

# MATHEMATICS & SCIENCE IMPORTANCE IN OUR LIFE

Prof: Belkar Janardhan Ambadas<sup>1</sup>  
 Prof: Pathare Dipak Vijay<sup>2</sup>  
 Prof: Kale Babasaheb Popat<sup>3</sup>  
 Prof: Laware Ramanath Vithal<sup>4</sup>  
 Prof: Ghogare Chandrakant Ramadas<sup>5</sup>  
 Prof: Patare Rajenrdar Abasaheb<sup>6</sup>  
 Prof: Kadu Ganesh Prakash<sup>7</sup>  
 Prof: Kawade Ajay Vilasarao<sup>8</sup>

<sup>1</sup> Lecturer in Mathematics Pd.D. Vitaliano Vikhe Patil Polytechnic College Loni, state Maharashtra.

<sup>2</sup> Lecturer in Mathematics Pd.D. Vitaliano Vikhe Patil Polytechnic College Loni, state Maharashtra.

<sup>3</sup> Lecturer in Mathematics Pd.D. Vitaliano Vikhe Patil Polytechnic College Loni, state Maharashtra.

<sup>4</sup> Lecturer in Mathematics Pd.D. Vitaliano Vikhe Patil Polytechnic College Loni, state Maharashtra <sup>5</sup>Lecturer in Mathematics Pd.D. Vitaliano Vikhe Patil Polytechnic College Loni, state Maharashtra

<sup>6</sup>Lecturer in Mathematics Pd.D. Vitaliano Vikhe Patil Polytechnic College Loni, state Maharashtra

<sup>7</sup>Lecturer in Mathematics Pd.D. Vitaliano Vikhe Patil Polytechnic College Loni, state Maharashtra

## ABSTRACT

Contemporary life demands the requirement to have good mathematical knowledge. Mathematics is important for life and supports all-round personal development. Mathematics significantly influences pupils' and students' education both in a special branch (mathematical knowledge) and in terms of moral education. In our paper we focus on the use of mathematics in human life. Our aim is to demonstrate that mathematics is not only the basis in technical fields but is also applied in the nature (some mathematical theories). Mathematics is the basis for research methods. We can find mathematical application in the nature, technology, architecture, machinery, building industry, in the banking sector, in research, cartography etc.

There are very interesting applications in genetics and in using mathematics in the nature. Statistical methods are used in hypothesis testing in genetics. By using mathematics, we can create statistical descriptions of quantitative relations. .

We wanted to influence the professional orientation of pupils and students and make them interested in technical fields, which are more useful in the labour market. The questionnaire consists of 11 questions. Four questions were closed and seven were open. Our goal was to increase the pupils' interest in mathematics We can develop pupils' interest in mathematics with the help of quality education, because mathematics is a part of our daily routine and influences the quality of our life and the quality of our professional orientation.

**Keyword:** Keywords: *mathematical application in our life, technical application of mathematics, mathematics in nature, mathematics in research*

## MATHEMATICS IMPORTANCE IN OUR LIFE

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**IMPORTANCE MATHEMATICS**

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**THE RELATIONSHIP OF PUPILS TO MATHEMATICS - SURVEY**

The objective of our survey was to find out the relationship of pupils to mathematics in different types of schools. We also examined whether pupils and students realized that they would need mathematics and natural science in practice. We also tried to identify the interest of pupils and students in the study of technical fields.

The total number of respondents was 115 pupils and students. The respondents included 61 girls and 54 boys aged 12-21. The questionnaire survey was conducted at the following schools: Tatenice Primary School (Czech Republic), Lanškroun Grammar School (Czech Republic) and Lanškroun Secondary Vocational School (Czech Republic). The questionnaire included 11 questions, of which 4 were closed (questions No. 2, 5, 8 and 10) and 7 were open. In the closed questions (No. 2, 5 and 10), the pupils and students could choose YES or NO. In question No. 8, they could choose from EXCELLENT, COMMENDABLE, GOOD, SUFFICIENT and INSUFFICIENT.

