



## Application of Educational Technologies in the Development of Students 'Creative Activity

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<http://dx.doi.org/10.47814/ijssrr.v4i5.142>

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### **Abstract**

The article discusses the organization of practical work of students in the field of technology and the direction of young people in the profession of national crafts through the use of educational technologies combined in creative activities.

**Keywords:** *Technology; Education; Upbringing; National Craft; Interest; Creative Activity; Creative Mastery; Design; Harmonization; Essence*

### **Introduction**

In the current period of gradual reforms in the field of education in our country, based on the requirements of the National Training Program, there is a need to put into practice the existing conclusions and recommendations to improve the effectiveness of education. In particular, one of the main goals of the "National Program of Personnel Training", which is being implemented in three stages, is to form competitive, active and creative individuals who can adapt to the transition to a market economy. In this regard, the President signed a decree on November 6, 2020 "On the development of education and science in the new period of development of Uzbekistan" The Decree PF-6108 "On development measures" also states that to form the necessary skills and knowledge " identified as one of the key areas in this area.<sup>1</sup> This issue, along with other disciplines, is a key task in the teaching of technology. This requires the effective and rational use of teaching methods in the teaching process, as well as the improvement of these methods, the search for new ones, increasing the effectiveness of technology education.

It is important to organize and develop students' creative activities in technology classes. It should also be noted that the organization and development of students' creative activity in technology classes is a very complex process for children from a pedagogical and psychological point of view. Because in this case, when creating a new item of any kind, the student must be able to think technically, that is, to understand the essence of the problem or task, it requires the ability to perform mental and physical tasks such as thinking, imagining the shape of an object, and being able to prepare it in practice. It is no secret

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<sup>1</sup> Decree of the President of the Republic of Uzbekistan "On measures to develop education and science in the new period of development of Uzbekistan." T., November 6, 2020 PF-6108

that in most students these three abilities are not integrated. Therefore, they, especially students in grades 5-7, can not easily get involved in such a process of creative work, it is necessary to use methods that help to imagine and work.

It is well known that there are a number of ways to prepare students for the creative process. These can include interesting picture puzzles, simple questions, assignments, issues, and more. Such methods can be integrated into a system in a specific sequence and used as follows:

**I. Make up a sentence by filling in the missing words.** This method is one of the simplest ways to prepare students for the process of creative activity, which is aimed at developing children's written and oral speech, thinking skills. Therefore, the effectiveness of teaching without them is unimaginable. In practice, this method is mainly used in language lessons. But experience shows that this method can also be used effectively in technology science classes. Take, for example, the saying, "The punch is made of ... and is used to grind planks." Students need to find the missing words in the sentence, replace them with dots, and complete the sentence. After the discussion, it became clear that these are the words "day", "knife", "pona". Using other similar expressions, to technical safety statements can also be made. For example, "Before working on the bench ...; while working on the bench ...; after working on the bench ...". The most interesting thing is that this method can also be used to test students' knowledge. For this purpose the following we recommend a test sheet in the form.

### Safety rules for drilling rigs

(class, student, date)

1. .... check it out
2. .... set it tight
3. .... follow
4. .... don't use your finger!
5. .... mark
6. .... Do not work with
7. .... do not put things!
8. .... do not stop manually
9. .... don't go ahead
10. .... Clean using
11. .... cut it off

So, you can find a lot of such examples and use them in lessons, extracurricular activities, on the pages of posters under the motto "Who can find first, concise and expressive" to increase and strengthen students' knowledge and develop thinking skills.

**II. Find answers to riddle-questions.** This method also develops students' thinking and ingenuity. Here are a few examples.

There are several such numbers in three-digit numbers that are paper to them.

The same expression - the result is visible when viewed from behind. One of them is 808. Find the rest.

1. How to use two without a hammer, i.e. without hitting can the board be nailed together?
2. Screwdriver - how to improve the handle of the corner? (Figure 1).
3. Find the pair of compounds described in Figure 2.
4. Combine the plywood pieces shown in Figure 3 to make a few straight Is it possible to form four corners?

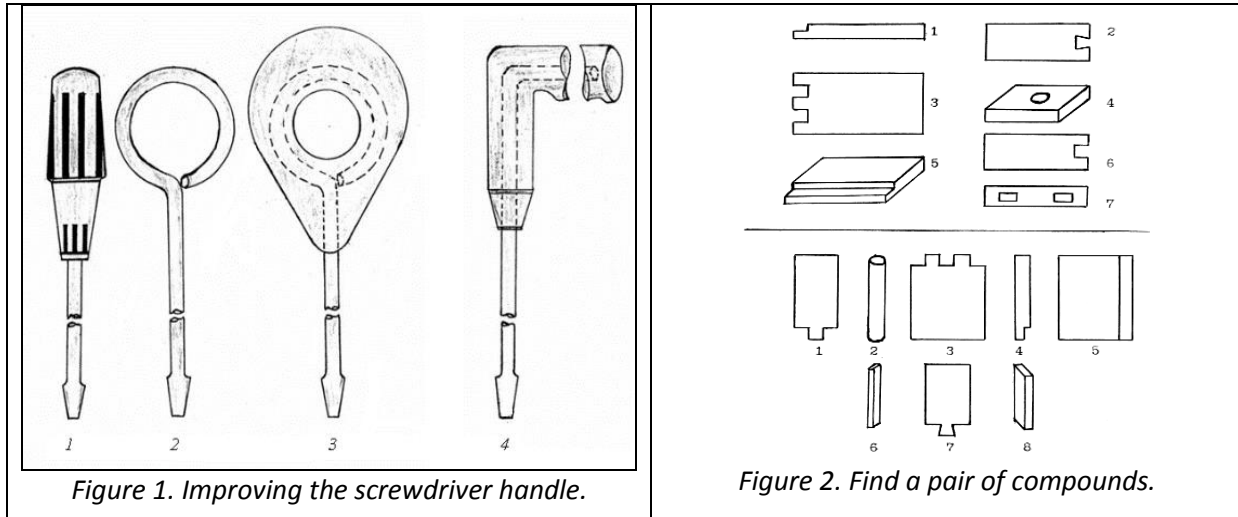


Figure 1. Improving the screwdriver handle.

Figure 2. Find a pair of compounds.

