

## **Evaluation of Knowledge and Skills Mathematics New Evidence for 2nd Year of Basic Education**

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**Abstract:** The purpose of this study is to analyze the evaluation process carried out in a Basic School of the Maule Region, in Chile, this process consists of a test that will be applied to the second grade of this establishment. This test was applied in the normal class schedule, the purpose is to comply with the Educational Improvement Plan and the current regulations of the Preferential School Grant Law.

The evaluation instrument used corresponds to a written test, called: "Test of Knowledge and mathematical ability", which consists of 20 questions, divided into 4 learning axes; Numeration, Operative, Knowledge and Resolution of Geometric Problems and Resolution of Arithmetic Problems. For this trial the percentage to have an expected result is 60%.

The second grade of the school obtains a great result because more than half of the respondents obtained an expected performance exactly 71%. Of the present results in addition to congratulate the professors and respective students it can be inferred that there are two areas that are weaker within the three courses which are geometry and operative, that is why it is suggested to try new methodologies to teach these areas, how to prove didactic activities for example using figures to make children feel more entertained, in addition, teachers can be trained in new teaching technologies. The report presents in much more detail the results obtained by the second grade in general and in detail, each one by itself with their respective learning axes.

**Key Word:** Education. Evaluation. Mathematical knowledge Mathematical ability. Expected result. Learning axis

#### Introduction

The preparation of the Educational Improvement Plan requires the school to have a diagnosis of the learning situation of its students and the institutional aspects that impact them, in order to determine annual achievement goals according to the results obtained in the evaluations. diagnostic tests. The present report, will give us the results obtained for Level NB1<sup>1</sup> in this case, second

<sup>1</sup> Level NB1 corresponds to the First and Second grade.



grade, specifying in each learning axis or item the percentage of students that manages to be within the expected category for the minimum level required. The test consists of four thematic axes, which include the key learning and learning indicators of each educational level.

#### **Evaluation Instrument**

The instrument "Evaluation of knowledge and mathematical skills" (E.C.H.M) measures key knowledge in the areas of numbering, operative, knowledge and resolution of geometric p

roblems and solving arithmetic problems for second basic. Such knowledge corresponds to the fundamental skills and learning for the development of deeper knowledge within the three courses, the second grade A, B and C.

The Test was designed and validated by the Research Institute, considering the guidelines of the Ministry of Education for such purposes.

The E.C.H.M is an instrument of election of answers, of items of unique selection. Each question has 4 answer options, where only one is correct. Some of the questions are accompanied by images or figures that serve as a contextualized element and facilitator of the understanding of the mathematical situations that must be developed.

The evaluation for NB1 consists of 20 questions, distributed among the four axes of mathematical knowledge.

**Table No. 1:** Distribution of questions by axes of learning

Learning axes	Number of Questions
Numbering	5
Operative: Oral and written	5
calculation	
Knowledge and resolution of	5

geometric problems	
Solving arithmetic problems	5
Total	20

In NB1, the test consists of a total score of 20 points, considering one point for each correct answer, where the level of requirement of the instrument is calculated at 60%, therefore, it will be considered a general performance as expected if the child or girl gets 12 correct questions. A requirement of 60% is considered for the instrument, since most educational establishments work with this level.

# Analysis of results in Diagnosis of Key Learning

#### **General Results**

The data in table N° 2 consider the number of students evaluated by level and the percentage of students in the expected performance in the mathematical diagnostic evaluation. And they do not consider the results obtained by the Integration students.

#### Table No. 2: General Results

Nivel/	N°	N° students	% students in
Grade	evaluated students	in expected performance <sup>2</sup>	expected performance
2° Grade	80	57	71%

Table No. 2 shows that the number of students evaluated is 80 people, of which 57 correspond to those who achieve the expected performance, this corresponds to 71% of the sample.

<sup>&</sup>lt;sup>2</sup> Expected performance is understood as when the student obtains the minimum percentage required for approval.



## Graphic Nº1: General Results



Table 3 shows the percentage of students who achieve the expected performance in each learning axis.

Table No.3: Results by Learning axes expressed as a percentage

Learning axes							
Digits expre	Digits expressed as a percentage						
Grade	Numeration	Operative	Geometry	Problem resolution			
2° Grade	91%	55%	51%	83%			

Graphic N°2: Results by Learning axes expressed as a percentage



In second grade, the axis with the highest percentage of students achieving the expected achievement is Numbering, while the Geometry axis shows the lowest percentage of students achieving the expected performance in the applied assessment.



