

Higher Standards for Education in XXI century

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Abstract. Increasing the amount of information in all 15 areas of knowledge base requires from teachers to establish its **rules of selection , sorting, ordering, ways of presenting and tools of presentation.** Selection of information is determined by the individual and the demands of social development in the coming decades . Sort information defined basic human activities and developing their methodological and logical apparatus . Ordering information is based on creation and allocation of a set of mnemonic devices and rules. Form submission of information should be based on systematic. A feature of such systematic should not only function " restore order " in the already known information field (along with the correction of false information) , but the predictive function. In addition, the taxonomy should not be formed by creating a formal spreadsheets and databases and based on the general laws of nature - concept of the symmetry , Homology, conservation laws involving combinatorics , which has repeatedly "used " by Nature as a search for optimal mutational paths of evolution , selection, adaptation and adjustment . Reporting tools should be used as a conditioned reflex and unconditioned reflex students activity.

Keywords: Education, Combinatory, Homology, Homologous series, Unitary Symmetry, Science Tree, Data base, Teaching Play Rope Playground Equipment.

I. Introduction

Twentieth Century completed chain centuries, during which mankind has discovered and realized the fundamental laws of Nature, comprehend the basic principles of the existence and development of human society. Accumulated a wealth of information in each of the 15 basic areas of knowledge: Linguistics, Literature, Safety, Physical development, Needlework and DIY techniques, Mysticism and religion, Art, Psychology, sociology and ethics, Statistics, Legislation, Natural science (physics, astronomy, chemistry, biology, geography, ecology), Mathematics, Informatics, History, Economics.

Twenty-first century has spawned a chain of specific actions aimed at preserving life on Earth in the form in which it got Homo Sapiens. This century scientists refocused on new research directions. Most likely our future lies in nanotechnology, biotechnology, robotics and programming.

And how should readjust Educational institutions and their programs? How to reorganize the information needed for the study. Which subjects to study in the preschool period, and which only study in school? Do early specialization in training and how should it be built? As early childhood begin methodologically effective engagement in the educational process?

In practice we must build the Spiral of Educational Process methodologically and scientifically within these 15 vital branches of Knowledge (See Fig. 1 - Spiral of Educational Process). In some subjects I have already developed detailed guidance " Spiral of Educational Process " and tested in a number of schools in the USA.

First, it reflects the natural learning process. As a child, we first take the book, tear its pages, then stared at the page, then try to understand the signs, letters, words, more words correlate with images and actions, then, with the development, reproduce words, generate new word combinations, etc.

Secondly, all knowledge in a particular area - this is a building. At first the boys do the cave. Then they build a hut. Then use some more sophisticated tools and materials.... Similarly, there is an accumulation of knowledge through the development of tools for the production of food - bow, spear, gun, rifle In girls, the development and preparation for childbirth comes from dolls and care for our smaller brothers.

Knowledge must be laid in layers. Only in this case it will be strong and durable.

Third, each person - a "tree." And the more diverse in its composition would be "soil", the faster the child and his parents begin to understand "Tree View" and especially its cultivation. Let us remember that we have answered the question "What do you want to become." It was the profession of those people with whom the child happened to meet in the near surroundings. As familiarity with other professions child changed their preferences.

Previously acquainted with a variety of knowledge contributes to early manifestation of talents.

Unfortunately not all 15 basic disciplines were included in the lessons timetable for children. In my opinion, it is wrong approach. These subjects must be learned by children from 4 to 17 years old annually, but with varying degrees of profoundness and detailing from year to year.

The concerns are:

- how to arrange these 15 basic branches one after another and how to fill them during School Educational Process;
- what to choose as fundamental pivotal conception; it is desirable that it should be common for all 15 branches;
- how to use not only "conditional reflex", but perception as well, in a rapid increase of the amount of information, necessary to learn.

To answer these questions, I chose the following organizing principle: **combinatory, homology, symmetry**

II. Combinatory - basis for building complex objects from simple elements

Combinatory is a declassified mathematical apparatus of Nature. Through various permutations and combinations it carried out the selection and adaptation mechanism launched almost all vital installations.

Realizing this natural mechanism, scientists have learned to use it in many other fields of knowledge - in physics, chemistry, biology, linguistics, programming ...

No field of knowledge where there could be used to represent combinatory.

No areas of knowledge outside of the natural sciences, where the notion of combinatory are used at very low scientific level.

The main reason is that the vast majority of teachers are beginning to explain the basics of Combinatorics with mathematical formulas and in a limited number of examples. [1] and [2]. This approach discourages students. They did not understand the physical interpretation of the physical meaning of combinatorial operations only memorize the basic formulas and become opponents of the combinatorial approach to the study of natural phenomena.

In this paper I will try to demonstrate a new perspective on Combinatorics, I, as a physicist, always hated, but lost in it, as a teacher, I learned a lot of what I did not understand before and fell in love it as my own child.

Thus, the problem can be called combinatorial if its solution is a brute of a finite set of elements.

Special sign combinatorial problems - a question that can be formulated in such a way that it would begin with the words:

- How many ways ...?
- How many options ...?

In order to solve the problem on combinatorics, you must first understand its meaning, that is, to present mentally process or the action described in the problem.

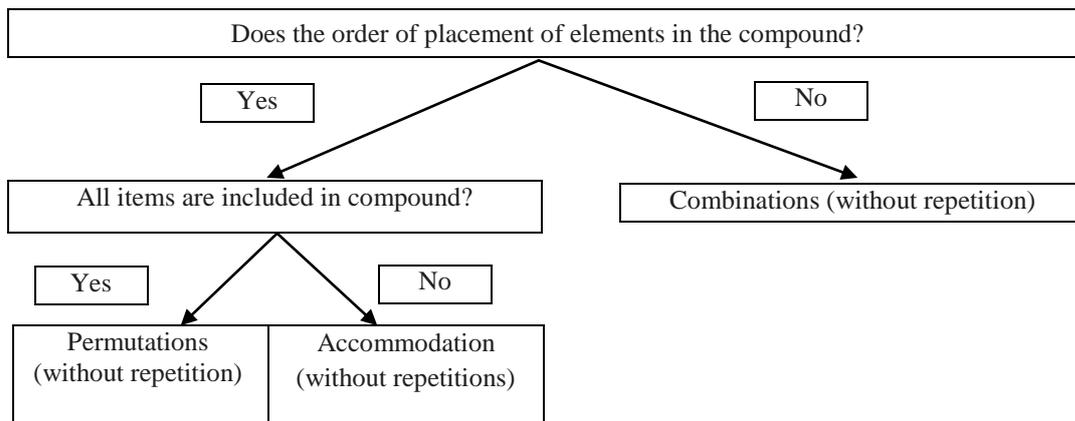
We need to clearly define the type of combinatorial compounds of the problem, and for this it is necessary, making a few different combinations, to check whether the items are repeated, whether changing their composition, whether the order of the elements is important.

