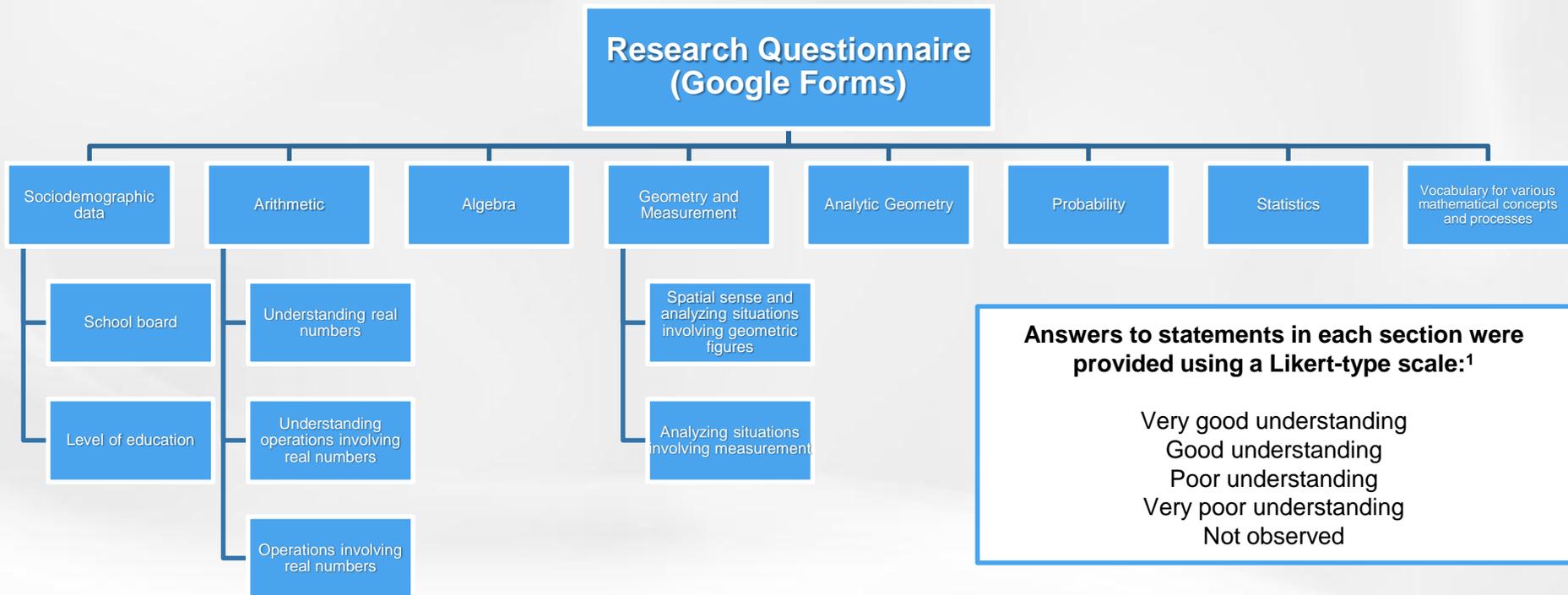


## Steps in the process

1. Identify the key concepts and processes that help students transition from elementary to secondary school
2. Create a questionnaire
3. Open the questionnaire in September 2019
4. Invite participants through the mailing list:  
[Quoi de neuf en mathématique ? \(What's new in Mathematics?\)](#)
5. Close the questionnaire on November 29, 2019



# Information gathering tool



<sup>1</sup> A Likert-type scale is an attitude scale consisting of a series of declarative statements for which respondents express an opinion (Fortin & Gagnon, 2016).



**375**

total respondents

**224**

at the elementary level

**94**

at the secondary level

**12**

at both levels

**45**

no level indicated



3

## **Presentation of results**

For each section of the questionnaire

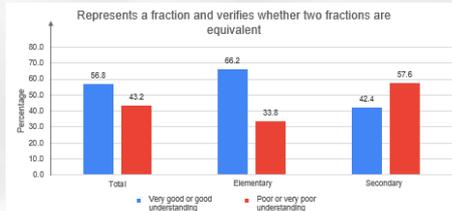


# Complete results

Responses	Represents a fraction and verifies whether two fractions are equivalent			Represents, reads, writes, approximates and compares decimals			Represents, reads, writes and compares integers		
	Overall	Elem.	Sec.	Overall	Elem.	Sec.	Overall	Elem.	Sec.
Very good understanding (%)	7.2	8.9	4.3	13.3	13.4	13.8	53.3	60.7	42.6
Good understanding (%)	48.5	55.8	37.2	56.8	61.2	47.9	34.4	32.6	31.9
Poor understanding (%)	39.2	31.3	53.2	25.6	21.4	33.0	10.4	5.4	22.3
Very poor understanding (%)	3.2	1.8	3.2	2.1	1.8	3.2	1.3	0.9	2.1
Not observed (%)	1.9	2.2	2.1	2.1	2.2	2.1	0.5	0.4	1.1
VG + G understanding (%)	56.8	66.2	42.4	71.7	76.3	63.0	88.2	93.7	75.3
P + VP understanding (%)	43.2	33.8	57.6	28.3	23.7	37.0	11.8	6.3	24.7

# Types of slides used for the presentation of results

## Arithmetic: Understanding real numbers



## Arithmetic: Operations involving real numbers



- Determines in writing the sum of two natural numbers of up to 4 digits
  - Good or very good understanding: 96.7%
- Determines in writing the difference between two natural numbers of up to 4 digits whose result is greater than 0
  - Good or very good understanding: 94.8%

