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RESEARCH IN STUDENTS IN PHYSICS AND ASTRONOMY CLASSES AND THE DEVELOPMENT OF COMPETENCIES OF THE XXI CENTURY. WAYS OF ORGANIZING PROJECT ACTIVITIES OF STUDENTS IN PHYSICS EDUCATION

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Abstract:
The development of the field of education and science is based on the meaning and relevance of state policy, which can be explained as follows: a new educational system, changes in the training of personnel of a harmonious generation and novel approaches, the emergence of modern professional spheres and its connection with the conditions of our country.
The concept of education, as a result of socio-economic development, from a certain period, becomes a separate independent sphere of human activity, transmitting the social experience of society to a later stage; education is the focus of efforts to form the intellectual-spiritual facets of a person's personality, ensure his active and successful participation in the production of society and social, political, cultural, educational life,
Therefore, STEAM education directly connects the development of student youth with the outside world. As you know, the technology directly related to the universe around us in Natural Sciences is constantly used in our daily lives, while engineering is reflected in houses, roads, bridges and machine mechanisms, some profession, our daily magulats are more or less connected with the science of mathematics. The approach based on STEAM education allows the reader to systematically explore the world, logically observe the processes taking place around them, to realize the interaction in them, to discover something new, unusual and interesting for himself. By waiting for some kind of novelty, the reader develops curiosity in young people, leads to the identification of an interesting issue for himself, the development of an algorithm for finding a solution, a critical assessment of the results, the formation of engineering aspects of thinking. In his life, a person must enter into personal, social, economic and professional relationships, take his place in society, solve the solution to the problems faced, and, most importantly, have the necessary support competencies to be competitive in his field, profession. In addition, in the process of mastering each academic discipline in education, private competencies related to the field are also formed in students, depending on the specificity, content of this discipline.
Based on the continuity of education in the Republic of Uzbekistan, the main competencies and private competencies based on the content of each academic subject are formulated in order to ensure the consistency of the content of umutalim Sciences taught in the general secondary, secondary special, professional education (9+3). At the beginning of the school year, the level of formation of competencies regarding the base and the subject of study, which are present in students, is determined. Students received some knowledge of physics through SCIENSE until the 7th grade. In particular, those who have learned such information as the globe, its atmosphere, its parts, the appearance of winds. In teaching physics, it was easy to study the concept of mass, based on the knowledge provided by these subjects, such topics as atmospheric pressure, Torichelli's experiment, measurement of atmospheric pressure, barometers, the phenomenon of convection in the oceans and seas and in the air, the circulation of water

in nature. In the study of topics such as" structure of the universe"," phenomena of Light"," Earth's own axis and rotation around the sun"," solar and lunar eclipses", he used data from geography to form competencies on the subject. Children are shown which sites of the internet have access to materials on physics and mathematics, what additional literature is available, and similar sources of information. The concept of surface studied in mathematics allows us to master the concept of pressure in physics, and the concept of volume allows us to master the concept of density in physics. In elementary grades, students are used to the fact that a clear solution to all issues will come out.