If the combinatorial problem contains a number of restrictions imposed on the connection, you need to understand how to influence or affect the restrictions on the connection.

In that case, it is difficult to immediately determine if any important moments task, would do well to try to understand the problem more easily, such as the one that does not count against the limitations, if any in the original problem, or a problem in which deals with fewer elements, then it will be easier to understand the principle of formation of the samples.

When combinatorial problem consists of different combinations of elementary tasks, then you just need to break the task into subtasks. [3]

Table 1. Selecting combinatorial operations and formulas depending on a number of conditions



2.1. Permutations and Combinations

Combinations and Permutations -what's the difference? If the order doesn't matter, it is a **Combination**, If the order **does** matter it is a **Permutation**. A Permutation is an **ordered** Combination.[2]

Permutations of a set of objects is an arrangement of those objects into a particular order.

We must distinguish between: "permutations, no repetitions, order (consecution) matters (P,Rn,O)", "permutations, no repetitions, no order (consecution) matters (P,Rn,On) - combinations", "permutation with repetition, no order (consecution) matters (P,R,On) - combinations", "permutation with repetition, order (consecution) matters (P,R,O)".

Combination is a way of selecting several things out of a larger group, where (unlike permutations) order does not matter.

Table 1 represent the basic concepts of combinatorial operations.

Table 1. Basic combinatorial operation, where **n** is the number of things to choose from, and you choose **k** of them by different ways - order (quality) matters (O) or no order (consecution) matters (On) ($n = 3, k = 2$ - "n choose k"). Note: it is generally agreed that $0! = 1, 1! = 1, 2! = 2, 3! = 3 \times 2 \times 1 = 6$. The figures in the examples are only the symbol element of a set. This Table looks like a **combination** of $\{R,Rn,O,On\}$, where $n=4, k=2$ and $\{R,Rn\}, \{O,On\}$

<p style="text-align: center;"><u>permutation (P,R,O) :</u></p> <ol style="list-style-type: none"> 1. sequence numbers matters - elements such, {1,2} and {2,1} to be considered different two elements 2. among the compounds are compounds with repeating starting elements - {1,1}, {2,2}, {3,3}. 	<p style="text-align: center;"><u>combination (P,R,On)</u></p> <ol style="list-style-type: none"> 1. sequence numbers does not matters - elements such, {1,2} and {2,1} to be considered the same elements (one element). 2. among the compounds are compounds with repeating starting elements - {1,1}, {2,2}, {3,3}.
<p>Example: 9 permutations</p> <p>{1,1},{1,2},{1,3}, {2,2}, {2,1}, {2,3}, {3,3}, {3,1},{3,2}</p>	<p>Example: 6 permutations</p> <p>{1,1},{1,2},{1,3}, {2,2}, {2,1}, {2,3}, {3,3}, {3,1},{3,2}</p>
<p style="text-align: center;"><u>The formula is written: ${}^n P_k = n^k$</u></p>	<p style="text-align: center;"><u>The formula is written: ${}^{n-1} C_{n+k-1} = \frac{(n+k-1)!}{k!(n-1)!}$</u></p>
<p style="text-align: center;"><u>permutation (P,Rn,O)</u></p> <ol style="list-style-type: none"> 1. sequence numbers matters - elements such, {1,2} and {2,1} to be considered different two elements. 2. this set of compounds does not include compounds with the same elements.- {1,1}, {2,2}, {3,3}. 	<p style="text-align: center;"><u>combination (P,Rn,On)</u></p> <ol style="list-style-type: none"> 1. sequence numbers does not matters - elements such, {1,2} and {2,1} to be considered the same elements (one element). 2. this set of compounds does not include compounds with the same elements.- {1,1}, {2,2}, {3,3}.
<p>Example 1: 6 permutations</p> <p>{1,1},{1,2},{1,3}, {2,2}, {2,1}, {2,3}, {3,3}, {3,1},{3,2}</p>	<p>Example 1: 3 permutations,</p> <p>{1,1},{1,2},{1,3} {2,2}, {2,1}, {2,3}, {3,3}, {3,1},{3,2}</p>
<p style="text-align: center;"><u>The formula is written: ${}^n P_k = n!/(n-k)!$</u></p>	<p style="text-align: center;"><u>The formula is written: ${}^n C_k = n!/k!(n-k)!$</u></p>

So look closely at the definition, it can be seen that the result depends on several factors simultaneously:

1. of how many items we can combine their sets (how big is the general set of elements - n)
2. how large sets of elements we need (k)
3. whether to have a significant order of the elements in the set.

2.2. Combinatorics and Homology

Children quickly learn more pictures than text. Therefore represent a plurality of n (n = 4 and k = 2) as a "combinatorial triangle" (see Fig. 2):

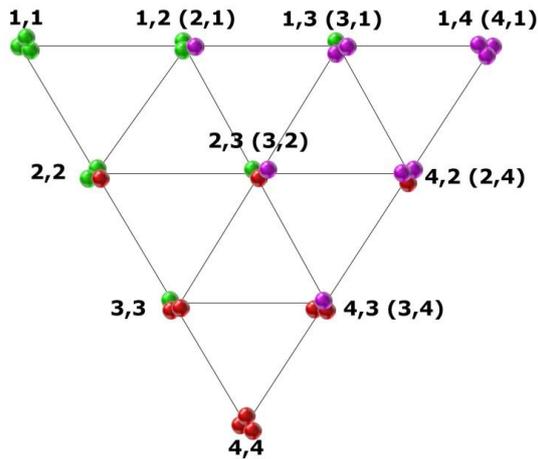


Fig. 2. Graphical interpretation of permutations and combinations ($n = 2,3,4$ and $k = 2$). Numerals in the figure are only a symbol element of a set, but clearly show the "combinatorial isomers" (to use the language of chemists) or "combinatorial degenerate states" (to use the language of physicists). Colored balls - red ball (R), yellow ball (Y), blue ball (B) - graphically express combinable elements and clearly expressed view of homological series.