## Arithmetic: Understanding operations involving real numbers



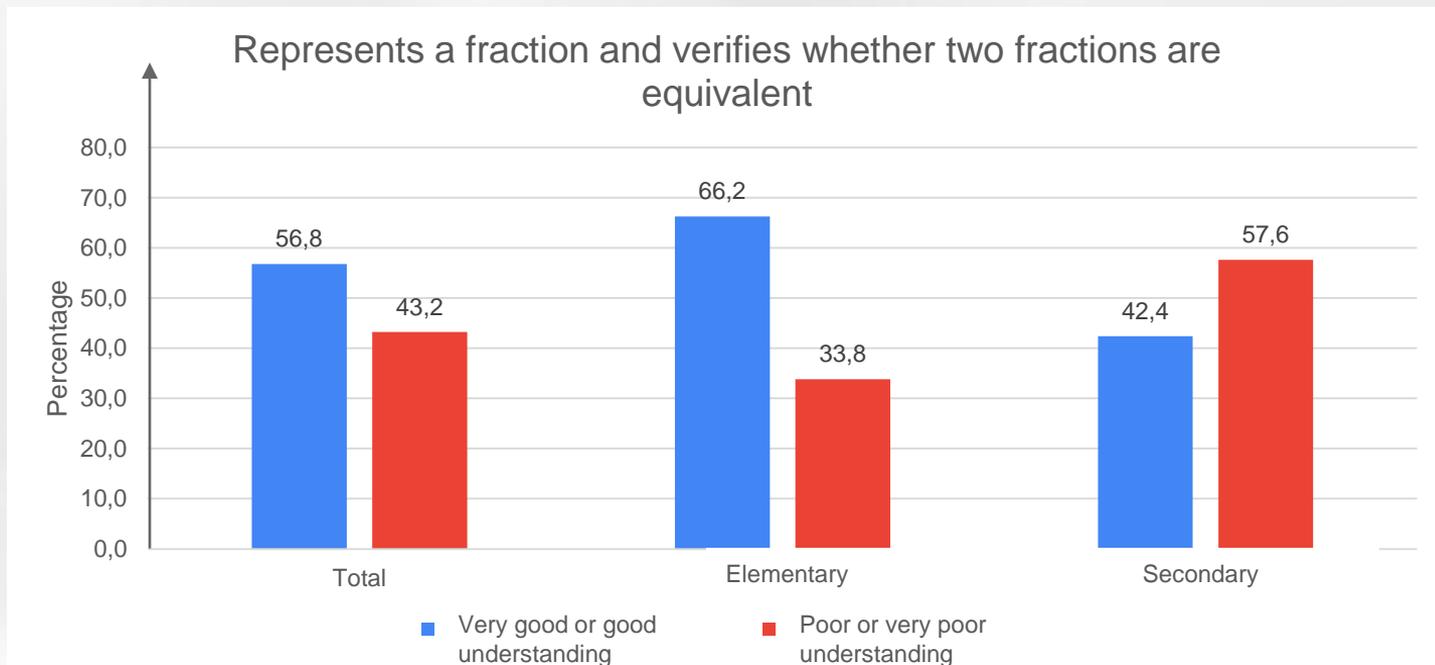
- Determines numerical equivalencies using relationships between operations (the commutative, associative and distributive properties)
  - Poor or very poor understanding: 72.6%

**3.1**

## **Arithmetic**



# Arithmetic: Understanding real numbers





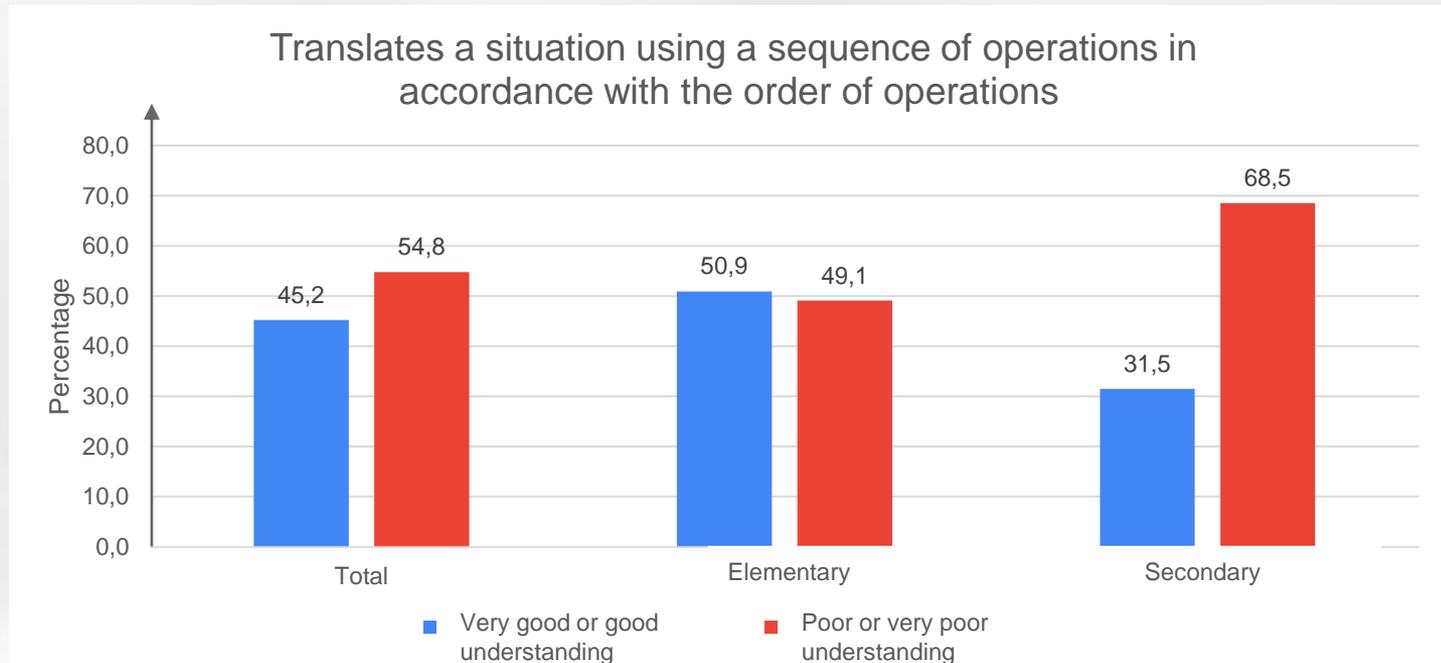
## Arithmetic:

# Understanding operations involving real numbers

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  - Poor or very poor understanding: 72.6%



