

DEVELOPING STUDENTS' MATHEMATICAL ABILITIES BY SOLVING SPECIAL EXERCISES

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ABSTRACT

The paper deals with the issues of developing mathematical abilities of the pupils. It is shown that 10 components of emplacing and improving mathematical ability as the structure, two of the are used for special matters in order to rise up mathematical skills.

Keywords: mathematical abilities, developing, getting mathematic information, mentality, retrieving information, generalization, issue, thinking.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

It has been done many changes in the sphere of education in our republic recent years. And pretty much work has been done to educate clever students, and improve their mathematical abilities as well. This gives us much opportunity to analyze their new mathematical abilities. In many researches, which done by scientists of developing countries, have been worked out different criteria develop students' mathematical abilities, and clearly shown their practical and theoretical sides. Requirement for mathematical scientists nowadays is increasing, especially in education, which is updating students' mathematical abilities as the result creating modern technologies and using them in reality[1-5].

Nowadays many scientists as well as teachers are working with kind students. Consequently they have been achieving high ranks and taking first places in international mathematical Olympiads. Of course, not stopping with achieved results, we should work out new methods of defining and develop students' mathematical abilities. Due to lack different literatures of increasing mathematical abilities we must work hard to create them and it is also requirement of modern standard. This problem involves working hard pedagogic-physiologic scholars.

Every human has their own abilities, as we discuss about students with mathematical abilities we call them mathematical-abilities. They are regarded as different students from others because they have got highly learning motivations and quality for creating new scientific ideas. Mathematical ability defines learning peculiarities of physiologic-individuals in activity of person and developing productive Mathematics as well[6].

To achieve the highest rank in mathematical sphere is very important and required to improve students' mathematical ability, because it has always been indispensable for students to gain fundamental subjects. B.A. Kruteskiy[6] worked out and created 9 structure developing mathematical abilities for pupils in 5-6 classes. In conclusion conducted scientific research for 11-12 aged pupils we suggest following components of developing abilities in table 1 (Q-ability students').

Components improving mathematical abilities for 11-12 aged pupils

Abilities	Componentnames	Suitable exercises for components
Q ¹	Improving to perceive	a) searching information b) testing and on mistake of methodic
Q ²	Improving understanding and imagination	a) oral and clear legalize b) productive task c) to arose imaginative notion
Q ³	To improve thinking	a) analytical solving problem b) bringing for discussing
Q ⁴	Improving concentration	a) classify main ability b) attracting constant attention c) About differentiate geometrical elements with shapes
Q ⁵	Improving mathematical memory	a) to arose imaginative notion b) forming cognition c) leading idea
Q ⁶	Analysis and synthesis	a) about uniting b) combination tasks c) task for making different conclusion
Q ⁷	Improving generalization	a) unreal exercises b) making up exercise on handed types
Q ⁸	Abstracting and concreting	a) about general arguments b) inter against tasks
Q ⁹	Classifying	a) staging requirement tasks b) reviewing task operation
Q ¹⁰	Concluding	a) about proving b) logical tasks c) about searching legality

Well these components comprise and suit for developing 5-6 form students' mathematical ability. According to the developing mathematical structural schemes we give some examples influencing on mathematical ability. For example: 1 table – on ability component Q²- for part. Exercise for the part –a.

1. On 12th May Sarvar's mother told him "The train that your father sit arrives in Tashkent after 2 days and 13 hours" And then Sarvar looked at his watch noticed that it was sharp 17:00. When and what time does the train arrive? (Tell the arrival time and day of the train)

Solution: To solve this kind task student should take into consideration the day consist 24 hours and according to his mom's day he orally calculates 2 days as 14th May. The time that his mother told him information was 17:00, to find exact answer, he adds 13 hours more in his mind. As we can this kind of tasks influence on students imagination and mentality to retrieving information. According to Sarvar's calculation his father arrives to Tashkent on May 15th at 4 o'clock. (a day=24 hours, 24-17=7 hours, 15th May and 13-7=4. At 4 o'clock on 15th May).

