



## Playfulness in Mathematics Teaching in the 5th Year of Elementary School at Tereza Lemos de Oliveira Santos State School in the Municipality of Atalaia do Norte-AM

*Playfulness in Mathematics Teaching in the 5th Grade of Elementary School at Tereza Lemos de Oliveira Santos State School in Atalaia do Norte-AM Municipality*

José Cruz Queiroz do Nascimento [1]

1. Graduated in pedagogy from the Federal University of Amazonas – UFAM, postgraduate in Educational Management from the Faculty of Education of Serra – FASE and specialization in basic teaching methodology in mathematics. Master in Educational Sciences from the Inter-American University of Paraguay. Email: josecruzatn@gmail.com .

### SUMMARY

The purpose of this work is to verify whether the teaching of mathematics can become interesting for students in the 5th year of Elementary School I, through entertainment using mathematical games. In this context, mathematical games: with you 60, multiplication dominoes, division marathon and race of integers, emerged as an educational process, with the aim of promoting teaching-learning through play. As a qualitative documentary approach methodology, a questionnaire was applied to find out the students' learning level, shortly after, a class was given on the contents of addition, subtraction, multiplication and division. As a complement, the games mentioned above were applied. When applying the questionnaire again, a great improvement was noted in the learning level of the students in this 5th year class, in relation to the four basic operations of mathematics. In this way, it can be noted that the use of games enabled the construction of students' knowledge, thus awakening creativity, logical reasoning and their motor skills. Also, through these activities, students showed greater interest and curiosity in learning mathematics.

**Key words:** Teaching Mathematics, Mathematical Games, Educational Process, Knowledge and Teaching-learning.

### ABSTRACT

The purpose of the present work is to verify whether the teaching of mathematics can become interesting for the students of the 5th year of Elementary School, through the playfulness with the use of mathematical games. In this context, mathematical games: contig 60, multiplication domino, division marathon and integer race, emerged as an educational process, with the aim of promoting teaching and learning through play. As a methodology of qualitative documentary approach, a questionnaire was applied to find out the students' level of learning, right after, there was a class on the contents of addition, subtraction, multiplication and division. As a complement, the games mentioned above were applied. When the questionnaire was applied again, there was a great improvement in the level of learning of the students in this 5th grade class, in relation to the four basic operations of mathematics. Thus, it can be noted that the use of games enabled the construction of students' knowledge, thus awakening creativity, logical reasoning and their motor skills. Also, through these activities, a greater interest and curiosity in learning mathematics was noticed in the students.

**Keywords:** Teaching of Mathematics, Mathematical Games, Educational Process, Knowledge and Teaching-learning

1

## 1. INTRODUCTION

Teaching mathematics at school today requires practical, methodological and technological innovations. To teach mathematics that is part of students' daily lives, involving them in activities that require knowledge of the world and its realities.

The article is structured into topics, where we highlight the Playfulness Theme in the study of the four fundamental operations of integers in the 5th year of Elementary School, the Delimitation of the Theme, Playfulness-



in the teaching of mathematics in the 5th year of Elementary School at the Tereza Lemos de Oliveira Santos State School in the municipality of Atalaia do Norte-AM. It is proposed to improve mathematics learning through play, especially the four fundamental operations of integers, and also encourage teachers to adopt in their teaching a dynamic methodology to teach mathematics through games with rules, enabling students to overcome their learning difficulties through these games.

This article is justified by the need for information in this globalized world where we live and, to understand certain questions and learnings, about how teaching mathematics today is an issue that involves and affects education in general.

In this research we can aim at playfulness as a path to effective learning, with the use of methodological procedures that involve games and games that contribute to the teaching and learning process of students with difficulty in learning mathematics, favoring interaction, personality and construction of knowledge in student training.

However, it is necessary to change the methodology of teaching mathematics today, leaving the paradigms of content inherent in our classrooms, which do not involve students in dynamic activities that can awaken their curiosity and pleasure in studying mathematics. This dynamism involves applying methodologies in mathematics classes that involve playful games to help understand certain content, thus awakening creativity, logical reasoning and motor skills.