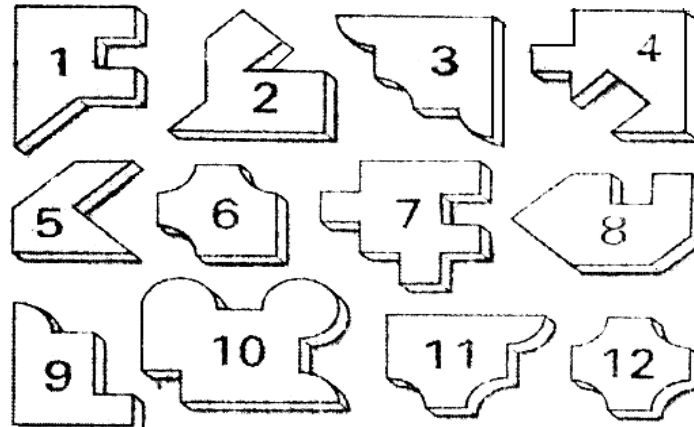


Figure 3. Combining the plywood pieces shown, how many right quadrilaterals can be formed?

**III. Using picture puzzles.** This method is also for students develops thinking, ingenuity, explores them, encourages thinking. Here are a few examples.

1. What are the characteristics of the items shown in Figure 4 can be made of wood? An example of this is the type of wood takes?
2. What is used to attach the items in the work shown in Figure 5?
3. Which of the tools in Figure 6 is left unpaired?
4. The parts depicted at the bottom of Figure 7 belong to which devices, the details of which are shown at the top of the figure?

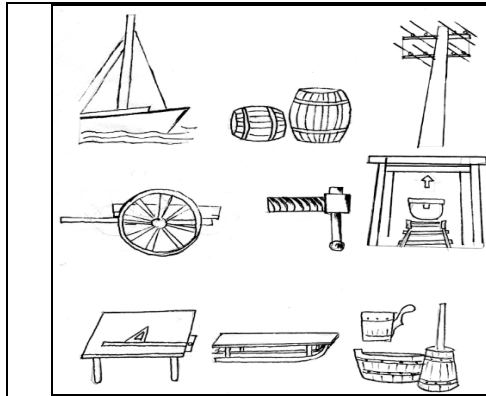


Figure 4.

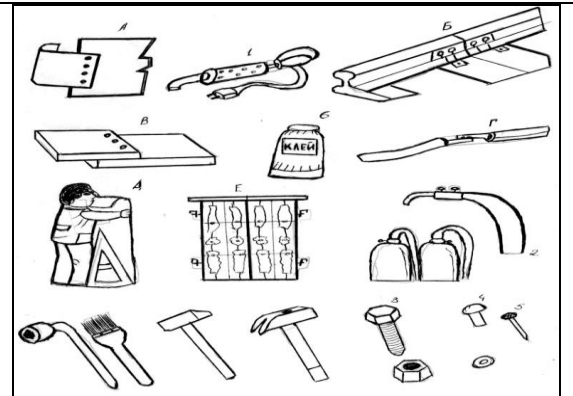


Figure 5.

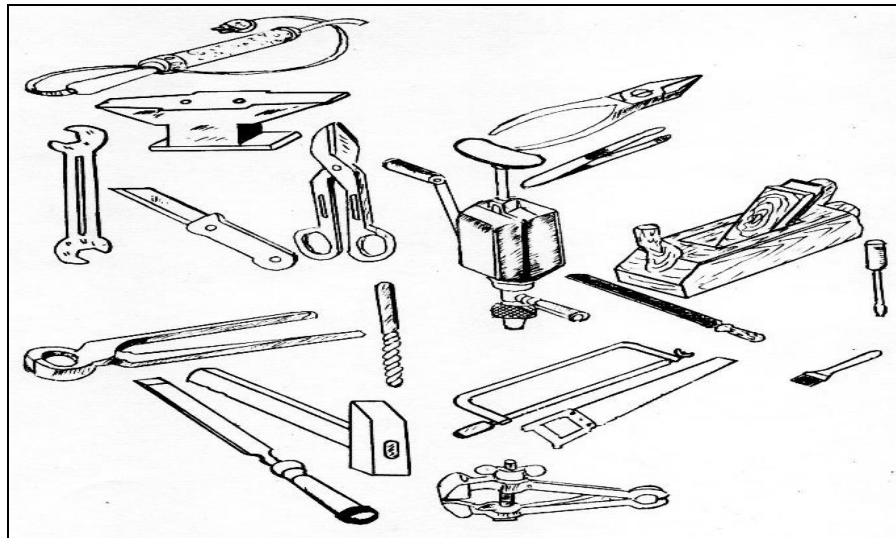


Figure 6

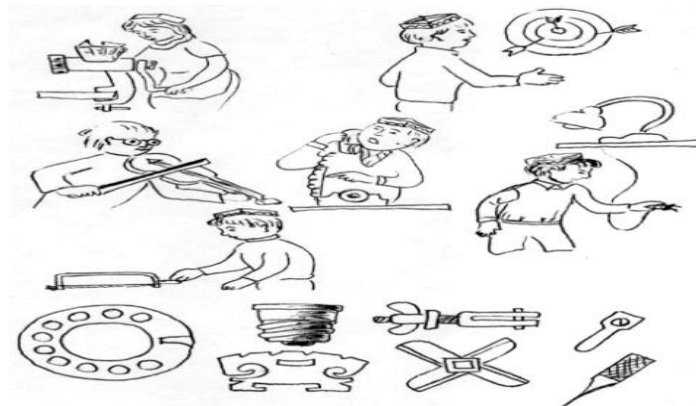


Figure 7.

5. What are the names of the devices shown in Figure 8? Which of them are called current sources, which are called consumers? Which ones have mechanical energy?