# Arithmetic: Understanding operations involving real numbers



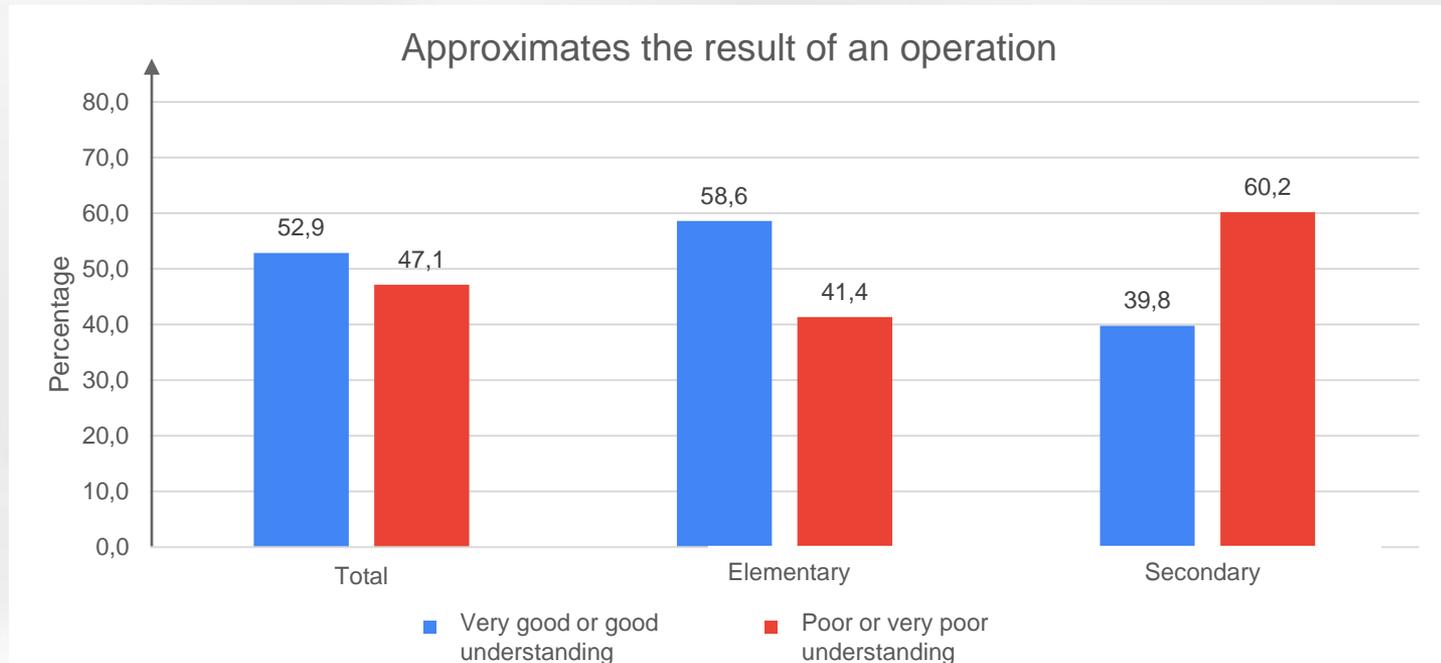


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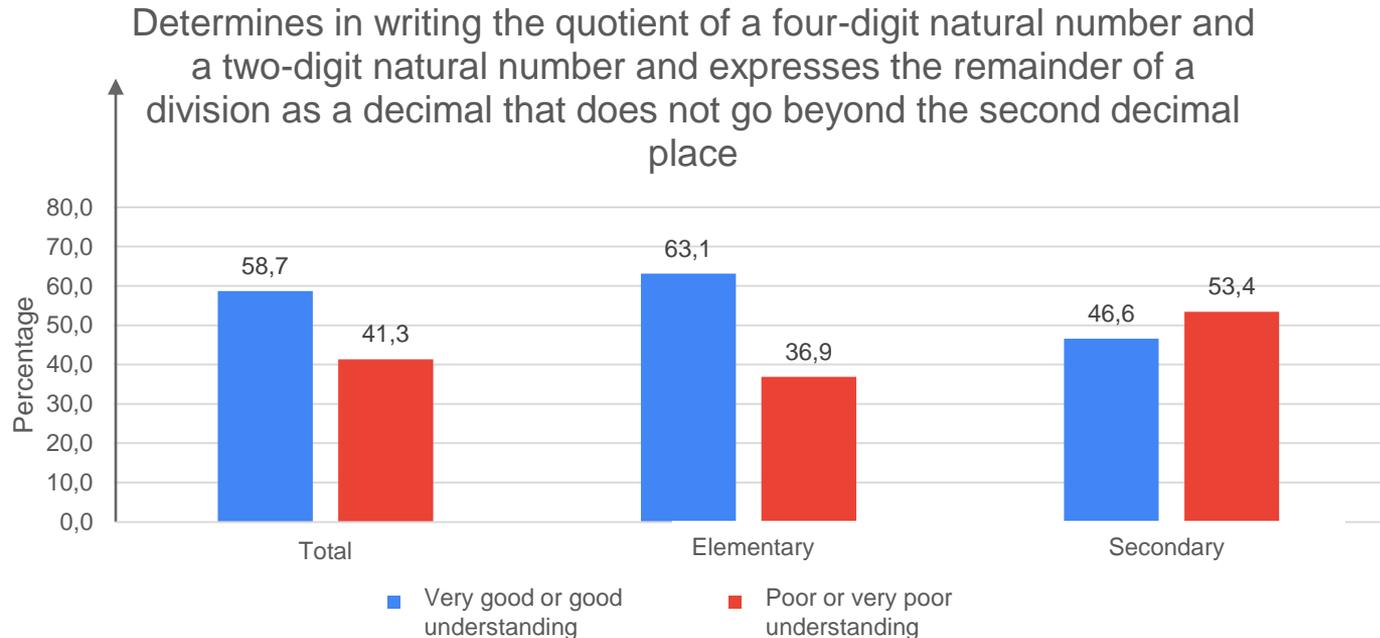