Do the games awaken curiosity, competitiveness, interest and logical reasoning in students, providing teaching and learning and will they learn from mathematical games to perform the four basic operations (addition, subtraction, multiplication and division)? And its objectives are to characterize the teaching of mathematics in the 5th year through play based on guidelines from the BNCC (National Common Curricular Base); Relate the problem-solving methodology with the use of play and teaching practice, observing student participation; Understand recreational activities as an important factor in the teaching and learning process of 5th year students at Tereza Lemos de Oliveira Santos State School. And also the construction of new methodologies for teaching fun in Mathematics in 5th year elementary school classrooms. Enabling students to become interested in mathematics without even having fully assimilated the content.

This proposal for new methodologies for teaching Mathematics in the 5th year needs to be based on the exploration of a wide variety of mathematical games, not just based on numbers, but those that develop logical reasoning, and allow the development of mathematical notions in students.

## 2 PLAYFULNESS IN MATHEMATICS TEACHING IN THE 5TH YEAR OF ELEMENTARY EDUCATION

Mathematics takes us, according to history, to cultural manifestations of various peoples with their customs, traditions and growths, in addition, through their knowledge it played an important role in what we know today about various learning, as most of this knowledge was acquired. of practical everyday activities. Just like mathematical and all other knowledge originated in the exploration of fascinating questions, because we are curious and want to know the truth it can be through empirical (popular) or academic knowledge.

For a long time, mathematics was transmitted to students in a way that left them apprehensive, with fear of the subject, even today this happens due to the lack of a dynamic and attractive methodology, without the use of playfulness as a tool to improve the learning of the subject. Regarding the function of the game, Kante (1999 apud NEVE and SANTIAGO, 2016, p. 45) states: "Through the game the child learns to coerce himself, to invest himself in a lasting activity, to know and develop the strength of your body. In general, the best games are those in which exercises of skill are added to exercises of the senses." For Kante, the child must have contact with the game from an early age, as learning from it lasts a lifetime, developing various concepts and skills.

two

Playfulness in mathematics teaching develops reasoning, logic, the spirit of inquiry and the ability to produce convincing arguments to understand the world. As the BNCC states:

It is also mathematical literacy that ensures students recognize that mathematical knowledge is fundamental for understanding and acting in the world and realizing the intellectual game character of mathematics, as an aspect that favors the development of logical and critical reasoning, stimulates investigation and it can be pleasurable (BNCC, 2017, p. 264).

The BNCC text highlights the development of skills through games, and these are





intrinsically related to quality and application of it in ways that stimulate mathematical learning in a playful way.

### 2.1 The game: teaching and learning

The game is of great importance in the teaching-learning of children, young people and adults and contributes to their intellectual development. This tool can also help with skills depending on the age range of the students. The game also appears as access to the child's spontaneous representations relating to limits and norms. Piaget analyzes play for a child's cognitive development into three categories.

The first is the exercise game, which refers to the child's sensorimotor development (0 – 2 years), therefore, the first forms of intelligence that begin with practice or sensorimotor development.

- motor. The symbolic game appears at the end of the second year. It's "make believe", the possibility of using an object as a symbol of something else. It originates in the last two stages of sensorimotor development, when the child begins to apply a sensorimotor schema.
- engine without content (that is, without object). Finally, the game of rules constitutes the last type of game: it originates in the proceeding, in dramatizations in which cooperation must necessarily intervene (PIAJET apud RIZZI, 1997, P. 27).

According to Piaget, the game implies the development of representation and creation of an instrument in the child to develop intelligence, assimilation, assimilating the outside world into their schemes and desires. Therefore, it is interesting to involve children from an early age in games of different types and adapting them to their corresponding age.

The game gains meaning for students when they assimilate its objective and its rules, making it interesting and enjoyable, providing this tool in a learning mode.

### 2.2 Games and teacher training

When talking about teacher training regarding playfulness, we see that there is still a lack of information on this subject. There is a lot of resistance from some educators when it comes to playfulness in support of their classes. According to Santos.

