PREPARING STUDENTS OF GRADE 7-9 FOR INTERNATIONAL PISA STUDIES

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Abstract: In the article, the preparation of 7-9 grade students of specialized general secondary schools for international PISA research is done by creating problem situations in chemistry. in the radical reform of the educational system, the issues of directing students to research activities, forming a scientific worldview in students during research activities, and developing creativity are highlighted.

Key words: PISA research, PISA test, express - research, research - competition, educational experience, creative assignments, intelligence – map

Аннотация: В статье осуществляется подготовка учащихся 7-9 классов общеобразовательных специальных школ к международным исследованиям PISA путем создания проблемных ситуаций по химии. В коренной реформе системы образования освещаются вопросы направленности учащихся на научно-исследовательскую деятельность, формирование у учащихся научного мировоззрения в ходе научно-исследовательской деятельности, развитие творческих способностей.

Ключевые слова: исследование PISA, тест PISA, экспресс-исследование, исследование-конкурс, образовательный опыт, творческие задания, интеллект-карта.

Today, the new educational paradigm will consist of raising the knowledge, skills and abilities of teachers of general secondary education institutions to the level of managing the development of teaching in the formation of personality.

According to PISA studies, in order to apply innovative technologies to the educational process, the teacher should not only have the skills to use information technologies, but also to fully master the skills of information transfer and processing, and at the same time, he should be able to form an information culture in students.

The PISA study has the following characteristics:

- it is a comprehensive and regularly held program all over the world;
- one of the largest, large-scale international monitoring studies in the field of education;
- 15-year-old students (from 15 years 3 months to 16 years 2 months) studying in general secondary educational institutions participate in the research;

➢ the level of "readiness for independent life" of students is evaluated, that is, to what extent they can use the knowledge and skills acquired at school to solve problems they may encounter in life;

➢ students' functional literacy, including reading (understanding the text), natural and mathematical literacy, as well as the ability to solve life problems in these areas are assessed;

➢ the research collects information that allows to get information on the uniqueness of the educational system of the participating countries.

Therefore, PISA International Studies has a special place in this process, it is a leading tool in raising the quality of the educational system to a new level, and responds to the needs of the state, labor market and society in the most adequate way.

The research we want to conduct is at the level of these requirements and is based on the creation of PISA studies in chemistry;

PISA studies need to have a "slightly higher intelligence" than traditional lessons, because of the possibility of simulating several aspects of the teacher's activity (giving advice when necessary and where it is needed, helping to consolidate acquired knowledge, etc.). have At the same time, it is necessary to fully cover the necessary (additional information) educational materials for the studied subject. Only a comprehensive curriculum of the subject can ensure the success of the e-textbook.

PISA subject: What happens if you eat a lot of onions?

PISA statement: Onion is one of the most cultivated vegetables in the world and is also known as the "queen of vegetables" due to its high nutritional value.

Onions contain not only essential nutrients for the body, but also many medicinal substances, including antioxidant, anti-cancer, anti-inflammatory, antibacterial, antiviral and other substances. In addition, onions contain a substance called fructan, which is not found in most other vegetables.

Fructans are healthy carbohydrates that reduce the production of cancer-causing substances in the body. This shows that they have a beneficial effect in the prevention of cancer and other chronic diseases. Fructans are also good nutrients for good bacteria in the gut, causing their numbers to increase(fig.1).

