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CJSC Christmas+

ECOLOGY-CHEMISTRY-BIOLOGY CLASS-PACKAGE FOR LABORATORY CLASSES ON ECOLOGY, CHEMISTRY, BIOLOGY

ANALYZE – GENERALIZE – MAKE CONCLUSIONS



Teacher set



Student set



Textbook

An indicative list of curricula for secondary schools, gymnasiums and lyceums, within which work with ecology-chemistry-biology package can be organized

- Programs on biology. Programs for the general secondary school (general laws, a human being and his health, an introduction to general biology and ecology, anatomy and human physiology).
- Programs on chemistry. Chemistry and Ecology. Chemistry and the environment. Chemical ecology.
- Programs on environmental. Ecology. General ecology. Observation of ecosystems. Practical exercise lesson. Ecology of modern man. Environmental monitoring.
- Programs of special and major courses “ecology of the urban environment”.
- Environmental monitoring. Field ecology. Chemical aspects of ecology, etc.

The equipment and accessories included in the ecology-chemistry-biology package for assessing ecologically important parameters of the state of the environment – water, air, soil and food products – allow directly to measure parameters using the simplest methods applicable in secondary schools and provide reliable environmental information.

Standard equipment is used for carrying out some experiments, and is available in school classrooms of chemistry, biology, natural science.

Educational and methodological support is presented by a textbook for a teacher with a set of instruction cards for students – the publication “Environmental practicum. Study guide with a set of instruction cards”. There is 1 copy in the teacher set and 1 copy in each student set. The manual has a stamp “Approved by the Ministry of Education”.

Technical characteristics

Overall dimensions (indicatively) – packing: 15 places, 14 places – 400×370×80 mm, 1 place – 530×290×280 mm.

The total weight is not more than 41 kg.

Practical work is carried out using simple means of chemical analysis – test systems, ready-made test solutions. The use of standard equipment of classrooms or educational laboratories is provided – stands, drying cabinet, simple glassware, etc.

No electricity or water supply is required.

The duration of practical work is 1 or 2 lessons.

The shelf life of indicator means is from 1 to 2 years.

It is part of a standard package of equipment (class-package) for the “Environmental Practicum” laboratory. Recommended by the Federal Expert Council for educational technology, instruments and equipment for educational and scientific purposes (certificate No. 12).

Purpose and scope of application

Ecology-chemistry-biology class-package for laboratory classes on ecology, chemistry, biology (hereinafter referred to as ECB) is intended for conducting a frontal laboratory practicum at a basic level in a secondary school within the framework of modern variable basic programs of subjects of the natural science cycle – chemistry, biology, ecology, as well as the organization of extracurricular work with pupils to familiarize themselves in the field of environmental studies of environmental objects.

Ecology-chemistry-biology package as a whole and its individual components meet the requirements of interdisciplinary unification, and can be part of the classrooms of chemistry, biology, geography, natural science, educational research centers and laboratories, complementing the existing educational and material base in the current direction of practical work – assessing the ecological state of the environment.

Ecology-chemistry-biology package allows

- Conduct demonstration experiments and laboratory frontal work in the classroom (28 people) on the topics “Water”, “Air”, “Soil”, “Environment and health” (36 experiments).
- Provide work in a classroom, training laboratory, in the field.
- Conduct work of the basic and advanced levels on the assessment of the state of the environment, health.

Studied indicators

Water: active chlorine, effect of synthetic detergents on plants, iron, hardness, acidity and mineral composition, copper, turbidity, organoleptic characteristics, decontamination, sulfides, color, alkalinity, pH, etc.;

Air environment: ammonia, dustiness, carbon dioxide;

Soil: salinity (content of soluble salts), acidity, texture, detection of heavy metals, determination of heavy metals, etc.;

Food products (vegetables, fruits, juices): nitrates;

Health indicators: by the activity of saliva enzymes (smoking, antibiotic, acidity), etc.

**We are always open
for cooperation!**

BEWARE OF IMITATIONS!

Themes of laboratory classes – experiments performed using the ecology-chemistry-biology package

1. Environmental research on the topic “Air”

The effect of acidic air pollution on plants. Influence of air pollution with ammonia on plants. Determination of the composition of the inhaled and exhaled air. Determination of the dustiness of the air in the room. Study of the dustiness of the air in various places of the school territory. Determination of the presence of microorganisms in the air. Express control of air pollution with ammonia.

2. Environmental research on the topic “Water”

Preparation of model water (wastewater) pollution and their express analysis. Observation of the composition of the atmospheric precipitation. Determination of organoleptic indicators of water quality. Determination of the pH value of water. Determination and elimination of water hardness. Detection of chlorides in the model solution, mineral water and soil extract. Effect of synthetic detergents (SD) on green aquatic plants. Water purification from synthetic detergents. Water purification from contamination.

3. Environmental research on the topic “Soil”

Preparation of soil extracts. Determination of soil extract pH and assessment of soil acidity. Determination of soil salinity by salt residue. Assessment of the ecological state of the soil by the salt composition of the water extract. Description of anthropogenic soil disturbances. The influence of artificial ecological environments on plants (modeling of ecological situations). The benefits and harms of polyethylene. Determination of organic matter in the soil. Detection of heavy metals in soils and water bodies.

4. Environmental research on the topic “Environment and health”

Express analysis of exhaled air for carbon dioxide content using indicator tubes. Evaluation of the quality of food products by the content of nitrates in them. Influence of the acidity of the environment on the activity of saliva enzymes. Influence of the acidity of the medium on the properties of the protein. The effect of smoking on the properties of saliva. The effect of an antibiotic on the properties of saliva. The effect of alcohol on protein properties. The effect of salts on protein properties.

Item and its contents	Description	Quantity in ecology-chemistry-biology package
Teacher ecology-chemistry-biology package This package includes: laboratory ware, accessories for work, chemical reagents and solutions, bottles for reagents and solutions, methodological and didactic material (environmental practicum with a set of instruction cards), a set of test systems for assessing the parameters of water, air, soil and food, set of self-adhesive labels.	Conducting demonstration experiments, providing pupils with handouts.	1
Student ecology-chemistry-biology package This package includes: laboratory ware, accessories for work, bottles for reagents and solutions, ready-made solutions for testing, methodological and didactic material (environmental practicum with a set of instruction cards).	Frontal work.	14 (1 set for 2 students)

Fewer student sets can be supplied if required. In this case, the cost of the package will be recalculated downward.

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