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INTEGRATED EDUCATION IN MATH AND COMPUTER SCIENCE

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Abstract

The given article deals with the essence of the integrated lessons and their value in the modern educational process. The necessity to conduct the integrated lessons is shown on the basis of concrete examples. Characteristics of the structure of the integrated lessons are revealed in the article. In today's information society, the ability to use modern information technology is equivalent to the necessary reading and writing skills for every member of society. Accordingly, the key task is the formation of the information culture of students, that is, to teach them to effectively use information in everyday life, developing the skills of searching, analyzing, processing, storing and disseminating information. This article shows the benefits of using integrated lessons. In addition to engaging students in an appropriate curriculum, encouraging students to discover the connections between mathematics and science helps show students why learning mathematics is valuable. Opportunities for the comprehensive teaching of mathematics and computer science were identified.

Keywords: integration, lessons, training, informatics and mathematics.

Түйіндеме.

Мақалада интеграцияланған сабақтардың мәні және олардың қазіргі білім беру процесіндегі маңызы көрсетілген. Нақты мысалдар негізінде интеграцияланған сабақтарды қалай жүргізу керектігі көрсетілген. Кіріктірілген сабақтар құрылымының өзіне тән ерекшеліктері анықталды. Бүгінгі ақпараттық қоғамда қазіргі ақпараттық технологияларды қолдана білу қабілетті қоғамның эрбір мүшесі үшін қажетті оқу жазу біліктерімен тепе-тең саналуда. Осыған сәйкес, студенттердің ақпараттық мәдениетін қалыптастыру, яғни ақпаратты іздеу, талдау, өңдеу, сақтау және тарату дағдыларын дамыта отырып, күнделікті өмірде тиімді пайдалануға үйрету өзекті міндет болып табылады. Бұл мақалада кіріктірілген сабақтарды қолданудың артықшылықтары көрсетілген. Оқушыларды тиісті оқу бағдарламасына қызықтырудан басқа, математика

мен жаратылыстану ғылымдарының арасындағы байланысты анықтауға ынталандыру оқушыларға математиканы оқудың не үшін құнды екенін көрсетуге көмектеседі. Математика мен информатиканы жан-жақты оқытудың мүмкіндіктері анықталды.

Түйінді сөздер: интеграция, сабақтар, оқыту, информатика және математика.

Аннотация

В статье раскрыты сущность интегрированных уроков и их значение в современном образовательном процессе. На основе конкретных примеров показано, как надо проводить интегрированные уроки. Выявлены характерные особенности структуры интегрированных уроков. В современном информационном обществе способность использовать современные информационные технологии эквивалентна необходимым навыкам чтения и письма для каждого члена общества. Соответственно, ключевой задачей является формирование информационной культуры учащихся, то есть научить их эффективно использовать информацию в повседневной жизни, развивая навыки поиска, анализа, обработки, хранения и распространения информации. В этой статье показаны преимущество использования интегрированных уроков. Помимо вовлечения учащихся в соответствующую учебную программу, побуждение учащихся к открытию связей между математикой и естественными науками помогает показать учащимся, почему изучение математики является ценным. Были определены возможности для комплексного обучения математике и информатике.

Ключевые слова: интеграция, уроки, обучение, информатика и математика.

Introduction

Integration is a deep interpenetration, the merging, as far as possible, in one educational material of generalized knowledge in a particular field. The concept of "integration" can have two meanings:

a) creating a holistic view of the world around students (here integration is considered as the goal of learning);
b) finding a common platform for bringing knowledge closer together (here integration is a learning tool)

First of all, it is the intensification of cognitive interest and the process of developing general educational skills based on solving the same question of the integrated course. This creates a prerequisite for the integration of the teaching process, when teachers of different cycles work together on a given topic. They can teach a lesson together or separately, but the result is achieved only by their combined efforts.

There are a number of reasons why integrated lessons are needed. First, the world around children is known by them in its diversity and unity, and often the subjects of the school cycle, aimed at studying individual phenomena of this unity, do not give an idea of the whole phenomenon, dividing it into disparate fragments. Secondly, integrated lessons develop the potential of students themselves, encourage them to actively learn about the surrounding reality, to understand and find cause-and-effect relationships, to develop logic, thinking, and communication skills. Third, the form of integrated lessons is non-standard and exciting.The use of various types of work during the lesson keeps the students attention at a high level, which allows us to speak about the sufficient effectiveness of the lessons. Integrated lessons open up significant pedagogical opportunities. Such lessons relieve fatigue, overstrain students by switching to a variety of activities, dramatically increase cognitive interest, and serve to develop students imagination, attention, thinking, speech, and memory. Fourth, integration in

modern society explains the need for integration in education. Modern society needs highly qualified, well-trained specialists.To meet this need: the training of educated, well-trained professionals should start from the lower grades, which is facilitated by integration in primary school. Fifth, integration provides an opportunity for self-realization, self-expression, creativity of the teacher, promotes the disclosure of abilities.

The advantages of integrated lessons are that they:

a) they contribute to increasing the motivation of teaching, the formation of students cognitive interest, a holistic scientific picture of the world and the consideration of the phenomenon from several sides.;
b) to a greater extent than ordinary lessons, they contribute to the development of speech, the formation of students ability to compare, generalize, draw conclusions, intensify the educational process, relieve overstrain and overload;
c) they not only deepen the understanding of the subject, expand the horizons, but also contribute to the formation of a versatile, harmoniously and intellectually developed personality;
d) integration is a source of finding new connections between facts that confirm or deepen certain conclusions of students ' observations in various subjects [2].