**Results in each Mathematics Knowledge** Axis

Next, the results obtained in each of the axes of mathematical knowledge evaluated are presented.

## 1. - Numbering Axis

## **Indicators of achievement**

• Solve problems related to the use of numbers up to 100, to quantify, compare and estimate quantities or magnitudes.

**Table No. 4:** Results of the numeration learning axis.

• Solve problems related to the position of the digits in 2-digit numbers and the relation to the concept of unit and decade.

Table No. 4 shows the data corresponding to the Numbering axis. It details the number of students evaluated, the number of students achieving the expected performance, the percentage of students achieving the expected performance, the expected annual goal, the number of students that ensure expected goal and the difference of students with respect to the expected goal.

r						
Learning	No°	No° students in	% students in	Expected	No° students	Difference of
axes.	evaluated	expected	expected	annual	that ensure	students with
	students.	performance.	performance.	goal.	expected goal.	respect to
						expected goal.
Numeration	80	73	91%	100%	80	7

The percentage of students at the level that is within the expected performance corresponds to 91%.

## **1.1.-** Analysis of the results Strengths

The students are able to:

- Handles numerical sequence in the range 1 to 100.
- Domain of the decimal numbering system and its components of place value, position and figures.

## **1.2.-** Recommendations

- Expand the numerical series in the range 100 to 999, based on the number line.
- Carry out 10-in-10 counts, complete sequence tables.
- Constantly reinforce the composition of our numbering system, carrying out a learning sequence based, first on pure concepts, notational and then applied concepts.

• Incorporate the hundred concept through groups of 100 units or 10 tens.

## 2.- Operating axis

## **Indicators of achievement**

- They calculate mentally, using basic • additive combinations and extension to two-digit numbers (2 + 6 = 8, 8-2 = 6, 8-6)= 2, 20 + 60 = 80, 80-20 = 60, 80-60, =20) and additive decomposition (for 2 + 8 = 20 + 10 = 30).
- They perform written calculations in the numerical level of the level using strategies such as the additive decomposition of each addend (40 + 13 =40 + 10 + 3, 26 - 18 = 26 - 10 - 8).

Table 5 shows the data corresponding to the Arithmetic Operative axis. It details the number of students evaluated, the number of students



achieving the expected performance, the percentage of students achieving the expected performance, the expected annual goal, the number of students that ensure expected goal and the difference of students with respect to the expected goal.

Table	No <sup>o</sup> 5:	Results	of the	operative	learning	axis.
		10000100		operative		

Learning	No°	No° students	% students in	Expected	No° students	Difference of students
axis.	evaluated	in expected	expected	annual	that ensure	with respect to
	students.	performance.	performance.	goal.	expected	expected goal.
					goal.	
Operative	80	44	55%	90%	72	28

The percentage of students at the level that is within the expected performance corresponds to 55%.

## 2.1.- Analysis of the results

## Weaknesses

The students have difficulties to:

- Master the number sequence from 1 to 100. Students master meaningful counting strategies.
- Know the decimal numbering system and its characteristics.
- Master the oral and written calculus by applying strategies of additive decomposition of the quantities.
- To master the operation of addition, understood as the union of elements of two disjoint sets.

## 2.2.- Recommendations

- Reinforce the ascending and descending count and construction of groups with concrete graphic and abstract elements to introduce the concept of place value.
- Incorporate the concept of ten as a grouping of 10 units.
- Work and complete positional tables.
- Work one-to-one addition. Associate the subtraction with expressions and actions to add and remove.
- Complete numerical series with concrete elements and expand their difficulty including more variables in the sequence.

• Work on calculating additions and subtractions through a variety of strategies.

# **3.-** Axis of Knowledge and Resolution of Geometric Problems

## Indicators of achievement

- Associate environmental objects with geometric shapes (one, two and three dimensions); using the corresponding geometric names and identifying their elements and characteristics.
- Solve problems in which geometric shapes that will be obtained from making cuts, bends or juxtaposition of figures (squares, triangles and rectangles) must be anticipated or predicted.

Table 6 shows the data corresponding to the Geometry axis. It details the number of students evaluated, the number of students achieving the expected performance, the percentage of students achieving the expected performance, the expected annual goal, the number of students that ensure expected goal and the difference of students with respect to the expected goal.



