

UNIQUE STUDY POINT BY SUMEET SAHU

Nature's Treasures

Class 6 — Science — Chapter 11

NCERT Comprehensive Notes 2025-26

01 Overview — Nature's Treasures

Chapter 11 of the NCERT Curiosity textbook (Class 6 Science) introduces students to the invaluable treasures that nature provides for the survival and well-being of all living beings on Earth. Through the story of Bhoomi, Surya, and their grandmother Ajji who lives in a village near the Western Ghats, students discover the importance of air, water, sunlight, forests, soil, rocks, minerals, and fossil fuels. The chapter emphasises that these natural resources are essential for all life forms and must be conserved and used judiciously. It also introduces the concept of renewable and non-renewable resources, helping students understand why responsible use of Earth's treasures is vital for the future.

★ USP Key Points

- ★ Air is a mixture of gases: Nitrogen (78%), Oxygen (21%), and Argon, CO₂ & other gases (1%).
- ★ Water covers about two-thirds (approximately 66%) of the Earth's surface, but most of it is saline (ocean water).
- ★ Only a very small fraction of freshwater in ponds, rivers, lakes, and wells is easily accessible for human use.
- ★ The Sun is the main source of energy on Earth — all plants and animals depend on it directly or indirectly.
- ★ World Water Day is observed on 22nd March every year to raise awareness about water conservation.
- ★ The Chipko Movement started in the early 1970s in Uttarakhand to protect forests from being felled.
- ★ Van Mahotsav is a weeklong tree-planting festival celebrated in July to increase the green cover across India.
- ★ Fossil fuels (coal, petroleum, natural gas) take millions of years to form and are found in limited quantities.
- ★ A basic mobile phone contains about a dozen minerals including gold, silver, copper, and cobalt.
- ★ Bawadi (Rajasthan) and Vav (Gujarat) are traditional stepwells built for rainwater harvesting.


📌 **NCERT Chapter Summary:** Resources required for our survival are provided by nature and are called natural resources. Important natural resources include air, water, energy from the Sun, forests, soil, rocks, minerals, and fossil fuels. Resources created by humans are called human-made resources. Natural resources are classified as renewable (air, water, forests — restored within a reasonable time) and non-renewable (minerals, coal, petroleum, natural gas — found in limited quantities). All living beings depend on natural resources, so we must use them judiciously.

SECTION	TOPIC COVERED	KEY TAKEAWAY
11.1	Air	Air is a mixture of gases (N ₂ 78%, O ₂ 21%); wind energy can generate electricity
11.2	Water	Only a small fraction of Earth's water is freshwater; conserve through rainwater harvesting
11.3	Energy from the Sun	Sun is the main energy source; solar panels and cookers harness solar energy
11.4	Forests	Forests provide food, shelter, oxygen; Chipko Movement and Van Mahotsav protect them
11.5	Soil, Rocks & Minerals	Soil forms over thousands of years; rocks contain minerals used in manufacturing
11.6	Fossil Fuels	Coal, petroleum, natural gas take millions of years to form; cause pollution when burnt
11.7	Renewable vs Non-Renewable	Renewable = replenished naturally; Non-renewable = limited, cannot be replaced easily
11.8	Resources We Use	We depend on natural resources daily; must conserve and use responsibly

02 Air — The Breath of Life

Importance of Air

Air is one of the most essential natural resources for the survival of living beings. Ajji teaches Bhoomi and Surya about breathing exercises — taking deep breaths helps get more fresh air (oxygen) into the lungs and keeps us healthy. The air we breathe in contains oxygen, which our body needs to perform its various functions. When we hold our breath for a long time, our body does not get enough oxygen, and we start feeling uncomfortable. We can survive without food or water for a few days, but we cannot survive without oxygen for even a few minutes. Most living beings need oxygen for their survival.

 **Did You Know?** We can survive without food or water for a few days, but we cannot survive without oxygen for even a few minutes!

Composition of Air

The air that surrounds the Earth is a mixture of gases. Air contains nitrogen, oxygen, argon, carbon dioxide, and other gases in small quantities. Out of 100 parts of air, 78 parts are occupied by nitrogen, 21 parts by oxygen, and 1 part by argon, carbon dioxide, and other gases together.

COMPONENT OF AIR	PERCENTAGE (%)	KEY ROLE
Nitrogen	78%	Essential for plant growth; makes up most of the atmosphere
Oxygen	21%	Needed by living beings for breathing and survival
Argon, CO ₂ & other gases	1%	CO ₂ used by plants for food-making; maintains temperature balance


Wind and Its Uses


You notice the presence of air when leaves rustle, clothes on a line sway, or pages of a book flutter when a fan is switched on. Moving air is called wind. Sometimes it blows fast (during a storm), and sometimes gently as a breeze. Wind can be harnessed for useful purposes. A firki (paper pinwheel) rotates when wind blows on it. The working of a windmill is similar to that of a firki — wind rotates the wings of a windmill.

