FEATURES OF ARITHMETIC OPERATIONS IN MULTIPLICATION

Dustov Mansur Khurramovich
Teacher of Tashkent University of Applied Sciences
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Abstract. *It follows from the opinions expressed in the article that the necessary factor ensuring the effectiveness of the cognitive process is theoretical (psychological-pedagogical) foundations and their practical implementation, which is understood as a unity of teaching methods and forms that ensure the active and effective cognitive activity of students, the development of their intellectual, professional and creative abilities. is the use of teaching technology. The psychological theory of knowledge acquisition as the theoretical basis of the new technology, the rules of modern achievements, the psychology of the development of creative abilities can serve to increase the effectiveness of the educational process.*

Keywords: *arithmetic, actions, additions, multiplications, divisibility, division, subtraction, equations.*

It is considered as a process of solving many pedagogical issues that always arise when it is necessary to transfer the student from one state to another: to attract him to certain knowledge, to transfer the system of learning and qualifications to another system. It requires many solutions and finding a better way to achieve the desired result. In this regard, it is necessary to transfer these tasks into the language of a system of problems in a certain sequence in order to awaken the interest and organization of didactic conditions and technology content of students' knowledge, creative activity activation.

There are different systems for describing educational technologies. Chronologically, the first of them belongs to V.P. Bespalko. The type of organization and management of cognitive activity is taken as the basis for classification. This problem identified eight types of technologies:

1) traditional lecture teaching (management - distributed, open, individual, verbal);

2) teaching using audio-visual technical means (distributed, individual, verbal);

3) "consultative" system (spread, individual, verbal);

4) teaching using textbooks (distributed, individual, using educational tools);

5) "small group system (cyclic, frontal, verbal) - group, differentiated (differentiated) teaching methods;

6) computer training (cyclic, frontal, automated);

7) "tutor" system (cyclic, individual, verbal) - individual training;

8) "programmed training" (cyclical, individual, automated), for which there will be a pre-made program.

A huge volume of information in the field of educational technologies was systematized and summarized by G.K. Selevko. He proposed a number of criteria for the classification of modern pedagogical technologies. He divided the following classes:

- according to the level of application - general pedagogical, special-methodical and local (modular) technologies;

-according to the philosophical basis - materialist and idealist, dialectical and metaphysical, scientific and religious, humanist and anti-humanist, anthroposophical and theosophical, pragmatic and existentialist, free education and coercion, etc. technologies;

- on the leading factor of mental development - biogenic, sociogenic, psychogenic and idealistic technologies;

-according to the scientific concept of mastering experience - associative-reflective, behavioral technologies, gestalt technologies, interiorizing, developing technologies;

- on orientation to personality structures - information technologies (formation of mental skills of memory - XAM), operational (formation of methods of mental actions - AMU), emotional-artistic and emotional-spiritual (formation of aesthetic and spiritual spheres of the person - EMS) technologies, self-development, heuristic and practical (active-practical sphere formation) technologies;

- according to the character of the content and structure - teaching and educational, secular and religious, general educational and vocationally oriented, humanitarian and technocratic, private subject technologies, technologies of various branches, and also complex (polytechnologies) and monotechnologies and absorbing technologies.

- by the type of organization and management of cognitive activity. This was explained above;

-on the approach to the child - authoritarian, didactic-centered, personality-oriented, humanistic-personality technologies, cooperation technologies, free education technologies, esoteric technologies;

- on teaching methods, methods and tools - dogmatic, reproductive, explanatory-illustrative technologies, programmed teaching, developmental teaching, self-taught, dialogic, communicative, playful, creative, etc. technologies;

- by categories of students - public school technology for the average student within the public school, accelerated level technologies, compensatory teaching technologies, various victimological technologies, technologies for working with difficult and gifted children;

- according to the levels of modernization and modification - technologies based on the humanization and democratization of pedagogical relations, on the basis of activation and acceleration of student activities, on the basis of effective organization and management of the educational process, on the basis of methodical improvement and reconstruction of educational material, technologies adapted to nature, alternative, complex polytechnologies.

M.I.Dzhumaev distinguishes three groups of effective pedagogical technologies: research technologies, construction technologies and interaction technologies.

Research technologies help the pedagogue to accumulate knowledge about his students, their motivations, abilities, system of relations (information fund). Construction technologies include educational process, educational subject, construction of educational information. Interaction technologies are aimed at establishing relationships between teachers and students in accordance with pedagogical goals, organizing active and effective cognitive activities.

M.M.Dzhumaeva began to create her own system of educational technologies. In his work, an attempt was made to establish compatibility between the usual terminology of didactics and the language of educational technology.

According to the analysis of methodological, pedagogical, scientific-methodical and psychological literature, a very large part of creative results was created using technologies based on these four main ideas.

1. Enlargement of didactic units. Based on it, all-block and modular technologies are developed and introduced.

2. Planning learning outcomes. Based on this idea, goal setting and differentiated instructional technologies are developed.