Table Noº6: Results of the k	knowledge and resolution	n of geometric	problems	learning axis.
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Learning	No°	No° students	% students in	Expected	No° students	Difference of
axis.	evaluated	in expected	expected	annual	that ensure	students with respect
	students.	performance.	performance.	goal.	expected goal.	to expected goal.
Geometry	80	41	51%	90%	72	31

The percentage of students at the level that is within the expected performance corresponds to 51%.

## 3.1.- Analysis of the results

## Weaknesses

The students have difficulties to:

- Recognize fundamental geometric notions; idea of space, point, plane, surface, etc.
- Understand the concept of plane in space. Without these ideas it is difficult to understand figures and bodies.
- Recognize fundamental elements of figures and geometric bodies (sides, edges, vertices, etc.).
- Represent figures and bodies through mental representations, which allow establishing new locations and positions of the forms in space.

## 3.2. - Recommendations

- Deepen the study of polygonal shapes and their elements and characteristics.
- Deepen the study of polyhedra and bodies of revolution.
- Develop positioning exercises and generation of geometric bodies through

problems of cutting or juxtaposition of forms.

## 4. - Arithmetic Problem Resolution Axis Achievement indicators

- Solve problems related to the addition relative to the add actions; put together; move along; in the numerical level of the level.
- Solve problems related to the subtraction relative to the actions to be removed; pull apart; back; in the numerical level of the level.

Table 7 shows the data corresponding to the Problem solving axis. It details the number of students evaluated, the number of students achieving the expected performance, the percentage of students achieving the expected performance, the expected annual goal, the number of students that ensure expected goal and the difference of students with respect to the expected goal.

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Table No	<b>n°</b> /:	Results	of the	arithmetic	problems	learning	2X1S
I able I to	• •	results	or the	uninnetie	problems	rearing	anno.

Learning	No°	No° students	% students in	Expected	No° students	Difference of students
axes.	evaluated	in expected	expected	annual	that ensure	with respect to
	students.	performance.	performance.	goal.	expected	expected goal.
					goal.	
R. Problems.	80	66	83%	90%	72	6

The percentage of students at the level that is within the expected performance corresponds to 83%.



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# **4.1.-** Analysis of the results Strengths

#### The students are able to:

- Master the natural numbers in the 0 to 100 range.
- Manage the operation of written calculation of additions and subtractions, using diversity of strategies; count in sequences, additive decomposition, algorithm, etc.
- Properly apply a problem-solving method that involves translation of verbal statements into arithmetic expressions.

Establish an analytical model of problem solving that allows to extract from the verbal statements the necessary and useful information to express the solutions arithmetically.

## 4.2.- Recommendations

- Expand the meaning of actions that allow the establishment of additions and subtractions in the numerical level of the level.
- Investigate different problem-solving strategies.

Grade	No° evaluated students.	No° students in expected performance.	% of achievement
Α	29	21	72%
В	27	22	81%
С	24	14	58%

## **Graphic Comparative By Grades**

**Comparative second basic results** 

Achievement indicators table by Grade



In the previous graphic it is observed that the second grade with the highest percentage of students that achieve the expected performance, is the second B, while the course that presents a lower percentage of students that achieve the expected performance is the second C.



## Second Grade A

## Achievement indicators table by key learning, Second grade A

Learning	N°	No° students in	% students in	Expected	No° students	Difference of students
axes.	evaluated	expected	expected	annual	that ensure	with respect to
	students.	performance.	performance.	goal.	expected goal.	expected goal.
Numeration	29	28	97%	100%	29	1
Operative	29	18	62%	90%	26	8
Geometry	29	6	21%	90%	26	20
Problem						
Resolution	29	26	90%	100%	29	3

The present graphic shows the percentages of students of the second grade A, who achieved the expected performance in each key learning.

#### **Graphic Second Grade A**



The graphic shows that the key learning with the highest percentage of students achieving the expected performance is Numeration. The key learning that presents lower percentage of students that achieve the expected performance is Geometry.



## Second grade B

#### Achievement indicators table by key learning, Second grade B

Learning	No°	No° students in	% students in	Expected	No° students	Difference of
axes.	evaluated	expected	expected	annual goal.	that ensure	students with
	students.	performance.	performance.		expected goal.	respect to
						expected goal.
Numeration	27	24	89%	100%	27	3
Operative	27	16	59%	90%	24	8
Geometry	27	22	81%	90%	24	2
Problem						
Resolution	27	23	85%	100%	27	4

The present graphic shows the percentages of students in the second grade B, who achieved the expected performance in each key learning.

