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Changing your Tomorrow

GREEN SKILLS

Class IX , Ch-5 Green Skills: I (IT #402)

Session 1: Society and Environment

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Learning outcome of this Session

The students will be able to:

- ❑ Describe the various natural resources and the need to conserve them;
- ❑ Differentiate between non-renewable and renewable resources;
- ❑ State the factors affecting pollution and the different types of pollution;
- ❑ Describe the climate change and natural disasters;
- ❑ Identify the actions damaging our earth and environment; and
- ❑ Describe the actions for saving the environment.

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Introduction

Human societies are built around using soil, water, energy, wind and mineral resources. They require these and other resources for their continued survival and growth. The environment around us affects all aspects of our life; and all our day-to-day activities also affect the environment. A resource can be defined as any natural or artificial substance, energy or organism, which is used by human being for its welfare. These things include water, land, soils, rocks, forests, animals, fossil fuels and minerals. They are called natural resources as they are the basis of life on earth. We use these resources to survive and also to function properly. Pollution and climate change are creating challenges for humans and society around the world. To judiciously use these natural resources and to save our environment, we need to educate people. Education is important, as it gives people the knowledge and skills that they need to perform.

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Natural Resources

1. **Land Resource**: Land resource is a finite resource which is subject to agricultural and non-agricultural uses, including infrastructure development.
2. **Forest Resource**: Forest resource is used for various purposes. For example, wood is used for making furniture, tool-handles, railway sleepers, matches, ploughs, bridges, boats, etc. and as a source of energy for cooking purpose and for keeping warm. Tannins, gums, drugs, spices, insecticides, waxes, honey, horns, musk, ivory, hides, etc. are all provided by the flora and fauna of forests.
3. **Water Resource**: Water resource include rivers, lakes, oceans, and underground aquifers, etc. Water is a vital resource in agriculture, industrial, household and recreational and environmental activities.
4. **Mineral Resource**: Mineral resources are non-renewable and include metals (e.g., iron, copper, and aluminium), and non-metals (e.g., salt, gypsum, clay, sand, phosphates). Some minerals consist of a single element, such as gold, silver, diamond (carbon), and sulphur.
5. **Food Resources**: Resources that are used as food, or provide food for organisms are called food resources. Agriculture is the main source of plant food resource for human beings.
6. **Energy Resources**: Most of the energy that we use today come from fossil fuels. But fossils fuels have a disadvantage in that they are non-renewable on a human time scale, and causes other potentially harmful effects on the environment.

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Natural Resources

1. **Inexhaustible Resources**: The resources which cannot be exhausted by human consumption are called inexhaustible resources. These include energy sources, like solar radiation, wind power, water power and tidal power, etc.
2. **Exhaustible Resources**: These are resources, which are available in limited quantities and are going to be exhausted as a result of continuous use.
3. **Renewable Resources**: Renewable resources are those that are constantly available (like water) or can be reasonably replaced or recovered, like vegetative lands. Renewable energy systems use resources that are constantly replaced and are usually less polluting. Examples include hydropower, solar, wind, and geothermal (energy from the heat inside the earth).
4. **Non-renewable Resources**: Non-renewable resources are those that cannot easily be replaced once they are destroyed. For example, fossil fuels and minerals. Nonrenewable resources can be called inorganic resources if they come from non-living things. For example, minerals, wind, land, soil and rocks.

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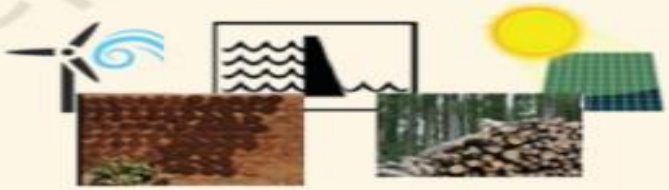
Difference between Non-renewable and Renewable Resources