We now turn to the definition of homology. Dictionaries give only the translation: Homology (al-Greek.. ὁμοιος - like, similar; λογος - word, law, reason, sense). Next in dictionaries follow "free" interpretation of homology and homologous series in more than 20 fields of science and human activity [4].

So, the concept of homology refers to the comparative analysis. But in order to compare (as a process) the objects need to decompose them into elementary components (parts). **Then two objects that differ only in one part can be called Homology.**

Objects matching at least one part essential for this analysis can be called Analogs. (The analogy comes from Greek. Αναλογία «line», then from the Greek. Ανάλογος «commensurate accordingly» from ανά «on, according to» + λόγος «word, law, reason, sense»).

Sequence of objects that appears when replacing one of the qualitative characteristics of the other part of the same characteristics can be called **Homologous series**.

Sequence of objects displayed when replacing the main part of one qualitative characteristic to the other major part of other quality characteristics can be called **Analog series**.

On Fig. 1. Homologous series of easy to detect: RRY - RRB, RYY - RYB - RBB, YYY - YYB - YBB - BBB (replacement Y \leftrightarrow B). Thus, we can conclude that combinatorial operations are closely related to homological series and are actually their mathematical interpretation.

It should be noted that the concept of homological series organizes our knowledge about evolution - all the fundamental changes taking place in Nature by replacing "one part of the quality" with "another part of the same quality." In other words, the philosophical idea of going "Quantity-Quality" is carried out within the combinatorial representation in the form of a homologous series of successive changes

To convince the reader that these fundamental relationships, we refer to the known multiplet of baryons (See Fig. 3):

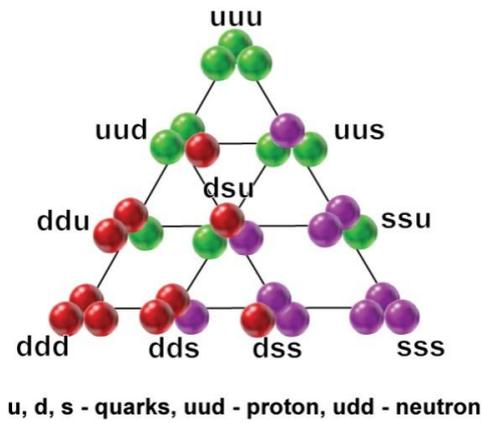


Fig.3. Combinations of three u, d or s quarks forming baryons with a spin $-\frac{3}{2}$ form the uds baryon decuplet [5]

Another important example of the application of Combinatorics is constructed by the author [6], the system of chemical elements and their isotopes and ions:

COMBINATORIAL MODEL NUCLEI, ATOMS, ISOTOPS AND IONS

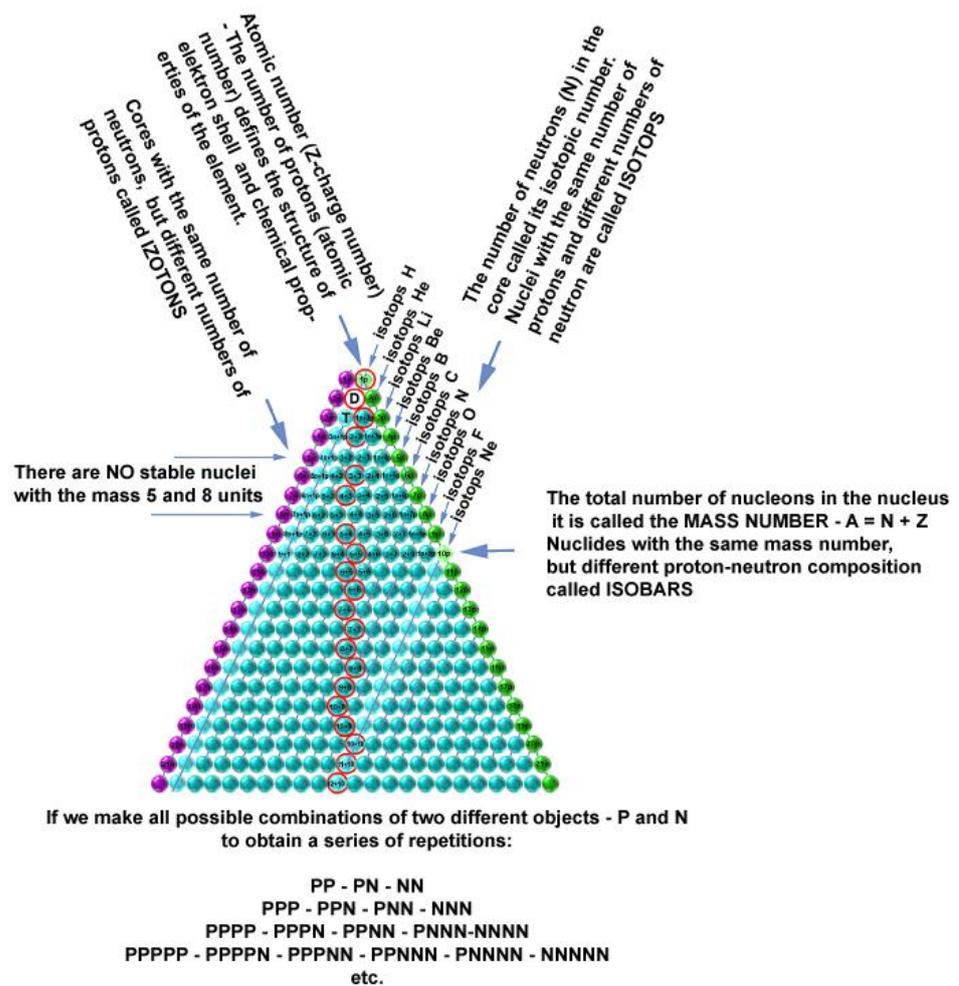
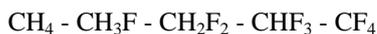
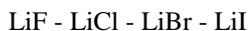


Fig. 4. Frame of nuclei of chemical elements, chemical elements themselves, and their isotope and ions. Red circled stable isotopes, where P - proton, N - neutron.