#### **Graphic Second grade B**



The graphic shows that the key learnings with the highest percentage of students achieving the expected performance is numeration. The key learning that has the lowest percentage of students that achieve the expected performance is Operative.



#### Second grade C

This graphic shows the percentages of students in the second grade C, who achieved the expected performance in each key learning.

## **Graphic Second grade C**



#### Achievement indicators table by key learning, Second grade C

Learning axes.	N° evaluated students.	No° students in expected performance.	% students in expected performance.	Expected annual goal.	No° students that ensure expected goal.	Difference of students with respect to expected goal.
Numeration	24	21	88%	100%	24	3
Operative	24	10	42%	90%	22	12
Geometry	24	13	54%	90%	22	9
Problem						
Resolution	24	17	71%	90%	22	5

The graphic shows that the key learnings with the highest percentage of students achieving the expected performance is Numeration. The key learning that has the lowest percentage of students that achieve the expected performance is Operative.

## Results of students by learning axes and by levels of achievement

#### **Results per axis of Learning**

The final average of the test is obtained taking into consideration the total score of the test and the score obtained by the student, as shown in the following formula:

Total score of the test: 20.

Score obtained by the student: X

Test requirement: 60%

 $\frac{X*100}{20} \ge 60$ : The student achieved the test.

In turn it is important to note that the approval of each axis was made with a requirement of 60% of the total score of it as follows:

Total score of the axis: 5.



Score obtained by the student on the axis: X

Requirement for approval of the axis: 60% of the axis score (3 points)

 $\frac{x*100}{5} \ge 60$ : the student achieved the axis.

## Results expressed in levels of achievement

The results of the assessment of Mathematical Skills will be expressed in levels of achievement, considering that: Each Level of Achievement is associated with a certain range of scores, which allows classifying the student's performance according to their score obtained. In the following tables the scoring ranges are presented to determine each Achievement Level (Initial, Intermediate and Advanced)

Achievement levels	Range of scores*
Initial	0% a 60%
Intermediate	61% a 80%
Advanced	81% a 100%

Score range: Percentage of students in each level of achievement.

It is worth mentioning that the scoring ranges are exclusive for this evaluation. The results obtained by the school, expressed in levels of achievement, are the following:

	Levels of achievement								
	Digits expressed as percentage								
Grade	Initial	Initial Intermediate Advanced							
2° Grade	43% 50% 8%								



As can be seen in the graphic, students are mainly at the level of intemediate achievement and at the level of advanced achievement there are only a few students.