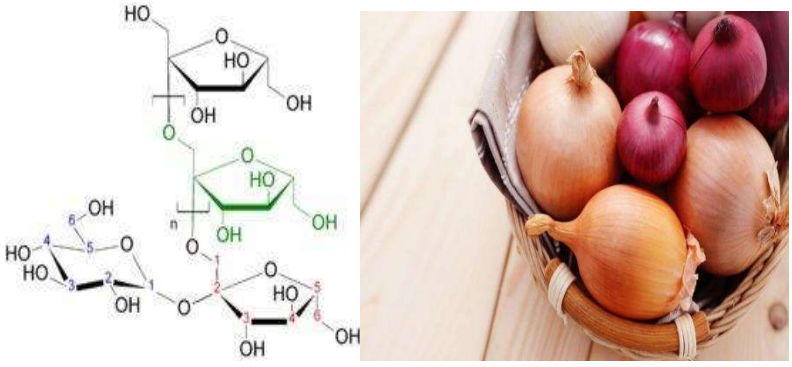


Figura.1 Structure Fructan and Onions

However, eating too much onion can also cause some side effects. The fact is that there are no enzymes that break down fructans in the intestine, so fructans are not digested and absorbed by the body. As a result, a large amount of fructans accumulates in the intestine, causing it to swell. This condition can cause intestinal problems such as abdominal pain and gas accumulation in the abdomen. Therefore, it is not recommended to eat a lot of onions. Its daily consumption is recommended to be 50 - 80 grams

PISA assignment:

1. Why does a person tear up when wiping onions in the kitchen.
2. What is the basis of the bacterioseptic properties of onions?
3. How to get natural dye from onion peel?

PISA topic: Why does food taste unpleasant after brushing teeth?

PISA statement: This is because of the foaming agent used in most toothpastes. The sodium lauryl sulfate contained in it weakens the taste receptors that are responsible for the perception of sweet taste.

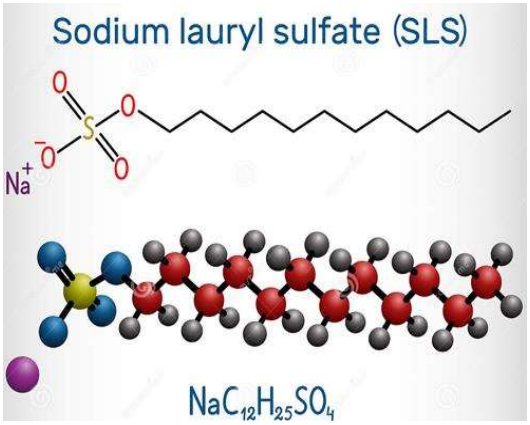




Figura 2. Strurture Sodium lauryl sulfate and tootthtaste

In addition, sodium lauryl sulfate has the ability to break down phospholipids, which reduces the perception of bitter taste.

PISA assignment:

1. Write a report on what ingredients are in toothpaste?
2. What was used instead of toothpaste in ancient times?
3. When choosing a toothpaste, what features and what type should you choose?

PISA topic: Do you know about dry alcohol?

PISA statement: In chemistry, there is a term called "dry alcohol". It is also called " dry $_{\text{fuel}}$ ". is obtained by evaporating the mixture under vacuum:

$6HCHO + 4NH_3 = (CH_2)_6N_4 + 6H_2O$

PISA assignment:

1. How to get dry alcohol?
2. How is dry alcohol similar and different from ethyl alcohol?
3. Can dry alcohol be dissolved in water and drunk?

PISA answer: For the first time this substance was synthesized by Butlerov in 1860. It is a white crystalline substance with a sweet taste and burns with a yellowish-blue flame (like ethyl alcohol). After burning, no ash remains, because all combustion products are formed in the gaseous state and evaporate.:

$(CH_2)6N_4 + 9O_2 = 6CO_2\uparrow + 2N_2\uparrow + 6H_2O\uparrow$

Urotropin has nothing to do with real alcohol (it is dangerous to mix it with water like alcohol!).