Uses of Windmills: Windmills can be used to run flour mills, pull up water from wells, or generate electricity. India has many windmill farms that use wind energy to generate electricity.

★ Famous Windmill Farms in India

- ★ Muppandal Wind Farm — Tamil Nadu
- ★ Jaisalmer Wind Park — Rajasthan
- ★ Brahmanvel Wind Farm — Maharashtra

 **Activity 11.1 — Breathing Exercise:** Take a deep breath in, then breathe out slowly. Take a deeper breath again and hold it as long as you can. You will find it is difficult to hold your breath for a long time because the body does not get enough oxygen to perform its functions. This shows how essential oxygen is for our survival.

 **Activity 11.2 — Making a Firki (Paper Pinwheel):** Take a 15 cm × 15 cm square paper, scissors, an all-pin, and a soft stick. Cut and fold as shown in the textbook to make a firki. Hold it and run, or blow air on it — the firki rotates! This demonstrates that wind (moving air) has energy and can do work, just like a windmill.

Wind

Moving air is called wind. It can blow fast (storm) or gently (breeze) and can be used to generate energy.

Percentage

The number of parts in 100, denoted by the symbol '%'. For example, oxygen makes up 21% of air.

Windmill Farm

An area with a large number of windmills that use the energy of wind to generate electricity. India has several windmill farms including Muppandal (Tamil Nadu) and Jaisalmer Wind Park (Rajasthan).

03 Water — The Elixir of Life

Importance and Uses of Water

Water is essential and precious for all living beings. We need water for many daily activities such as drinking, cooking, bathing, washing, and cleaning. Water is also used for growing crops (agriculture) and for industrial purposes. Ajji teaches Bhoomi and Surya how to water plants carefully so that every drop is used and none of it goes to waste.

Distribution of Water on Earth

Water covers about two-thirds of the Earth's surface. However, most of this water is found in oceans and seas and is saline (salty). Saline water is not fit for domestic, agricultural, or industrial use. For all these activities, we need freshwater, which is present in the form of ice sheets or snow, rivers or lakes on the surface of the Earth, and underground. The freshwater present in ice sheets and snow or underground is difficult to access. Only a very small fraction of freshwater present in ponds, rivers, lakes, and wells is easily accessible.

⚠ Important: Although water covers about two-thirds of the Earth's surface, most of it is saline (ocean water). Only a very small fraction of freshwater is easily accessible for human use. Water is precious!

Water Wastage and Conservation

Water can be wasted in many daily activities such as hand washing, washing clothes, washing utensils, taking showers, cooking, gardening, and brushing teeth. There are many ways to reduce wastage of water, including turning off taps when not in use, fixing water leakages, recycling water, and water harvesting.

🔍 Activity 11.3 — Finding Water Wastage: Observe how water is wasted in daily activities like hand washing, washing clothes and utensils, taking showers, cooking, gardening, and brushing teeth. For each activity, note how water is wasted and suggest ways to reduce this wastage. Conclusion: We waste a lot of water daily, but simple changes in habits can save a significant amount of water.

TYPE OF WATER	LOCATION	ACCESSIBILITY	FIT FOR USE?
Saline water	Oceans and seas	Covers most of Earth's surface	Not fit for domestic/agricultural use
Freshwater (ice/snow)	Ice sheets, glaciers	Difficult to access	Fit, but hard to reach
Freshwater (underground)	Below Earth's surface	Difficult to access	Fit, requires pumping
Freshwater (surface)	Ponds, rivers, lakes, wells	Easily accessible (very small fraction)	Fit for use after treatment

ACTIVITY	HOW WATER IS WASTED	WAYS TO REDUCE WASTAGE
Hand washing	Keeping tap running while soaping	Turn off tap while soaping; use a mug
Washing clothes	Using excess water; multiple rinse cycles	Use bucket instead of running water; reuse rinse water
Washing utensils	Continuous running of tap	Fill a basin to wash; turn off tap when not rinsing
Taking shower	Long showers with running water	Use a bucket and mug; take shorter showers
Gardening	Using hose pipe; watering at midday	Use drip irrigation; water in early morning or evening
Brushing teeth	Keeping tap on while brushing	Use a glass of water; turn off tap while brushing


Water Pollution

Our country is blessed with numerous rivers, streams, and lakes. However, we pollute freshwater sources by throwing trash (waste materials) in them. Waste from homes and industries also pollutes our water sources when dumped into them. Polluted water is not fit for consumption by living beings. It is important for us to conserve water, use it judiciously, and prevent it from being polluted.

Rainwater Harvesting

Water harvesting is one of the methods for conserving water. In many buildings, rainwater is collected and stored in large quantities for later use. This is called rainwater harvesting. It is an age-old practice in India.

