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METHODOLOGY OF MULTIMEDIA TECHNOLOGIES IN EDUCATION IN THE TEACHING OF MATHEMATICS.

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Annotation
Today, multimedia technology is one of the promising areas of informatization of the educational process. Improvement of software and methodology Software, material base, as well as compulsory professional development the teaching staff sees the prospects for successful application of modern information technologies in education. Multimedia and hypermedia technologies combine a strong distribution of educational resources, they can create an environment for the formation and manifestation of communicative core competencies, primarily containing information. Multimedia and telecommunication technologies open up fundamentally new methodological approaches in the general education system.

Keywords: Multimedia technologies, CD-ROM and DVD, hypermedia, software, multimedia projectors, resident catalogs, automated, visual-sensory information, educational information, interactive multimedia.

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Hypermedia is the movement of computer files between multimedia objects that are linked via hypertext links. Internet technology for the organization of computer classes in schools is attractive, but has the advantages of access to relevant information, the ability to organize a dialogue with almost the whole world, they have serious drawbacks: difficult to work in large volumes data (and, for example, the abundance of RF in remote areas and rural areas), the impossibility of working without communication lines. These shortcomings are overcome by the use of optical CDs called CD-ROMs and DVDs. Existing software products, including ready-made e-textbooks and books, as well as proprietary changes, allow the teacher to increase the effectiveness of teaching. Communication with colleagues, an integral teacher's assistant as a tool in finding and receiving information, becomes the Internet.

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successful application of modern information technology in education. Multimedia and hypermedia technologies combine a strong distribution of educational resources, they can create an environment for the formation and manifestation of communicative core competencies, primarily containing information. Multimedia and telecommunication technologies open up fundamentally new methodological approaches in the general education system.

Multimedia-based interactive technologies solve the problem both on the basis of Internet schools and at the expense of rural school "regional studies" interactive CD-ROM courses and the use of satellite Internet in schools. Multimedia is the interaction of controlled visual and audio effects using modern techniques, interactive software and software that combines text, sound, graphics, photos, video into a single digital representation.

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The use of multimedia technologies can be recommended to the following main methodological features of the organization of teaching modern school students

1) Lessons with the use of multimedia presentations are conducted in computer laboratories multimedia projectors, resident catalogs, automated training systems, video recordings of various programs, etc .;

2) In practical classes each student should be allocated a computer, called the class code, which is appropriate to create his personal folder, and the name of the student;

3) Individual approach, which should be widely used, including individual training programs, multi-level task bank (day) practical exercises and laboratory work);

4) It is advisable to conduct a significant part of the training in the form of business games; as assignments should be highly variable and undelivered in real life

Tasks, especially activities that graduates meet professionally;

7) The project method should be widely used, within which the necessary principles of consistency and continuity should be observed; this means that the global task must be performed consistently in all practical ways (laboratory) and a complete system consistent with the completed and expanded computational and graphical work;
8) The main sections of the program, which should provide the opportunity for parallel and concentric learning; this allows students to master the course without losing integrity, gaining an increasingly in-depth knowledge of each section, the presentation of all materials;
9) It is necessary to rely on the following interrelated principles: cognitive motivation; multifaceted perception; "penetration" system-information analysis;
10) The problem-based teaching method should be used more widely, students of real programs (documents, tables, databases) that can be developed are used in the learning process.

The use of multimedia technologies in the educational process has the following advantages compared to traditional teaching:
1) Allows the use of color graphics, animation, soundtracks, hypertext;
2) Provides the opportunity to be constantly updated;
3) Low cost for publication and reproduction;
4) Allows you to place interactive web elements in it, such as tests or workbook;
5) Provides an opportunity to copy and transfer copies for quotation;
6) Bridges that allow the material to be non-linear due to the majority;
7) Build bridges with additional literature in electronic libraries or educational sites;
Multimedia allows you to combine verbal and visual-sensory information to motivate readers, to help create a realistic approach to learning.
The organization of classroom lessons using multimedia technologies provides an opportunity to save time, thereby enhancing the presentation of educational material, using the very simple tools available to any student. Throughout the lesson, students can create their own visualized colorful learning and play environment to the limit, which has a truly revolutionary impact on perception of the topic.
"Informatics" of school students. Multimedia computer technology allows the teacher to quickly combine different tools for deeper and more conscious promotion, mastering the learned material, saving lesson time, filling it with information. The introduction of multimedia technologies in the teaching of modern computer science course highlighted a number of positive aspects and several difficulties. Thus, the organization allows you to accurately demonstrate the capabilities of the software

