

Интегрированный урок биологии и английского языка « Проблемы экологии в современной Великобритании.»

Урок был подготовлен и проведен на английском и русском языках с обучающимися 9-х классов, которые владеют разговорной речью на английском языке. Урок проводился после изучения темы «Экология» на уроках биологии и английского языка. Именно такая форма проведения позволяет интегрировать знания по двум предметам на одном уроке.

Группа обучающихся 9-х классов под руководством и с помощью учителей биологии и английского языка провели большую подготовительную работу, изучили большое количество материала по проблемам экологии в современной Великобритании.

Учителя-координаторы: Учитель биологии Полянская Ольга Николаевна и учитель английского языка Петрушко Татьяна Яковлевна, ГБОУ СШ № 641 Невского района Санкт-Петербурга.

Цель урока: интегрирование межпредметных связей и знаний обучающихся, полученных в ходе работы над темой «Экология» на уроках биологии и английского языка.

Задачи:

Образовательные:

- расширение знаний обучающихся о природе;
- изучение экологических проблем;
- умение рассказать об экологических проблемах и путях их решений;
- формирование экологического мировоззрения обучающихся.

Воспитательные:

- воспитание бережного отношения к природе;
- формирование целостного мировоззрения.

Развивающие:

- развитие навыков анализа и обобщения;
- развитие воображения и восприятия речи на слух;
- развитие навыков монологической и диалогической иностранной речи.

Оборудование:

- мультимедийное оборудование;
- компьютер;
- презентация в PowerPoint;

Ход урока

Здравствуйте дорогие гости!

Мы рады приветствовать вас в славном городе Санкт-Петербурге. Наша встреча посвящена глобальным проблемам человечества.

Глобальными называют проблемы, которые охватывают весь мир, все человечество, создают угрозу нашему настоящему и будущему. В научной литературе можно встретить разные перечни глобальных проблем, где их число варьирует от 8-10 до 40-45. Выделяют старые и новые проблемы. Так, в конце 20 века на первый план вышли : демографическая, предотвращение третьей мировой войны, энергетическая, сырьевая, продовольственная, использование Мирового океана, предотвращение отсталости развивающихся стран, мировое освоение космоса, экологическая.

Истощение окружающей среды в результате нерационального природопользования, выражающегося в расширении эрозии почв, обезлесивании, загрязнение ее твердыми, жидкими и газообразными отходами, отравлении ее радиоактивными и высокотоксичными веществами, уже привели к значительной деградации глобальной экологической системы. Вот почему экологическая проблема сейчас стала едва ли не главной проблемой выживания человечества. В наши дни все большее число стран начинают объединяться для ее решения.

На нашей встрече присутствуют представители клуба экологов Великобритании. Они покажут нам, как проходят заседания клуба.

Повестка заседания клуба:

1. Загрязнение рек, озер и прибрежных вод:

А) пестицидами (заражение и мор рыбы в реке Бессбрук)

Б) отходами из канализации (заражение птиц: приводит к снижению у них иммунитета, самцы рыбы меняют пол)

В) мусором (за последние 15 лет количество пластикового мусора на пляжах в Великобритании увеличилось на 126%)

Г) нефтяными отходами (аварии на морских станциях).

2. Загрязнение воздуха:

А) свалка в Йоркшире (15 миллионов тонн мусора, закрытие завода по переработке, пожары, угарный газ)

Б) Болезни (ожирение, аутизм, суицид, уменьшение мозга)

3. Пути решения.

Ход заседания клуба экологов из Великобритании.

- Good day, dear colleagues. We have gathered here to discuss the most important ecological problems of our country. At the beginning of our conference let's talk about the water situation in the UK. It has certain issues. Our task here is to point them out and find solutions.

I think we would all agree that the first thing we should discuss is the problem with pesticide usage. I know you all have been researching this issue. Elizabeth, would you like to start?