This form includes original presentation and image Homology - general scientific predictive mechanism for the evolution of the Material World (much deeper compared to the periodic table of elements).

Placing combinatorial aligned homologous nuclei and the corresponding particles in the space of their physical and chemical parameters shows one of the most important symmetries of Nature - Unitary Symmetry - SU (n).[7] And as we know, from the Theory of Symmetry the conservation laws follow, which greatly facilitate the process of cognition. .

For the molecules the possibility of constructing a homologous series of even more extensive:



For example in [8], [9], we have constructed a system for homologous series of halogenated methane (See Fig.5).

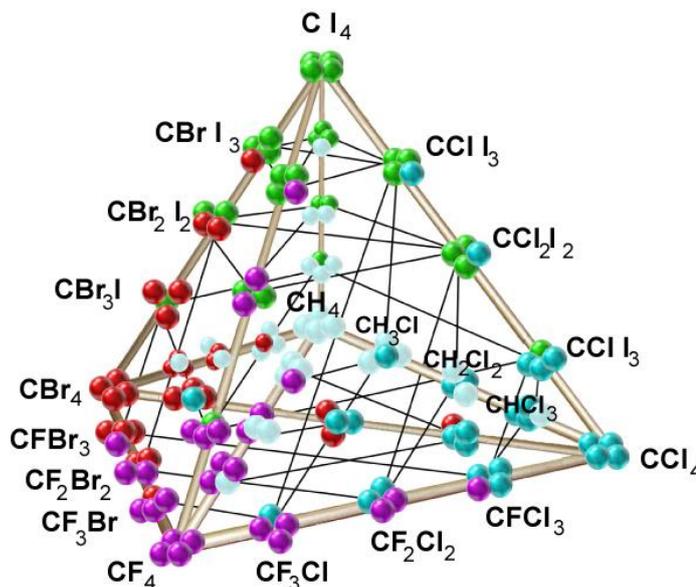


Fig. 5. This is an illustration of all possible combinations of 5 different objects (H,F,Cl,Br,I) with 4 repetitions. Building such a structure allows for more intuitive form to submit a combinatorial nature, such as the family of halogenated methane.

Placing the system of the homologous series of halogenated methane in the space of physical and chemical parameters, we obtain a distribution with great predictive power [10],[11],[12],[13].

Based on the combinatorial principles the system of homologous series can be constructed for codons (Fig. 6):

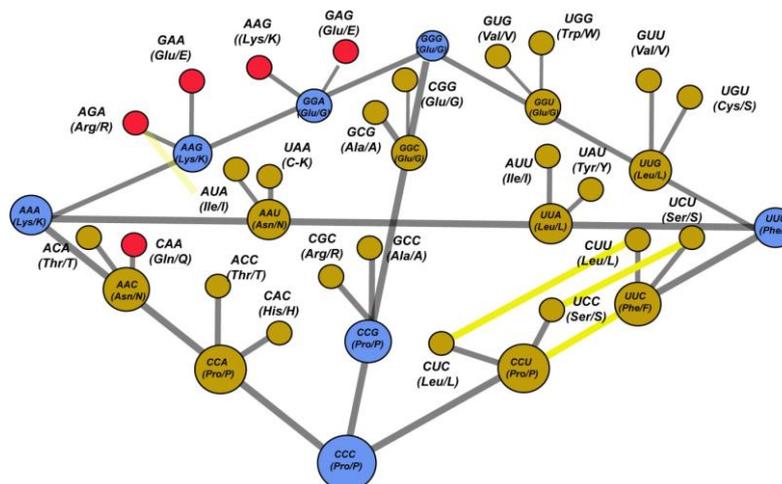


Fig.6. The formal structure of homologous series of codons. Codons, specify which amino acid (in brackets) will be added next during protein synthesis..

This representation is better than the conventional tabular famous artificial variants [14].

- First, a representation of Systematics codon is in line with the combinatorial mechanism of evolution of the Material World. And in the educational process this fact must be constantly emphasized .
- Second , this form includes the presentation and image Homology [4] in genetics (mutations) - general scientific predictive mechanism for the evolution of the Material World .
- Third , placing combinatorial aligned homologous series of codons in the space of physical, chemical and biochemical parameters shows very interesting mutational and biochemical patterns in which geneticists have yet to understand.

2.3. Combinatorics, Homology and Symmetry

To complete the "First Educational Rod" we must answer the sacramental question of all students: Why do we need this?

Those who are going to engage in the natural sciences, I can recommend our article [6], [7], [8], [9] in which the Unitary Symmetry for combinatorial objects has been found. This Parametric Symmetry (detectable in the parameter space objects) is very similar to the geometric symmetry, to which we are accustomed from childhood, looking at herself in the mirror. Of that and other Symmetries following the conservation law.

For other readers, I recommend to try to delve deeper into submissions of evolution, adaptation variability and adaptability.

Furthermore,

1. Conservation laws simplify the calculations of the parameters of objects.

For example for baryons Law of Conservation for the Rest mass (RM) can be written in such the form:

$$RM(dss) - RM(dus) = RM(uss) - RM(uus)$$

For halogenated methane's the Law of Conservation can be written in such, for example, the form:

$$[J(CH_3 F) - J(CH_3 Cl)] - [J(CH_3 Br) - J(CH_3 I)] = const,$$

where J - a physical or chemical parameter of the molecule.