being studied in the lessons using multimedia technologies using a special projector, saving time and saving material, thus activating the presentation of education. However, there will be additional requirements for preparation.multimedia materials and lesson organization. The introduction of information multimedia technologies makes the learning process more technological and efficient. Yes, there are challenges along the way, there are mistakes, you can't avoid them in the future. But there is also a major success - the interest of students, their readiness for creativity, the need to acquire new knowledge and a sense of independence. Computer lessons allow you to differentiate between them. This constant sense of novelty increases the interest in learning.

Thus, interactivity, structure and visualization of information from multimedia in the classroom increase the motivation of the student, his activity is a cognitive activity at both the subconscious and subconscious levels.

Work on the Internet among all information channels. The most powerful, so its use is more advanced in multimedia in education. However, this does not negate the importance of other media. For example, the effectiveness of mastering the material significantly increases the creation of its own rhythm for each multimedia textbook dominants with the optimal choice of musical accompaniment. The fact that the keyboard and mouse work together with others in thoughtful multimedia textbooks adds another advantage of this educational technology. This is based on the fact that manual exercises significantly develop memory. It is no coincidence that contour maps were drawn in high schools before - I remember to "fill in" the hand and do better. If an increase in standardization of use in the future is achieved (minimization of random keys), then it will be easier to formalize the dots associated with the mouse and the keyboard. Here we must rely on research in the field of engineering psychology and pedagogy. Individual works of the individual author's consciousness (text, pictures, audio series, video) are integrated into a new system. Interacting with each other is already the stage of script development (a product designed to calculate all the expected functions), they lose independence. As a result of this interaction, multimedia work acquires such qualities that there is no individual work. The fact is that science (linguistics, art history, etc.) has now begun to study multimedia environments that have accumulated knowledge about these particular information forms and properties. As a result, multimedia education is to some extent effective when using them is an educational task - to teach something, to develop skills in working with something. There is no doubt that multimedia technologies, especially

elementary or higher mathematics, enrich the learning process, making it possible to make learning more effective by involving educational information in the process of perceiving most of the emotional parts of the student. Thus, according to G. Kirmeyer [4], for the use of interactive multimedia technologies in the learning process, the share of assimilated material can be up to 75%.

Perhaps this is a clear optimistic assessment, but it was known long before the advent of computers, when both the visual and auditory components were involved in the process of perception and vision, to increase learning efficiency. Multimedia technology is the ability to track the appearance of learning from static to dynamic, i.e., the processes learned over time. Previously, such an opportunity was only available on educational radio or television, but this field of view has no aspect related to interactivity. Develop while simulating processes, change the parameters of these processes interactively, which is a very important didactic advantage of multimedia learning systems. Many educational tasks related to the demonstration of all the pleasantly studied events cannot be carried out in the classroom, in which case multimedia tools are the only thing available for today.

Experience in the use of multimedia technologies shows the following:

• Students' interest in work and their activity increases sharply;

1) develops algorithmic thinking style, the ability to adopt optimal solutions, change behavior;

2) The teacher gets rid of the mass of regular work, is given the opportunity to creative activity based on the results obtained.

Methods of developing didactic assistance in the use of mathematics lessons multimedia technologies

1) Features of the preparation of educational multimedia presentations should be taken into account in the preparation of educational multimedia presentations parties, general didactic principles of creating training courses, requirements, psychological features of perception of information on the screen and others printed basis (because any text that can be printed using a printer), ergonomic requirements and, on the other hand, the maximum use of opportunities, modern information technologies that provide us with telecommunications network applications. Naturally, it is necessary to begin with the didactic and cognitive goals and objectives for information technology tools - the essence of the tools for the implementation of didactic tasks.