The questionnaire included the following questions:

1. What do you imagine when you hear the word "mathematics"?
2. Is mathematics among your favorites subjects?
3. Which mathematical topics did you like?
4. Which mathematical topics did you fail to understand?
5. Which mathematical topics were the most difficult for you?
6. Do you solve tasks at school which you might encounter in practice?
7. What of mathematics do you use in everyday life?
8. What mathematics mark have you got on your school report most often?
9. Specify areas in which mathematics is used in practice.
10. Would you like to study a technical field? Which one?
11. What could change your relationship to mathematics?

In this paper, we include only some interesting findings that are the outcomes of the conducted survey. In particular, we were interested in whether mathematics was popular in primary and secondary schools. The research results are illustrated in chart 1 and chart 2

It can be seen in Chart 1 that mathematics is not a popular subject in primary schools. Mathematics is a favorites subject of only 31 % of the primary-school respondents. In comparing the responses of girls and boys, we found out that the popularity of mathematics as a school subject was more or less the same with both genders.

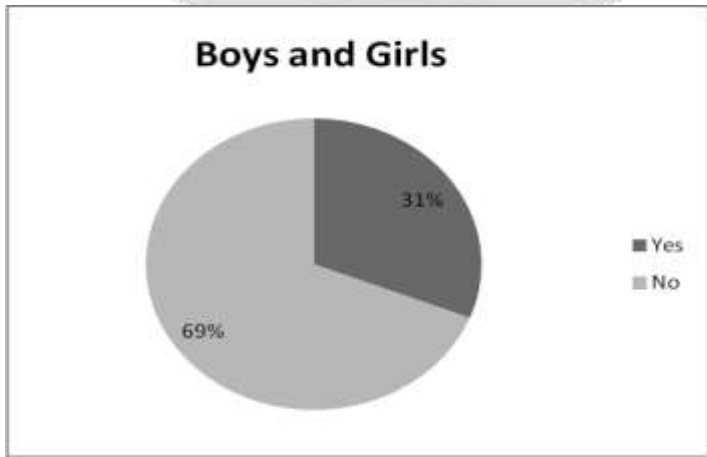


Fig. 1 Popularity of mathematics with primary-school pupils

In secondary schools, mathematics is a popular subject for 65 % of students. In comparison with primary schools, we may say that mathematics is more popular in secondary schools.

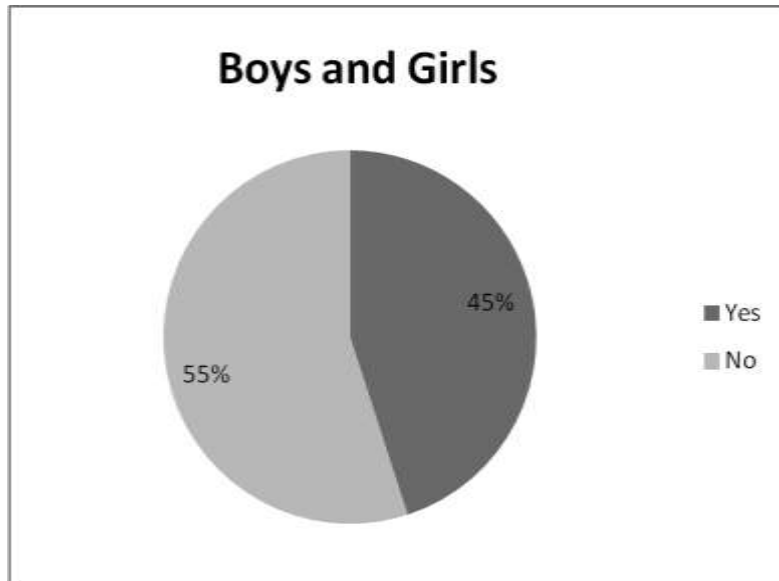


Fig. 2 Popularity of mathematics with secondary-school students

Most of the pupils responded that they did not like any mathematical topics. Some of the pupils stated that they liked only the topics which they understood.

In another question, we tried to identify the topics the primary-school pupils were not good at and the topics which they did not understand. The responses are listed in the next table (Fig. 3).

Mathematical topics which primary-school pupils do not understand

Responses	Number of responses
Geometry	10
Fractions	6
Equations	15
Pythagorean theorem	3
Rational numbers	3
Decimal numbers	2
nothing	2
everything	2

Primary-school pupils have most difficulties with geometry. Another difficult area for primary-school pupils consists in equations. Next table (Fig. 4) lists the topics not understood by secondary-school students.