-Yes, ma'am. Farmers actively use pesticides to protect their crops from pests and to increase productivity of plants. There is no denial that it is good for economy, but there is a flaw to it. They can get into human body with badly washed vegetables and fruit. Plants poorly assimilate nitrogen and phosphorus. Only 40% of nitrogen is absorbed, the other 60% transfers from soil to water and evaporates into the atmosphere. As a result, the water turns into swamp. Dead plants emit methane and hydrogen sulfide in the process of rotting and shorten the amount of oxygen in the water. Fish can't live in that habitat and die. Survived fish accumulate nitrates and become dangerous to eat. They can cause damage to digestive tract. (Slides 3,4)

Pesticides can also cause some serious health damage to human body:

- Damage of nervous system: your muscles begin to shiver and then to convulse;
- Damage of breathing system and blood vessels;
- Hyperactivity

- Confusions
- Small pupils
- Wheezing in the lungs;
- Losing consciousness(possibly to coma level)
- Dropping blood pressure
- Failing heart which could result in death

Pregnant women who lived by the areas of pesticide usage are 2/3 more likely to born babies with autism and other development disorders, than women who lived in pesticide-free areas. (Slide 16)

- My reporters have been to the Armagh county. Mass fish's deaths have been recorded in the river Bessbrook. They have been caused by the pollution of water by agricultural waste. Bad visibility in water prevents from counting the precise amount of dead fish. It is known that approximately 60 different kinds of fish died.

Not only fish suffer from water pollution, but also from sewage waste. 1/3 of male fish are in the process of gender changing. Hormones happen to be in the sewage, including those that comprise female contraceptives, are considered to be the cause of that phenomenon. (Slides 5, 6,7, 8,9)

- Due to my job, I've been to many coast lines and seen , that they are in a very bad shape. According to my report, 30% of rivers and 15% of coasts are in critical state because of pesticides and toxic waste. In the last 15 years the amount of plastic waste has increased to 126%. Tourists and local fishers often use the North Sea as a dump. Fish and sea birds suffer from that, because they eat waste along with food and die. 15% of waste floats in the sea, another 15% are being discarded to the shore, 70% drowns. "Save the North sea" is an organization that distributes the knowledge about the ecological problem of North Sea. (slides 10, 11)

- Surprisingly, bad ecology may have its benefits. Scientists of Cardiff University of Wales discovered that male birds sing better in polluted environment. Shai Markman is an ecologist who studies animals' behaviour. He observed wild European starlings, as those birds get food in sewage treatment plants. Worms that live there often contain harmful substances. They affect birds' brain. With time, the part of it, that is responsible for singing, enlarges. It allowed male birds to sing better. As a result, population of birds grows. Nevertheless, pollution weakens birds' immune system. (Slide 12)

These are all crucial problems with the UK's water resources that I wanted to point out.

- You all have done a great job. Now, let's move onto the next problem. Air in the UK is also polluted. It has the worst effect on everything: humans, animals, nature. Anton, maybe you could give us something on that matter?

- I have sent my confidant to the village in the Northern Yorkshire. What he had seen, shocked both me and him. There was a huge dump, nearly 15000 tons of mixed rubbish. The rubbish appears to be burning even when it is freezing cold and lightly raining there. It is only about hundred meters from residents' homes. The smell it provides is disgusting. Due to the chemical reactions this dump is on fire. We called fire brigade to put the fire away. Chief of this brigade told us that this isn't his first call to this dump. The toxic smell of it causes health problems. Locals complain about constant headaches. They think that authorities are to blame for it, because they do nothing at their meetings. The resident claims "instead of authorities paying money to clean this mess, we have to pay with our health".