2. Divide the number 150 into proportional numbers 2;3;5.

3. Write order of the growing numbers to $a=0,(6)$; $b=0,666$; $c=3/5$

Exercises on part -b of Q².

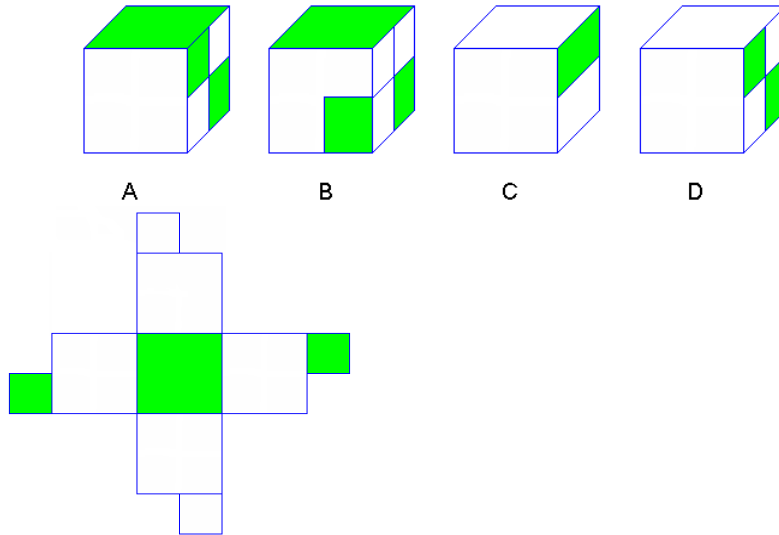
1. Dilshod solves 4 exercises every day while Asliddin 3 in summer camp of Youth mathematics. Dilshod solved all exercises in 6 days. In how many days can Asliddin solve exactly the same amount of exercises?

Solution: Although the exercise may seem to be easy it serves to make initial mathematical steps for students. Because task of this exercise is as an example of real life and student should approach creatively solving the task. Firstly students find the total amount solving exercises by Dilshod's doing $4 \cdot 6 = 24$. But Asliddin solved 3 exercises in a day. The

exercise requires to approach creatively by students and it is initial mathematical steps as well. The result of Dilshod's number is divided by Asliddin's daily exercises numbers so $24 : 3 = 8$. In this way he finds the solution for this exercise.

2. Calculate: $\left(1 - \frac{1}{2}\right) \cdot \left(1 - \frac{1}{3}\right) \cdot \left(1 - \frac{1}{4}\right) \cdot \left(1 - \frac{1}{5}\right) \cdot \left(1 - \frac{1}{6}\right)$

3. Which cube can it make out from the given cube of the right hand side?



Exercise for the part –c.

350 liter water of basin was taken and then added another 200 liter into it amount of water consisted 600 liter afterwards. How much water was in the basin at first?

Solution: initially student realizes that there was more than 350 liter water in the basin. So, the exercises creates in students imagination about there was more water in the basin after being taken 350 liters from basin, then adding another 200 liter into it. Consequently we can gain the following result: $x - 350 + 250 = 650$, $x = 800$ liters.

1. Dilnoza bought 2 kg nuts for 7500 sums. After taking the shells of nuts kilogram of kernel consisted 1 kg 300 g. How much did Dilnoza spend for each kilogram of nuts' shell?

2. Right- cornered parallelepiped's height is 1,5 centimeter, and it is 3 times bigger than its width, and its height 0,3 centimeters bigger than width. Find the result of all right-cornered parallelepiped's length.

Above given exercises can be used to develop students' thinking ability.

Q³ -ability component according to the table 1

Exercise for the part- a.

1. It has been announced about 30% discounts for products and staffs of the shop before the holiday. If a dress price cheapen 3600 sum, so for how much can it be bought?

Solution: Reading the task of exercise student realizes that price has been discounted 30% and one can buy it for cheapened price 3600 sum. If the price of the dress is =x, they find the

solution in the following way. $x \leftrightarrow 100\%$ $3600 \leftrightarrow 30\%$. $x = \frac{3600 \cdot 100}{30} = 12000$. And initial price of the dress is 12000 sum. So he finds solution for task doing following formula: $12000 - 3600 = 8400$.