Similarly can be written the Law of Conservation **for mixtures**: Consider two substances A and B. choose a concentration step of 10% of each of these substances. In this case, a mixture thereof can be represented as the homologous series:

$$A(100\%)B(0\%) - A(90\%)B(10\%) - A(80\%)B(20\%) - A(70\%)B(30\%) - A(60\%)B(40\%) - A(50\%)B(50\%) - A(40\%)B(60\%) - A(30\%)B(70\%) - A(20\%)B(80\%) - A(10\%)B(90\%) - A(0\%)B(100\%)$$

The same homologous series can be written for any number of components:

$$A(a\%)B(b\%)C(c\%)D(d\%)E(e\%)...$$

where $(a\%)+(b\%)+(c\%)+(d\%)+(e\%)...= 100\%$

Then the 5-component mixture can be written:

$$J [A(a,b,c,d,e)B(a'b'c'd'e')C(a''b''c''d''e'')D(a'''b'''c'''d'''e''')E(a''''b''''c''''e''''')] - J [A(a_i,b_i,c_i,d_i,e_i)B(a_i'b_i'c_i'd_i'e_i')C(a_i''b_i''c_i''d_i''e_i'')D(a_i'''b_i'''c_i'''d_i'''e_i''')E(a_i''''b_i''''c_i''''e_i''''')] = const,$$

where in parentheses are the equivalent fractions of the components, and J - physical or chemical parameter of a mixture of components that do not form chemical bonds among themselves.

Moreover, the smaller the concentration step is chosen, the more accurate will be the equality.

2. Homology system fixes the object at the intersection of several homologous series:

This intersection of several homologous series in one point (CFClI_2) shown in Fig.7.

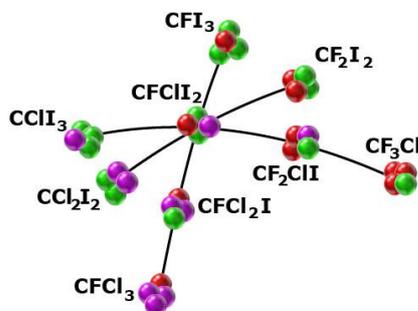


Fig. 7. One of the knots of system of homologous series of halogenated methane. Thus, there is a mutual self correlation position of the molecule in the space of its physical and chemical parameters.

In fact, the combinatorial network of homologous series is the basis for creating databases of physical and chemical parameters for the objects that make up such homologous series. This network allows you to:

1. easy to find errors in the experimental or calculated data.
2. predict new values
3. to form a mutually agreed database

So, combinatorial homology representation laid simple rule of thumb :

- Any set of all material objects (Homologs) interacting in a confined space, form Combinatorial Compound.
- Under certain environmental conditions Combinatorial connections become long-lived combination.
- These Combinatorial Compound (been a Homologs) become a set of objects that interact to form a compound of the following combinatorial complexity level of combinatorial compounds.

III. Educational Equipment and Tools

Of course ideas about symmetries (conservation laws), combinatorics (Nature's Way through the method connects and disconnects - trial and error) and Homology (evolutionary course of development) are not accustomed to the vast majority of teachers. But these ideas need to acquaint to the children. Because these ideas already found and are widely used in various fields of human activity from nuclear physics to sociology.

3.1 Signal System of Higher Nervous Activity

The process of cognition is formed by nature and consists of a sequence of formation of the signal systems of higher nervous activity.

Development of all life on earth was going on the way of forming response of the organism to external stimuli. This response began to call signal system - a complex of reactions to external stimuli.

Signaling system based only on the unconditioned reflex (which, in turn, based on survival instincts), I call **Zero signal system**. Zero Signal System - the basis of the development of living organisms.

Signaling system based on conditional and unconditional reflexes, called **the first signal system**. This is what we have in us as impressions, feelings and views of the surrounding environment, as the total for the whole of nature and of our social live, excluding word audible and visible. This is the first signal system of higher nervous activity,

common to all animals.

Signaling system based on the sounds and images, as well as visual stimuli and their images are called **the second signal system**. It appeared in the higher animals (humans view lemon creates external reaction to acid). Second signal system is the basis of individual human development.

Signaling system based on behavioral, which in turn formed the sounds and images of the environment, I call the **Third signal system**. It includes such control factors of "social images" - as the "conscience", "honesty", "loyalty", "betrayal" and other cultural priorities. Third Signal System is the basis of human social development

Here is the "layer cake" Signaling systems of higher nervous activity and is the basis of the learning process [15], [16].

3.2. Educational equipment and tools, based on the sequential development of Signal System of Higher Nervous Activity - From the Unconscious to Creative

From the first day the birth surrounds us a huge amount of information. This information is available to us mainly through hearing, sight and touch. Part of it is fixed by brains on an unconscious level. But under certain external influences Unconscious information may provide an important basis for conscious information. And this, in turn, connect with other Conscious information may lead to a new, creative, product.

In other words, if you want the baby

- «Zalyalyakal" in determination of the Nature time. To do this, you must "lyalyakat" with him, at least two to three hours a day.
- Spoke separate nouns in the time allotted by Nature. To do this, you must understand how the transition "Zalyalyakal-Spoke". To do this, you must follow his finger to say the names referred to them Items.
- Spoke connecting the words together for two or three To do this, you must understand how the transition of the "Speaking by separate nouns - Spoke related words". To do this, you must pronounce related words.
- Spoke meaningful phrases. To do this, you must understand that a meaningful phrase in the child's head is born as a result of connection "prior knowledge" and "momentary way." You must understand that the extensiveness of "prior knowledge" will depend on meaningful phrases.

But «Previous Knowledge" laid by surrounding of the child objects. If the cradle will hang over only one color balls later The baby will begin to understand different colors much later . If the child sees in the crib only one plush cat, later The baby will begin to understand variety of wildlife. If the The baby on the playground rides only by whirligig, then later he will begin to understand the variety of possibilities and mechanisms of movement in space.

Should distinguish between two directions in learning - Learning and Education.

Learning is limited, mostly by levels of "to do so", "Do as I do" or "Do It."

This implies that the teacher should (should be able) to first show, and then only require to reproduce. And in the final phase - offer personalized reproduction, i.e. make something by themselves in the process of reproduction.

Learning process involves the use of already known techniques, demonstration materials, models and programs.