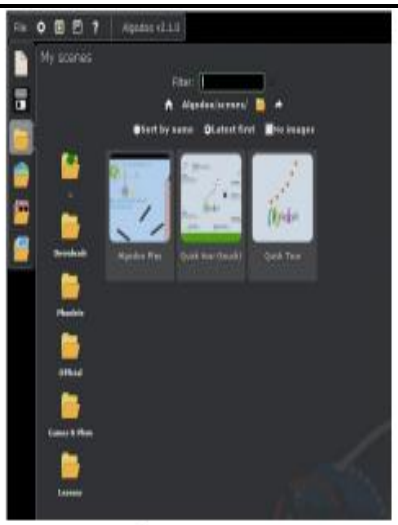
And the solution of some of the problems of physics will be approximate. Accordingly, teachers of mathematics and physics will have to jointly teach them to perform approximate calculations when solving certain examples. This makes it necessary for physics to also allow approximation in some measurements and to explain that the approximate value of The Associated computable magnitude is found. Usually the distance, surface, volume, angular magnitude are referred to as mathematical magnitudes. In some mathematics, the properties of these quantities and the theory of their measurement have been developed. Students do most of the measurement work when conducting experiments. In this case, those who have previously practiced mathematics use these qualifications due to the fact that they have solved issues related to measuring length, surface area, volume, mass, speed and have measured some of them directly. Mathematical knowledge is also used in the formation of such a concept as measuring accuracy of instruments in measurements. One of the important forms of interaction from physics and mathematics is the solution of mathematical problems of physical content. At one time, it is useful to solve problems (related to movement, density), which are subject to both physics and mathematics. The science of physics is concerned with geometry, and not only with the arithmetic or algebraic expressions of mathematics. The Shape of the bodies can be in rectangular, square, circle, triangle, Polygon, sphere, cube, rectangular parallelepiped views. In this, of course, the determination of their dimensions is carried out by using the knowledge gained in geometry. In the study of certain topics, it has been shown that there are opportunities for the formation of interdisciplinary competencies. In particular, to measure moisture in the soil, the mass of moist soil is measured, and then the amount of water in it is found by measuring the mass of dried soil. In this case, measurements of the mass of matter are used on the scales. It is said that the quality of many agricultural crops can be determined by measuring their densities. In our people there is talk of a melon sweet coming out, which is the same in appearance, but heavier when rubbed with a hand. This means that the density of the sweet melon, which is larger than the other, can be done with experiments. The fact that the starch content in potatoes with a similar density is greater than in others can be determined in the experiment. With this, from the knowledge gained, the task of solving the muaamos found in everyday life and the formation of a person is fulfilled. With the help of a bent hand, it is explained that it is possible to carry a lot of load on the written hand, and its reason is that the hand works like a fork. in ground handling, the plough, borona, the pressure the tractor wheel gives to the ground, the plows and Earth burners are also trained through pressure. The importance of sunlight for the Earth's temperature, flora, fauna for planting crops, accordingly, assumes that the energy supply of nutrients is carried out in close contact with the sciences of physics and biology. In the human body, constant oxidation of nutrients occurs. Carbohydrates and fats, as well as some proteins, are used in this as" fuel". The body releases 17 J of energy as a result of 1g protein and carbohydrate oxidation. When 1g fat is oxidized, the energy -38 J is released. Using this information, it is possible to make it a matter for the reader, for people who work physically or mentally, the calculation of the foods that they need to

consume in one day. With this, elements of self-development are formed as individuals. In teaching physics, there are many opportunities to use the knowledge, skills and qualifications gained in the process of Labor Education, and in teaching Labor, the knowledge gained in physics. For example: metal shearing scissors, the principle of operation of various omburns is explained by the fact that in “richags”, hooks that squeeze and fasten an item to work on wood or metal, in the “screw”, in the “Shell”, in the “pona” when fixing the threads of hammers and axes, in the unloading and increasing loads that come to the workshop, The fact that metals heat up when treated with egov or metals is an example of an internal energy change. Smoothing of fabrics by means of an iron indicates a change in the properties of materials under the influence of heat. When making items from wood, metal or gauze, measuring work is carried out on them by means of a measuring tape, a stencil. These instruments are used in physics to measure length or distance. Disciplines are also formed by explaining that sharpening the Blades of scissors, saws, axes and other cutting tools is done to achieve pressure. From the presence of a culinary direction in labor lessons also forms the skills of thermal processing on products, changes in the influence of heat, the application of the concept of temperature in practice. Electric machines used in labor workshops, electric plate, sewing machine, etc.k.the power of the LAR can be desired, the principle of operation is also based on physical laws. One of the areas of Labor Education is agricultural labor. In this, the concept of pressure in Hoe, panshaha, sickle, shovels used in ground processing, the competence of the use of their knowledge in practice is formed when they study these topics in physics of circular and advanced movements in machines and mechanisms. Competencies have been formed by involving children in research, explaining the topic widely and clearly, increasing their interest in science, conducting experiments systematically, orderly, planned, being able to correctly set a goal, assess their own activities. According to the results of the analysis, in pilot classes, the average efficiency was 4-5% higher compared to control classes. Physics at school should serve the general goals of teaching education, that is, to form and cultivate the potential of students for scientific worldview, ability to think logically, mental development, self-realization, to structure national and universal values in them, and to acquire the knowledge necessary for them to continue their social life and education. Mechanical, thermal, electrical, light, electromagnetic and quantum phenomena, as well as the magnitudes that characterize these phenomena, they acquire knowledge of the laws to which they obey, methods that scientifically study nature, and on the basis of what they have learned, they are able to form the physical picture of the universe. They acquire the skills of observing natural phenomena, summarizing the results of expression and observation by writing, Using Simple Measuring Instruments to study physical phenomena, expressing the results of observation and measurement through tables, graphs and finding empirical laws on their basis, explaining the acquired knowledge of various natural phenomena and processes, the principle of operation of various technical devices, being able to apply. When solving physical issues and conducting experimental research, independently mastering new knowledge of physics in the era of vital needs and interests, various resources (from textbooks, popular science literature, physical dictionaries and reference books, electronic development and textbooks, internet pages, etc.) are used.k.) to be able to work with physical information; in the process of analyzing and evaluating information, transforming one type of information into a second type, and solving similar intellectual problems, one develops an interest in knowledge, intellectual and creative abilities. The belief in the possibility of studying the surrounding world, the necessary use of the achievements of Science and technology for the further development of humanity, a respectful view of the creators of Science and technology, a view of physical education as an element of universal culture is cultivated; it