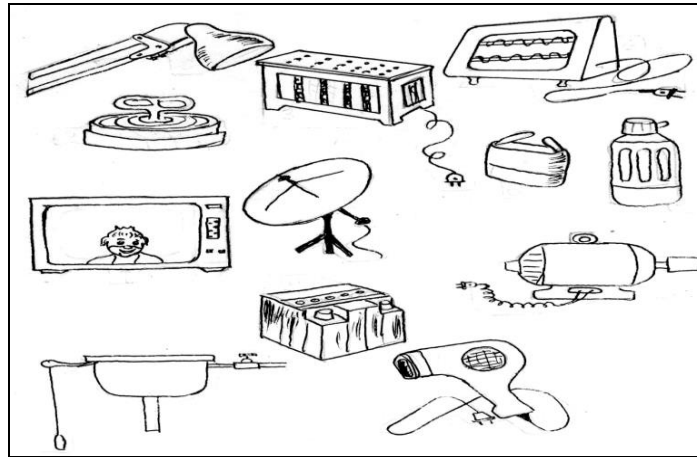


Figure 8.

1. Identify the names of the devices depicted in Figure 9, when, where, by whom they were invented or created.

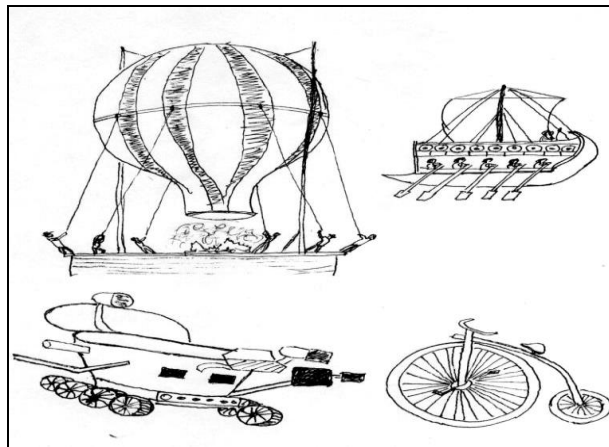


Figure 9.

Figure 10 shows the split boards. Which one of them тайёрлаш учун, қайси бири фойдаланиш учун қулай?

Why? Which beautiful? opinion. of them and

one is Justify your Choose one prepare.

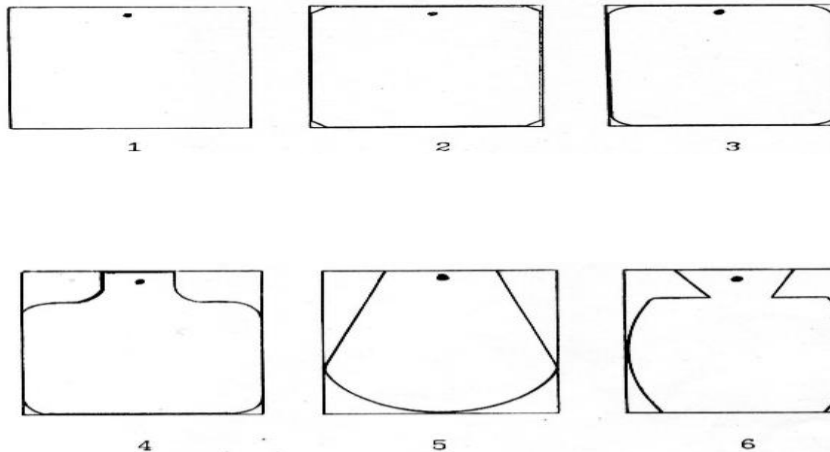


Figure 10. Which of the indicated slicing boards is easy to prepare and which is easy to use? Why? Which one is beautiful? Justify your opinion. Choose one of them and prepare.

**IV. Using different puzzles.** Practical classes can organize a variety of fun games to strengthen students' knowledge, develop their minds, develop their thinking skills, and prepare them for creative activities. One such game is a puzzle game. To organize this game, for example, the teacher draws a puzzle table on the board and the lines are numbered (or prepared by drawing in the form of a poster). For example:

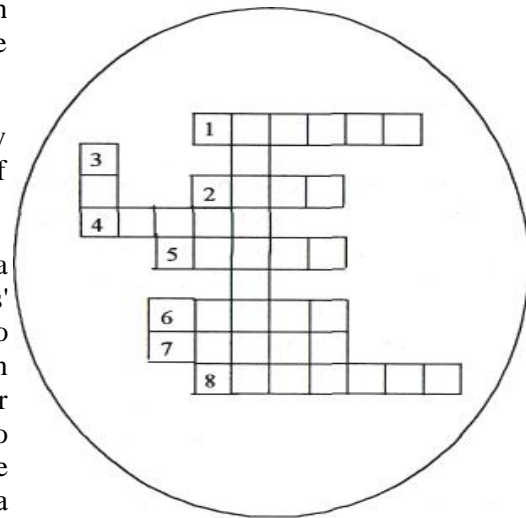
	1		6						
2									
	3								
		4							
	5								

To find the words in this line, the following questions are asked: Width: 1. In the same clothes in winter and summer. 2. The name of a fast-growing poplar. 3. Wood surface treatment tool. 4. A tool used for cutting wood materials. 5 ...., it is necessary for everyone (wood material, which is often used in construction). Buyiga: 6. The longest living tree. Students will be asked these questions. Students who find the answer raise their hand and the student who answers writes the word on the board. The letters of the words found by the students should match the squares. Thus the game continues and all the cells in the puzzle are filled with words.

**"Kashta" puzzle.** The following is a list of common misconceptions. If you can find the puzzle correctly, the name of the device used in embroidery will appear.

**Across** 1. Chok type. 2. Sewing tool. 3. Embroidery device. 4. The name of the ornament. 5. Type of embroidery. 6. Embroidery tool. 7. Material name.

**Height:** 8. The name of the sewn part. In addition, a variety of puzzles can be used to enhance students' knowledge in hands-on activities. Puzzles related to technology science, including puzzles about tools used in technology science lessons, can be given by the teacher or given to each other by the students themselves. Students who find the correct answer will be assessed throughout the lesson. Технология машгулотларида куйидагича топишмоқлардан фойдаланиш мумкин:



*He murmurs, murmurs, murmurs. (saw)*

*Carpenters make, decorate the face of bread. (hammer)*

At the end of the lesson, it is a good idea to ask students to come up with different puzzles and puzzles as homework. Quick sayings and folk sayings can also be used to engage students in technology lessons.

**Game of Thrones.** One of the ways to develop students' independent, creative thinking skills in technology classes is to organize in-class lessons. For example, in classes V-VII on wood and metal processing technology, this can be done as follows. As an example, let's take the topic "Study of work and measuring instruments used in woodworking." The training is scheduled for 4 hours.