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## Annex 1.1 Second grade A

			Datos del alu	mno		Evaluad	ion por ej	e de apre	ndizaje	Puntaje	Evaluación	NIVEL DE LOGRO
N⁰	Rut	Paterno	Materno	Nombres	Curso	NUM	OPE	GEO	PRO	Prueba	Prueba	Prueba
1	21476009	BUSTAMANTE	LOBOS	NICOLAS JESUS	А	100%	60%	60%	80%	15	75%	Intermedio
2	21489049	CACERES	LEMA	MATIAS ENRIQUE	А	80%	60%	40%	60%	12	60%	Inicial
3	21543630	CAMPOS	TAPIA	SERGIO SEBASTIAN	А	100%	60%	40%	80%	14	70%	Intermedio
4	21231828	COFRE	IBANEZ	FRANCISCA	А	100%	40%	40%	60%	12	60%	Inicial
5	21381852	DONOSO	RAVELLO	FRANCHESCA CATALINA	А	100%	60%	60%	60%	14	70%	Intermedio
6	21579010	ESCANILLA	QUIROZ	CONSTANZA	А	80%	80%	40%	80%	14	70%	Intermedio
7	21413621	FREIRE	MARTINEZ	VICENTE	А	80%	60%	60%	80%	14	70%	Intermedio
8	21513267	FREIRE	MUNOZ	THAIS ROMANE	А	80%	20%	40%	0%	7	35%	Inicial
9	21586529	GAVILAN	MONTECINOS	VALENTINA DEL PILAR	А	80%	40%	20%	100%	12	60%	Inicial
10	21087241	HEISE	ARELLANO	SERGIO	А	100%	20%	0%	80%	10	50%	Inicial
11	21290440	HERNANDEZ	RAMOS	MANUELIGNACIO	А	80%	20%	20%	20%	7	35%	Inicial
12	21450822	HERNANDEZ	SEPULVEDA	NATALIA FERNANDA	А	100%	80%	40%	80%	15	75%	Intermedio
13	21553833	HERNANDEZ	PINILLA	IGNACIO ANTONIO	А	80%	20%	40%	40%	9	45%	Inicial
14	21594179	LARA	MUNOZ	YULIANA ESCARLETT	А	40%	40%	40%	80%	10	50%	Inicial
15	21472870	LUNA	RAMIREZ	JUAN	А	80%	60%	0%	60%	10	50%	Inicial
16	21415359	MOLINA	VALENZUELA	ANTONIA BERNARDA	А	100%	60%	20%	60%	12	60%	Inicial
17	21472917	REBOLLEDO	BASOALTO	YOVANI ANTONIO	А	100%	80%	20%	80%	14	70%	Intermedio
18	21167376	RETAMAL	RAMOS	CHRISTIAN ALEXIS	А	100%	40%	80%	60%	14	70%	Intermedio
19	21524652	RODRIGUEZ	QUEZADA	JOSEFA ANTONELLA	А	100%	80%	40%	60%	14	70%	Intermedio
20	21313060	SALAS	MILLANES	JUAN	А	100%	80%	40%	60%	14	70%	Intermedio
21	21328242	SALGADO	IBANEZ	MONSERRAT ROCIO DEL C	А	100%	80%	80%	80%	17	85%	Avanzado
22	21408890	SALGADO	GATICA	MATIAS ALEJANDRO	А	100%	60%	40%	100%	15	75%	Intermedio
23	21394925	SALINAS	MOYA	PABLO ALONSO	А	80%	40%	20%	100%	12	60%	Inicial
24	21491915	SEPULVEDA	JAQUE	NISSI ESMERALDA	А	100%	60%	20%	80%	13	65%	Intermedio
25	21545153	SEPULVEDA	CONCHA	DIEGO	А	60%	40%	20%	80%	10	50%	Inicial
26	21402472	SILVA	ZUNIGA	YORDAN ANDRES	А	100%	80%	60%	80%	16	80%	Intermedio
27	21531278	SILVA	CISTERNAS	KATHERINNE ALEJANDRA	А	100%	60%	40%	60%	13	65%	Intermedio
28	21440156	ZUNIGA	FIGUEROA	SEBASTIAN DANILO	А	80%	60%	40%	100%	14	70%	Intermedio
29	21482858	ZURITA	FERNANDEZ	BRUNO IGNACIO	А	80%	40%	20%	80%	11	55%	Inicial

#### Achievement levels Second grade A evaluation

	Achievement levels	Amount of students	% of students
	Initial	13	45%
Second Grade A	Intermediate	15	52%
	Advanced	1	3%



In the second grade A, 45% of the students are in the level of initial achievement, that is, 13 students obtained a percentage of achievement of the evaluation less than 60%. 52% of the students



are in the intermediate level of achievement, that is, 15 students obtained a percentage of achievement of the evaluation between 61% and 80%. Finally, 3% of the class, equivalent to 1 student, is at the advanced level of achievement, obtaining a percentage of achievement of the evaluation higher than 81%.