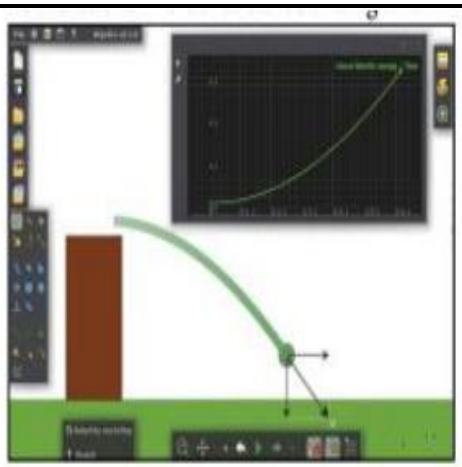
is able to use the knowledge and skills it possesses in solving practical issues Competency of a student in physics is the ability to use the knowledge, skills and qualifications acquired in Physics in the field of discovery, understanding of scientific innovations encountered in his daily life, use and practice in solving practical and theoretical issues. If we say that the main purpose of traditional education is to teach knowledge and use this knowledge to think and create, the STEAM approach teaches us to combine the knowledge gained with real skills. This gives schoolchildren the opportunity not only to have some ideas, but also to put them into practice and implement them. That. only knowledge that can be used in reality is really valuable. Mechanical motion, body interaction, diffusion, thermal motion, convection, radiation, heat transfer, atmospheric pressure, fluid and gas movement, evaporation, condensation, boiling, vibration and waves, sound, free fall of bodies, inertia, deformation, elasticity, friction, melting, hardening, aggregate states, electrification of bodies, interaction of charges, short circuit, lightning, thunder, electric current, magnetic interaction, Earth magnetic field, induction phenomenon, own induction phenomenon, propagation of light in a straight line, return and refraction of light, shadow, shadow formation, Lunar and solar eclipses, interference of light, dispersion, diffraction phenomena, image formation in the lens, alternation of day and night, alternation of seasons on Earth, phases and periods of the Moon, celestial bodies, planetary motion, meteor flight observation have the skills to apply in solving physical issues. Measurement of certain parameters of processes and phenomena in the process of observation; knowledge of the physical concept and description of magnitudes; formulas connecting this magnitude with other magnitudes; units of physical magnitudes; types of measurement of magnitude; errors in measuring physical magnitudes; being able to measure directly identifiable physical magnitudes with instruments; identification of indirectly calculated physical magnitudes using physical instruments. It is scientifically explained on the basis of the conditions of occurrence and conditions of occurrence of physical processes and phenomena, the relationship of these phenomena to other phenomena, physical laws of processes and phenomena (Newton, Archimedes, molecular-kinetic theory of matter, Coulomb, Ampere, Joule'-Lens, conservation and circulation of energy, etc.). Know the purpose of conducting an experiment in physics; be able to select, assemble and use physical instruments for the experiment; it is necessary to write down the conditions and results of the implementation of the experiment and be able to draw conclusions and develop the research characteristics of students. Teaching to work with physical instruments consists of, for example: scales; dynamometer; barometer; simple mechanisms; hydraulic press; thermometer; psychrometer; internal combustion engine; refrigerant; ammeter; Vol'tmeter; dynamic; microphone; being able to explain the operation and structure of glasses and similar instruments, and form their use in future lives. Using the studied concepts, rules, definitions, laws and formulas to cope with issues related to physical phenomena; from the knowledge, skills acquired in physics to everyday life, techniques and safety of life, solving environmental problems (saving energy, preserving heat in winter, being able to use electrical farm tools and eliminate minor defects, etc.).k.) consists of use. In conclusion, we would like to note that, compared to traditional teaching methods, the STEAM approach in high school encourages children to experiment, build models, turn their ideas into reality and create a final product. This educational approach allows children to effectively combine theory and practical skills, and facilitates university admission and further study. The severe changes in our country are opening up a wide path to the development of the educational system on a global scale, the rapid development of modern information technologies, the improvement of global telecommunication technologies in the e-learning environment require the creativeness of students ' approach to education and their