Initially, students are given insights on the topic, which are used in the learning process in the process of reviewing and consolidating the knowledge they have acquired. He said to the students, "Oh students, now we are playing a great game with you. The condition of our game is as follows. We are divided into two groups: Group 1, the name - builder-carpenter; Group 2, name - furniture maker-carpenter. I tell you битта-биттадан асбоблар тасвири туширилган расмни кўрсатаман. Be careful! The picture is divided into equal parts and represented by numbers. The numbers indicate the beginning of the first letter of the words you need to find. Be careful! You will be prompted for information on which device image was downloaded. Whoever finds it first will be allowed to speak (or write) first."

**1-for example** (Figure 11). Students will be shown a picture of a hammer. Height: 1. What brand of steel is the hammer seal made of?

2. What is the shape of the seal? 3. Which professionals use this tool the most?

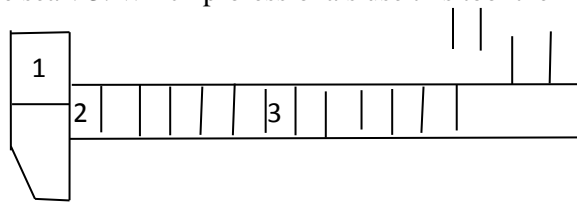


Figure 11.

Students begin to search one by one. Their activities medicine is done. Students in groups will have the opportunity to consult with each other. A specific score is assigned for each answer (this is done by the teacher). The conditions given in the figure announce the scores of the groups once they are fully satisfied with the questions. In summary: hence condition 1: U7; Condition 2: square; Condition 3: blacksmithing.

Reinforcement: 1. What does U7 represent? 2. How many are different depending on the structure of the seal? 3. How many types of metalworking professions are there? Reinforcement work is done by answering similar questions.

**Example 2** (Figure 12). Height: 1. Name of the precision device. Width (clockwise): 2. Part of the tool. 3. Non-ferrous metal type. Hence, in the caliper: 1) nonius; 2) barbell; 3) As long as the words aluminum are located.

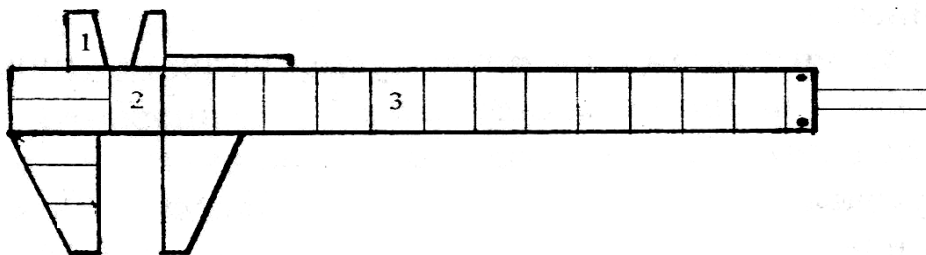


Figure 12.

**3-for example** (Figure 13). Width: 1) the name of the device; 2) work operation performed on the tool. Clockwise: 3) part of the instrument; 4) deflection of the teeth in the form of a right triangle (in terms of degrees).

**Answers:** 1) dastarra; 2) sawing; 3) cloth; 4) sixty.

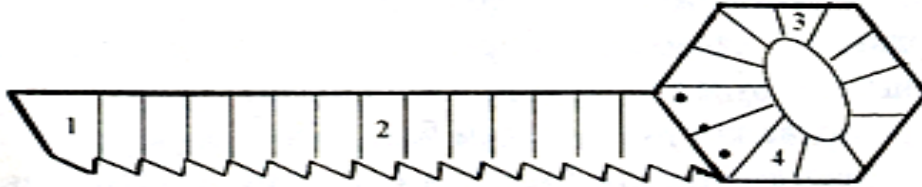
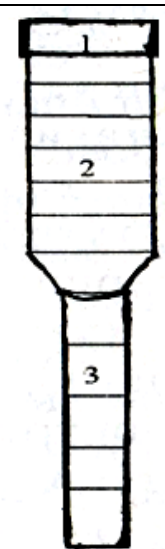


Figure 13.

<p><b>Example 4</b> (Figure 17). Height: 1) one type of device; 2) the name of the device; 3) when opening the nail Working tool used. <b>Answers:</b> 1) carver; 2) scan; 3) saw.</p>	 <p>Figure 14.</p>
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**5-for example** Figure 15): 1) the name of the technological device; 2) the base of the device; 3) part of the device; 4) inner cylindrical surface.

Answers: 1) vorotok; 2) corpus; 3) stopper; 4) hole.

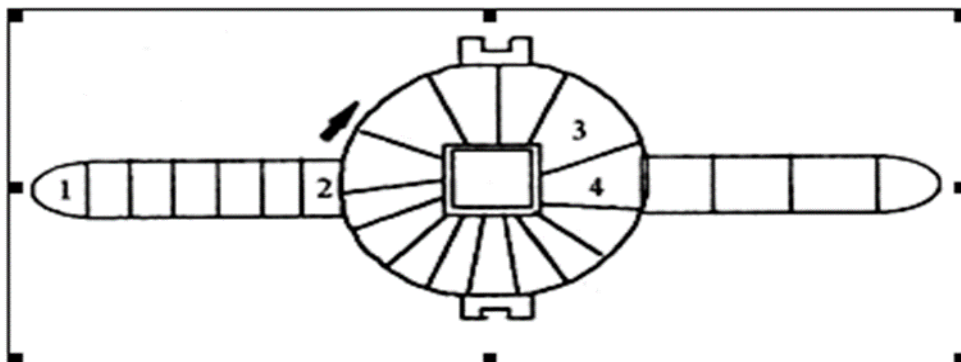


Figure 16.



**V. Creating and modifying the shapes of various objects using a finished product or detail.** This method helps to develop students' initial working skills while developing their thinking and imagination skills. This can also be seen from the following examples.

1. From five sticks of the same size, such as a match or a counting stick, make a star shape as shown in Figure 17 in the appendix. What other forms can be created in this way? It should be noted that only five sticks should be involved in this, so that they do not increase or decrease.
2. Using the sticks as above, create square squares as shown in Figure 18 in the appendix. How many squares are there? Take two sticks from it so that the result is two squares left.
3. Make square squares from the sticks as shown in Figure 19. Take four sticks from it so that five of the same squares remain.