In other words, the effectiveness of multimedia presentations depends on the quality of the materials used (training courses) and the skill of the teachers involved in the process. Therefore, the pedagogical, meaningful organization of multimedia presentations (both at the design stage of the presentation and in the process of its use) is a priority. The importance of conceptual pedagogical rules stems from the need to build a modern lesson using multimedia presentations. Consider the following when creating multimedia presentations

Requirements: Motivation. Motivation is a necessary part of this learning and is maintained throughout the lesson. This is a clear goal set for school children of great importance. Motivation is rapidly declining if the level of tasks set does not match the student's level of preparation. Defining the purpose of education. The student should know from the beginning to work on the computer and what is required of him. The student will need to systematically understand and clearly express the specific goals of the learning process in the course of the lesson. Creating the necessary conditions for the understanding of the learning material. Creating Prerequisites for Understanding the Learning Material can be aided by auxiliary materials (student guide) included in the textbook or a manual prepared by the teacher. Presentation of training material. Material enrichment strategy is determined depending on the educational tasks solved. An important issue is the display screen for registering assigned employees. Certain principles of reading should be used. Assessment: A learning material that students need to know how to deal with when working with a computer. The most important thing is to organize a "Student-Teacher-Student" dialogue. For these purposes, it is recommended to organize the work of school students in projects or "collaborative learning" discussions.

When creating a multimedia presentation should take into account not only relevant, but also the principles of classical didactics, as well as the specific principles of use of computer multimedia presentations. A study of the works of the classics has shown that teacher-multimedia producers 'presentations are useful, for example, the recommendations given by F. Diesterveg, "A Guide to the Teaching of German Teachers". They remain very relevant with the most modern pedagogical technologies of our time. Here are some of them: - Divide each material into specific steps and small prefabricated parts;

- at each step, indicate the individual parts of the next material and avoid significant interruptions, bring specific information to stimulate it, the student's curiosity, dissatisfaction with it, however, in full;

- Distribute and organize the material, the next step, if possible, while learning a new one, repeating the previous one.

You need to be covered with material. The use of well-known brands or (reputation) is an interest that can lead sources, brands and concepts to treat people more. Use different graphics, animations and simulations to help increase the attractiveness of online courses.

The use of multimedia technologies for the creation of electronic materials determines the specifics of the laws and sets certain requirements for approaches and methods of development.

Multimedia teaching aids are designed to help the teacher and allow the material to be presented easily and clearly. Even the simplest software graphics tools are extremely effective tools.

A skillful presentation can capture and arouse the audience's interest in learning. However, it is a presentation about special effects that do not take a person and do not abuse them from the outside. If you are overreacting in the preparation of the presentation, then reduce the overall effectiveness of the presentation. It is necessary to find such a balance between the served material and the influences that will literally "sit" your students "This rule applies to all multimedia presentations in general, but in particular: in the educational process for presentations.

2) Designing a scenario for a multimedia presentation when creating a scenario diagram and creating a multimedia text accompaniment, the presentation should be based on the following principles:

- The presentation should be short, clear and compositionally coherent. The duration of the presentation with the scenario should not exceed 20-30 minutes. For the demonstration, you need to prepare about 20-25 slides (showing one), the slide lasts about 1 minute, as well as time to answer questions from the audience).
- Demonstration parties to return to them from time to time to highlight the various aspects of the topic that need to be highlighted in the presentation of the material. This will ensure that the information is received correctly by your audience. No. If you want to be internal, if you are afraid of repeating your idea, instructions on how to create an effective presentation The following idea will help you work on your presentation.
- Before you start working on a presentation, understand what you want to talk about to get the full results.