involvement in research. Today, one of the important professional tasks of Educators of a general secondary educational institution is the development of the ability to adapt to the innovations of the modern world, prepare the younger generation for the life of a constantly updated society and actively participate in the processes of improving it in accordance with the requirements of the time. The economic development of industry, in particular the country, depends on the use of creative abilities of human resources. At the same time, the formation of creative researcher people is one of the most important tasks of the educational system. Creativity, research refers to an individual's ability to create new, original ideas in any activity. At the same time, the process of developing creativism is characteristic of various fields of activity. [6] O'quvchilarning tadqiqotchilik ko'nikmalarini rivojantirish - bu it is a great way to prepare children for a modern high-tech lifestyle. In the formation of research skills of students in our country and CIS countries K.T. Suyarov, M.A Kuchkarov ,I.Sh research is being conducted and conducted by Egamberganov and others. Also, scientists from the Commonwealth of Independent States I.N.Golitsyna, N.L.Plotnikova, B.E.Starichenko's place mobile technology among promising ICT. Also, M.Y.Novikov, I.I.Roganova, and other educators used mobile applications and their services in their pedagogical practices

When conducting STEM education in physics, a huge number of web tools can be used-we will cite several of them with their advantages and disadvantages in the well. Virtual laboratories in physics have changed significantly in recent years. This cannot be compared with working in an educational or scientific laboratory, often the possibilities and conditions for conducting real experiments are considered not terrestrial. In the same place, virtual laboratories come to our aid. This article lists laboratory dasses Phet.colorado.edu and analyzed the impact of teaching technology on creative thinking using Algodoo technologies. PhET provides interesting, free, interactive, research-based simulations of Physics, Chemistry, Biology, and mathematics. To ensure educational effectiveness, each simulation is extensively tested and evaluated. Simulations are written in HTML5 (with some older simulations in Java or Flash) and can be run online or downloaded to a computer. Several sponsors support the PhET project, which allows these resources to be free for all students and faculty. The Usbu web page covers a huge number of physical processes. Due to the fact that each process is clearly compatible with its natural analogue, the virtual laboratory work performed will give the same result as in the specific natural process. While this web saxifa is in English, you can familiarize yourself with the experimental work of hoda, which installed the web version of google translator in Uzbek. In the formation of creative thinking skills, therefore, Phet is very important in understanding difficult physical concepts and processes . When organizing laboratory work using Phet, you can do the laboratory work you need by entering through the following QR code Algodoo (www.algodoo.com) it is a digital application for physics 2D simulations. This allows students and teachers to easily create 2D animations of physical processes.This saga is considered very important when creating animation of physical processes in the Departments of mechanics and optics. A user-friendly interface can cause some complications due to being in English, but with the help of a dictionary, this problem is also easily solved.



1-rasm



2-rasm

Figure 1-2 gives a plaque from the animation of physical processes created using the algodoo program. Finished projects in algodoo can be shared with other users around the world via the Internet. Similarly, you can download projects from other users and launch them yourself. Algodoo is a tool for studying physics as well as programming. Very easy to invent, discover, learn and Algodoo. In the Algodoo program, you can download it to your computer using the following QR code. In addition to the two dsasters mentioned above, many more software and web pages can be exemplified Phet.colorado.edu and there is also software of Algodoo technologies. When using them, uploading to the phone itself is quite enough. The role of these programs is unparalleled so that students and students can engage independently. Therefore, when teaching physics, it is necessary to introduce new innovative technologies and pedagogical technologies. Especially when organizing laboratory dases, these tools are very important. The use of Web pages and mobile applications is in accordance with the requirements of today's times. The convenience of Web pages and mobile applications is that the use of information and educational resources related to physics, solving examples and issues, performing laboratory work, collecting data , improving the effectiveness of teacher activities in analysis, and improving students ' ability to fall.

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