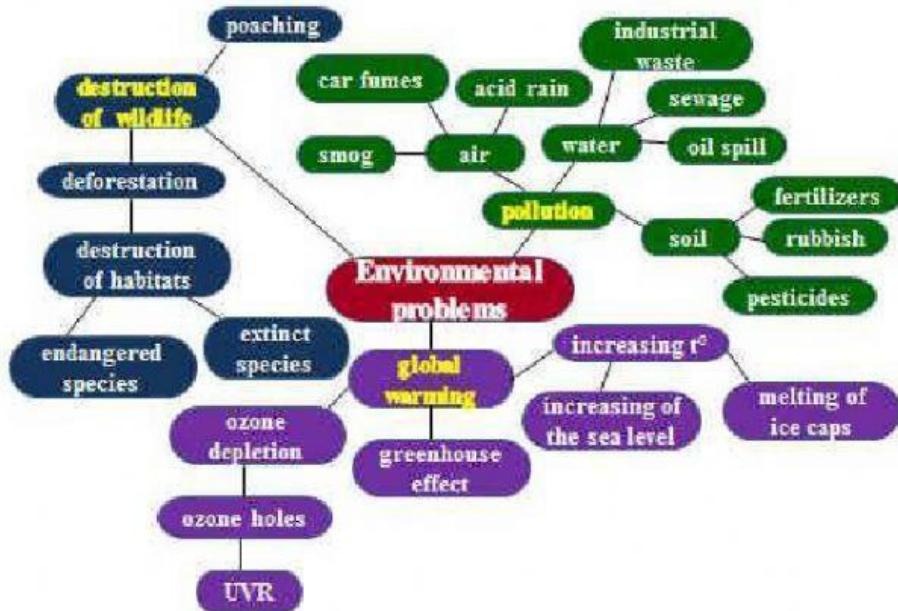


PROTECTION OF THE ENVIRONMENT

I. Evocation.

1. Task: consult the cluster; answer the questions below; share your views with the class.



1. Are we facing some global environmental problems today?
2. Should ecological education be introduced at schools?
3. Why is air pollution a serious problem?
4. Are people getting ecologically wise?
5. Should people recycle things?
6. Should the ecological campaign be better advertised?

2. Task: argue the statement.

Cars are a major contributor to air pollution.

II. Realization.

3. Task: think in brief **whether means of transport that do not contribute to air pollution exist nowadays.**

4. Task: read the text and say

what environmental engineers specialize in.

Transportation and the Environment: Energy, Fuels and Emissions

Engineers design and build many different things that benefit society. Unfortunately, some of these designs lead to the release of pollution into the environment. Pollution can have a negative effect on the health of humans and the environment and even cause deterioration of national landmarks. Environmental engineers specialize in cleaning up and minimizing the amount of pollution that is emitted to assure clean air and water for the population. Many different types of engineers work together to explore options of how to make daily processes, such as driving a vehicle, cleaner and better for the environment.

There were identified six common air pollutants: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide and lead. Automobiles and other modes of transport (buses, trucks, etc.) play a large role in the emissions of many of these types of dangerous pollution, emitting four of the six common pollutants into the environment. While environmental policies have helped to greatly reduce the amount of emissions per vehicle, the number of vehicles on the road, and the distance traveled per vehicle, have both greatly increased.

As seen recently in the news media, alternative fuels and vehicles have been developed and are gaining mainstream popularity. The main two types of alternative vehicles are hybrid and electric. The common hybrid vehicle is a gas-electric hybrid, utilizing both gas and electric engines to increase fuel efficiency and greatly decrease emissions. Electric vehicles rely solely on electric battery power to run the vehicle, which causes them to have no need for gasoline and very low emissions. Each vehicle has its limitations, though both show a movement towards decreasing vehicle emissions and taking responsibility for protecting our environment.

Biodiesel is an animal fat- or vegetable oil-based alternative fuel which has much lower emissions than regular unleaded or diesel fuels. Biodiesel is a sustainable and non-toxic resource that can be made locally and from recycled ingredients, such as vegetable (soybean) oil used at restaurants. These ingredients are processed at a refinery and turned into a fuel-grade product. Remember, you cannot just put vegetable oil into your vehicle's gas tank and expect it to run – that would definitely harm your car's engine.

Other possibilities for alternative vehicles in the future include increasing the efficiency of hybrids and ease of use of electrics as well as the development of hydrogen-powered cars. Hydrogen cars are close to zero emissions and use an infinitely renewable resource.

5. Task: explain the terms; use the information from the text.

- biodiesel
- electric vehicle
- hybrid vehicle
- ozone
- air pollutant
- emissions
- hydrogen
- pollution

6. Group project “The Cleanest Type of Vehicle”.

Task A: brainstorm a list of different methods of transportation; judge each mode in the view of greenness, efficiency, ease of use, cost, fuel efficiency and cool factor; rate each type of vehicle from 1 to 10 and find out which one is the best.

Task B: make a quickly present the order that each group has been decided, and as a class come to a consensus about which travel modes are the best for the environment.