- There should be nothing superfluous in the presentation. Each slide should reflect the desired link in the story and work on the overall idea of the presentation. Unsuccessful slides need to be merged, moved, or deleted with others altogether.
- Use predefined templates when choosing a character style and background color. No be afraid to be creative. Experience creating graphics and creating special effects.
- Do not overload slides with unnecessary details. Sometimes a solid is better than a solid
a slide to present a few simple things. You don't have to try to "push" a single slide with too much information.
- Additional effects should not become a goal in themselves. They should be minimized and used only to draw the viewer's attention to the key moments of the show. Audio and visual effects make no sense to come forward and hide useful information
A multimedia presentation should have the following qualities:
- Convenient navigation system that allows you to easily navigate through the presentation
- Use of multimedia capabilities of modern computers Internet (graphics additions, animation, sound if necessary, etc.).
- Divide the lesson into small logical closed blocks (slides).
- Each slide in your presentation should have a title.
- References to literary sources, electronic libraries and sources, and information on the Internet.
- Process - fast loading without complicating effects. When creating multimedia presentations, you need:
- Divide the lesson into small semantic parts - modules. Each slide should have a title; For each module of relevant expression and presentation, the selection should include a section title, texts, pictures, tables, graphics, sound and frames, and so on. (according to the content);
- Modeling the cognitive activity of students in the study of the section and the use of the results in its compilation (the main sequence of transitions between slides);
- Designing ways to strengthen knowledge and skills and implement feedback
communication (task selection, control questions, modeling, development assignments
methods of analysis of answers, copies of common incorrect answers, compilation tips (help));
- compose texts, draw pictures, tables, diagrams, pictures, video sequences,

In accordance with the requirements of ergonomics; with the location of the modules in each section of the course ergonomic perspective.

Each module includes a maximum of:

- Objectives of the study of the psychological mood text module
- Questions to read
- educational material
- A set of key issues on the topic of the module
- The best works of the students of the previous group
- New works of students
- Questions for self-examination and reflection (preferably with answers, comments and suggestions with comments)
- Block diagram of the module
- List of publications for the module and links to Internet sites on the topic of the module.

When creating multimedia presentations, its features should be taken into account. Perception of information from a computer screen. It is important to maintain a consistent presentation style throughout the lesson and strive to unify the structure and form of presentation of the learning material (integrating the user interface, using graphic elements, creating lesson templates). It is recommended to use standard fonts - Times, Arial. It is best to limit yourself to using two or three fonts for the entire presentation. For example, the main text presentation font is Times New Roman, the slide title is Arial. It is advisable to use different markers (etc.) to highlight elements of text (marked lists).

For example:

Text1
Text2
Text3
Text4

It is recommended to use color in the presentation, it is most effective to highlight individual parts of the colored text and individual cells of the table or the whole table in color (background) cells or table background. The whole presentation is usually done in a single color palette

based on a single template. It is important to make sure your presentation can be read from a computer screen. Texts presentations do not have to be large. It is recommended to use compressed, informative method of presenting the material.

When creating a multimedia presentation, you need to solve the problem: the maximum saturation of the product, the simplicity and transparency of the organization of the training material for the student to ensure the maximum.

One way to solve this problem is to limit both ways of presenting this education

A set of material and navigation objects. In this case, the student quickly masters, in the future the features of this presentation interface will not distract him, focusing all attention on the content of educational information. When creating a multimedia presentation, the teacher faces a number of difficult tasks:

- The need to create a simple and intuitive interface, educational information is visually combined with navigation tools;
- Determining the structure and form of presentation of educational material in accordance with the established pedagogical goals.

The main purpose of the proposed approach is to focus on the study of the organizational process, the content and presentation in the most convenient form for the student to understand.

The important point is to choose a general presentation style. When defining a presentation class, it is easier to choose the category of audience, the style. To make the right choice of style, you need to know the principles of ergonomics, presentation of ways to use some components of multimedia in practice. Given this step, you can analyze the presentations in more detail, suggesting ways to identify their shortcomings and eliminate them.

You need to be able to adapt, engage, and retain as much information as possible in as few words as possible. Just copying and pasting data from other media is no longer enough for a presentation. Once the “zeb” is given, you can start developing the structure of the presentations, creating a navigation scheme, choosing more tools, the levels correspond to the essence and level of the lesson. An educational-methodical complex for multimedia presentation providing didactic functions was presented

The following requirements:

1. Highlight semantic accents that may accompany audio or video information for text fragments. To express heterogeneous or hypertext data, it is recommended to use a multi-window interface.
2. The multimedia presentation may contain additional materials and material for in-depth study of the topic.
3. The most important elements of a multimedia presentation should have tips or

Explanations. The main material of the presentation includes basic definitions of important dates in the history of mathematics and computer science, some comparison tables, properties of objects, and so on.