Non-renewable Resources	Renewable Resources
	
Coal Coal is one of the cheapest sources of fuel.It is used in power houses, factories and houses for cooking and heating.	**Water** Only about 2.5 % of water on earth is fresh water. Energy from rivers is used to make electricity. Energy produced by tides in sea and oceans can also be converted into electricity.
Petroleum It includes petrol, diesel and mineral oils. It is used to run motor vehicles, furnaces and power-houses.	**Sun** Sun's energy can be used to generate electricity. These are used in calculators, street lamps, and even in room heaters and water heaters.
LPG Liquefied petroleum gas (LPG) is made from petroleum gas. LPG is used for cooking and also for running vehicles.	**Wind** The energy from the force of the wind is wind energy. This energy can be used for work as grinding grain, pumping water, etc. This energy can also be converted to electricity.
Natural Gas It is formed by decomposition of dead animals and plants that are buried under lakes and oceans. It is found above the oil in the oil wells. Compressed natural gas (CNG) is used for running vehicles.	**Biomass** Energy can be produced by wastes from plants and animals. It can be used for any heating purpose, such as cooking. It can also be used to produce electricity and heat.
Nuclear Plants Nuclear energy is made available to us with the help of nuclear power plants. Nuclear energy is becoming a common source of electricity throughout the world. It has the danger of causing great harm in case of an accident.	**Soil** Nutrients in the soil helps plants grow. Soil is used to provide shelter. Soil quality gets damaged due to addition to harmful chemicals, land pollution, construction activities, and cutting down of trees.
Minerals The earth contains minerals like gold, bauxite, mica, iron-ore and many others. They are reducing as larger and deeper mines are being dug to obtain these minerals. Mining these minerals causes damage to the earth.	**Forests** Forests are necessary to preserve ecology. They play an important role in providing clean air and attracting rain clouds. They also provide the wood, fruits, and plant products which have medicinal value.

Actions Damaging our Earth and Environment

(i) Overexploitation: It results when harvesting of resources exceeds their reproduction or replenishment. It means that when we exploit the species faster than the natural populations can recover, then it may result in extinction of the species, thus affecting directly or indirectly the ecological cycle and our environment.

(ii) Mining: Some of the environmental impacts of mining include erosion, formation of sinkholes, loss of biodiversity, and contamination of soil, groundwater and surface water by chemicals from the mining processes.

(iii) Deforestation: It results in loss of habitat for many plants and animals living in the forest. It may also lead to extinction of plant and animal species.

(iv) Pollution: Pollution is the effect of undesirable changes in our surroundings that have harmful effects on plants, animals and human beings. Pollutants are produced due to human activity, which have a detrimental effect on our environment.

For example, water pollution caused by factories and other industries can be the most serious problem. They also pollute the air through fossil fuel emissions. These emissions include carbon dioxide, methane, and nitrous oxide, which are harmful to the living beings.

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Factors affecting Environment Pollution

Some of the factors responsible for polluting the environment are as follows:

- Exhaust fumes released from vehicle pollutes the air.
- Excessive use of chemicals in agriculture (like insecticides and fertilizers) affect the alkalinity of the soil or the soil pH.
- Plastic waste like bottles, bags, etc., thrown on land and sea pollutes the water and destroys the flora and fauna.
- Dangerous gases (chlorofluorocarbons or CFCs, methane, carbon dioxide, etc.) released into the air.

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Pollutants

- Pollutants are of two types, as described in the table given below

Pollutants that can decompose	Pollutants that cannot decompose
Pollutants that break down into simpler, harmless substances naturally (by the action of moisture and bacteria) are called biodegradable pollutants	Pollutants which cannot be broken down into simpler and harmless substances are called non-biodegradable pollutants. The harmful effect caused by these pollutants will be there for hundreds of years.
Examples: vegetable waste, sewage waste, paper, wood, cattle dung, agricultural waste from organic farms, etc.	Examples: plastics, insecticides, pesticides, chemicals like mercury or lead, aluminium, glass, etc.

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Types of Pollution

	Land Pollution	Water Pollution	Air Pollution
What it is?	• Damage to the land because of harmful substances is known as land pollution.	• Adding harmful substances and disease causing bacteria and other microorganisms to rivers, lakes, and oceans results in water pollution.	• Addition of harmful gases and particles in air results in air pollution.
What happens because of this pollution?	• Diseases, such as dysentery, cholera and typhoid • Less land is available for use of forests, farms or homes	• Diseases, such as dysentery, diarrhoea, jaundice, typhoid, etc. • Local earnings, like tourism, fishing, etc. are adversely affected. • Less drinking water	• Heart and breathing problems and cancers. • Climate change, droughts, famines and floods
Why does it happen?	• Cutting down forests • Harmful pesticides and fertilisers • Mining and heavy construction • Release of sewage, toilet waste, waste from houses/factories, and chemical waste	• Throwing waste in water • Leakage from sewer lines • Release of waste water from houses, farms and factories • Accidental oil leakage from ships	• Burning of fuels • Smoke from traffic • Burning waste and remains of crops • Pesticides and fertilisers • Smoke from factories • Dust from construction
How to prevent it?	• Reduce waste • Segregate (separate) waste products • Plant trees • Adopt natural and organic farming methods • Use biodegradable items	• Do not throw waste into water bodies • Do not throw chemicals, medicines, oils, etc., in drains • Avoid using pesticides and fertilisers • Ensure proper treatment of sewage and factory waste • Use water wisely	• Use renewable sources of energy • Avoid polluting vehicles • Stop others from burning waste and left-over crops • Avoid pesticides and fertilisers which release harmful gases