Fig. 4 Mathematical topics which secondary-school students do not understand

Responses	Number of responses
Geometry	29

Combinatorics	10
everything	5
Logarithms	4
Functions	4
Graphs	3
Trigonometric functions	2
Vectors	2
Roots	2
other response	8

The secondary-school students selected geometry as a difficult topic, just like the primary-school pupils. Topics difficult for secondary-school students also include combinatorics and functions. In one of the closed questions, we tried to identify whether the primary-school pupils and secondary-school students solved practical tasks in their mathematics lessons. 69 % of all the primary-school respondents stated that they solved practical tasks. Only 31 % of the pupils believe that they do not solve tasks at school which they might encounter later in life.

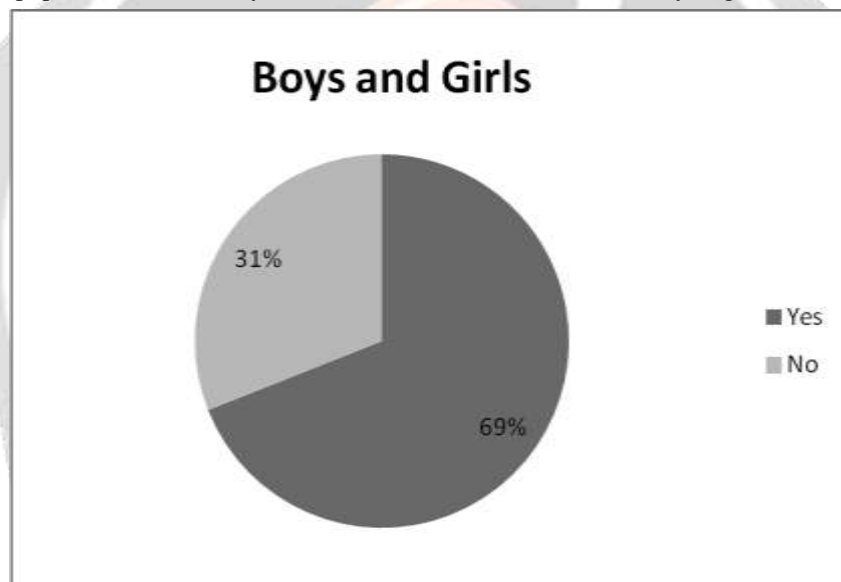


Fig. 5 Solving practical tasks in mathematics in primary schools

65 % of the fourth-year secondary-school students believe that they solve practical tasks in mathematics, which can be seen in next chart (Fig. 6).

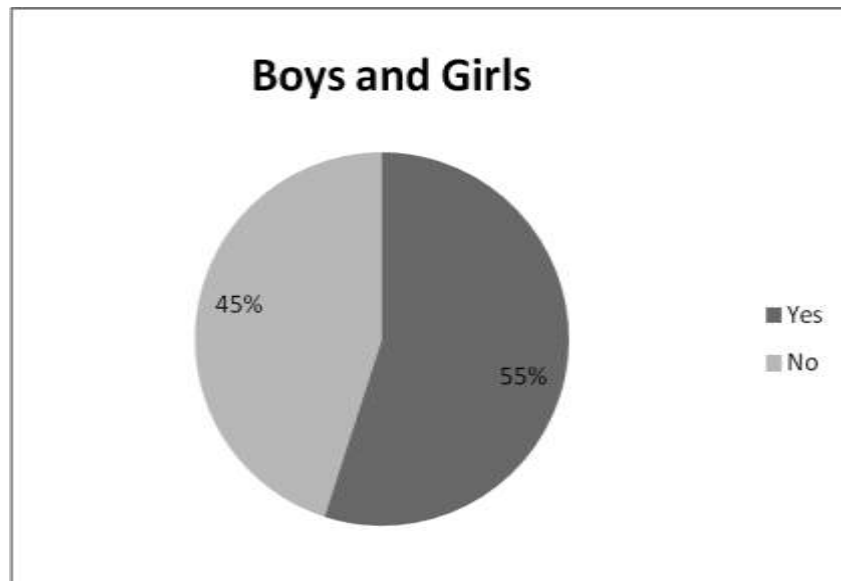


Fig. 6 Solving practical tasks in mathematics in secondary schools

We examined what the pupils thought about using mathematics in practice. The primary-school pupils and secondary-school students were supposed to state fields in which mathematics was used. The responses of the primary-school pupils are listed in next table (Fig. 7) and the responses of the secondary-school students are listed in other table

Most of the pupils stated that they used mathematics when shopping. Another field in which mathematics is used is economy. The pupils also mentioned mathematics teachers, repairmen and servicemen, builders and bankers.