[...] the work of teacher training must, therefore, be based simultaneously on reflection groups on theories and conceptions of childhood linked to playing and the experience of interactive game situations, having as a support point children in activities recreational activities, as well as evaluation of the pedagogical practice of current and future teachers (SANTOS, 2001, p.80).

Therefore, it is extremely important to train education professionals on the subject of playfulness, not only in mathematics but in all disciplines, and for educators to seek to research and learn about playfulness, as activities that provide students with learning from different teaching situations.

### 2.3 Playfulness in teaching mathematics in the 5th year

Playfulness is seen as an interaction in learning, that is, it helps with learning difficulties and lack of interest among students noted today, especially when related to teaching mathematics. Playfulness in the 5th year can have a strong influence because it is the grade in which students are already familiar with their educational knowledge more structured, being able to interact with inductive games about their logical reasoning such as board games, memory games, games involving the 4 operations, among others, that is, rule games. As Gitirana and Carvalho tell us about the human need for knowledge.

The need for human beings to understand the phenomena that surround them and to progressively expand, deepen and organize their knowledge and ability to intervene on these phenomena has always driven – drives – the construction of knowledge mathematical (GITIRANA; CARVALHO, 2010, p. 69)



The authors tell us that mathematical concepts and procedures are constructed with evolution of society, that is, based on our daily need for contact with other areas of knowledge, which makes us think about interaction with playfulness.

Teachers need to recognize the importance of games in contributing to learning and they propose to determine the quality and application of play for this age group of students studying in the 5th year of Elementary Education, seeking ways to allow the best form of use of play and mathematical games in the classroom context.

### 3 MATERIALS AND METHODS

This project is guided by a qualitative approach methodology and its data source was bibliographic, field and documentary research. ANDhe was carried out in morning classes of the 5th year of Elementary School at a State school in the municipality of Atalaia do Norte – Am. The present work intends to show that through play included in mathematics teaching, especially in the final grades of elementary school, it can have a positive result in relation to learning difficulties in the related discipline. Initially, a survey of the students' prior knowledge was carried out, a conversation about play, their knowledge of mainly mathematical games, a short questionnaire about games in education; to begin the development of activities. To collect data, activities were applied that guided the theme in action, playfulness in the teaching of Mathematics in the 5th year of Elementary School and the activities that were carried out were the application of rule games involving the four basic operations (addition, subtraction, multiplication and division) of integers.

Well, with the new scenario that is happening on this planet, which has already decimated millions of people across the continent. The same is happening in this municipality (Atalaia do Norte) so far from the large urban centers of our country/state (Brazil/Amazonas). Therefore, with the restrictions imposed to minimize the transmission of COVID-19 in the municipality and in schools, we will have to adopt measures in accordance with the safety protocols of the Health Department of this municipality and also the safety schedule against the spread of the corona virus established by the school. Tereza Lemos de Oliveira Santos to execute and apply the questionnaires and playful games that will guide the results of this project Playfulness in teaching mathematics with the four fundamental operations in the 5th year of Elementary School at the Teresa Lemos de Oliveira Santos State School in the municipality of Atalaia do Norte – AM.

#### 3.1 Implementation of the project at school

The implementation of the project aimed to apply a questionnaire to collect the previous learning of the students involved regarding the four basic operations (addition, subtraction, multiplication and division) of integers. The work began through the presentation of the theme of playfulness in the study of four fundamental operations of integers in the 5th year of Elementary School, specifying the main objective and actions that would occur during the development of the activities, carrying out a discussion with the students about the importance of playfulness in the development of learning through games. After the lecture, the questionnaire was administered, where students had a few minutes to answer the five questions shown below.