# Arithmetic: Operations involving real numbers



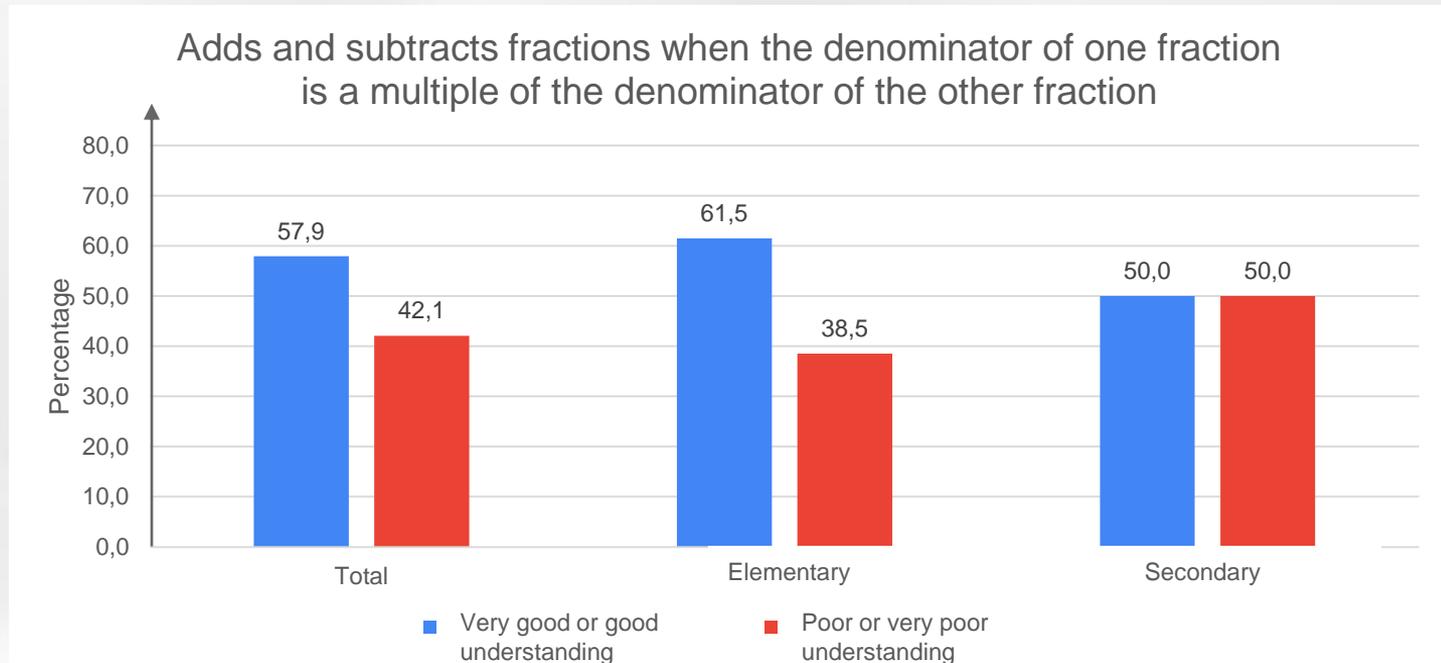


# Arithmetic: Operations involving real numbers





# Arithmetic: Operations involving real numbers



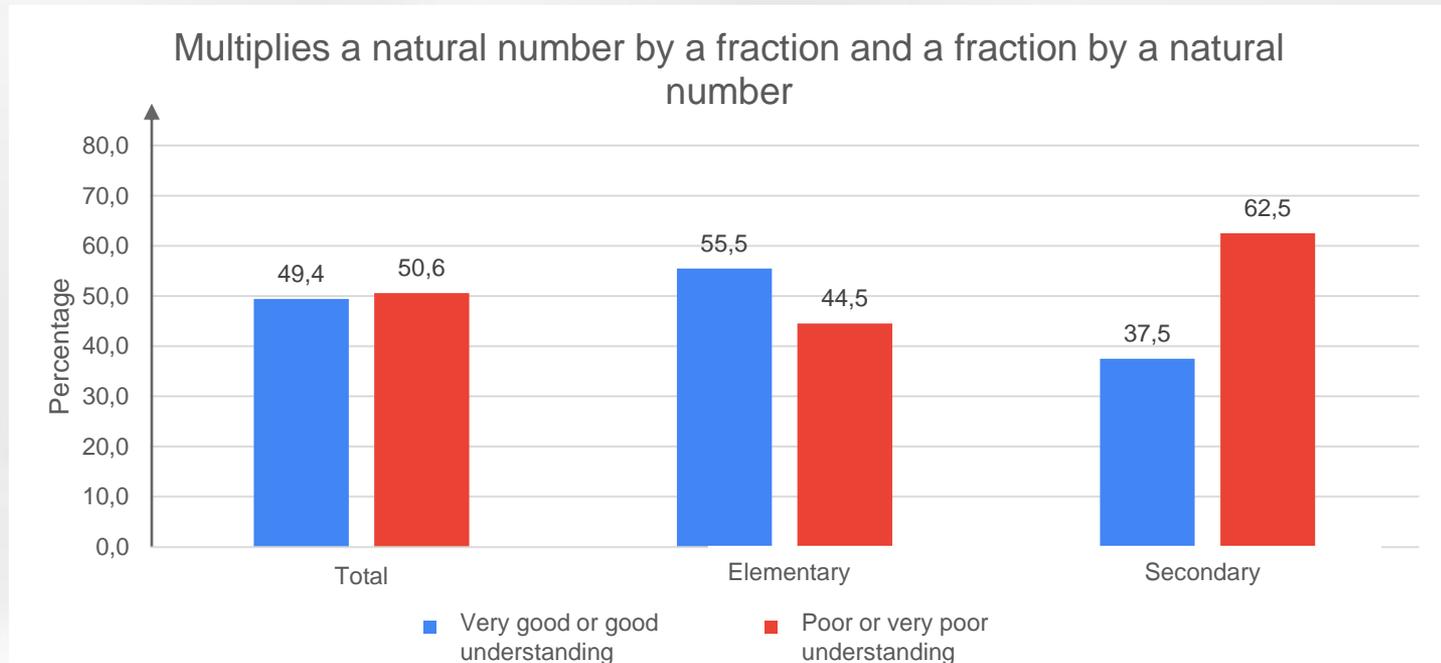


## Arithmetic: Operations involving real numbers

- Determines the divisibility of a number by 2, 3, 4, 5, 6, 8, 9 and 10
  - Poor or very poor understanding: 55.4%

