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Nature's Treasures

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Introduction

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Natural things around us like lush green hills, fertile soil, a variety of flora and fauna, pure air, water and sunlight are the essential elements that sustain life and contribute to the beauty and balance of nature. These natural resources are vital for our survival and comfort.

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Air

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The air we breathe contains oxygen, which our body needs to perform its functions. Fresh air helps keep the lungs healthy and is essential for survival.

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Composition of Air

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Air is a mixture of gases including nitrogen, oxygen, argon, carbon dioxide, and other gases. Nitrogen makes up about 78%, oxygen about 21%, and other gases about 1% of the air.

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Natural Resources Overview

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Natural resources include air, water, forests, soil, rocks, minerals, fossil fuels, and energy from the Sun. They are essential for life and human activities. Resources can be renewable or non-renewable.

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Wind and Windmills

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Wind causes the rotation of windmills, which can be used to run flour mills, pump water, or generate electricity. Windmill farms are areas with many windmills used for electricity generation.

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Water

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Water is essential for drinking, cooking, bathing, washing, agriculture, and industry. Sources of water include rivers, lakes, ponds, rain, groundwater, oceans, reservoirs, streams, glaciers, and ice caps.

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Most of the Earth's water is saline and found in oceans, while freshwater is found in ice sheets, rivers, lakes, and underground.

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Water Conservation

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Water wastage occurs in daily activities such as washing, bathing, cooking, and gardening. Conservation methods include turning off taps when not in use, fixing leaks, using basins, and watering plants judiciously.

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Water Pollution

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Water pollution is caused by littering, industrial waste, agricultural runoff, sewage disposal, and oil spills. Reducing pollution involves proper waste disposal, waste treatment, regulations, and education.

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Water Scarcity and Harvesting

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Water scarcity affects many regions. Conservation methods include rainwater harvesting, efficient usage, leak prevention, and water-efficient fixtures.

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Traditional Water Harvesting

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Stepwells are traditional structures in India used to capture and store rainwater and seepage water, helping manage water in arid regions.

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Water Cycle and Sun

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The Sun causes evaporation of water from surfaces, contributing to the water cycle. Sunlight also helps dry objects by removing moisture.

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Energy from the Sun

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The Sun provides heat and light essential for life. Uses include drying clothes, cooking with solar cookers, heating water, generating electricity with solar panels, and photosynthesis in plants.

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Forests

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Forests provide food and shelter for animals and help prevent soil erosion. They recycle nutrients through decaying leaves. Forests are decreasing due to human activities, so conservation is important. Events like Van Mahotsav promote tree planting and forest protection.

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Soil, Rocks and Minerals

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Soil forms from weathered rocks and contains organic matter, minerals, and living organisms. Different soils have different textures and uses. Rocks are natural solid mineral formations used in construction and tools. Minerals extracted from rocks are used in various industries.

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Fossil Fuels

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Fossil fuels like petroleum, natural gas, and coal are formed from ancient organic matter and are used for energy. Burning them causes pollution. Alternatives include electric vehicles, hybrid vehicles, public transport, cycling, and renewable energy.

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Natural Resources: Renewable and Non-renewable

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Natural resources are obtained from nature and include air, water, soil, plants, animals, minerals, and fossil fuels. Human-made resources are created by humans. Renewable resources replenish naturally, while non-renewable resources do not. Conservation is essential for sustainability.

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Solved Examples

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Example 1: Calculate the percentage of oxygen in air if air contains 21% oxygen by volume.

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Solution: Given that oxygen makes up 21% of air by volume, the percentage of oxygen in air is 21%.

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Example 2: Explain how a windmill generates electricity.

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Solution: Wind causes the blades of a windmill to rotate. The rotating blades turn a rotor connected to a generator inside the windmill. The generator converts the kinetic energy of the wind into electrical energy.

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Practice Set

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- **Level 1 – Easy:** What are the main gases present in the air we breathe?

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- **Level 2 – Moderate:** Describe two ways to conserve water in daily life.

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- **Level 3 – Challenging:** Explain the environmental impact of burning fossil fuels and suggest alternatives to reduce pollution.

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Answer Key

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- **Level 1:** The main gases in air are nitrogen (78%) and oxygen (21%).

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- **Level 2:** Two ways to conserve water are turning off taps when not in use and using rainwater harvesting.

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- **Level 3:** Burning fossil fuels releases pollutants causing air pollution and climate change. Alternatives include using electric vehicles, renewable energy sources like solar and wind, and promoting public transportation.

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Quick Reference Table

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- **Air Composition:** Nitrogen 78%, Oxygen 21%, Other gases 1%

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- **Water Sources:** Rivers, lakes, rain, groundwater, oceans

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- **Fossil Fuels:** Petroleum, natural gas, coal

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- **Renewable Resources:** Air, water, forests, solar energy

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- **Non-renewable Resources:** Minerals, fossil fuels, soil

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- **Uses of Sunlight:** Photosynthesis, drying, cooking, heating, electricity generation

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Common Mistakes and Misconceptions

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- Misconception: Air is a single gas. Fact: Air is a mixture of gases.

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- Misconception: All water on Earth is usable. Fact: Most water is saline and not suitable for drinking or agriculture.

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- Misconception: Fossil fuels are renewable. Fact: Fossil fuels are non-renewable and take millions of years to form.

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- Misconception: Windmills only pump water. Fact: Windmills can also generate electricity and run mills.

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Glossary

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- **Air:** Mixture of gases surrounding the Earth.

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- **Fossil Fuels:** Energy sources formed from ancient organic matter.

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- **Renewable Resources:** Natural resources that replenish naturally.

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- **Non-renewable Resources:** Resources that do not replenish within a human time scale.

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- **Photosynthesis:** Process by which plants make food using sunlight.

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- **Rainwater Harvesting:** Collecting and storing rainwater for use.

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- **Windmill:** A device that converts wind energy into mechanical or electrical energy.

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- **Soil:** The top layer of Earth's surface that supports plant life.

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- **Minerals:** Naturally occurring substances extracted from rocks.

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