(Slide 13)

- I think that air pollution is the most dangerous one, because it has direct influence on human body. In 2015 British scientists conducted a study. It showed that human brain diminishes under the long-term influence of polluted air. Increase in harmful particles (Carbon dioxide, FOR INSTANCE) up to 2 mg/m³ leads to decrease in brain volume of a person by 0,32%(zero point 32), which corresponds to 1 year of brain aging. Also it increases chance of strokes up to 46%. You can locate this disorder only by MRI. (Slide 14)

Breathing bad air increases risk of committing suicide. The researchers of the University of Utah have studied more than 1500 suicides. They concluded that those, who have been influenced by finely divided particles or nitrogen dioxide, committed suicide 5-20% more often than the others. Psychological, physical and ecological factors in cooperation may enlarge the risk of suicides. (Slide 15)

Polluted air can be dangerous to those who have not been born. If pregnant woman breathes dirty air that contains high levels of ozone or carbon monoxide, especially during the second month of pregnancy, the risk of having a child with such disorders as cleft lip, cleft palate and cardiac valve defects are high. It means that polluted air increases chance of giving birth to a child not only with autism but with many other illnesses. (Slide 16)

According to new researches, dirty air leads to obesity. Scientists assume that particles of industrial and cigarette smoke can cause inflammation which lowers the body's ability to use energy. That is how dirty air can lead to obesity. In the University of Ohio an experiment has been made. Mice have been put in the polluted environment. As a result, mice got fat. Also it was noted that their susceptibility to insulin has lowered. It was confirmed that human organism reacts to polluted air the same way. (Slides 17, 18)

- Air pollution is mostly caused by Particulate Matter or PM. Those are the small particles from airborne bacteria, coal particles emitted from the power plants, organic dust and construction dust. These small particles float in the air and are a major threat to the environment and human health. Air pollution and PM 10 are interrelated because of the air pollution from the industrial sources, gases from the motor vehicles, wildlife and the burning of waste forms this type of particulates. The gases undergo a chemical reaction in the air that results in the formation of particulates and as a result affects people's health. The factors responsible for air pollution in the UK are the southern and eastern winds, which bring dust to the country.

The World Health Organization has named 12 cities of the UK that PM was found to be the highest in. Some of them are London (22), Glasgow (23), Oxford, Nottingham, Southampton, having 21, and the highest measured in Port Talbot as 25. Port Talbot tops the list with the highest amount of PM as the steel industry causes maximum pollution in this area. During transportation of the iron ore to the plants and its conversion into steel, its tiny particles and those of the coal burned to convert it escape into the air. The other causes are manufacturing industries, higher concentration of gases emitted from industries and commercial and domestic heating systems. Many people in those cities died of cancer, respiratory problems, heart diseases and strokes. (slide 20)

- Here are some statistics on diabetes situation. We discovered that those who breathe dirty air have an 11% higher risk of having diabetes. In the UK 34, 2% have obesity problems. 11, 1 % of them are caused by hormonal imbalance, which could be a result of breathing bad air.

- What ways of solving these problems can you suggest?

- Oxford Street, one of the central streets of London, is going to be closed for traffic in 2020. This decision is a part of ecological plan of Sadiq Khan, the mayor of London. He approved of building three new passages across the Thames in East London.

The mayor is planning to build the Silvertown tunnel, a bridge for pedestrians and bicyclists. He also mentioned new ecologically harmless routes for busses, which will go through the tunnel.

London rubbish will be turned into bio oil. Two projects: British Airways' project to reduce ejection of CO₂ and the project to reduce the amount of dumps around London, -collaborated and signed an agreement with the City Hall. In 2015 they launched a factory to recycle rubbish into bio oil. London's authorities promised to provide the materials regularly and to pay for its recycling. Because of that agreement British Airways moves rubbish away from the capital of the UK to make it into fuel.

National parks cover 9% of the total land area of UK. As an ecologist, I believe we should organize areas where land should be left open and free from urban sprawl. We could call them green belts.

- Thank you for your reports. Now we know that we must get to work immediately. I am very concerned with that matter. I am going to supervise the implementation of the plan personally.

Спасибо, коллеги! Ваш опыт работы очень интересен и полезен. Мы рады были послушать сообщения о Вашей работе. Проблемы в наших странах схожие и решать их придется нашему поколению всем вместе.