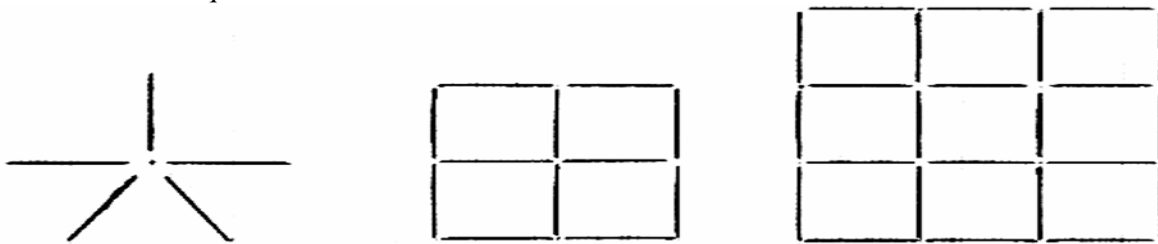
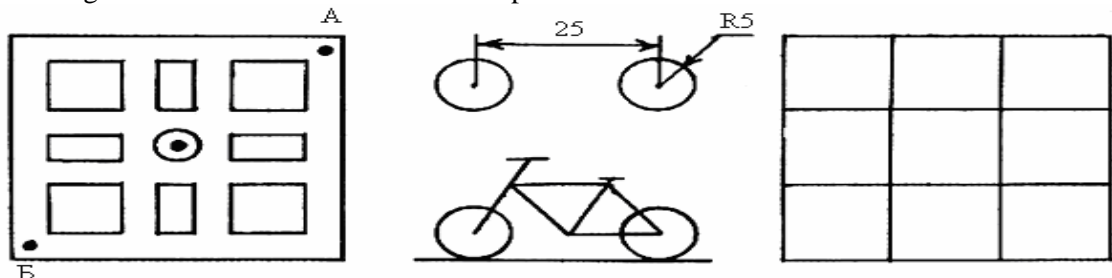


Figure 17 Figure 18. Figure 19

**VI. Draw simple shapes, drawings, pictures.** This method aims to improve students' thinking, imagining, and practical performance skills. Consider the following examples.

1. Find the shortest and most winding path from point A to point B (Figure 20, a).
2. Radius 5 mm, distance between centers 25 mm, side by side Draw two circles. Connect them using straight lines to form a bicycle shape (Fig. 20, b). What other forms can be created in this way? Explain where and for what purposes they will be used.
3. Draw nine square squares on the paper as shown in Figure 20c. Is it possible to cut them in one direction using scissors and divide them into nine pieces?



**VII. Use of technical issues.** Currently, more attention is paid to the use of this method in the development of creative activity of students. We will discuss this in more detail below.

One of the most effective ways to develop students' creative activity in technology classes in grades V-VII is to solve technical problems in the classroom and in extracurricular activities. It allows students to develop skills such as creative thinking, imagination and practical work, improve the theoretical knowledge they have acquired from the sciences and apply it in practice.

*A technical problem is usually understood as a problem associated with the performance of work, such as the design, manufacture, or improvement of an item or part, and the work to solve it. Solving this problem means finding a solution to the problem. It is known that solving any problem is a process of thinking, research. A number of studies have been conducted in this regard as well. In particular, in the monograph G.A. Ball "Theory of teaching tasks" issues used in the educational process, there are valuable recommendations on their types and ways of use. But the issue is always the issue. Its content usually requires serious consideration and thus a solution. This is not of interest to some students, it is a challenge for them. We have tried to avoid such inconveniences, to draw the attention of students to the issues that can be used in technology classes in an interesting way. It should be noted that in our schools, the solution of problems in technology classes (especially in the creative form) is not as widespread as in mathematics, physics, chemistry. That's why it's a little awkward to talk about it, even to some people it may seem like a meltdown, but in reality it's not. Because in technology science classes, unlike in other sciences, the end result of problem solving is the creation or improvement of any detail or item, the elimination of defects in the mechanism or machine parts. Accordingly, the issues used in technology science classes are divided into technical issues in design, technological and organizational forms, depending on the task and content.*

**Design** The solution of the problem consists of: - the structure of the product or part, the principle of operation and to determine the field of application, to find ways to increase its stability, durability, reliability; - selection of methods to eliminate the effects of harmful phenomena such as friction, corrosion, moisture;

- Convenient shape, quantity of details, methods of their attachment identification, selection of materials used for the manufacture of the product or their alternatives;- change some dimensions of the product without violating the proportions of details or parts; - reduction or expansion of the scope of the product.

**Technological** The solution is as follows:

- selection of materials, determination of methods of their processing, determination of the order of performance of work operations (measurement, planning, separation, processing, finishing), mastering, checking, adjusting and testing of equipment and devices, found shortcomings elimination of;

- selection of convenient methods of measurement and control;
  - saving energy, time and material during operation
- devices, as well as perform very difficult work operations  
selection and use of facilities that allow;
- selection of work methods (technology) that allow economical use of materials;
  - the choice of methods of work (technology) that allows you to save energy;
  - selection of work methods (technologies) that allow to save time;
  - to improve the quality of the product prepared for the technological process  
make targeted changes.

**Organizational** The solution of the problems is related to the solution of the following issues: - preparation and adaptation of the workplace;

- Spiritual preparation to perform the assigned work individually and as a team; - Sanitary and hygienic requirements and occupational safety in the workplace to perform the work assigned to him in accordance with the rules; work in a spirit of interaction and solidarity with other students, saving time and effort;
- expanding the use of equipment and facilities without changing their structure;
- Improving working methods.

It is also possible to divide technical issues into general (or simple) and creative issues according to the above conditions. Problems of a general or simple nature are not so difficult to solve, and the information given in the context of the problem helps to solve it easily, without torturing it. It does not require complex calculations, analysis, only a detail or item is made according to the given size, shape. In a word, simple executive work is done. Therefore, in such cases, although a certain preparation and approach is required from the student, the creative side of his / her work is very low. However, in solving technical problems of a creative nature, in addition to executive activity, such qualities as creative thinking, ingenuity are needed. Because the exact solution to the problem is unknown in advance, it is necessary to find exactly that in the context of the problem. Such creative technical issues can also consist of design, technological, organizational issues. The peculiarity of solving technical problems in a creative way is that the solution of exactly one problem can be multiple (even infinite!). Therefore, solving such problems can often lead to a novelty or invention. From these solutions, the most convenient and optimal view that satisfies the condition of the case is selected.