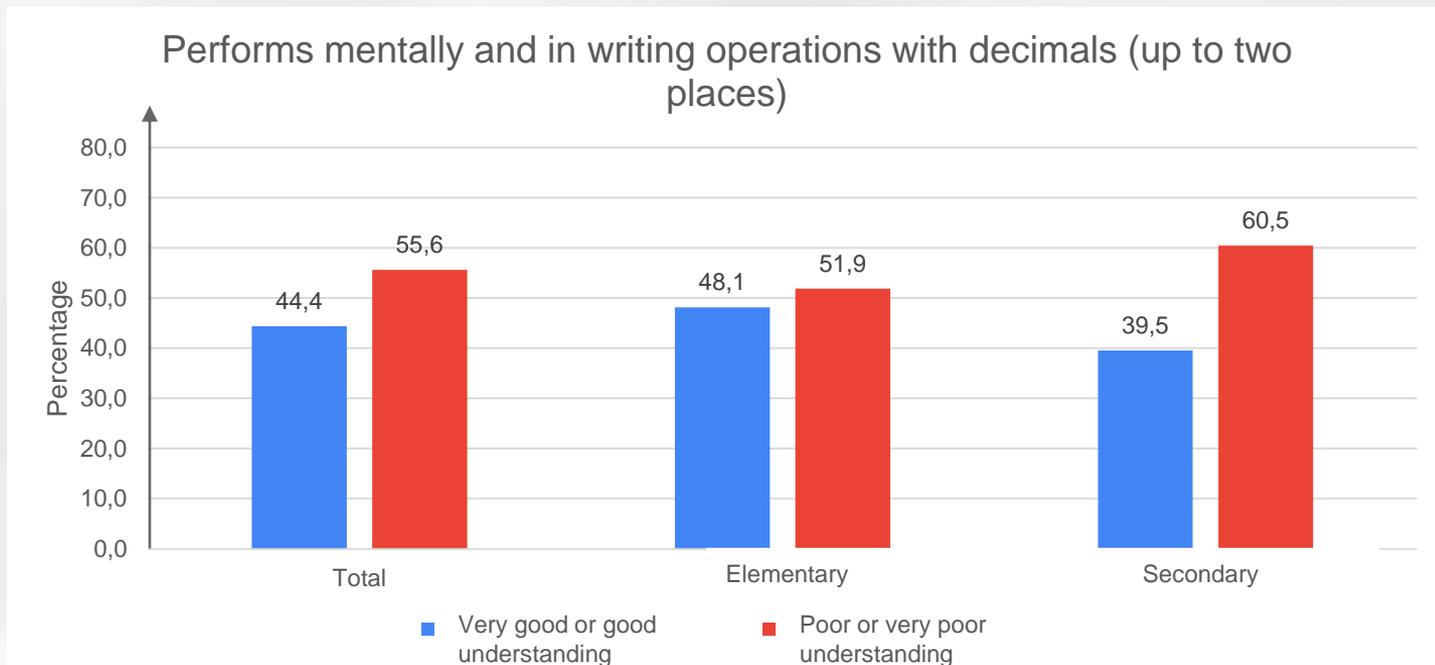


# Arithmetic: Operations involving real numbers



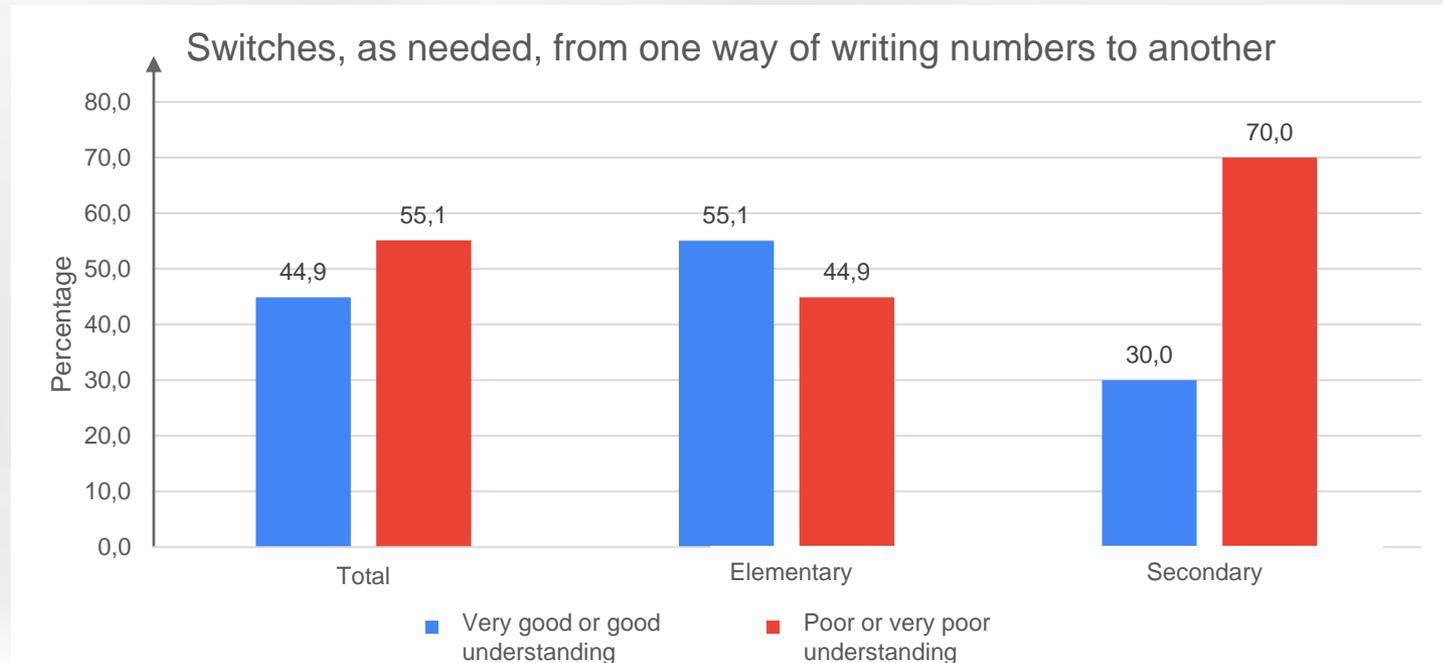


# Arithmetic: Operations involving real numbers





# Arithmetic: Operations involving real numbers



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**3.2**

## **Algebra**



## Algebra

- ◉ Determines the missing term in an equation
  - Poor or very poor understanding: 55.7%