In this case, you should keep in mind the following structure tools:

- tools designed for "unconditional" perception - posters, pictures, reliefs, sculptures, models, light installations, game (sports) training sites, etc.
- tools based on direct contact with the "Master" in the dialog mode - computer programs, educational games, educational films, school plays, ecological hikes, experiments in the classroom and outdoors, layout, museums, theaters, exhibitions, lectures and seminars, etc.

Educational process involves commands of teacher - "We can do so, but you can find another option to achieve the goal."

Mandatory element of the educational process must be the question "how to find additional information to confirm the correctness of the chosen solution". At the same time, someone from the students may appear "innovative" approach. This should immediately encouraged and rewarded by individual education plans.

The educational process aims to use a proven path as only as a basis for more effective ways to achieve the goal.

Common to the Learning and Educational process is the perception and use of new information. The difference - or strict adherence to known rules and methods, or performance with the sample "mutation" options.

So Who to Educate? Of course those who still may be educated, formed in a shape to sculpt. Others can only teach. Although, of course, there are intermediate forms between "Educate and Teach."

Such a series of intermediate types "can only be Educated (E)» and «can only be Learned (L)» is presented below:

EEEE – EEEL – EELL – ELLL - LLLL

You can continue to joke, suggesting that a combination of «EEEE» corresponds very creative individual. For these students, one of Goals of Knowledge is to find a certain General Law of Nature, from which flowed to all other laws and regularities.

Because:

Knowing some principles easily compensates ignorance of some facts (a defense mechanism - to minimize the amount of protection) - **Claude Adrien Helvetius**.

He remembers almost nothing. But everything quickly deduces.

Combination «LLLL» corresponds to individual, for example, working on a conveyor assembly machines. Taught him five screw nuts and he does it with success. An extreme interpretation of a combination of «LLLL» - it's a robot.

The conclusion from this joke is: To form can only individuals capable of getting information correlated with their genetic program (adaptation) and run adaptive process adapts the individual to new information. Children locate in the above series indefinitely. Their identification as changes depending on genetic bookmarks and depending on external influences of the social groups (Parents , caregivers and teachers) . Over time, each individual takes a certain "form" and gets its combination «EEEL», or «EELL», or «ELLL».

With age, the ability for education reduces in favor of Teaching.

3.2.1. Baby cot - classroom number 1

If you want your child to develop active and versatile, connect the child to the educational process not only through the subjects perceived him through conditional reflex action - played with dice, praised, but also objects of a higher educational level, which until some time the child will be perceived "moving eyes "as the sky, as air ... Based on the course of unconditional reflex activity. Start with "Learning cot", "Teaching floor", "Learning Wall" ...:

The most common objects and images used as educational tools are drawn (separately) animals . There is information about the appearance . No traces of generalization and building laws - educational potential is almost zero .

And this is the wrong way !

Much more useful to present some initial classification of the) animals. On the walls of the bed can be placed illustration of one of the basic laws of nature (as an introduction to statistics) - a normal distribution . On parts of the crib can be placed visible portion of the electromagnetic spectrum , geometric shapes , etc. (see Fig.8)



Fig.8. Educational Baby cot allows you to submit your child for the first unconditional perception patterns. This incredible poster presents a tremendous amount of information in an easily understandable way. Along the left edge, the major milestones (physical developments) of vertebrate evolution are shown and described.

The milestones are marked on it to show the resulting animal clades. The beginning and end of each branch shows when they lived; the thickness of the branch indicates their relative abundance or scarcity during each geological period. 119 species are shown, all in the proper geological period. This makes it easy to see which animals lived at the same time. Interesting insets explain everything. [17]

Besides the visual training aids can be developed a set of music that can be an alarm a signal corresponding to the appearance of a parent, etc. In all 15 basic disciplines we have developed similar training materials.

If you want your child to success, place it in a learning environment and partially free yourself for other concerns and affairs.

3. 2. 2. Children's room - language lab

Do you remember your first encounter with the words ? First - strange sounds. The child correlates the sound with "image - subject" . Then the "image -subject" correlates with the "smell - subject" , the "feeling - subject" .

Later came the "Pointlessness Era Sounds" - air, heat - cold, good - evil ... At this time children begin to perceive really nobody to Big Man . He says "Objectified and Nonobjectified Sounds and correlates them with the outside world of children , according to his feelings.

Did you notice that I (and all of us - parents and teachers) have missed one very important step - a simple correlation Sound Cipher - lines indicates a sound . Line - the letters in the form of a set of lines - the words must be in the child's surrounding objects !

Stick around for all baby items Stickers : chair, table , painting , basket, wall lamp Will be more useful if the words to write in two languages.

In order to begin to teach a child to combinatorics place in the room poster with anagrams (An **anagram** is a type of word play, the result of rearranging the letters of a word or phrase to produce a new word or phrase, using all the original letters exactly once; for example "orchestra" can be rearranged into "carthorse")[18].

When the child attains a certain vocabulary, can be discuss with him how the meaning of words and the image of the permutation of letters.

Raise your child to a more complex educational level. After that it will be easier to learn a lower level:

"Who does not know any foreign language does not know his own" - this phrase attributed to Johann Wolfgang von Goethe.

Study fully support the idea of Goethe: language acquisition raises native language of the child to a higher level, as the assimilation algebra raises to a higher level arithmetic thinking, allowing to understand every arithmetic operation as a special case of algebraic, giving more free abstract and generalized, and thus more deep and rich look at operations with specific amounts.

