



## MODERN METHODS OF TEACHING MATHEMATICS

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### Abstract

It is well known the difficulty of teaching and learning Mathematics in schools. But, over the last years, teacher's teaching style has changed significantly. The traditional way that Mathematics was delivered (through memorization and repeating techniques) is replaced by the modern way (applied way) of teaching and learning Mathematics. The aim of this paper is to describe the positive impact and the importance of modern teaching methods. This paper recommends that all Maths teachers should use modern, interactive methods in order to improve the performance of their students.

**Keywords:** Didactic methods; Mathematics; teaching.

### Introduction

Most Mathematics teachers use traditional methods when it comes to teaching Mathematics (e.g. white/ black and marker/ chalk). Thus, the teacher plays the role of an instructor. He is the one who decides which teaching-learning method will be used. Most often students are regarded as having "gaps in knowledge" that the teacher must fill with lots of information. Too often, Mathematical education is separate from the students' daily experiences. Thus, the teacher fails to engage the students' interests in the transfer of new knowledge. So, the teacher has to answer questions such as "Why do we need it?", "Why do we need to learn this?".

It is obvious, and research confirms this, that students learn much better when they are encouraged to discover their own knowledge of the surrounding world. It's about the so-called experiential learning. In order to improve students' Mathematics and their literacy ability, Mathematics teachers (but also those of other sciences) should have the freedom and ability to develop and apply modern strategies that give pupils the opportunity to discover new knowledge and to develop problem-solving skills from the process of defining and optimizing a solution to a genuine, real-world practice. It is obvious that besides the modern methods that should be used more often than the traditional ones, the use of integrated learning is also useful. The latter will provide opportunities for more relevant and stimulating experiences for students, regardless of their age. Thus, the recommendation of the European Parliament and of





the Council of 18 December 2006 (2006/962 / EC) is to include Mathematical competences and basic competences in science and technology within the key competences for lifelong learning.

A criterion for classifying the teaching methods can be related to their history in the educational process: traditional methods, such as didactic exposition, didactic conversation, demonstration, observation, working with the manual, exercise and modern methods, such as algorithmization, modeling, problematization, programmed instruction, case study, simulation methods, discovery learning.

Explanation involves rigorous reasoning and rational use of the knowledge (notions, concepts, etc.) by the teacher, with the purpose to help students understand rules and information, as well as express the newly acquired information in their own words. A very important role in transmitting and learning mathematics is the explanation based on a deductive argumentation of the notions, the fundamental properties of the various operations, for example, or the step-by-step disclosure of the algorithms for solving equations. The teacher should carefully choose the examples to capture the essentials of the notions taught in the lessons and so facilitate their understanding. Usually, in Math classes, explanation is accompanied by exercise.

At the end of the class, through oral presentation, the contents taught are reviewed and some exercises well chosen by the teacher will be developed to highlight the level of understanding of the subject. The teacher can ask questions, ask for a report or essay, or give an individual assessment sheet to each student. If oral evaluation is used, then each student is asked a question to answer without the help of the team.

We use the cubing method for a lesson of recapitulation and systematization of knowledge for the unit of learning Divisibility of Natural Numbers, 5th grade. The teacher has prepared a cardboard cube with sides of different colours, according to the lesson topic and divides the class into six groups of students. By throwing the dice, each group will analyse the proposed topic according to the verb associated with that face.

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After receiving the papers, all pupils with the same letter on the sheet, group together to form expert groups. In each group of experts, students must read the material on the paper, discuss, analyse, give examples, and decide on how they will present their subject to the classmates. In the next step, each expert returns to the group and





presents the section prepared for colleagues. In the next step, each expert returns to the group and presents the section prepared for colleagues. Thus, finally, in each initial group, students are supported to discover and acquire the criteria of divisibility, with examples. Each student becomes a teacher, aware of their own learning, their role in the initial group is the correct and complete transmission of information. Thus, the teacher only monitors students' activities in order that the information to be correctly understood and retransmitted and intervenes only if necessary.

What do we notice when we enter into a class where modern methods are used? Instead of the rows of desks seen in the traditional classroom, we will see desks grouped together so that students can interact with each other as they learn. Therefore, the emphasis is on students. This differs greatly from traditional teaching methods, where students are seated in order to ensure that the focus is on the teacher. Students are divided into small work groups up to five to six students each. These small groups can be formed based on student Math skills and therefore the parties do not change frequently. In this way, students are used to work together and they are convinced that, if necessary, their colleagues can provide support for them to successfully complete their work. Modern learning methods involve students in activities by using concrete materials, simulations and games to explore new Mathematics. An alternative to the traditional methods of teaching-learning-evaluation in Mathematics presented above is given by modern methods such as the jigsaw and cubing.

So, students can exchange worksheets or they can put on the boards the exercises that seemed more difficult for them. The method also stimulates collaboration and teamwork. Teacher monitors the activity, gives instructions and makes sure that all students are actively involved in solving the task.

Essential to this method of teaching-learning is interdependence among group members. Thus, the members of a team are stimulated to collaborate, because the common task cannot be fulfilled unless each student contributes. Moreover, the tendency to establish a group hierarchy and social laziness that often threatens cooperation in a group are eliminated. The interdependence between members and individualisation of the contribution are complementary to this method. The use of this method aims at developing the capacity for reflection, active listening, cooperation, creative thinking and increasing the cohesion of the groups; students must understand that solving the problem is both the benefit of the group and of each individual.





## Conclusion

Teaching methods have changed a lot over the last few years. It is obvious that learning by heart, memorizing and exposing or reciting should be abandoned. Sonia Jackson wrote a blog post on modern teaching methods for Smart Getting. She says: "The traditional chalk and speech teaching method, which has lasted for hundreds of years, now achieves inferior results compared to the modern and revolutionary teaching methods available for use in today's schools. It encourages more intense student interaction; authority limits are broken down and emphasis is placed on students' joy to learn." The mathematics teacher will use both traditional methods and modern teaching methods to meet the requirements of the school syllabus and to facilitate the development of logical reasoning. The success of a mathematics lesson depends on how the teacher manages to choose the most suitable methods, and didactic instruments, to combine them and to organize them in a harmonious assembly to achieve the proposed objectives.

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