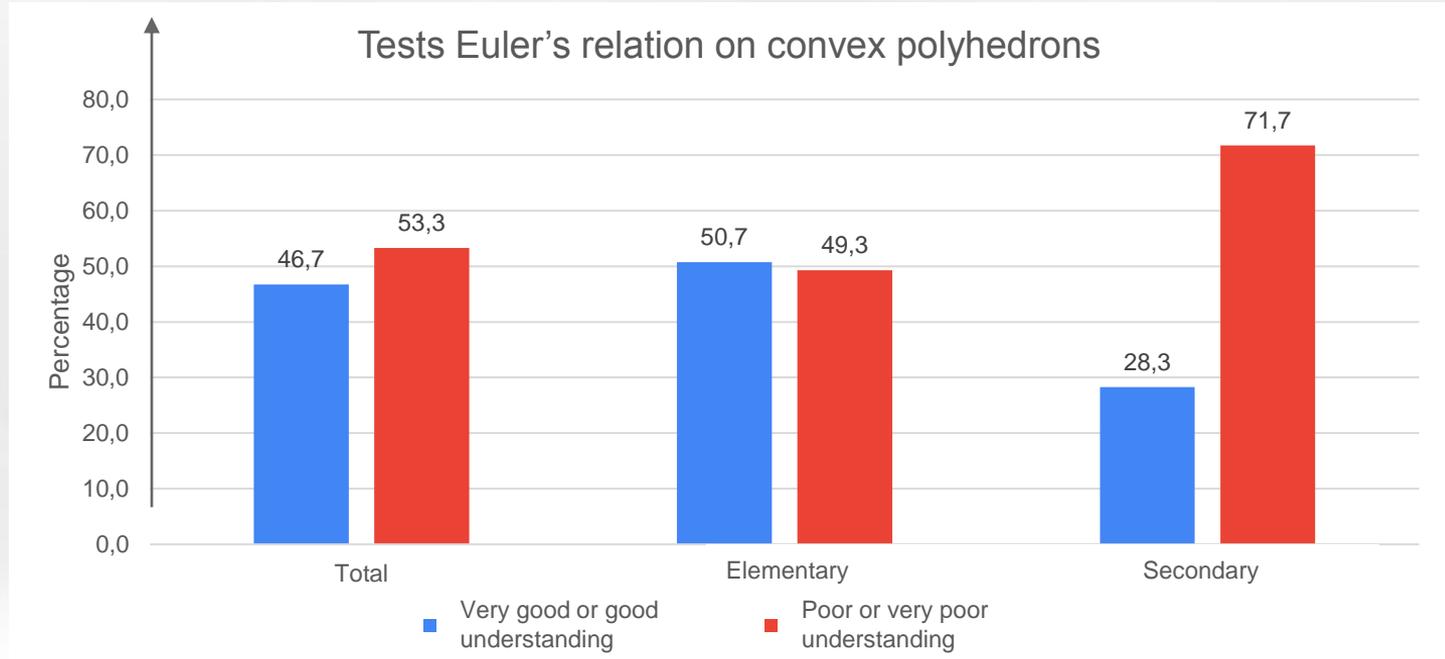
**Any comments regarding  
arithmetic and algebra?**

**3.3**

## **Geometry and Measurement**

# Geometry and Measurement

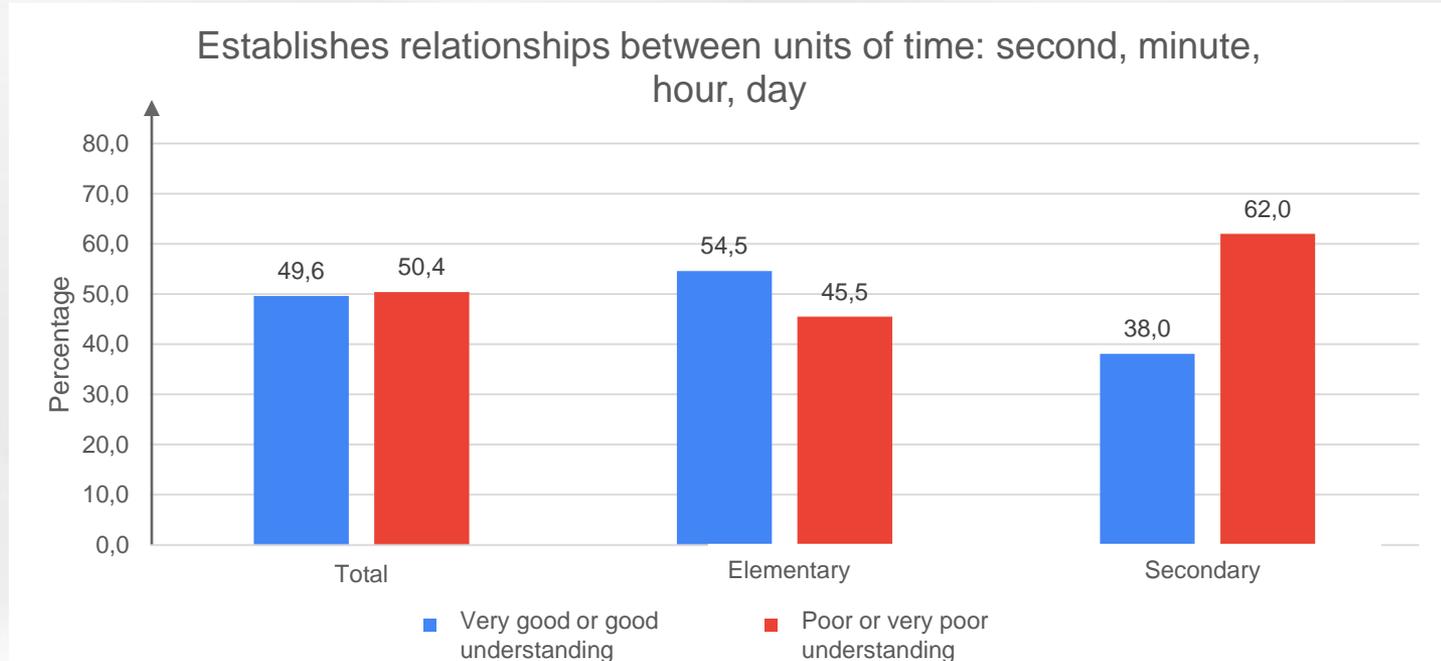
Spatial sense and analyzing situations involving geometric figures





# Geometry and Measurement

## Analyzing situations involving measurements



**3.4**

## **Analytic Geometry**



## Analytic Geometry

- ◉ Locates points in a Cartesian plane, based on the types of numbers studied ( $x$ - and  $y$ -coordinates of a point)
  - Good or very good understanding: 91.6%