#### QUESTIONNAIRE

1. Do you like studying mathematics?

very much  little  dislike

4 2. Do you like games that involve mathematical operations?

very much  little  dislike

3. Can you solve problem situations that involve the four basic operations of mathematics?  
math (addition, subtraction, multiplication and division)?

already know  partly  don't know



4. Given the mathematical operation  $2.438 \times 5$ , the correct result will be:

- 12,290     12,190     10,190     none

5. Would it be easier for you to learn mathematics through mathematical games?

- Yes     Sometimes no

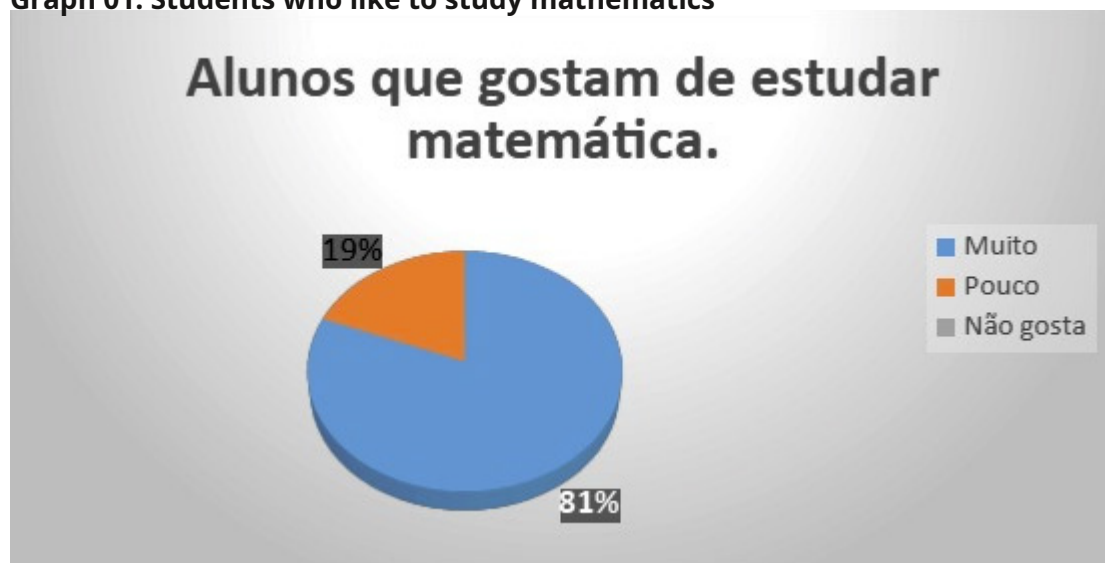
## 4 RESULTS AND DISCUSSIONS

This intervention project was interested in developing an alternative methodology for learning the four mathematical operations (addition, subtraction, multiplication and division), in elementary school I. And through games, providing tools and subsidies so that students can increase their learning and their motivations in the study of mathematics. This intervention proposal was carried out at the Tereza Lemos de Oliveira Santos State School in a 5th year elementary school class.

The implementation of the questionnaire was carried out with a class of 30 students from the 5th year of Elementary School I. Therefore, the class was divided into 50% for the application of the questionnaire due to the safety protocol against covid-19, and had the following results :

The) When asked if students enjoy studying mathematics, 81% of them responded that they like it a lot, and 19% responded that they like it a little and none of them said they don't like it. As shown in graph 1.