Many students, especially 5th graders, find it very difficult to solve technical problems in a creative way. This can be explained by the complexity of creative technical problems and the unpreparedness of students for the process of solving such problems. That is why it is so in solving problems, as noted above, it is first necessary to use methods that prepare students for the creative process and gradually move on to solving problems where the content becomes more complex. It is also important that the context of the issue is clear, clearly stated to the students, and that there is some information and certain limitations that help them to understand, to imagine.

Now let's look at the following issue, which allows students to organize their creative work.

**Issue.** Make a pencil out of wood with a fresh look (first-class issue).

**Solve.** In solving such problems, the work can be done in the following stages:

- Analysis of the situation and finding a solution;
- design and construction of the product (visualize and draw the shape, determine the dimensions; selection of the necessary equipment, devices and materials, determine the methods and sequence of work, process map create and make an item on the basis of this card);
- inspection of the finished product, elimination of defects by improving its design, expanding the range of services;
- Artistic processing of the product.

In the case of any issue, it is indicated what requirements the product must meet. Therefore, in order to find a solution to the problem, it is necessary to carefully study its condition.

**1. Analysis of the condition of the matter.** It is well known that pens and pencils are the writing tools that are often needed in our daily lives. Pencils are used to place them neatly on the desk. In terms of the above issue, the pencil should be easy to use, have a fresh look, and be made of compatible material using as simple working methods as possible. So, the creative work of the students here is meant to be the held pencil should not only be easy to prepare and use, but also reflect some new look.

The most common pencil has a cylindrical appearance, i.e. a glass appearance. But the mixing of pens in it makes it a little inconvenient to use. A simple-looking pencil can also be made by drilling holes in a piece of wood, opening nests, or making a box out of plywood (Figure 21). But these do not have a new look, that is, it does not satisfy the condition of the matter. Therefore, the pencil can be used in other forms, such as fish, hedgehog, duck, turtle, horse, dinosaur. (Figure 22) can be prepared from such views.

In this case, in addition to the function of a pencil, the object is reminiscent of the shape of an animal. This makes a more or less pleasant impression on a person. In this way we will find both technical and artistic solutions to the problem of making a pencil.

**Design and manufacture of the product.** Depending on the product to be made raw materials and equipment are selected, methods of work are determined.

For example, to make a dinosaur-shaped pencil, a piece of solid or medium-hard board is taken. When it is first treated, the shape of a dinosaur is drawn on its surface. Then cut or drill a hole next to these lines by hand using a special saw (using a bench or tool) is used to separate the shaped part of the board, grind it. Then a space is created for the pens by opening the nest by drilling. Finishing is done on the product with the help of sandpaper.

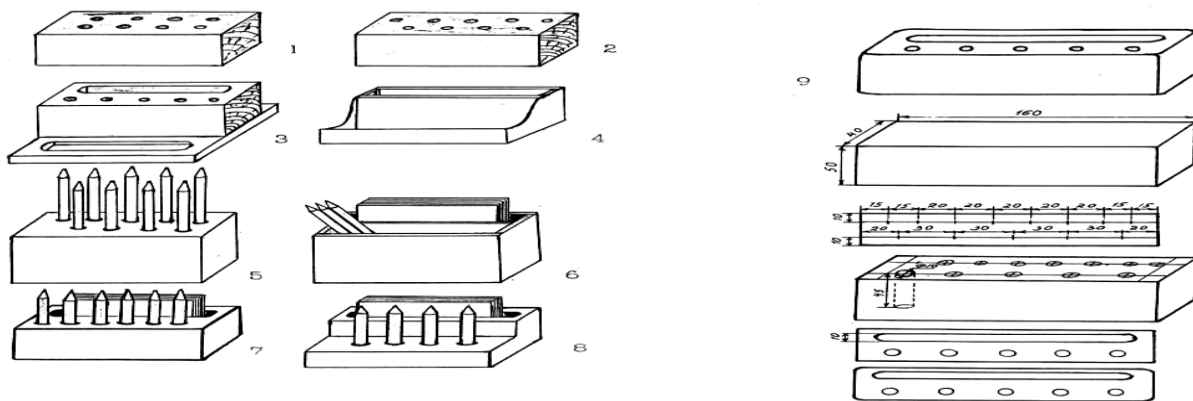


Figure 22. Pencils of different shapes:  
1-fish, 2-hedgehog, 3-dinosaur.

**3. Product inspection and service scope expansion.** The ease of use of the device usually depends on its size. For example, if a dinosaur pencil is 200-210 mm long, 100-110 mm high and 25-30 mm thick, it will fit comfortably on a desk and can hold 10-12 pencils. If tin, plywood or thin board is attached to the bottom of the pencil according to its dimensions, its stability will be further increased. But keep in mind that the main function of the pen is to store the pen. It is therefore important to take into account the size of the fingers when creating space for pencils. It is also possible to create space in the pencil for additional items such as paper, erasers, paper clips, and recommend these works to students as separate creative assignments (more on this later). Shortcomings identified at this stage will be taken into account in future work.

**4. Artistic processing of the product.** For this purpose, works such as creating various images, varnishing or painting on the surface of the pencil by methods such as drawing, burning, engraving are performed. This work can be used in practical classes on sawing, sawing, carving, or circle work in grades V-VII. It should be noted that in our experimental classes, students were also asked to make pencils in the form of a house, a TV set, a glass, a rocket car (katyusha). In the course of this work, we again became convinced that, although seemingly simple on the surface, it only required the organization of a more creative approach of students in solving the problem of making the above-mentioned pencils. This is not an easy task.

As mentioned above, in the organization of the pedagogical process of designing and preparing such items, it is advisable to carry out the work step by step, using issues and tasks that complicate the content. Let's look at a few of these.