#### Annex 1.2 Second grade B

			Datos del	alumno		Evaluad	ion por ej	e de apre	ndizaje	Puntaje	Evaluación	NIVEL DE LOGRO
N⁰	Rut	Paterno	Materno	Nombres	Curso	NUM	OPE	GEO	PRO	Prueba	Prueba	Prueba
1	21601490	ARAYA	ARAYA	JUAN PABLO	в	100%	40%	80%	80%	15	75%	Intermedio
2	21494475	BILCHE	MUNOZ	ANTONIA IGNACIA ALMENDRA	в	80%	60%	60%	20%	11	55%	Inicial
3	21439681	BURGOS	URRUTIA	NICOL	в	100%	80%	60%	100%	17	85%	Avanzado
4	21585136	CIFUENTES	VARGAS	BELEN EMILIA	в	100%	40%	80%	80%	15	75%	Intermedio
5	21460149	CISTERNA	VILLAR	CRISTOBAL ANDRES	в	80%	60%	60%	80%	14	70%	Intermedio
6	21466875	CONCHA	PAVEZ	MONSERRAT SORLABINIA	В	100%	60%	60%	100%	16	80%	Intermedio
7	21405500	CONTRERAS	POVEA	MARCO ANTONIO	в	100%	60%	100%	80%	17	85%	Avanzado
8	21329123	FERNANDEZ	VILLALOBOS	FABIAN MATIAS	в	100%	40%	40%	80%	13	65%	Intermedio
9	21329149	FERNANDEZ	VILLALOBOS	AXEL MAXIMILIANO	В	100%	60%	60%	20%	12	60%	Inicial
10	21489044	FREIRE	MUNOZ	KEVIN ALEXANDER	в	100%	80%	60%	80%	16	80%	Intermedio
11	21392550	GONZALEZ	SUAREZ	MARIA	в	0%	0%	0%	0%	0	0%	Inicial
12	21588366	GONZALEZ	SANCHEZ	MATIAS FELIPE	в	100%	60%	80%	80%	16	80%	Intermedio
13	21521098	GUZMAN	LABRANA	FLORENCIA IGNACIA	в	100%	60%	80%	80%	16	80%	Intermedio
14	21595130	JARA	CARRASCO	CRISTOPHER ALEJANDRO	в	80%	40%	40%	60%	11	55%	Inicial
15	21573517	LAGOS	AEDO	SOFIA FRANCISCA	в	60%	40%	60%	80%	12	60%	Inicial
16	21479375	MALDONADO	LARA	CONSTANZA BELEN	в	100%	60%	80%	80%	16	80%	Intermedio
17	21415730	MORALES	VERDUGO	LEONARDO EMILIO	в	100%	40%	80%	80%	15	75%	Intermedio
18	21379048	MUNOZ	MORALES	DAMIAN ALEXIS	В	100%	40%	60%	80%	14	70%	Intermedio
19	21610554	NAVARRO	BALBOA	MARTINA ANTONIA	в	100%	60%	60%	80%	15	75%	Intermedio
20	21462775	OSSES	ALARCON	CRISTOBAL	В	80%	60%	40%	80%	13	65%	Intermedio
21	21595208	PACHECO	SEPULVEDA	PAULINA	в	100%	80%	60%	80%	16	80%	Intermedio
22	21523941	PARRA	POVEA	NICOLAS ESTEBAN	в	100%	80%	60%	80%	16	80%	Intermedio
23	21560999	POLLINY	GANGAS	CONSTANZA ALESSANDRA	В	80%	80%	100%	100%	18	90%	Avanzado
24	21614122	RIQUELME	MONTOYA	LUCAS FRANCISCO	в	20%	40%	60%	60%	9	45%	Inicial
25	21513553	RIVERA	SEPULVEDA	NICOLAS ANDRES	в	100%	60%	60%	80%	15	75%	Intermedio
26	21515742	VALENZUELA	ARAVENA	SEBASTIAN ALEXIS	в	0%	0%	0%	0%	0	0%	Inicial
27	21370804	VASQUEZ	SALGADO	CRISTIAN MARCELO	в	100%	40%	60%	80%	14	70%	Intermedio

#### Achievement levels Second grade B evaluation

	Achievement levels	Amount of students	% of students
	Initial	7	26%
Second grade B	Intermediate	17	63%
	Advanced	3	11%





In the second grade B, 26% of the students are in the initial achievement level, that is, 7 students obtained a percentage of achievement of the evaluation less than 60%.

63% of the students are in the intermediate level of achievement, that is, 17 students obtained a

percentage of achievement of the evaluation between 61% and 80%.

Finally, 11% of the course, equivalent to 3 students, are in the advanced level of achievement, obtaining a percentage of achievement of the evaluation higher than 81%.