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**3.5**

# **Probability**

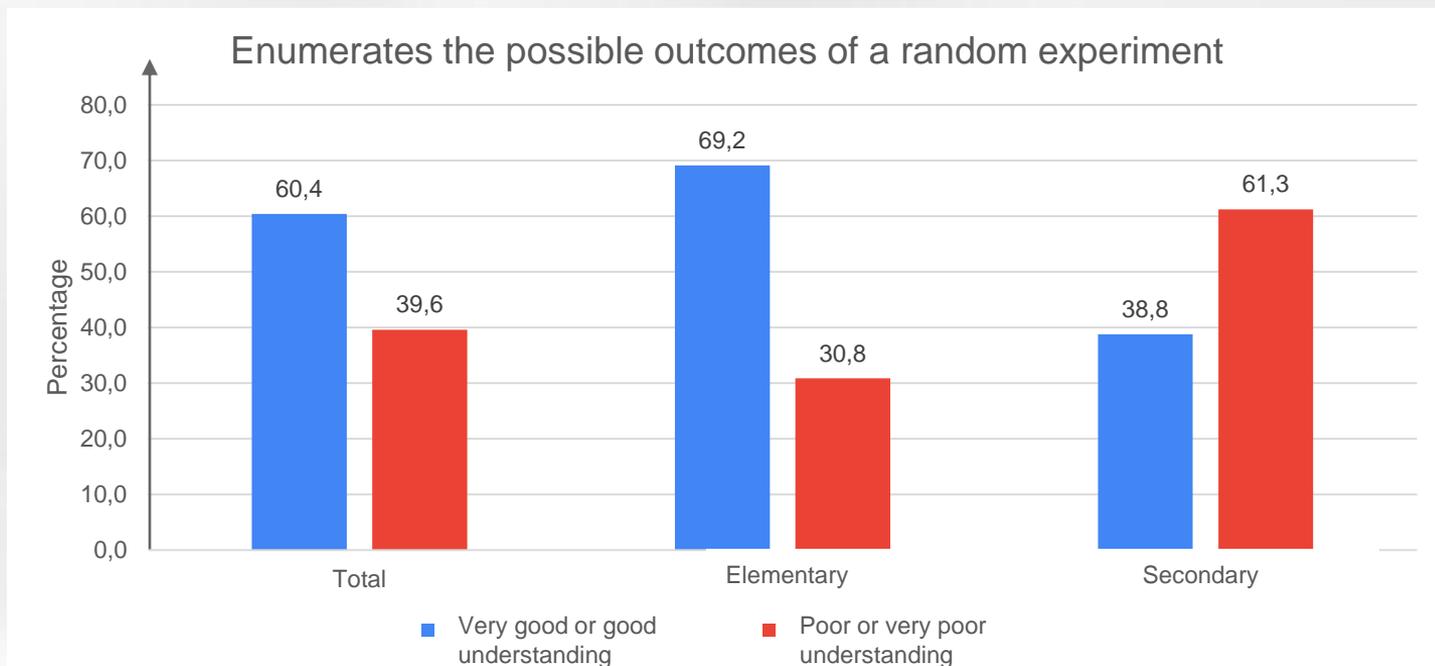


## Probability

- ◉ Uses fractions, decimals or percentages to quantify a probability
  - ◉ Poor or very poor understanding: 58.4%



# Probability





**Any comments regarding geometry,  
measurement and probability?**

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**3.6**

## **Vocabulary**



## Vocabulary for various mathematical concepts and processes

- ◉ Natural number: place value (unit, tens place, hundreds place, . . . , million) even and odd numbers
- ◉ Comparison: is equal to, is not equal to, is greater than, is bigger than, is less than, is smaller than
- ◉ Angle: right, acute and obtuse
- ◉ Graph: bar graph, broken-line graph and circle graph

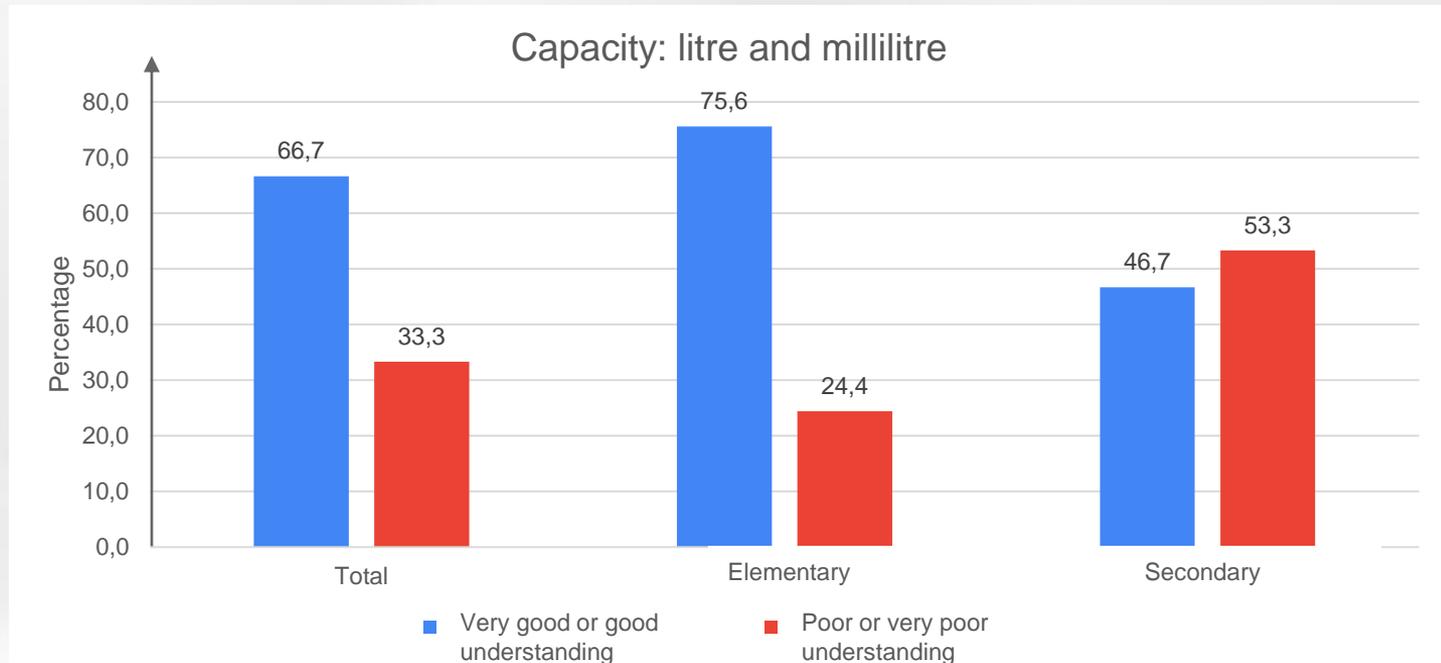


## Vocabulary for various mathematical concepts and processes

- Exponentiation: exponent, power, squared, cubed
  - Poor or very poor understanding: 55.2%