**Issue 1.** Make a pencil out of a piece of board 160 mm long, 60 mm wide and 50 mm thick. Put 6 pencils in it.

**Solve. Problem condition analysis.** It is known that in the 5th grade students

In the practical training on woodworking technology, students will receive basic information about wood and how to process it. They make a variety of simple items, including boards (pallets). From these boards it is possible to make the above-mentioned pencil. As mentioned above, the pencil is one of the items used in the maintenance of the workplace, and its main function (function) - storage of pens and pencils. An additional function - it can also be used to store things such as parma, hammer (kerner), bisque, ruler, screwdriver, nail.

**Designing and making an item.** The pencil is a one-piece piece with dimensions of  $160 \times 60 \times 50$  mm. Preparation time for one student - 2 hours (one training). The pencil can be made of wood material of any hardness or its waste. But in class B it is necessary to use softer wood materials such as willow, poplar, pine and use simple working methods. It should also be noted that students' work will be much easier if they first make a pencil out of a longer board and then cut it to the required size. It is also possible to open the slots for pens in different views, such as two rows parallel or at an angle.

**Inspect the item...** In this case, the teacher shows a pencil formed by drilling two rows of nests by drilling a piece of board (Figure 22.1). The fact that the nests in the pencil are opened in parallel and at the same depth makes it inconvenient to use, asks how this shortcoming can be overcome. After a lot of explanatory and analytical work, the following solutions can be reached:

- deeper drilling of the first row (the simplest and easiest way!);
- open the cells at an angle, not parallel;
- use both of the above methods. Then the pencils in the first row will not prevent you from getting the pencils in the second row (Figure 22.2).

**Artistic processing of the product.** Бу ҳақда юқорида баён этилган.

**Issue 2.** How to make room for things like paper, eraser, paper clip in the pencil above? How is its stability ensured? (Some of the solutions to these problems are shown in Figures 22.3; 22.4; 22.6; 22.7; 22.8 in the appendix).

**Issue 3.** How to make a pencil that looks more beautiful than the above? Figure 24 shows examples of solutions to this problem. This work is done in each of the V-VII grades or in grades, depending on the capabilities of the students, (even higher classes).

### Various details and from wood and metal materials

#### creative issues related to making things

1. Make a back handle - a handle for the grinding wheel, taking into account the shape of the fingers (level 1 issue, Fig. 23).
2. If you have a hanging base for the phone (Level 2 issue, Figure 24).
3. Make a shovel for the kindergarten children using wood and plywood (Level 2 issue, Figure 25).
4. Make a mattress for the kindergarten children using wooden materials (Level 3 issue, Figure 26).
5. Make a folding table - a plate, which was used in ancient times for reading books (level 3 problem, Fig. 27).
6. Make a fruit dryer box (level 3 issue, Figure 28).
7. How to install an alarm clock on the wall? (Level 1 issue, Figure 29).
8. Make a decorative base out of tin for ironing (level 3 issue, Fig. 30).



Figure 23. Handle.

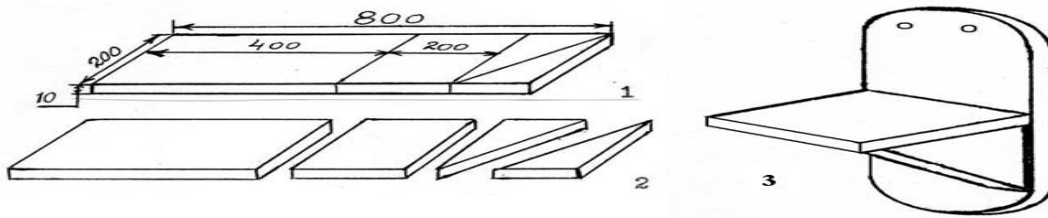


Figure 24 Hanging base for mounting the telephone.  
Figure 25. Mattress and shovel for kindergarten children