Graph 01: Students who like to study mathematics

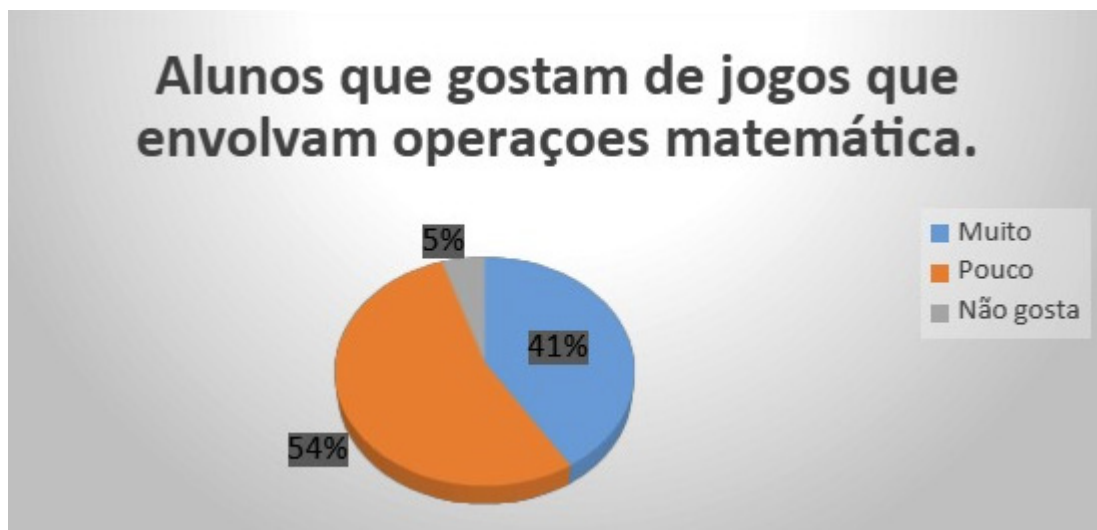


Source: Nascimento, 2021

B) When asked if students like games that involve mathematical operations, 41% said they liked it a lot, 54% said they liked it a little and only 5% said they didn't like it. As shown in graph 2.



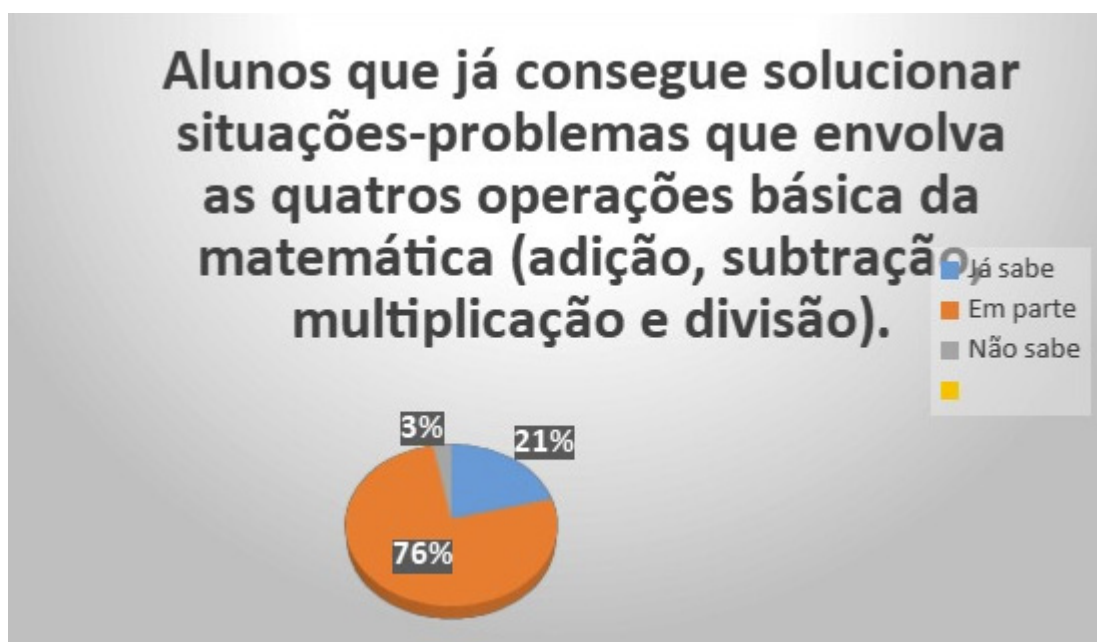
**Graph 02: Students who like games**



Source: Nascimento, 2021

w) When asked if students can already solve problem situations that involving the four basic operations of mathematics (addition, subtraction, multiplication and division), 21% responded that they already know, 76% responded that they know in parts and 3% responded that they still don't know, as shown in graph 3.