And even the following poster, located somewhere on the wall begin to teach a child at the level of unconditioned reflexes in systematics (Fig.9)

:

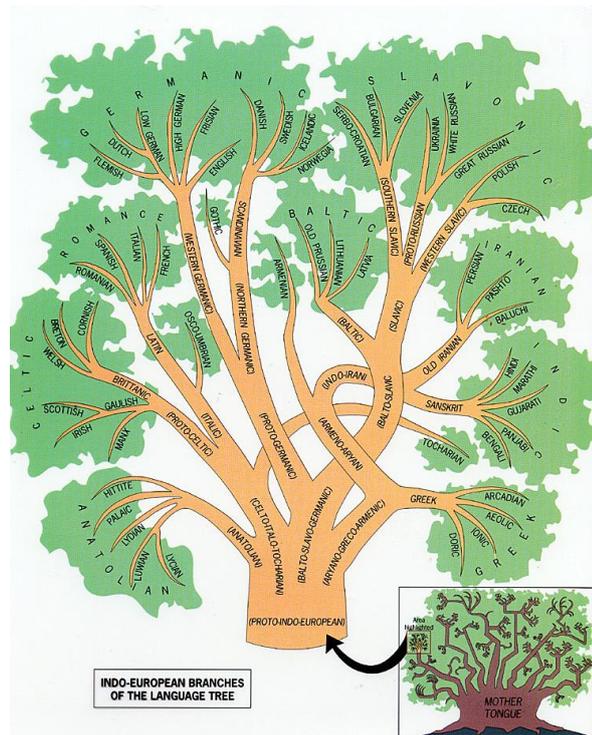


Fig. 9. Indo-Europeans Branches of the Language Tree [19]

3. 3.3. Playground - classroom "Open air"

What are their playgrounds yourself ? Set of swings, roundabouts , slides , etc. There are also more advanced tools [20]. **But all these structures only develop motor skills of children.** Playground - a real educational polygon. Educational potential of the vast majority of playgrounds stood at zoo inhabitants. Physical development of children today is largely due to swings, slides and roundabouts.

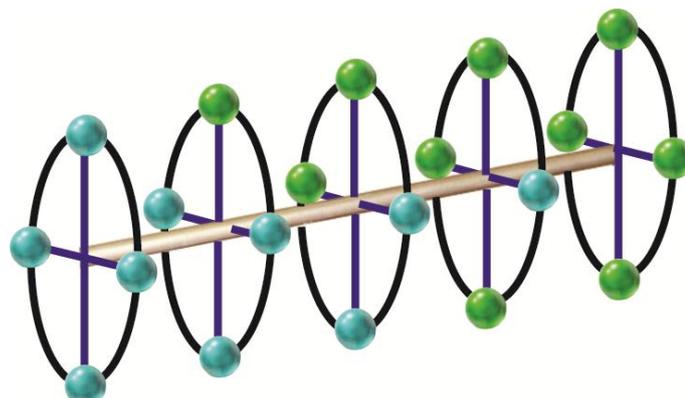
I greatly improved these structures. They appeared scientific basis.

3. 3. 3.1. Easy "Climbing - homology"

I will focus here on only one direction - the creation of training playgrounds.

As I have proposed the concept of Education Playgrounds a major role played by the representation of Combinatorics and Homology.

Here is the simplest representation of Homology for Playground (Fig. 10)



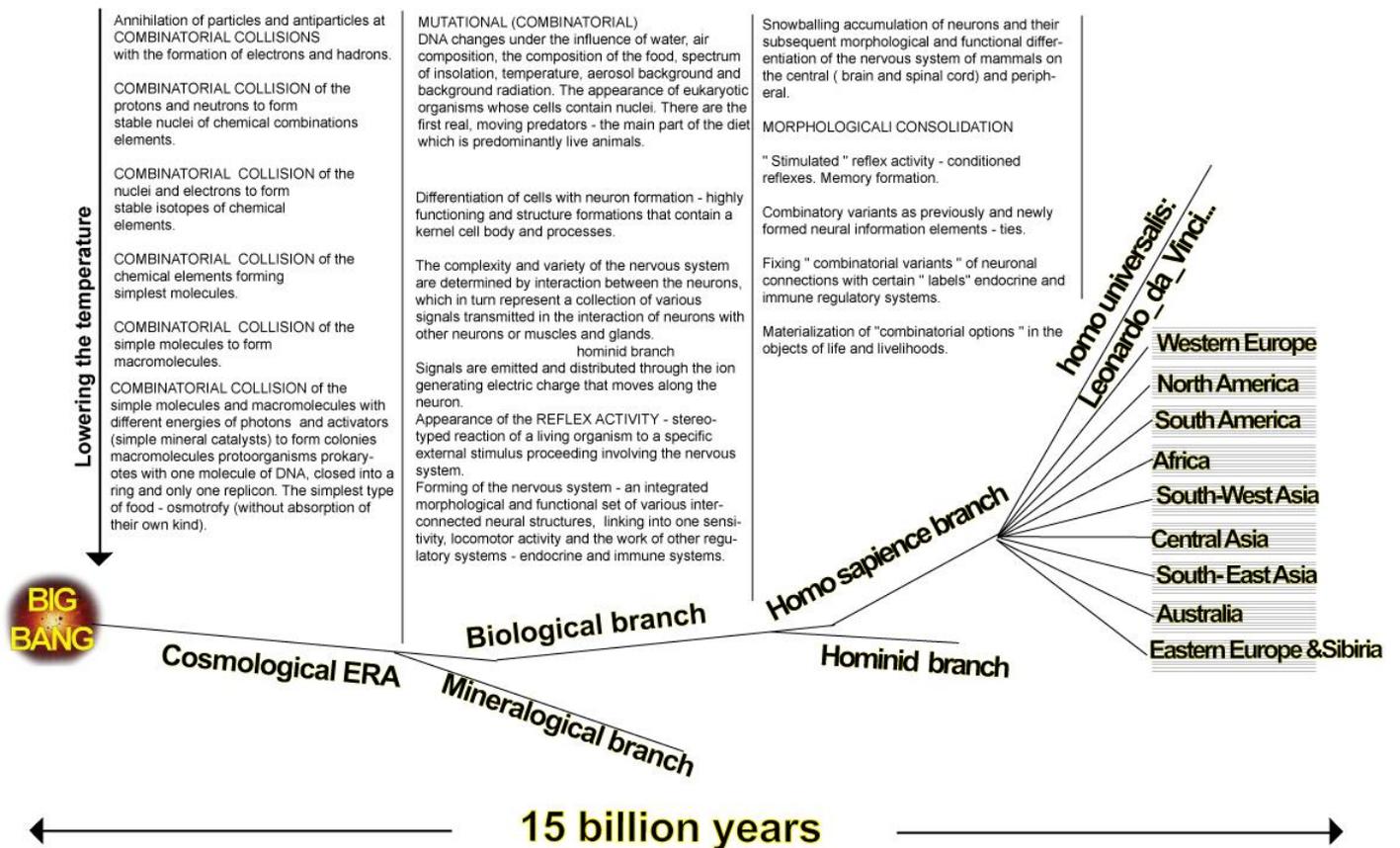


Fig. 12. On this poster shows a combinatorial interpretation processes occurring in our galaxy and in particular in the world during the cooling clot matter after the Big Bang . Here (right) - evolutionary events that took place in Western Europe . Next - evolutionary events in North America , the evolutionary events that took place in South America , the evolutionary events that took place in Africa , the evolutionary events that took place in South-West Asia , evolutionary events , taking place in Central Asia , the evolutionary events in South- East Asia , the evolutionary events that took place in Australia and Islands , the evolutionary events that took place in Eastern Europe and Sibiria.