3. Psychologizing the educational process, that is, building the educational process based on the theories of psychological mastery.

4. Computerization – it means computer support for teaching and educational process management.

Many authors see the level of application of technologies in the educational process in different levels: from increasing the effectiveness of teaching a specific subject to training the increasingly complex educational system, to its standardization and unification.

The result of a multiplication is called a product. When one factor is an integer, the product is a multiple of the other or of the product of the others. Thus, is a multiple of , as is . A product of integers is a multiple of each factor; for example, 15 is the product of 3 and 5 and is both a multiple of 3 and a multiple of 5.

Multiplication Definition in Math

Multiplication is one of the four basic arithmetic operations, alongside addition**,** subtraction**,** and division**.** In math, multiply means the repeated addition of groups of equal sizes.

To understand better, let us take a multiplication example of the ice creams.

Each group has ice creams, and there are two such groups.

Total ice creams are 3+3=6.

However, you have added two groups of 3 ice creams. Therefore, you have multiplied three ice creams by two. You may also write it as 2×3=6.

As we can see, 3+3 is the same as 2×3.When we multiply two numbers, the answer is called product. The number of objects in each group is called multiplicand, and the number of such equal groups is called the multiplier**.** In our case, 3 is the multiplicand, 2 is the multiplier and 6 is the product.

There are many ways to read an equation that involves multiplication.

For example, 2×3=6. It can be read as follows:

Symbol of Multiplication

Multiplication is represented by the signs cross (×), asterisk (*), or dot (·). While writing in your notebooks, you are most likely to use the cross. The asterisk and dot are used in computer languages and algebra (higher mathematics).

For example: 6×5=30

7∗8=56

Multiplying Integers

In order to multiply the integers, we need to see the sign of the integers.

Multiply two positive integers

The product of the two positive integers is always a positive integer.

For example: 5×6=30

Multiply one positive and one negative integer

The product of a positive and negative integer is always a negative number.

For example: (− 5)×6=(− 30)

Multiply two negative integers

The product of two negative integers is always a positive integer.

For example: (− 5)×(− 6)=30

Multiplying Fractions

In order to multiply the fractions, the numerators and denominators are multiplied together such that:

a/b×c/d=(a×c)/(b×d)

For example: Multiply 1/2 and 3/4.

1/2×34=1×3 : 2×4=3/8

Multiplying Decimals

Multiplying the decimals is the same as multiplying the integers.

For example: Multiply 13.2 and 3.5.

Let us multiply 13.2 and 3.5 by removing the decimals here and consider them whole numbers. Hence,

132×35=4620

We put the decimal point back, then the product of the two decimal numbers will have decimal up to two positions from right to left, such that

13.2×3.5=46.20

When the bases and powers are different

Let the two expressions be xn and ym. Here, the bases are x and y. The powers are n and m. When we multiply these expressions, each expression is evaluated separately and then multiplied. It can be written mathematically as

For example: 32×43=9×64=576

Properties of Multiplication

Just like addition, multiplication also follows specific properties, which are as follows:

Commutative Property: This property states that when we multiply two numbers, the order will not cause any change in the product.

Let us consider 2×3=6, for example. If we reverse the order, i.e., compute 3×2, the answer will still be 6.

Associative Property: This property states that if we multiply three numbers or more, one after the other, the order does not matter. For example: if we have to 2,3 and 4:

(2×3)×4=24

2×(3×4)=24

If you jumble the order and multiply, the result will still not change.

3×(2×4)=24

Distributive Property: This property states that if you multiply a number by the sum of two numbers, the result will be equal to the sum of products you obtain by multiplying that number by those two numbers individually. For example, 3×8.

You can write 8 as 6+2. Therefore 3×8=3×(6+2)=24

Now, 3×6=18. Also, 3×2=6.

18+6=24=3×8. Therefore, distributive property holds true.

Tips to Master Multiplication

Here are some tips that will come in handy while multiplying:

Memorizing tables: Multiplication is all a game of tables. So, if you have tables at your fingertips, you will find little easy to multiply.

Making good use of the properties: If you are thorough with the properties of multiplication, you will be able to deconstruct complex problems into simpler ones. For example:

3×13=3×(10+3)=(3×10)+(3×3) (Distributive property)

This also helps in deriving new facts from the known facts.

For example :

If you know 2×9 is 18, using the commutative property of multiplication, you also know that 9×2 is also 18.

If you know 2×10 is 20 and 2×4 is 8, using the distributive property of multiplication, you also know that 2×14 is 28.

Fun Facts

If you multiply any number by 1, the answer will be the number itself. One is called the identity element under multiplication.

If you multiply any number by zero, the result is always zero.

Conclusion

Multiplication is not just an arithmetic tool. It is a life skill that students must master at a very early age to solve real life problems. We hope this helped you deepen your understanding of the subject.To read more such informative articles on other concepts, do visit our website. We, at Splashlearn, are on a mission to make learning fun and interactive for all students.