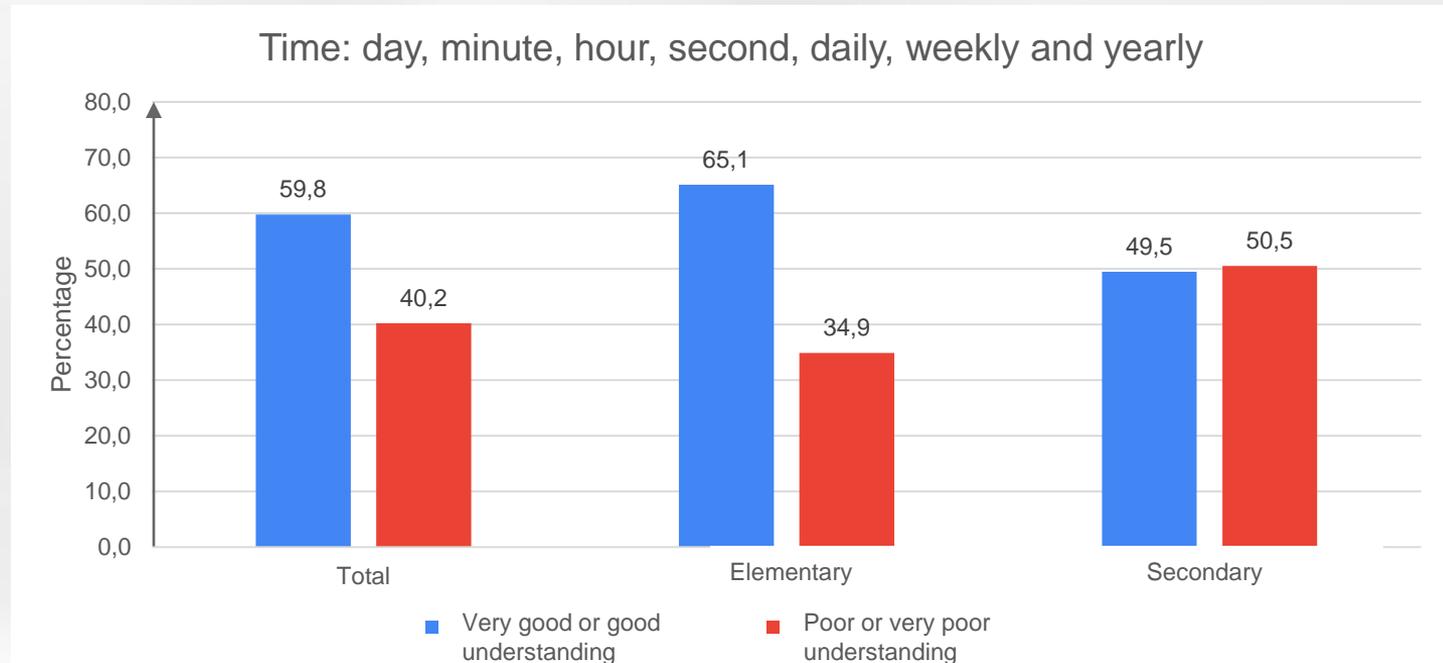


# Vocabulary for various mathematical concepts and processes



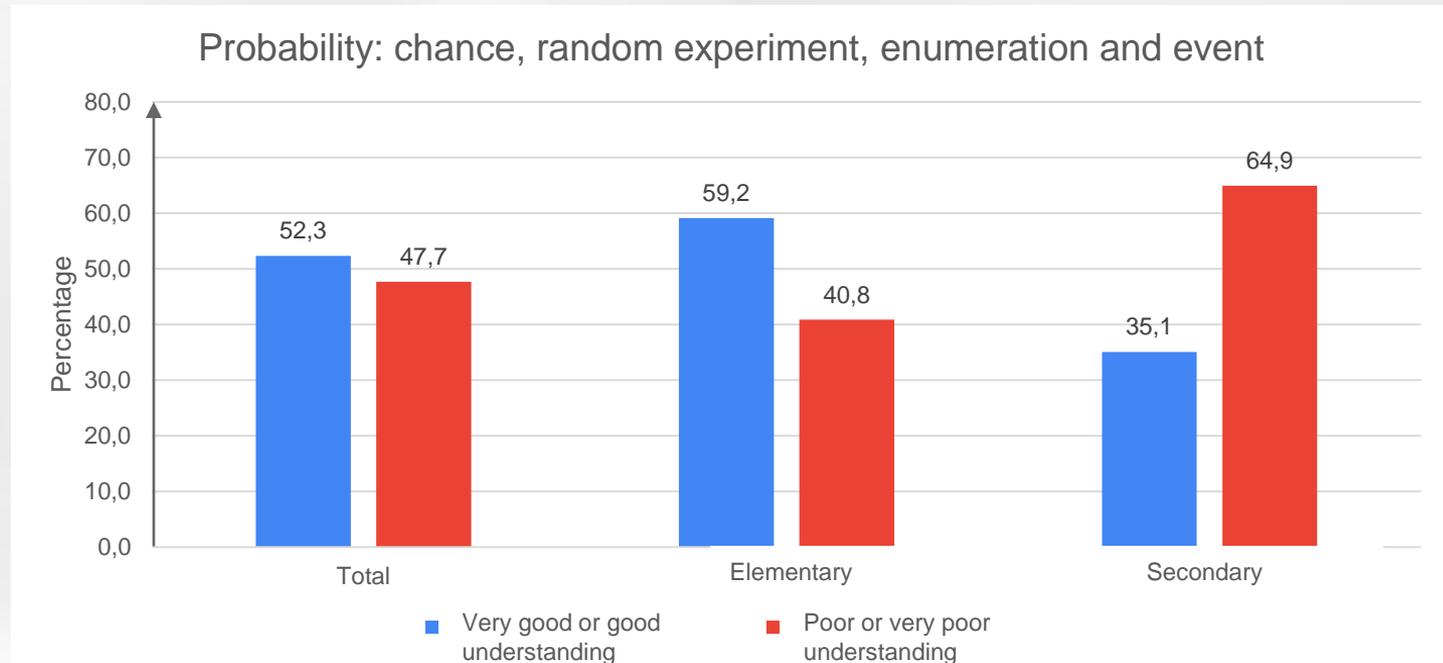


# Vocabulary for various mathematical concepts and processes





# Vocabulary for various mathematical concepts and processes



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## Thoughts and ideas

Discussion with participants



**What are your thoughts on the presentation of results?**



## Where to go from here

- ◉ How can the results help professional practices?
- ◉ How can these results be used?
- ◉ How can teachers and students be supported based on these results?
- ◉ What course of action should be followed by the Mathematics curriculum team?
- ◉ How can we adjust the training offered to teachers and education consultants?



# Thank you!

***Any questions?***

To contact us: [FGJ-math@education.gouv.qc.ca](mailto:FGJ-math@education.gouv.qc.ca)

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