#### Annex 1.3 Second grade C

			Datos del alu	mno		Evaluad	ion por ej	e de apre	ndizaje	Puntaje	Evaluación	NIVEL DE LOGRO
N⁰	Rut	Paterno	Materno	Nombres	Curso	NUM	OPE	GEO	PRO	Prueba	Prueba	Prueba
1	21361137	ABRIGO	SEGURA	BAYRON MAURICIO	С	60%	60%	40%	80%	12	60%	Inicial
2	100191083	BALLADARES	BORDON	SARA ELENA BELEN	С	100%	60%	100%	80%	17	85%	Avanzado
3	21348455	BENITES	YEVENES	JORGE	С	100%	60%	80%	100%	17	85%	Avanzado
4	21478920	IBANEZ	BUSTAMANTE	CHRISTIANNE ANDREA	С	80%	60%	0%	80%	11	55%	Inicial
5	21315602	MAUREIRA	OLIVEROS	ELIZABETH ESPERANZA	С	80%	80%	40%	80%	14	70%	Intermedio
6	21494400	MEDINA	CACERES	MATIAS IGNACIO	С	60%	20%	60%	0%	7	35%	Inicial
7	21405655	MENDEZ	SALDANA	FERNANDO ANDRES	С	100%	40%	40%	80%	13	65%	Intermedio
8	21566621	MUNOZ	SALDANA	PEDRO JEREMIAS	С	100%	20%	60%	60%	12	60%	Inicial
9	21590000	MUNOZ	REBOLLEDO	SILVIA ANDREA	С	40%	20%	40%	20%	6	30%	Inicial
10	21337330	PARRA	SAZO	MARIA CATALINA ANDREA	С	100%	40%	20%	80%	12	60%	Inicial
11	21583849	PEREIRA	OLIVARES	DANIELA	С	80%	20%	60%	40%	10	50%	Inicial
12	26356734	QUEZADA	ORELLANA	BELEN	С	80%	80%	60%	80%	15	75%	Intermedio
13	21144200	QUINTEROS	RAMOS	PEDRO	С	80%	20%	80%	60%	12	60%	Inicial
14	21368500	RAMIREZ	ORELLANA	JEISON MATIAS	С	100%	20%	60%	100%	14	70%	Intermedio
15	21356173	RETAMAL	ROSALES	BENJAMIN ALEJANDRO	С	80%	40%	60%	100%	14	70%	Intermedio
16	21387403	REVECO	BASOALTO	FELIPE ANSELMO	С	100%	60%	20%	40%	11	55%	Inicial
17	21296645	ROCA	ANTUNEZ	JAVIER	С	80%	20%	20%	100%	11	55%	Inicial
18	21350095	SEPULVEDA	SILVA	JAVIERA BELEN	С	100%	80%	40%	100%	16	80%	Intermedio
19	21176061	SOTOMAYOR	VILLAR	HECTOR	С	100%	40%	60%	100%	15	75%	Intermedio
20	21531339	ΤΑΡΙΑ	ZURITA	MOISES ALEJANDRO	С	40%	40%	60%	40%	9	45%	Inicial
21	21587928	TEMPINI	PAZ	MARLENE ANDREA	С	60%	40%	0%	40%	7	35%	Inicial
22	21530832	TORRES	BARROS	YHULIANO STEEVEN	С	80%	80%	60%	60%	14	70%	Intermedio
23	21302617	VASQUEZ	soto	PABLO	С	60%	40%	20%	40%	8	40%	Inicial
24	21389018	villarroel	silva	luis	С	40%	60%	60%	60%	11	55%	Inicial

#### Achievement levels Second grade C evaluation

	Achievement levels	Amount of students	% of students
	Initial	14	58%
Second grade C	Intermediate	8	33%
	Advanced	2	8%





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In the second grade C, 58% of the students are in the level of initial achievement, that is, 14 students obtained a percentage of achievement of the evaluation less than 60%.

33% of the students are in the intermediate level of achievement, that is, 8 students obtained a percentage of achievement of the evaluation between 61% and 80%.

Finally, 8% of the course, equivalent to 2 students, are at the advanced level of achievement, obtaining a percentage of achievement of the evaluation higher than 81%.

## **General Conclusions**

Finally we can conclude that the grade that stands out is the second grade B, because the percentage of students who achieve the expected achievement is significantly higher in relation to the other grades.

Regarding the axes of learning, the three grades (A, B and C) coincide when presenting a better numbering performance, and a deficit in the operating axis.

At the school level, the axis that presents the highest percentage of students that achieve the expected achievement corresponds to Numeration and the axis with the lowest percentage of students that achieve the expected achievement corresponds to Geometry.

#### **Bibliographic references**

- 1. Araya, R. (2000) Inteligencia Matemática. Santiago: Editorial Universitaria
- Blum, W. (1993). Mathematical modelling in mathematics education and instruction. In T. Breiteig, Huntley, & G. Kaiser-Messmer (Eds.), Teaching and learning mathematics in context (pp. 3-14). Chichester, UK: Horwood.