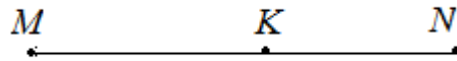
2. If cub's dimension is 512 cm^3 , so what is its corners' cm?

3. Find the addition result: $10 - 2\frac{1}{4} : 3,75 + (2,5 - 1\frac{1}{3}) \cdot 6$.

Exercises for the part – b.

1. Point K divides cutting into two parts MK and KN . MK point cutting is $1\frac{1}{8}$ is much shorter than KN . If $MN=13,6$ cm, find the length of MK and KN .

Solution: $1\frac{1}{8}MK + MK = 13,6$, $MK = 6,4$, $KN = 1\frac{1}{8}MN = 7,2$.

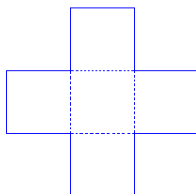


2. If MATIZ car uses 5,8 liter petrol per 100 km, how much km does it run for 8,7 liter petrol?

3. There will be a football world championship in Russia this year. It must be stated that it will be 21 times. If world championship is held every four years, when was 8th world championship held?

Above shown exercises can be used to improve students' imagination and understanding. Researches show that improving students' mathematical abilities requires rising by our suggested improving components. Yet it's developing sphere, so there isn't enough information in many scientific literatures about it. For instance, there isn't information about what exercise can improve and opens up students the same kind ability. It has been shown solution to these problems by our suggested improving students' mathematic component abilities. There are two or more different exercises in each 10 ability components. Exercises have been shown clearly according to the rules and thematically and components were formed in the following way. Forming exercises for developing ability components will be easy especially for 13 year aged and for older students, because in higher classes mathematical tasks will be difficult and subdivided thematically. There is even one mathematical task which might improve exactly needed mathematical sphere of the student. Now we look through one example.

Example: 1. Shape given in the picture consists of equally quadrates, and its surface equaled to 64 cm^2 . Find one side of quadrates.



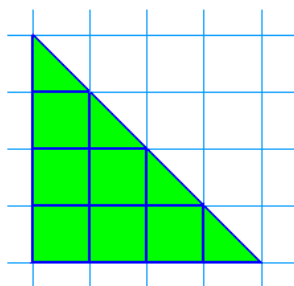
Solving exercise students imagine the drawing, and put quadrates in order like Q^4 , its require special skill of attention to separate number of quadrates.

Solution: According to the task of exercise $S = 64 \text{ cm}^2$ and student defines the number of quadrates is 4. And then according to their special skill they define equation each surface of the quadrates $S_1 = 64 : 4 = 16 \text{ cm}^2$. This means that it helps students to distinguish geometrical shape abilities and solves the exercise in the following way $S = a^2 = 16$. $a = 4$.

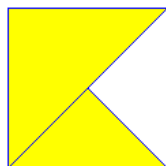
2. Sanjar went to the shop to buy ice-cream. There were 3 different kinds of ice-cream there with prices which were shown on the table. How many ice-creams can Sanjar mostly buy spending 2200 sums?

Icecream	price	number	number
With cream	250 s		
With nut	350 s		
With chocolate	500 s	5	

3. Draw the quadrates with pencil so that you can make shape to equal its surface to 10 km^2 .



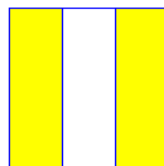
4. Which quadrates' parts given below have been drawn?



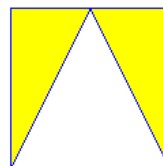
A



B



C



D

Above given exercises can be used to improve students' attention. According to the scientific research we can conclude following: to improve students' mathematical ability with help of special exercises, we should define exercise which suitable according to our components, must be put into practice. This helps for youth educated to gain new stages of mathematical subjects in the future and find solution to unsolved mathematical problems, indeed, improves thinking in highly intellectual way, and helps to find solution to vital problems as well.

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