**Graph 03: Students who solve problem situations**

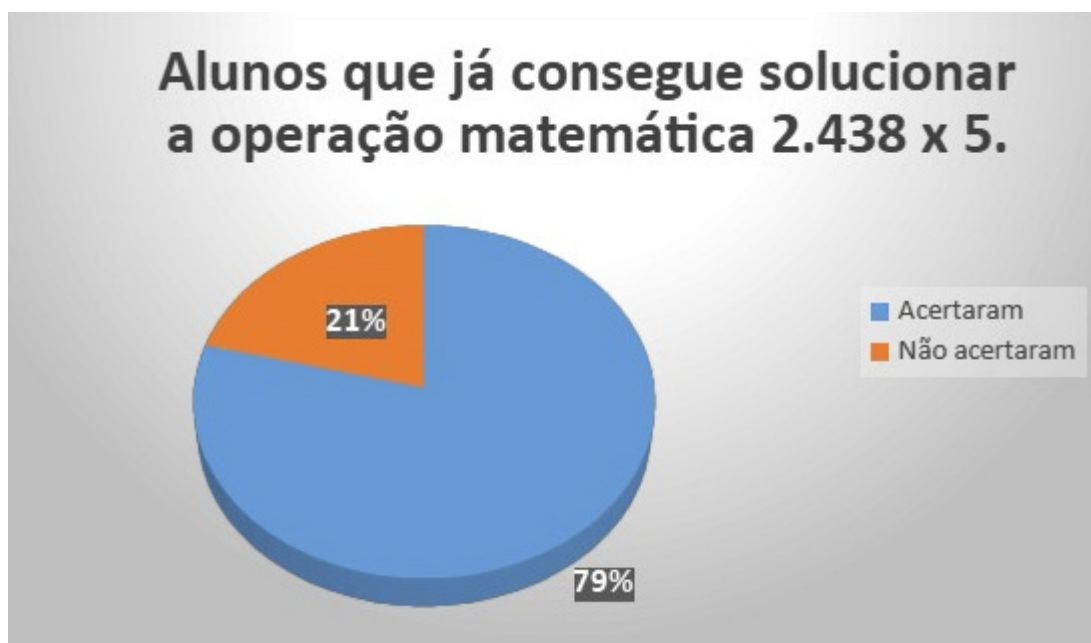


Source: Nascimento, 2021

6

d) When given a mathematical operation (multiplication count) to students, solved, 79% were able to solve it and give the right answer and 21% were unable to solve it and gave the wrong answer, as shown in graph 4.

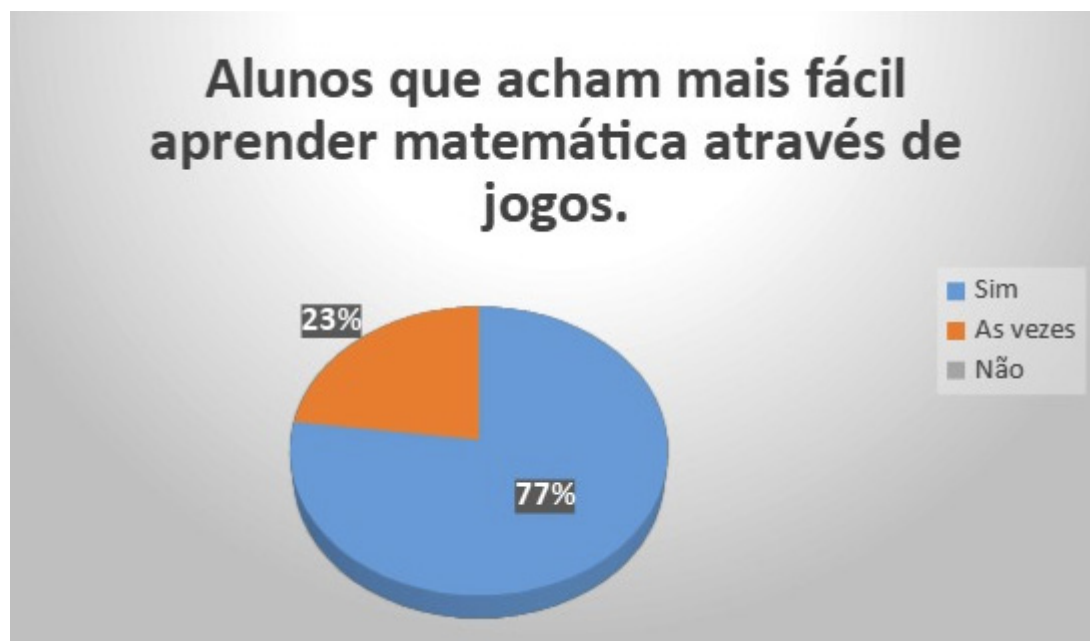
**Graph 04: Students who solve operations**



Source: Nascimento, 2021

When students were asked what they found easiest to learn math through games, 77% responded yes, 23% responded that sometimes they can learn and none responded no, as shown in graph 5.