4. After reviewing each component of the study material in the presentation, include a material for generalization, which is more representative of the material studied.

5. The multimedia presentation should be open to development.

6. The text of the multimedia presentation should be copied, printed.

In preparing multimedia presentations, the teacher should use the Internet, modern multimedia encyclopedias and electronic options textbooks. Over time, the best multimedia presentations use them as a basis in the course preparation process.

You need to find as many contact points as possible when creating a presentation. Subject and "external" information flows. This will allow you to make a more interesting, relevant and exciting presentation.

The multimedia tools used in the presentation help to accomplish more effective collaboration with the audience. Plan and maintain in advance for all aspects of this.

Flexibility is one of the keys to a successful presentation. Be prepared to make changes along the way Presentations in response to student reactions.

The presentation can consist of two versions for teacher and student. Electronic presentation is constantly updated and improved with new materials. For his student the presentation is complemented by personal work. Modern software and hardware allow you to easily change the content of the presentation and save large volumes of information.

Stages of preparation of multimedia presentation: Development of educational material. Create an implementation scenario Develop a presentation design. Preparation of media fragments (texts, illustrations, videos, audio recordings) Test preparation of musical accompaniment. Techniques of using multimedia presentations. The forms and place of use of the multimedia presentation (or even a separate slide) in the lesson really depends on the content, the purpose of the lesson. Again, practice allows us to highlight some common, most common.

Effective ways to take advantage of such benefits:

1. When learning new material. Using visual aids that allow you to depict different things. The application is especially useful when necessary to show the development dynamics of the process.

2. In consolidating a new theme.

3. Computer tests to test knowledge are self-testing and self-awareness, it is a good incentive to learn, it is a way of functioning and expressing yourself. For the teacher, this is a way to control the quality of programmed knowledge, a method of collecting assumptions.
4. Deepen knowledge as additional material for lessons.
5. When examining frontal independent work. Oral visual control of the results provided.
6. In solving educational problems. Helps to complete the drawing, plan the solution and monitor the intermediate and final results Independent work on this plan
7. A means of emotional relief. Long consultations during block lessons or before exams - video screens of experiments should be added or cartoons at the same time students lose fatigue, curiosity, they seek answers, ask questions to the teacher and recharge with new energy they do.
Multimedia - programs are similar to video, but have the ability to interact, process actions and conduct dialogue.
8. Didactic material, codograms and maps as a means of preparing handouts. The personal computer in the teacher's hand, in addition to the scanner and printer, is the teacher's mini-typography.
There are three ways to use a computer in educational activities,
1) Car simulator,
2) As a tutor performing some functions, the machine is a teacher and therefore the machine can work better than a human.
3) A device that simulates a particular environment and the actions of professionals in it.
It is best to use training systems to consolidate previously acquired skills. It is best to use tutoring systems when the goals and objectives of the training are clearly defined. Modeling of simulation exercises is carried out in cases when the training material is not of a systemic nature and the most suitable limits for it are not clearly defined.
When using a multimedia presentation, it can be used in a classroom system or in newer models of its application.
The project method can be noted as the most promising pedagogical technology, which allows you to fully reveal the creative abilities of school students, the main thing is to form the ability to move in a sea of big information in the spotlight, take responsibility for yourself Take it upon yourself and decide that the project method requires the highest qualification for teachers, a creative approach to the school

curriculum, the ability to generalize knowledge on several topics and, of course, organizational skills. The use of information technology has given new life to a long-known design methodology that has been in the implementation of the project in school and, of course, in the development of materials for it. The main components of the project method are the research work of school students. and the evaluation of these activities is the best way of presenting all the means of multimedia learning in a variety of ways, including knowledge that encompasses all modes of perception. Working with multimedia tools, school students have the richest arsenal at their disposal for self-expression of the studied material. Multimedia is a more creative approach to the process of acquiring and presenting knowledge.