Solved Examples On Multiplication

Multiply 4×2 **using a number line.**

4×2 means 4 jumps of 2 or 2 jumps of 4 which is 8 in both cases.

Compute the problem: 2×16**.**

2×16=2×(10+6)=(2×10)+(2×6)=20+12=32.

3×25=25×3**.**

Which property is this?

The property given above is the commutative property of multiplication i.e.

Math Mammoth End of the Year Test

This test is quite long, so I do not recommend having your child/student do it in one sitting. Break it into parts and administer them either on consecutive days, or perhaps on morning/evening/morning. Use your judgment.

This is to be used as a diagnostic test. Thus, you may even skip those areas and concepts that you already know for sure your student has mastered.

The test does not cover every single concept that is covered in the Math Mammoth Grade 3 Complete Curriculum, but all the major concepts and ideas are tested here. This test is evaluating the child's ability in the following content areas:

- multiplication tables and basic division facts
- mental addition and subtraction
- regrouping in addition and subtraction
- basic word problems

- multiplication and related concepts
- clock to the minute and elapsed time calculations
- basic money calculations (finding totals and change)
- place value and rounding with four-digit numbers
- quadrilaterals, perimeter, and area
- division and related concepts (remainder, word problems)
- measuring lines in inches and centimeters
- basic usage of measuring units
- the concept of a fraction and mixed number, equivalent fractions, and comparing fractions

Currently, there are a number of reasons encouraging the development and implementation of pedagogical technologies. These include:

- the maturity of the need to introduce a systematic-pedagogical approach to pedagogy, to systematize teaching methods at school and higher education institution;

-the need to implement personality-oriented teaching at all levels of the educational system, to replace the less effective verbal transfer of knowledge;

- the ability to expertly design a technological chain of procedures, methods, and organizational forms of interaction between students and teachers that provide guaranteed results in teaching ... and reduce the negative consequences of the work of low-skilled teachers.

The subjective aspect of pedagogical work is expressed in the functional-role characteristics and subjective-activity qualities necessary for the teacher to perform professional duties. It primarily consists of:

- professional knowledge - information about all aspects of a pedagogue's work resulting from the combination of objectively necessary and practically required general and professional components. They are the basis for professional education, skills, unique psychological qualities, professional positions with the implementation of the selected model, algorithm and technology of achieving the results of pedagogical work;

- professional training and skills - work and methods used by the pedagogue to fulfill his obligations and tasks in the educational process. They will be primary elements of the integrated system of pedagogical labor technology;

- specific pedagogical characteristics (qualities) represent the formation of all components of the teacher's psyche - processes, properties, structures, situations;

- the professional position of the pedagogue is his stable position and direction; are the relations, evaluations of internal and surrounding experience, reality and perspective, as well as private aspirations realized in professional activity (unrealized, partially realized). They include social and professional aspects.

These specified characteristics of the teacher's work are complemented by the requirements set by the state standards regarding the knowledge that college students should acquire in the subjects.

The psychological and didactic approach of educational and professional activity to the content of independent training and lesson preparation affects the didactic conditions and technology of activating the knowledge and creative activity of students, in which theoretical knowledge serves as a tool for the specialist to solve actual practical issues and cases.

The analysis of the state educational standard (DTS), program and literature showed that the following components should be included in the content of increasing the creative activity of vocational college students: setting educational goals and objectives, choosing the content of educational material, designing the use of educational tools, methods and forms, methodological didactic interaction of demand, intermediate and final feedback training and skills training, as well as training for analysis of one's own activity and reflection training, didactic conditions for activating students' knowledge and creative activity serve as the basis for teaching technology.

It is considered as a process of solving many pedagogical issues that always arise when it is necessary to transfer the student from one state to another: to attract him to certain knowledge, to transfer the system of learning and qualifications to another system. It requires many solutions and finding a better way to achieve the desired result. In this regard, it is necessary to transfer these tasks into the language of a system of problems in a certain sequence in order to awaken the interest and organization of didactic conditions and technology content of students' knowledge, creative activity activation.

All this requires the integration of students' specific knowledge and learning. In particular, in order to design and conduct an educational session, it is necessary not only to know the content of the subject, but also to master various methods of organizing knowledge, to be able to choose their form in accordance with the educational task being solved, to arouse and maintain the students' cognitive activities, to analyze the progress of the training and to evaluate their results. it is necessary to know. Conducting each training session requires the integration (synthesis) of the pedagogue's science-related, pedagogical, psychological, general cultural, and physiological knowledge and learning. Unfortunately, the necessary integration does not occur in the structuring of educational content related to science.

A mathematical operation, in simple words, is a question that requires an answer. Next, we will use exactly this formulation. Depending on the purpose, operations are divided into 2 types: calculate to compare, or in another way: action operations and relationship operations.

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