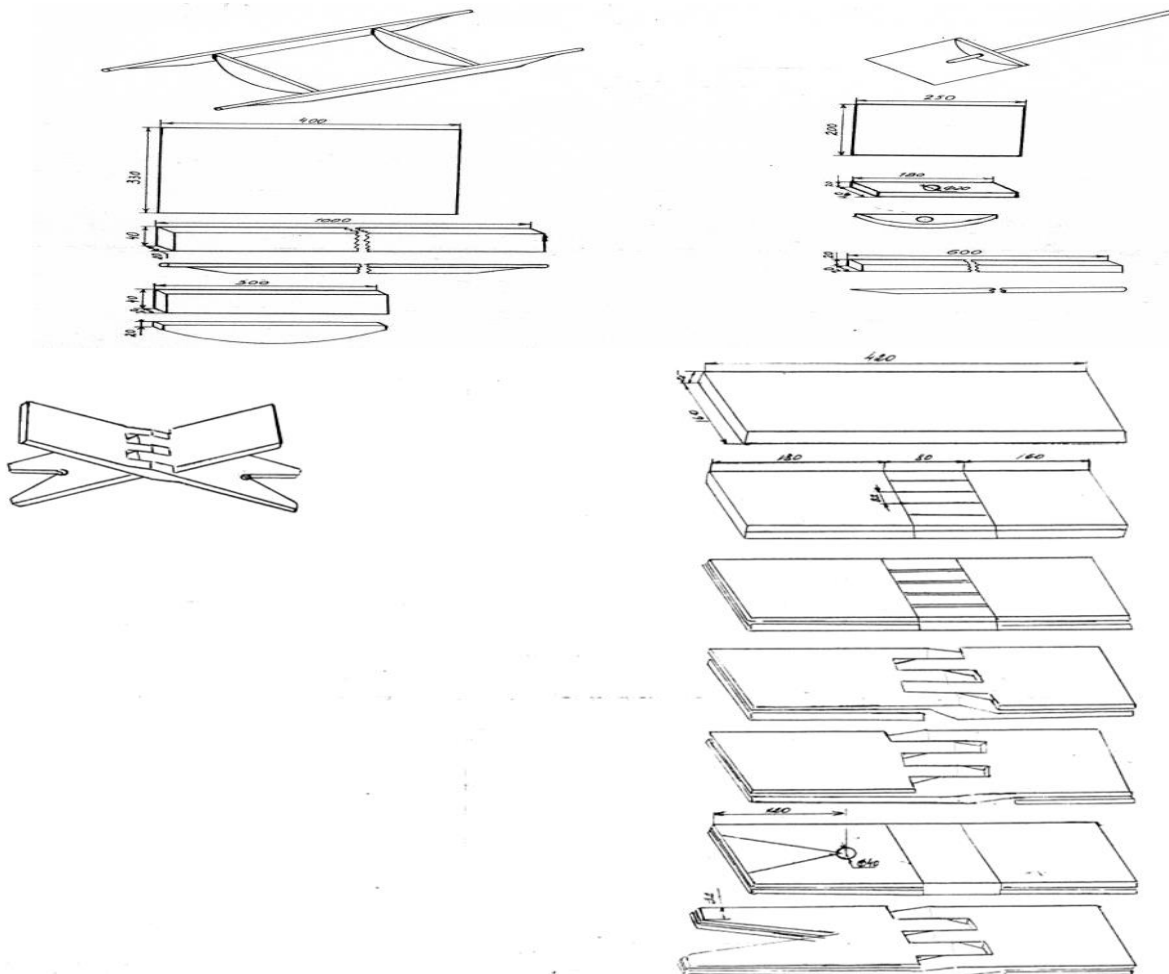


Figure 26. Lavh.

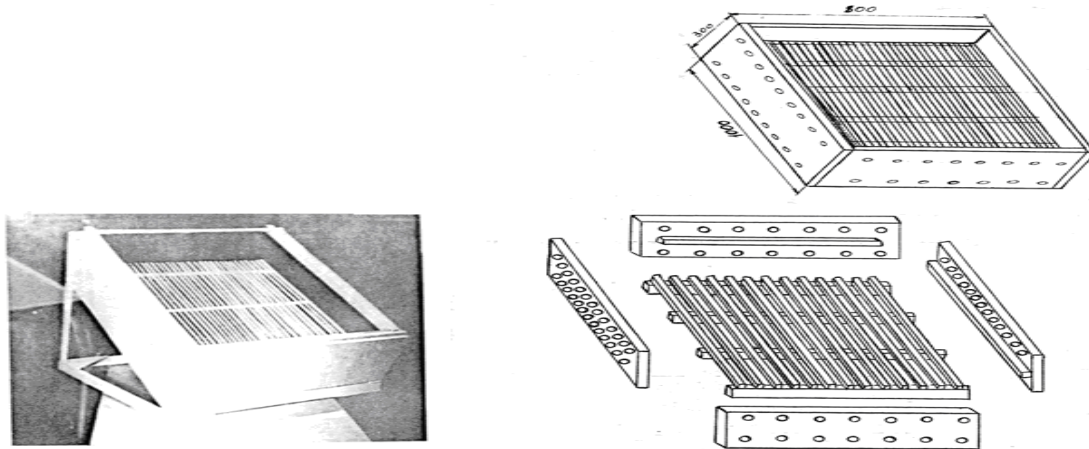


Figure 27. Fruit drying box.

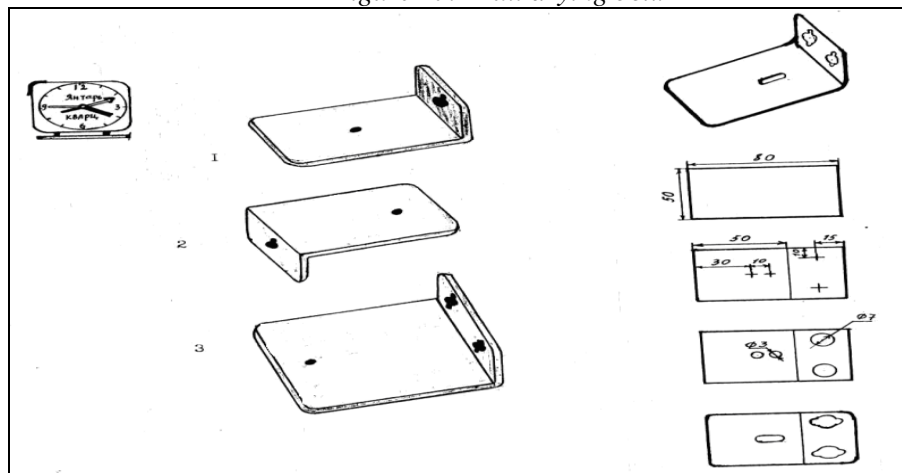


Figure 28. To mount the electronic alarm clock on the wall designed tin device.

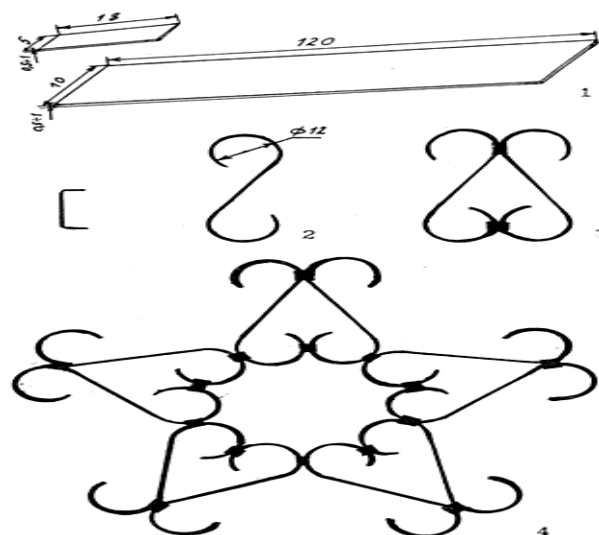


Figure 29. A decorative tin base designed for placing irons and similar hot items.

### Issues related to electrical work and combined work

1. Make a lamp using wooden sticks (level 3 issue).
2. How to make a greenhouse (electrobruder) for chickens is it possible (Level 5 issue).

In order to make it easier to solve creative problems in technology lessons, it is advisable to use its simpler methods and tools at first. Below we consider one such method - the use of a morphological table. From the above information, it is clear that teaching and educating students is hard work. One of the most difficult tasks of a teacher is to ensure that all students in the classroom, taking into account the individual characteristics of each student, activity. It is important to keep in mind that student activity does not increase spontaneously, but is the result of a conscious attitude. Since activism arises as a result of consciousness, it requires the coordination of the content, form of organization, methods and means of implementation of educational work. The teacher should try to consciously increase the interest of students in reading.

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