In this process, the planning and implementation of practical assignments-projects, which gradually complicate the educational system in which students acquire knowledge and skills.

One of the person-centered technologies is the method of organizing independence, student activities aimed at solving the problem of the educational project, the combination of problem-based approach, group methods, reflexive and other techniques.

In our opinion, the most advanced multimedia features are a means of learning to use them as an interactive multichannel in the educational process. Research in the education system, project-based approach school students, constantly develop their own multimedia hypermedia projects Use of multimedia for educational purposes in all disciplines General cultural and science teaching, traditional o The learning process that allows for change is evolving and evolving creatively. Information technology allows students to create a unique opportunity for themselves in the learning process, regardless of the teacher, learn a new concept, alert regularity, advance your hypothesis, how to feel math questions. The ability to use the project method is an indicator of a highly qualified teacher, his advanced teaching methods and student development. Not surprisingly, technologies are classified as 21st century technologies, primarily postindustrial societies adapting to rapidly changing human conditions. But it should also be noted that the project method can only benefit from the use of the right, well-thought-out structure to realize the personal interests of all participants in ongoing projects and projects. Teaching methods are closely related to the nature of the presentation and perception of information for both the learner and the educator. And in connection with this fact, it should be noted that the use of multimedia technology significantly affects the nature of the presentation of

information, and therefore there are opportunities to use methodological techniques like I on teaching methods - we are talking teacher-student interaction Or describe the text in which the presentation operation is incomplete but is presented to the student himself. Game teaching methods are widely used. Multimedia elements create additional psychological structures, contribute to the perception and memorization of material, for example, summarizing, adding a specific sound or tone that can be adjusted before each presentation trainee for a particular type of work.

The most effective use of combined teaching methods. It is recommended to combine both traditional forms of education in computer science classes (conversation, lecture, independent study, group lesson computer with visual demonstration) and various new forms (methods) of organization of educational activities, projects, small group work, game methods, extensive use of individual training programs, training tests). The use of the creative potential of interns is expedient and expedient. Organizing interns 'work on creating, developing, and designing specific web pages can significantly enhance their learning activities. This work, as a rule, is associated with deep inner motivation, which allows you to connect between teachers and students, to show intelligence and imagination, to express themselves in achieving the goal. Informatics teaching traditionally uses computer-based training programs for a number of reasons. First, one of the main producers of computer training was specialists in software informatics, secondly, the descriptions of official language algorithms allowed high-quality automated control of grammatical structures, thirdly, the content of a number of sections of computer science is well structured assists the office. The most effective and promising areas of Internet use are: interpersonal communication, search for more information about different educational disciplines, acquaintance with educational projects, and independent production of websites. Current research on the use of multimedia tools highlights the following issues: The study does not take into account personalized methods in the use of multimedia. In other words, the true individualization of based learning occurs only when the use of multimedia is compatible with the user style of the author of multimedia programs and the cognitive style;

- Communicative or socio-cognitive aspects of education are not taken into account. The emotional (and therefore motivational) effect on the reader is to provide effective communication that ensures the importance of the inclusion of graphics, video images and audio information does not solve the problem;

- the introduction of various types of media exposure (including audio, graphics, video, animation) always prevents listeners from improving perception, comprehension and memorization of information and sometimes due to noise;
- Willingness of teachers to use multimedia for free Due to low multimedia literacy (ability to implement), the rational choice of multimedia tools for the implementation of educational pedagogical goals, knowledge of multimedia, possibilities and modern trends training multimedia development tools for multimedia module meetings);
- The problem of rejection of existing programs and resources due to the process of reasons why multimedia programs are not enough for real education;
- The traditional use of multimedia as a new didactic tool does not allow educational systems to optimize the implementation of education, and the development of multimedia resources thus, traditional educational technologies should be replaced by new ones.