Climate Change

- You might be knowing that the atmosphere protects us from harmful radiation from the sun. This is done by a layer all around the earth, in the atmosphere, called the ‘Ozone Layer’. It is made of a gas called ‘Ozone’. This layer in the atmosphere protects us from the harmful radiation.
- Cleaning chemicals, coolants in refrigerators and air conditioners, etc., release ozone depleting substances, such as chlorofluorocarbons in the atmosphere. These destroy the ozone in the atmosphere, making ‘holes’ in the ozone layer.

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Natural Disasters

- Natural disasters include floods, earthquakes, landslides, storms, etc. Our actions in exploiting natural resources for building structures, such as large dams and buildings sometimes aggravates the impact of natural calamities and disasters.

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Saving the Environment

To save our environment, we need to educate people. Education is important, as it gives people the knowledge and skills that they need to perform.

i. **Learning about the environment**: Learning about the environment focuses mainly on acquisition of knowledge and understanding of our surroundings and related issues.

ii. **Learning through the environment**: Learning through the environment refers to the processes of learning while being engaged with environment inside and outside the classroom. It focuses on learning process, such as observation, hands-on experience, learning-by-doing, and problem-solving through an exposure to the environment and learning.

iii. **Learning for the environment**: Learning for the environment aims at the development of an informed response and responsibility towards the environment.

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Saving the Environment

	Avoid	Prefer
Air pollution	Burning materials, for example burning wheat or rice straw in agricultural field	Using natural ventilation or fans in place of airconditioners
Energy use	Leaving electrical lights or appliances on, when not required	Using public transport buses and cycles (instead of cars), using solar or wind energy
Water pollution	Throwing waste in rivers and lakes	Using recycled water or water harvested through rains for watering garden plants
Waste	Using plastic bags	Segregating waste before throwing, so that the biodegradable waste can be harvested
Chemicals in food	Using chemical pesticides or fertilisers	Organic (natural and chemical free) food to promote organic farming
Forest Plants	Over-use of paper should be avoided	Reusing paper for making paper based products
Water	Over-use of water should be avoided	Reducing water use during bathing by using water filled in a bucket instead of shower

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Saving the Environment

Reduce, Reuse, Recycle There are three Rs which you can apply for saving the environment – Reduce, Reuse and Recycle. It is a concept of the modern waste management.

- Reduce: Do not use what you do not need.
- Reuse: Reuse the materials for other purposes, such as making pillow covers or rags out of used shirts or ladies suits.
- Recycling: Recycling is reusing some components of the waste that may have some economic value.

Reduce: Use less things	Reuse: Use things for longer time	Recycle: Use things in new or different ways
Paper for each notebook means cutting down of a tree. Do not leave too much spaces, while writing the text. Reduce the wastage of paper.	Use both sides of paper for writing. Give your old books and notebooks to someone who can use them. In this way, you will promote reuse of paper.	Paper is recycled into making paper again. It is also used to make *papier mache*, which is a composite material consisting of paper pieces or pulp which is sometimes reinforced with textiles, bound with an adhesive, such as glue, starch, or wallpaper paste.

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A Quick Recap Of This Session

In this session, you have learnt about the natural resources, difference between non-renewable and renewable resources, environment pollution, pollutants, natural disasters and actions for saving our environment, including reduce, reuse and recycle.

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Home Assignment

A. Multiple choice questions

Read the questions carefully and circle the letter (a), (b), (c) or (d) that best answers the question.

1) What are some of the environmental changes caused due to modern methods of agriculture?
   a) Chemical pollution due to fertilizers
   b) Improvement in the environment
   c) Lower air pollution due to crops
   d) Decrease in forest areas
2) How can we conserve our health and environment?(Choose all the correct options)
   a) Grow organic crops
   b) Use natural fertilisers
   c) Manage waste water
   d) Use more air conditioning
3) A steel factory burns firewood and charcoal for heating and melting the steel? What are the possible effects on the environment? (Choose all the correct options)
   a) Increase in global temperature
   b) Decrease in global temperature
   c) Increase in air pollution
   d) Decrease in air pollution

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Home Assignment

B. Subjective questions

1. What are the five sources of energy available to us? Give two examples of each source?
2. What are the sources of pollution?
3. Classify the following under the three respective categories of natural resources:

Air, iron, sand, petroleum, wind, clay, fish, forest, gold, pearls.

Inexhaustible	Renewable	Non- renewable

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