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A METHODOLOGY FOR USING PISA TASKS IN TEACHING BIOLOGY (USING THE EXAMPLE OF GRADE 9)

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Abstract: This article examines the features of using PISA-type tasks in teaching biology in the 9th grade. The main focus is on developing students' functional literacy through solving tasks related to the topic "Body Mass Index (BMI)." It is shown that the use of such tasks contributes to the development of students' skills in data analysis, interpretation, and the application of biological knowledge in real-life situations. An example of a practical task and methodological recommendations for teachers are provided.

Keywords: PISA, functional literacy, biology, body mass index, 9th grade, teaching methods.

Introduction

Modern education is aimed at developing in students not only subject knowledge, but also the ability to apply it in life situations. One of the international assessment tools for such skills is the PISA (Programme for International Student Assessment), administered by the Organisation for Economic Co-operation and Development (OECD). PISA tasks require students to analyze information, work with graphs, tables, and charts, draw conclusions, and make decisions based on facts. Using PISA tasks in biology lessons promotes scientific literacy and increases student interest in the subject.

Main Part

1. The Importance of PISA Tasks for Teaching Biology

PISA tasks allow students to develop not only their knowledge of biological facts but also their practical application skills. Students learn to analyze real-world situations, draw conclusions based on scientific data, and evaluate the consequences of their decisions. For example, when studying the topic "Body Mass Index," students can compare their calculations with WHO standards, evaluate their lifestyle and diet, and then develop recommendations for improving their health.

Using PISA tasks helps develop critical thinking: students not only know the formula, but also understand how and why it is applied. Additionally, such tasks help develop group work skills: by discussing calculation results, students learn to justify their point of view and listen to the opinions of others.

2. Example Topic: "Body Mass Index (BMI)"

Body mass index is a simple and visual indicator that allows you to assess the correspondence between body weight and height. Working with this indicator helps students understand the relationship between nutrition, physical activity, and human health.

As an extended example, we can offer several situations:

- Student A is 1.55 m tall and weighs 50 kg;
- Student B is 1.70 m tall and weighs 75 kg;
- Student C is 1.60 m tall and weighs 85 kg.

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Students calculate the BMI for each student, compare it to the norm, and analyze possible causes of deviations: overeating, lack of physical activity, genetic factors. Students can also discuss measures they can take to maintain a healthy weight, such as regular exercise, dietary changes, and calorie monitoring.

3. Diversity of PISA Tasks

To develop functional literacy, PISA tasks can be of various types:

• Mathematical calculations: calculating BMI, analyzing statistical data on population health;

• Graph interpretation: comparing weight and height charts for different groups of adolescents;

• Practical recommendations: formulating proposals for improving health, rational meal planning;

• Situational tasks: analyzing a specific life situation and making decisions based on data.

This approach helps students see the real value of the material they are learning and teaches them how to apply their knowledge in everyday life.

4. Methods for Working with PISA Assignments

The following methods can be used when teaching biology in 9th-grade classes:

1. Group work: Students are divided into teams. Each team receives a data set and performs calculations, then discusses the results with the class.

2. Project activities: Students create mini-research projects, for example, analyzing the height and weight of members of their family or class, comparing them with norms, and preparing a report.

3. Case discussions: The teacher presents real-life situations, such as an overweight teenager, and students must propose solutions.

4. Data visualization: Using tables, charts, and graphs to analyze results allows students to better understand the relationships between health indicators.

These methods not only increase interest in biology but also develop analytical and communication skills, as well as critical thinking.

5. Practical example of an extended assignment

Situation: A medical examination is being conducted at a school. A student has the following data: height – 1.68 m, weight – 72 kg. The teacher provides a BMI chart and asks:

1. Calculate the body mass index.
2. Determine the body weight category.
3. Analyze possible causes of deviations from the norm (diet, lifestyle, physical activity).
4. Create recommendations for improving health and maintaining a healthy weight.
5. Suggest ways to monitor health over the course of a month.

This assignment combines calculations, analysis, and recommendations – exactly what is required to develop functional literacy according to the PISA standard.

Conclusion

The use of PISA-formatted assignments in biology studies contributes to the development of students' functional literacy and key competencies for the 21st century. Using the topic "Body Mass Index" as an example, it is shown that such assignments make learning more meaningful and practice-oriented.

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