Why is "reasonable" branch was " territorial cleavage " on different ethnic groups ?

It is known that the formation and development of all life on earth is defined by seven natural factors:

1. composition of drinking water (w)
2. composition of the air (a)
3. food composition (f)
4. range of insolation (i)
5. temperature regime (t)
6. aerosol background (s)
7. background radiation (r)

Seven factors (w, a, f, i, t, s, r) according to their percentage composition in natural combinations led to the formation of all ethnic branches of Homo Sapiens. And to this must be drawn into children from an early age. This - path to racial tolerance.

SCIENCE TREE (BIOLOGY TREE)

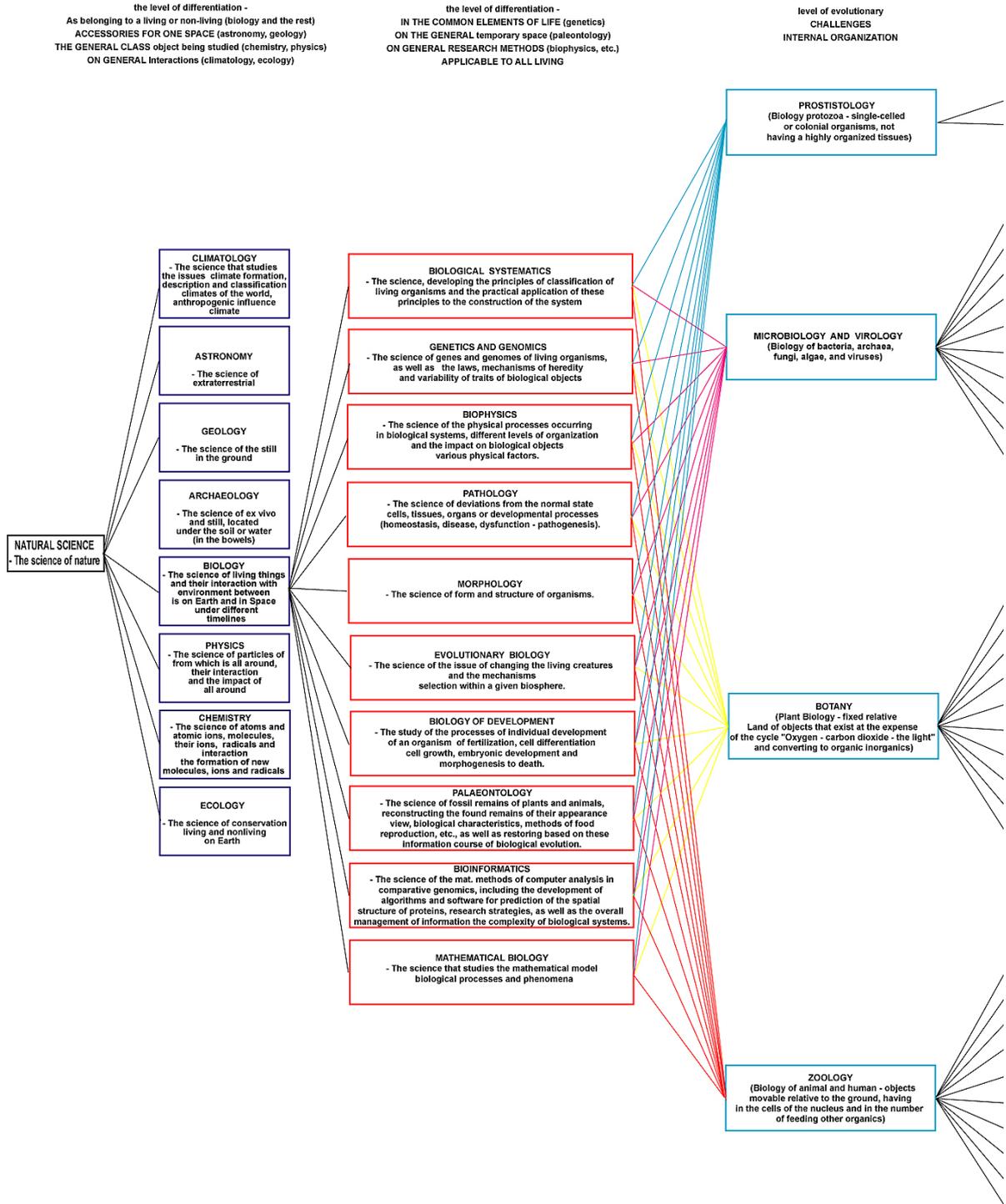


Fig.14. Biology Tree

Below is an location example of such posters (Fig.15).



Fig.15. Examples of arrangements of posters on the walls of the school corridors

What is the usefulness of such posters?

Deliberate step in a child's education will make it easier.

4. Summary

- proposed Spiral system of teaching children from 3 to 17 years
- developed and proposed a new form of combinatorial operations associated with the concepts of Homology and Symmetries
- proposed a new definition of Homology and shows its difference from Analogies
- proposed a combinatorial representation of chemical elements and their isotopes and ions
- proposed the possibility of constructing self-consistent databases on the basis of representations of the Unitary Symmetry of atoms and molecules
- proposed layouts " Educational children's room ", " playground Education " and " Educational school corridors "
- proposed a fragment of Science Tree, for example Biology Tree

This knowledge will help students and teachers achieve three major objectives: **to familiarize students with a growing amount of information for a very limited time of the learning process , to teach children analytical thinking, to create tools and techniques to address the first two problems.**

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