- Blum, W., Galbraith, P.L., Henn, W-H., & Niss, M. (Eds.) (2007). Modelling and applications in mathematics education: The 14th ICMI study. New York: Springer.
- Blum, W.; Galbraith, P.; Henn, H. & Niss, M. (2007) Modeling and Applications in Mathematics Education. Springer Verlag.
- 5. Borromeo-Ferri, R. (2006). Theoretical and empirical differentiations of phases in the modeling process. ZDM, 38(2), 86-95.
- Bruner, J. (1971): Toward a Theory of Instruction. Fifth printing. Cambridge: The Belknap prees of Harvard University.
- 7. Bruner, J. (1988). Desarrollo cognitivo y educación. 1ra edición. Madrid: Morata.
- Bruner, J. (2006). Actos de significado: más álla de la revolución cognitiva. Madrid: Alianza editorial.
- Chiu, M. M. (2000). Metaphorical reasoning: Origins, uses, development and interactions in mathematics. Education Journal, 28(1), 13-46
- Chiu, M. M.: 1992, 'Reinterpreting misconceptions through metaphor and metonymy: Teaching and learning mathematics', Unpublished manuscript, University of California, Berkeley.
- 11. Chiu, M. M.: 1998, 'Metaphorical reasoning in a domain', Unpublished manuscript, University of California, Los Angeles.
- 12. Dörig, Roman: Handlungsorientierter Unterricht - Ansätze, Kritik und Neuorientierung aus bildungstheoretischer, curricularer und instruktionspsychologischer Perspektive. Stuttgart: WiKuVerlag (2003).
- 13. Galbraith, P. L., Stillman, G., & Brown, J. (2010). Turning ideas into modelling problems. In R.



- Lesh, P. L. Galbraith, C. R. Haines, & A. Hurford (Eds.), mathematical modelling competencies: ICTMA 13 (pp. 133-144).
- 15. Kaiser, G. (2005). Mathematical modelling in school. Examples and experiences. En H-W. Henn, G, Kaiser (Eds.), Mathematikunterricht im Spannungsfeld von Evolution und Evaluation. Festband für Werner Blum. Hildesheim: Franzbecker. 99-108.
- 16. Kaiser, G., Blum, W., Borromeo Ferri, R., & Stillman, G. (Eds.) (2011). Trends in teaching and learning of mathematical modelling: ICTMA14. New York: Springer.
- Mayer, R. (1986). Mathematics, en R. F. Dillon y R. J. Sternberg (Eds.) Cognition and Instruction. San Diego: Academic. 127-154. 24
- 18. Propuesta de Bases Curriculares de 7° básico a 2° medio, aprobada por el Consejo Nacional de Educación. Matemática diciembre 2013
- OECD. (2003). The PISA 2003 Assessment Framework – Mathematics, Reading, Science and Problem Solving Knowledge and Skills. Paris: OECD Publications.
- 20. OECD. (2010). Pathways to Success: How knowledge and skills at age 15 shape future lives in Canada. Paris: OECD Publications.
- 21. OECD. (2010). PISA 2012 mathematics Framework. Extraído de la página web:
- 22. http://www.oecd.org/pisa/pisaproducts/469 61598.pdf
- 23. Oteiza, F y Villarreal G (2011). El Modelo Interactivo, una innovación curricular en matemática: resultados de su implementación en el contexto

educacional chileno. Costa Rica, Cuadernos Año 6, Número 9, junio 2011.

- 24. Oteiza, F, Araya, R y Miranda H (2004) Aprender Matemática Creando Soluciones, Material del Profesor, Santiago Chile: Editorial Zigzag.
- 25. Soto-Andrade, J. (2006). Un monde dans un grain de sable: Mètaphores et analogies dans l'apprentissage des mathèmatiques. Annales de Didactique et Sciences Cognitives, 11, 123-147.
- 26. Soto-Andrade, J. (2007). Metaphors and cognitive styles in the teaching-learning of mathematics.
- 27. En D. Pitta-Pantazi, y J. Philippou (Eds.). Proceedings CERME 5, 191-200.
- 28. Soto-Andrade, J. y Reyes-Santander, P. (2011). Conceptual metaphors and "Grundvorstellungen". A case of convergence. En M. Pytlak, T. Rowland y Ewa Swoboda (Eds.), Proceedings of the Seventh
- 29. Congress of the European Society for Research in Mathematics Education. Rzeszów: University of Rzeszów. 1625-1635
- TIMSS. (2011). Marcos de la evaluación. Ministerio de educación, Cutura y Deporte, Instituto Nacional de Evaluación Educativa, Madrid, España.
- 31. Vigotsky, L. (2008). Pensamiento y lenguaje. Mexico: Quinto Sol