Information evolving pedagogical technologies. With their help, such pedagogical situations in the classroom, the activities of teachers and students, based on the use of modern information technology in research and dressing heuristic. In order to successfully implement these technologies, the teacher must have the skills of a computer user, the ability to plan the structure, the actions to achieve the goal based on a defined set of funds; describe objects and events through the construction of information facilities; organization of transfer and search of electronic data; clear and concise words problem, task, idea, etc. Currently, schools are creating conditions to address most of the above-mentioned problems. The essence of new information technologies has crystallized - information that creates conditions for the development of self-study skills by providing teachers and students with access to modern electronic resources organization of educational work, integration and updating of knowledge on various topics. Reform Modern education can be done electronically Sources of educational informationInteractive didactic options boards SMART Board Appliance Kit is a specially designed classroom system for the learning process and allows you to use it without changing the usual method of computer technology school conduct lessons. The interactive whiteboard primarily allows you to control the computer system, being directly next to the whiteboard. An important characteristic of your interactive whiteboard is its “dimensionlessness,” that is. All of the information written on this board can be stored indefinitely. All information provided on the board can be used throughout the course. The information that the teacher or student can return to the previous one at any time, as well as all the

information of the current lesson can be additional lessons that do not need to be used in the next. Unlike a traditional whiteboard, an interactive whiteboard has more graphic interpretation tools that allow you to improve the quality of the screenshots provided to highlight the images of the information provided to students, i.e.: a pencil for more colors, a pencil for each different shapes and thicknesses, as well as the ability to set different colors on the background of the board. An interactive whiteboard allows you to save time during the lesson in creating a variety of things, such as drawings, diagrams, charts, graphics, a large number of construction tools, geometric shapes. Another feature of an interactive whiteboard is the ability to store the data stored on it in a video format.

For example, you need to solve the problem later so that the problem you can fix is not a static end result, but the process itself to solve the problem from start to finish and at any speed. An interactive whiteboard can be used as an effective tool for creating educational and didactic materials: examples of problem solving, diagrams, charts, graphs, etc., both static and dynamic. All this material can be created directly in the classroom and then in the material, which can be used to explain the new material, with repetition, as well as simulators for individual work.

Identify the didactic features of the five interactive whiteboards from above, all the possible ways to use it: computer control, unlimited space, rich arsenal of fixing tools, on-screen information and graphic commentary images, ability to save recorded data in electronic form and then unlimited repetition, the ability to dynamically store information form (in a video file). Let's describe some of the techniques using a lesson example in the form of a math conversation or lecture in high school. As the teacher conducts the lesson, she writes the main points on the board, as if she were doing it on a simple board. An example of a solution to this problem could be a brief description of any concept, picture, table, etc. However, if it places, it will move to a new screen (page) and the board is no longer enough. Each page can be stylized as a logically completed module. During the course you can make additional notes or any changes by instantly returning to the previous pages.The number of pages is almost unlimited. When the teacher writes on the board, he can choose any color of the pencil and choose the thickness of the pencil, i.e. each page is in different colors and different styles that optional teachers can add clarity to the details. In his story, the teacher can use static graphics, pre-prepared or taken from previous lessons, with which he can make various recordings stored in the used picture. Features of these characters can be made with a pencil or marker, its properties (color, thickness, shape, and

transparency) can be customized. If a teacher uses a video clip in his lecture, then here too he has the ability to interpret the video image with the same tools and the ability to stop the video sequence or save the recorded data in pause mode, not in two modes electronic form allows the teacher to use it to summarize knowledge in the next lesson or later lessons in revision. Thus, the teacher directly prepares the material for the next lesson in the classroom. The stored information may or may not be part of a paper submitted to students in electronic form or printed for self-study in the classroom or at home. The data stored in the form of video can be used as a simulator in the consolidation phase of the course knowledge. Such a way of storing learning material can be to create demos of sample solutions, refer to algebraic problems, construction problems (e.g. task - finish a picture, fill in a picture or graphic, etc.).

The following example illustrates another technique. The teacher plays a video of the problem solving, prepares a pause, and invites students to continue the solution, then one student or the teacher finishes solving the problem from the student's words on the board, then the teacher continues the video for comparison. Includes. Similar images can be included in a multimedia library of computer models discussed below.

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