The structure of integrated lessons is characterized by clarity, compactness, compactness, logical interdependence of the educational material at each stage of the lesson, and a large informative capacity of the material. In the form of integrated lessons, it is advisable to conduct generalizing lessons that reveal the problems that are most important for two or more subjects. Integrated lessons are an essential part of the system of inter-subject communication.The material of such lessons shows the unity of the processes occurring in the world around us, allows students to see the interdependence of various sciences. In computer science classes, interdisciplinary connections of computer science and mathematics are carried out. The task of

the teacher in these lessons is to form the student's information competence, the ability to transform information objects in practice with the help of information technology tools. Such lessons also allow you to clearly show the connection of subjects, teach you to apply theoretical knowledge in practice, practice computer skills, activate the mental activity of students, stimulate them to independently acquire knowledge. Each student works actively, the children develop curiosity, cognitive interest. These lessons are taught by two subject teachers, for example, in our case, a math teacher and a computer science teacher.

The lesson offered by us is an integrated lesson in geometry and computer science in the seventh grade when studying the topic "Angles". When creating this integrated lesson, the first thing that was done was to coordinate the curricula for the subjects: mathematics and computer science, discuss and formulate general concepts, agree on the time of their study, and hold mutual consultations with teachers. Then the approaches to the study of the same processes were considered. After that, a plan for the topic of the lesson is drawn up.

As you know, the drawing plays a special role in the study of the geometry course. Along with the development of logic of thinking, the ability to reason, argue, prove, the most important task of teaching geometry is the formation of students ' spatial representations, geometric vision.Logical thinking in teaching geometry cannot fully develop outside of the organic connection with the development of imaginative thinking: if deduction is a means of organizing geometric material, a way of presenting it, spatial forms constitute the very subject of geometry, its "living soul". The drawing is a material embodiment, a model of an abstract geometric image – a geometric figure.In planimetry, drawings, unlike stereometry, do not distort the relations between the elements of geometric shapes, being in the sense of their adequate visual images, this determines their didactic role.

When introducing and learning new concepts in geometry, drawing plays an important role. For concepts whose definitions serve only for their introduction and do not work further

in deductive reasoning, it is enough after passing the stage of their initial development to be able to recognize the drawing and build the corresponding figures. Such concepts include a segment, triangle, quadrilateral, polygon, adjacent angles, vertical angles, the outer corner of a triangle, (polygon), the diagonal of a polygon, the center of a circle, chord, diameter. Therefore, in the lesson, we suggested that students perform the construction on the computer. For example, the LOGO language in the seventh grade in computer science is studied in a special ALPLogo environment. Commands in it will also be performed by the Turtle. The turtle moves around the working field. By executing the commands given to her, she can draw something anywhere in the working field by raising and lowering her pen.The main window of the ALPLogo programming environment consists of two main parts: the program field (Code area) and the working field (Graphics Area). The code area is a simple text editor. Here are the commands that the Turtle must execute. And the graphics area on the right is the" territory " of the Turtle. The task of the Turtle is to execute programs written in the Code Area. When you click the Start button on the toolbar, it starts executing the program. Like every performer, the Turtle has its own command system. [1]

In order for it to move in a straight line, two commands are provided-forward and backward: forward <number of steps> back <number of steps> The turtle can turn right and left at any angle. To do this, the following commands are provided: right <corner> left <corner> The Turtle commands are very simple: forward, backward, right, left. You can use these commands to draw lines and various shapes.But to do this, you need to use the commands "lower the pen", "raise the pen". After the command "put down the pen", the Turtle, moving, leaves a trace. So that she does not draw lines when moving, she needs to give the command "lift the pen". In the initial position, the Turtle's feather is raised and the head is pointed up. To return the Turtle from any point of the working field to its original position – the center of the field, you need to set the command "home". At the same time, the graphics on the working

field are not erased. If you need to erase the graphics, you need to ask the Turtle to clear the command.

Discussion

As a rule, students are happy to work with this program and at the same time learn the basic concepts without noticing. Thus, integrated lessons in mathematics and computer science allow you to get a synergistic effect and knowledge is absorbed more effectively. At the same time, the assimilation of mathematical concepts is faster, since everything becomes clear by means of information technologies. And computer science is revealed as an applied science and shows the possibility of its use in the study of various branches of knowledge – in particular, mathematical. In math lessons, it is also very effective to consolidate and summarize the knowledge gained through presentations created by the students themselves. Therefore, students should present the results of this lesson in the form of a presentation.

Conclusion

Integration is a necessary condition for the modern educational process, its possible implementation within the framework of any school would be the transition of this school to a new quality level of education. The use of computer technologies increases the level of self-preparation for lessons, makes the learning process more interesting; creates new opportunities for the formation of unprecedented creative professional skills; In addition, this corresponds to the level of social demand for schools by the state. Thus, we see that integrated lessons give the student a fairly broad and vivid idea of the world in which he lives, about the relationship of phenomena and objects, solve many individual problems and their totality. The forms of the lesson may be different, but each should have enough material for the exercise of the" active forces " of the child, given to him by nature.

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