Fig. 7 Use of mathematics in practice – the opinions of primary-school pupils

Responses	Number of responses
Shopping	19
Economy	5
Mathematics teachers	4
Transport	3
Civil engineering	2
Repairmen, servicemen	2
Banking	2

Fig. 8 Use of mathematics in practice – the opinions of secondary-school students

Responses	Number of responses
Adding, subtraction, multiplication, division	19
Figures	7
Rule of proportion	6
Geometry	4
Volumes, areas	3

Interest	2
everything	2
Probability	2
Pythagorean theorem	2
Percentage	2
other response	6

In the questionnaire, we also examined whether the primary-school pupils would like to study a technical field. 69 % of the pupils responded that they did not want to study any technical field; 34 % of the pupils want to study a technical field and 7 % have not decided yet. The pupils who responded that they wanted to study a technical field mentioned architecture and civil engineering.

The same question was posed to the secondary-school students. 15 % of the students responded that they wanted to study a technical field, 82 % of the students do not think of studying a technical field and 3 % of the students have not decided yet. The students who are interested in technical fields want to study chemistry, technology, mechanical engineering or informatics.

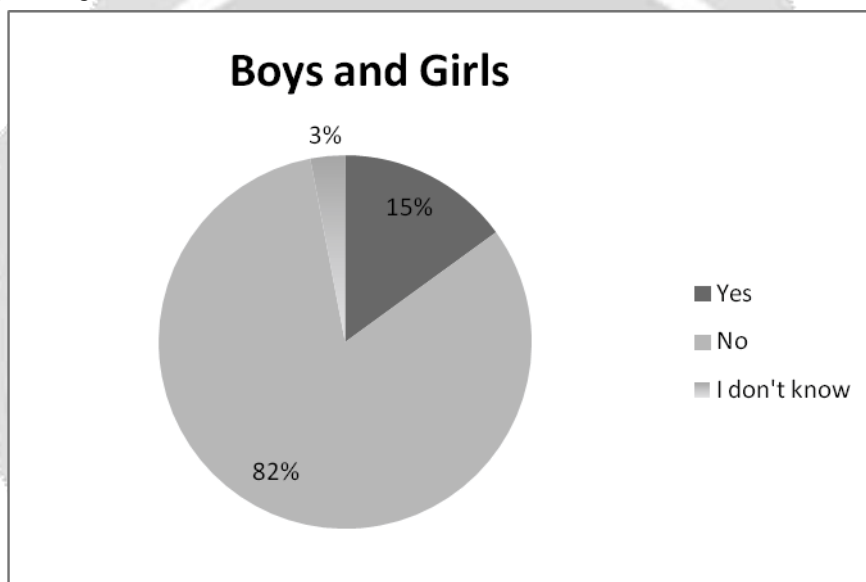


Fig. 9 Interest of secondary-school students in the study of technical fields

We also tried to identify what could change the relationship of a primary-school pupil and secondary school student to mathematics. Some of the respondents said that they would like playful mathematics, logical games, origami and puzzles. Primary-school pupils and secondary-school students are interested in mathematics lessons which are more entertaining, and they want to solve easier tasks.

**CONCLUSION**

In conclusion, we can say that it is necessary to educate pupils and students for technical practice. The knowledge of mathematics and the study of technical fields will enable students to find jobs and be successful in the labour market. The interest of primary-school pupils and secondary-school students in the study of mathematics and technical fields may be influenced by modern teaching methods. This means using graphic programs in lessons and teaching mathematics by means of discovering new concepts. It is necessary to involve primary-school pupils and secondary-school students in mathematics lessons so that they actively participate in the process of learning. In the teaching of mathematics, it is important to support an active approach of primary-school pupils and secondary-school students in acquiring new knowledge. Pupils and students who participate in the learning process will have a better knowledge of mathematics, which is the basis for the study of technical fields.

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