Mode of transport	Greenness	Ease of use	Cost	Fuel Efficiency	Cool Factor	Total

7. Task: read the passage and explain the difference between **RENEWABLE** and **NON-RENEWABLE** natural resources.

All of the products that we use every day are made from natural resources. Natural resources are found in nature: plants and trees, animals, water, air, rocks, minerals and fossil fuels. Natural resources are turned into raw materials and then used to make products. Here are some examples: animals (natural resource), such as cows, are used to obtain leather (raw material). The leather is then turned into jackets, shoes or furniture (products). Rocks (natural resource), such as iron ore, are used to make steel (raw material). The steel is then turned into refrigerators, cars, etc. (products). Fossil fuels (natural resource), such as oil, are used to make plastic (raw material). The plastic is then turned into soda bottles, toys, cups, etc. (products). Renewable resources are those resources which can be replenished in a relatively short time by human action or natural processes. These include plants and trees, animals, water and air. If managed carefully these resources can last indefinitely. Rock, minerals and fossil fuels, on the other hand are non-renewable. They take hundreds of thousands or millions of years to be replaced by natural processes. Some examples of fossil fuels are coal, natural gas and petroleum. Fossil fuels are not only used for energy, but they are also used to make plastics and cosmetic products. By practicing the 3R's – Reduce, Reuse, Recycle - we can conserve these precious resources so that there will be an adequate supply for future generations.

8. Look at the pictures. 3Rs are presented here:

1R – reduce, 2R – reuse, 3R- recycle.

Task: brainstorm ideas for solving the ecological problems; answer the questions below.



1. What can we reuse?
2. How can we reduce using natural resources?
3. What things can we recycle?

9. The business of recycling cars is a multi-billion dollar industry that is crucial to the steel and automotive industries. But just what type of journey does an automobile take until it ends up as another car or truck?

Task: fill in the gaps with the words from the box and name the steps of automobile recycling process.

recycling packaging scrap separated nonferrous dismantling flattened removed
conditions engine weighed.

Most end-of-life vehicles begin their journey at vehicle 1) _____ facilities where they are picked through for usable parts that can be resold or re-manufactured. To further prepare the vehicle for 2) _____, other items like batteries, tires and gas tanks are 3) _____. All 4) _____ fluids are properly drained, stored and recycled, as well as refrigerant gases from air 5) _____. Once these have been removed, the remainder of the car can be 6) _____, for space conserving reasons, and delivered to a 7) _____ dealer. The flattened crushed automobiles arrive where they are 8) _____ and unloaded. Next, they enter a shredding process where the remaining material is separated into three streams: iron and steel, 9) _____ metal and non-metallic scrap. The iron and steel are magnetically 10) _____ from the other materials and recycled to produce new steel and iron. The remaining non-metallic scrap typically consists of a mix of materials including polyurethane foams, polymers, metal oxides and glass. These materials are used for producing different types of 11) _____.

III. Reflection.

10. Free writing.

Task: comment on the following statement. **Some people think that cars should be banned from the centers of big cities. What is your opinion?**

11. Fulfill the crossword.

1. n. - a colorless gas that is a form of oxygen.
2. n. - a container in which liquids are kept under pressure and forced out in a spray (= mass of small drops).
3. n. - the measured amount of heat in a place or in the body.
4. n. - worthless and unwanted things or ideas; garbage.
5. v. - to make something less in size, amount, degree, importance, or price.
6. n. - the materials in which objects are wrapped before being sold.
7. n. - an empty space or opening in an object.
8. v. - to collect and treat used objects and materials that are ready to be thrown out in order to produce materials that can be used again.

9. n. the result of a particular influence; something that happens because of something else.

10. n. - a form of matter that is neither solid nor liquid and can increase in size to fill any container.

11. n. - able to decay naturally and without harming the environment.

12. n. - the act of polluting, or the substances that pollute.

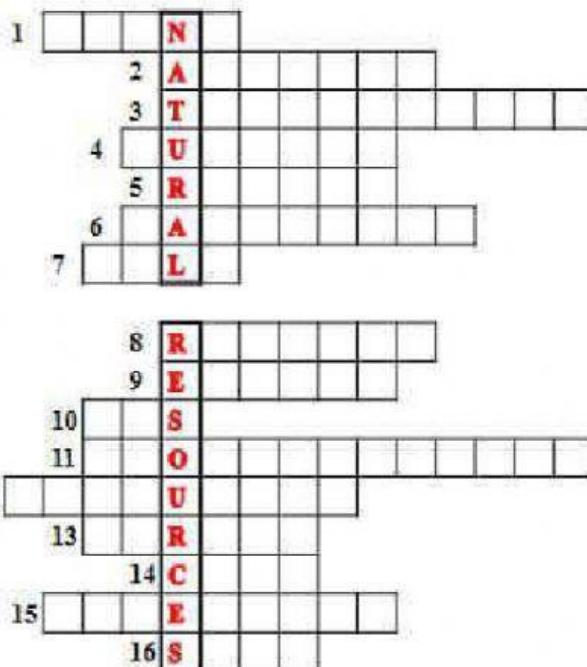
13. n. - a chemical element that is contained in all animals and plants, and that is an important part of other substances such as coal and oil, and exists in its pure form as diamonds and graphite.

14. n. - a hard, black substance that is dug from the earth in lumps and used as a fuel, or a single piece of this substance.

15. adj. - can be used and easily replaced.

16. v. - to make or keep someone or something safe from danger or harm, or to bring something back to a satisfactory condition.

CROSSWORD



IV. Extension.

12. Personal project.

Task: remember those four renewable energy sources you've learned about; pretend yourself environmental engineers and brainstorm ideas of something you could design to help keeping the water or air clean; think how your invention could use a renewable energy source.
