

## ECOLOGY IN RAILWAY TRANSPORT

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### **Abstract:**

Natural resources are plants, animals, water, soil, minerals. They provide us with food, clothing, shelter, fuel, energy, and others. They are essential for human life.

**Key words:** Nature, forest, desert, animal world, river, mountain, nature protection, natural resources, relationship between man and nature, atmosphere.

Our Earth is beautiful and rich. Huge spaces on it are occupied by dense forests, mighty mountains covered with eternal snow, deserts. Numerous fast rivers, blue lakes adorn our Earth.

Astronauts say that looking at a planet from space, one can especially clearly understand and feel its insecurity against the background of an infinite universe. And then there is a feeling of deep responsibility for the preservation of the Earth, its nature.

In the age of the scientific and technological revolution, man takes more and more from nature. But the resources of nature are not endless. The essence of nature protection is to rationally and wisely use the soil, flora and fauna, water, minerals.

In the 21st century, all people are concerned about the problems of nature protection. Previously, humanity considered nature to be a source from which you can take wealth infinitely. Now every year the problem of preserving natural resources is becoming more and more important.

Today, one hectare of forest is cut down on Earth every two seconds. A modern plane, which makes only one flight, burns as much oxygen as a hundred hectares of forest produces it in a whole year.

Using natural resources, a person inevitably changes their state. Therefore, in 1962, the World Wide Fund for Nature was founded. Its purpose is to preserve and protect endangered flora and fauna.

At all times of its existence, man has been closely connected with nature. Man has been polluting the atmosphere for millennia, and yet the consequences of the use of fire were very small.

Man began to interfere more and more with the functioning of the biosphere, that part of our planet where life exists. The atmosphere is polluted by three main factors: industry, household boilers and transport. Depending on the location, the share of each of the three sources of pollution varies greatly. Improving the content of education and upbringing in the process of teaching physics in conjunction with local history of ecology when performing laboratory work is a periodic process, in his native land.

As you know, teaching in conjunction with laboratory work with the content about the ecology of the region is being improved while maintaining the appropriate correlation of the components, both invariant and variable.

When teaching physics using laboratory work on the ecology of the region, it is advisable to take into account such educational principles as scientific nature, the unity of theory and practice, the systematic nature of education and upbringing, to observe such didactic principles as comprehensibility, correctness and truthfulness of the results.

### **Principles for the selection of laboratory works in teaching physics on the topic of the ecology of the region:**

Laboratory work with the content of the ecology of the region must be reliable and scientifically substantiated.

The selected laboratory works with the content of the regional ecology must correspond to the program content of the educational material.

Laboratory work with the content of the ecology of the region must correspond to the age, interests and level of general development of students.

When selecting objects for laboratory work with the content of the ecology of the region, it is necessary to take into account the participation of students in social work.

The study and implementation of laboratory work with the content of the ecology of the region should be carried out as comprehensively as possible.

The use of laboratory and practical work with the content of the ecology of the region in teaching physics, first of all, excites, develops and improves students' feelings of respect and love for the region where they live and for its ecology.

Regular use of laboratory and practical work with the content of the ecology of the region brings students closer to practice and prepares them for an independent life.

The organization of interdisciplinary elective courses using laboratory and practical work with the content of the ecology of the region expands and deepens the theoretical and practical knowledge of students about their region, especially develops their logical thinking, fosters interest in learning, forms a sense of a conscious approach to choosing a profession in their native region.

Most importantly, a solid foundation is being created for the choice and further development of a profession by students in their native land.

The atmosphere is polluted by three main factors: industry, household boilers and transport. Depending on the location, the share of each of the three pollution sources varies greatly. Thermal power plants become sources of pollution, emitting sulfur dioxide and carbon dioxide together with smoke into the atmosphere.

Thermal pollution of the surface of water bodies and coastal sea areas appears as a result of the discharge of heated wastewater from power plants and some industrial industries.

The soil cover of the Earth is the most important component of the biosphere. It is the soil cover that determines many processes in the biosphere.

The most important role of soils is the accumulation of organic matter, various chemical elements, as well as energy. The soil cover plays the role of a biological absorber, destroyer and neutralizer of various pollutants. If this link of the biosphere is destroyed, then the existing functioning of the biosphere will be irreversibly disrupted. That is why it is very important to study the global biochemical significance of the soil cover, its current state and changes under the influence of anthropogenic activity. One of the types of anthropogenic impact is pesticide pollution.

In Uzbekistan, rail transport accounts for 70% of freight turnover and 60% of passenger turnover in public transport. Such volumes of work are associated with a large consumption of natural resources and, accordingly, polluting emissions from rail transport are significantly less than from road transport. The decrease in the scale of the impact of rail transport on the environment is due to the following main reasons:

- Low specific fuel consumption per unit of transport work (lower fuel consumption is due to a lower rolling resistance coefficient when wheelsets move on rails in comparison with the movement of car tires on the road);
- Widespread use of electric traction (in this case, there are no emissions of pollutants from the rolling stock);

Despite the listed positive aspects, the impact of railway transport on the environmental situation is very noticeable. It manifests itself, first of all, in the pollution of the air, water environment and land during the construction and operation of railways.

Emissions of pollutants from mobile sources average 1.65 million tons per year.

During operation of mainline diesel locomotives, exhaust gases are emitted into the atmosphere, the composition of which is similar to the exhaust of automobiles. One section of the locomotive emits 28 kg of carbon monoxide, 17.5 kg of nitrogen oxides, and up to 2 kg of soot into the atmosphere per hour of operation. But diesel locomotive diesels during train operation have a more stable load regime, since speed control is carried out using an electric transmission, and a diesel engine operates with small deviations of rotation frequencies. In this regard, the emission of pollutants is significantly reduced.

At the same time, shunting diesel locomotives operate in variable modes with frequent starts, accelerations and decelerations. In this case, the exhaust gas emission increases significantly. A similar nature of pollution is observed in diesel locomotives of temporary operation departments, providing transportation of construction and other goods to the sites and objects of construction work. Passenger cars are contaminated with dry waste and sewage. For each path of a kilometer of track, up to 180-200 cubic meters of water flows out, and 60% of the pollution falls on the stretches, the rest - on the territory of the stations. Until now, passenger cars have not been fully switched to electric heating.

In the event that the natural environment is not able to cope with the impact of railway transport, it is necessary to provide for treatment facilities or carry out restoration work. Balance in nature can be ensured using legal, socio-economic, organizational, technical, sanitary - hygienic, biological and other methods.

Humanity must abandon the old habit of thinking that nature is eternal. Love nature!

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