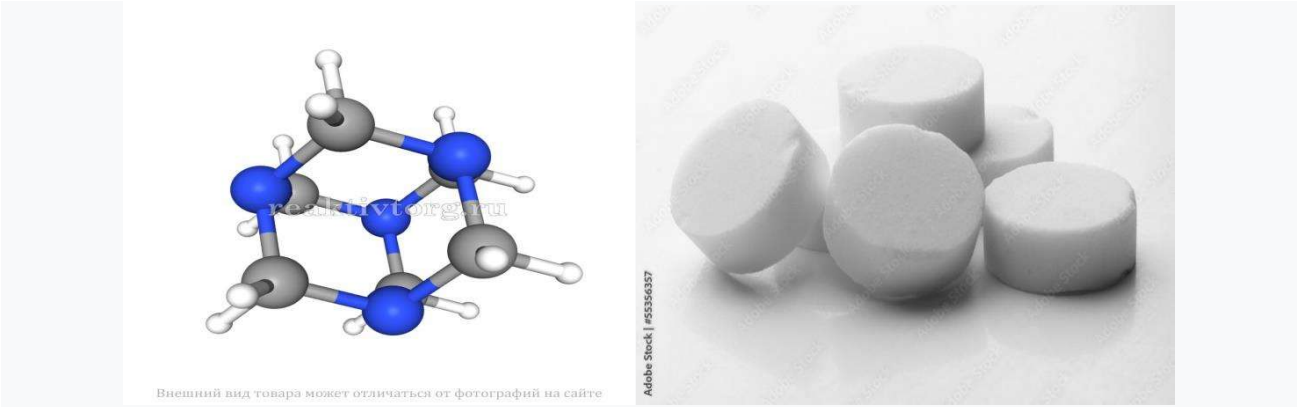


Figura 3. Struture urotropin and Dry fuel based on urotropin

As a fuel, dry alcohol is very convenient: it burns easily, and when it burns, it is easily extinguished if it is covered with a metal lid. Therefore, it is used for lighting fires in laboratories and on trips. It should be protected from moisture during storage.

PISA topic: Did you know that aspirin fights cancer?

PISA statement: It is known that aspirin has the property of thinning the blood. Doctors who used aspirin for a long time observed an interesting situation. The fact is that in order to prevent heart attack (infarction) or vascular (stroke) diseases, taking aspirin for a long time and patients Many years of follow-up are required. This has led to the emergence of a large amount of statistical data about those patients. When these statistics are analyzed, some side effects of aspirin therapy are revealed. along with its secrets, positive effects have also been identified. One of the negative effects is that sudden discontinuation of this drug leads to an increased risk of heart attack or stroke. However, it also has a positive side, and according to Oxford University professor Peter Rothwell, long-term use of aspirin reduces the risk of cancer in humans.

PISA topic: Gas from wetlands

In swampy areas, bubbles of some kind of gas can be seen. Usually this gas is released - methane CH_4. Methane is the main component of natural gas and is a colorless flammable gas that is poorly soluble in water. It is formed when organic matter decomposes in the absence of air. Previously, this gas was called "swamp gas". A mixture of methane with air, or in other words "mine gas", often accumulates in coal mines and poses a great danger to miners. A large amount of thermal energy is generated from the combustion of methane:

$CH_4 + 2O_2 = CO_2\uparrow + 2H_2O\uparrow$.

Under laboratory conditions, methane can be obtained by reacting sodium hydroxide (NaOH) with sodium acetate In this case, it is necessary to heat both salt mixtures:

$CH_3COONa + NaOH = CH_4\uparrow + Na_2CO_3$

We know that methane, along with other hydrocarbons, is extracted in large quantities from gas fields and is used as a fuel and chemical raw material.

In **conclusion, the content of** the PISA international research activities for the 7th-9th grade students of the general secondary school is directed to the development of personal intellectual qualities in the process of educational and creative research tasks, solving problem situations. 7-9- Based on the PISA international research activity of students of the first grade as a set of interrelated components (organizational, content, activity, assessment-result), this system improves the methodology of developing students' research activity based on a humanistic approach and develops educational content. served to exit.

The structural structure of the development of the activities of preparing 7-9th grade students for PISA research is presented as a set of interrelated components such as cognitive, creative, organizational-research, reflexive-evaluation, and limited, permissible and appears at optimal levels. This serves to improve the methodical aspects of evaluating students' knowledge results and research competencies.

Developing a method of self-creative development through the development of technologies for students' preparation for PISA studies (problematic, design, intellectual-map), systematic changes, problem-complexization and integration of the teaching content, as well as cooperative reflexive management of the teaching process. As a result, it was possible to improve the methodology of developing students' research activities by means of educational resources.

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