**Graph 05: Students who prefer to learn through games**



Source: Nascimento, 2021

7

Analyzing the responses to the applied questionnaire, it was possible to verify that the majority of students stood out positively regarding the basic notions of teaching mathematics, a qualitative improvement was also noted in learning the four basic operations of mathematics (addition, subtraction, multiplication and division), after applying the games: with you 60, multiplication dominoes, division marathon and integer race. Many of them who only had notions of mathematical calculations managed to assimilate new

concepts of basic mathematical operations by playing these games.

It is also clear that the application of mathematical games goes beyond limits, in a certain way, in learning how to learn. As in the 5th question, when asked if it would be easier to learn mathematics through games, the majority of students answered yes.

**Table 1 - number of students who answered the questionnaire**

Questions	Quantity	%	Quantity	%	Quantity	%	Total Students	Total %
Do you like studying mathematics?	Very 21	81	Little 9	19	Don't like 0	0	30	100
Do you like games that involve mathematical operations?	Very 11	41	Little 14	54	Don't like 5	5	30	100
Can you solve problem situations involving the four basic mathematical operations (addition, subtraction, multiplication and division)?	Already he knows 9	21	Little 18	76	Don't know 3	3	30	100
Given the mathematical operation $2.438 \times 5$ , the correct result will be:	Acer-tou 19	79	Wrong 11	21			30	100
Would it be easier for you to learn mathematics through mathematical games?	Yes 17	77	The sees 13	23	No 0	0	30	100

Source: Nascimento, JCQ (2021)

**Table 2 - student performance after the activity.**

Note	Quantity	%
9.0	19	79
7.0	8	18
Below 5.0	3	3
Total	30	100

Source: Nascimento, JCQ (2021)

It can be seen through the application of the games that there was a significant interest among students in mathematics, as shown in the tables above, showing that when evaluated, the majority of them received good grades and only a smaller number received grades below 5.0 points.

## CONCLUSIONS

8

By carrying out this work it is clear how necessary a different methodology focused on play is necessary, changing the traditionalism of our classrooms with regard to teaching mathematics, which frightens students so much.

As it was found in the application of the questionnaire, some of the students' difficulties regarding the operations basic mathematics. Reinforcement classes were given for these detected difficulties and the application of games that involved four mathematical operations, it was noted that the result of this intervention was achieved.

This article does not intend to change the way mathematics is taught, but rather, it shows





a method that can help teachers makes it more interesting and enjoyable, such as teaching mathematics using games that develop students' logical reasoning.

However, this activity developed in this project is not limited to this series, but can be adapted to other educational levels. It is expected that this work will contribute directly and indirectly to the teaching/learning process of mathematics and other teachers and students at this school.

## REFERENCES

BRAZIL, Ministry of Education (MEC). **Common National Curriculum Base**. Mathematics in Elementary School Early Years. Brasília 2017.

BRAZIL, Ministry of Education (MEC). Mathematics in Elementary School. **The mathematics of context and context in Mathematics**. Fernandes de Carvalho. Brasília: Secretariat of Basic Education. 2010.

NEVES, Liberia Rodrigues. **The use of theatrical games in education**. Possibility in the face of school failure/ Libéria Rodrigues Neves; Ana Lydia Bezerra Santiago. 2nd ed. - Campinas, sp. Papyrus, 2010.

RIZZI, Leonor and Haydt, Regina Célia. **Playful activities in child education**. Ed. Ática, 6th edition, Education Series. 1997.

SANTOS, Marli Pires dos. **Playfulness as a science**. Petrópolis: Voices, 2001.