Traditional Water Harvesting: Stepwells (commonly known as *Bawadi* in Rajasthan and *Vav* in Gujarat) are built for water harvesting. They store not only rainwater but also water seeping from nearby lakes, ponds, and rivers. The walls of the trenches are lined with blocks of stones that allow seepage of water. *Toorji ka Jhalra* in Jodhpur, Rajasthan is a famous example.

 **World Water Day** is observed on 22nd March every year to raise awareness about the importance of freshwater and the need to manage freshwater resources sustainably.

04 Energy from the Sun

Sun: The Main Source of Energy

The Sun is the main source of energy on Earth. All plants and animals are dependent on it. We use heat and light from the Sun for various purposes such as drying clothes, drying food items (like chillies and mangoes), making food by plants (photosynthesis), and evaporation of water in the water cycle. One cannot imagine life on Earth without the Sun.

Energy Chain from the Sun: Plants get energy from the Sun and produce food → Animals eat plants and grow → We get food from both plants and animals. This entire cycle on Earth is possible due to the Sun. So, all living beings are dependent on the Sun as the main source of energy.


How a Cow Gets Energy from the Sun

In the textbook, Bhoomi and Surya see a cow grazing grass. The cow eats grass to get energy. But grass needs sunlight to grow. So the original source of energy for the cow is also the Sun. The cow does not get energy directly from standing in the Sun — it gets energy indirectly through the food chain (Sun → Grass → Cow).

Solar Energy and Its Uses

Solar panels capture the Sun's energy and produce electricity. Energy from the Sun can also be directly used for cooking in a solar cooker or for heating water in a solar water heater. Solar panels can be seen on rooftops, on top of street lights, and on traffic signals.

USE OF SOLAR ENERGY	DEVICE/METHOD	APPLICATION
Generating electricity	Solar panels	Rooftops, street lights, traffic signals
Cooking food	Solar cooker	Homes, community kitchens
Heating water	Solar water heater	Homes, hotels, hospitals
Drying food/clothes	Direct sunlight	Homes, farms, industries
Plant food-making	Photosynthesis	All green plants

 **Cultural Fact:** In many households in India, water is offered to the Sun early in the morning as an expression of gratitude to the Sun.

Solar Energy

Energy obtained from the Sun that can be used for generating electricity, cooking, heating water, and many other purposes.

? What Will Happen if the Sun is Not Visible for a Few Days?

1. We may have to depend on artificial lighting during daytime.
2. Plants will not be able to make food through photosynthesis, affecting the food chain.
3. The temperature will drop significantly, making it very cold.
4. Solar panels will not generate electricity.
5. The water cycle will be disrupted as evaporation will slow down, leading to less rainfall.
6. Animals that depend on warmth from the Sun will be affected.

05 Forests — Green Treasure

What are Forests?

Forests are large areas with dense growth of various types of plants, including herbs, shrubs, and trees. They are a natural home for many wild animals, including birds and insects, and provide food and shelter to them. In nature, every animal depends on other life forms for survival. The diversity of life forms ensures food for every living being.

Products from Forests

We get many useful products from forests such as timber (wood for construction and furniture), fruits and nuts, medicinal herbs, honey, rubber, gum, spices, firewood, and raw materials for paper-making. Forests also provide clean air by absorbing carbon dioxide and releasing oxygen.


FOREST PRODUCT	EXAMPLES	USES
Timber (Wood)	Teak, Sal, Pine, Deodar	Construction, furniture, tools, boats
Fruits & Nuts	Nellikai (Indian gooseberry), berries, walnuts	Food for humans and animals
Medicinal herbs	Tulsi, Neem, Ashwagandha	Traditional and modern medicines
Other products	Honey, rubber, gum, resins, lac	Industrial and domestic applications
Clean oxygen	Released by all green plants	Essential for breathing of all living beings


★ Key Products from Forests

- ★ Timber (wood) — for construction, furniture, and tools
- ★ Fruits, nuts, and berries — food for humans and animals
- ★ Medicinal herbs and plants — for traditional and modern medicines
- ★ Honey, rubber, gum, resins — industrial and domestic use
- ★ Clean oxygen — forests act as the "lungs" of the Earth

Threats to Forests and Conservation

Over the years, forest cover has been decreasing, mainly due to human activities like large-scale cutting of trees. It takes many years to grow a new forest or restore lost forests. Therefore, we must preserve and use forests responsibly so that they get enough time to regenerate. The roots of plants hold on to the soil and prevent it from being washed away. The leaves that fall from trees decay and enrich the soil with nutrients. This soil is used by new plants and trees to grow — an example of recycling in nature.

 **Chipko Movement:** One of the most famous efforts to protect forests is the Chipko Movement. It started in the early 1970s in Uttarakhand (previously part of Uttar Pradesh). Local women actively participated in this movement. They encircled and hugged the trees to protect them from being cut down (felled).

 **Van Mahotsav:** A weeklong event celebrated across India during the month of July. It is a forest festival during which new plants and trees are planted, and awareness about respecting forests is raised. The aim is to increase the green cover.

Consequences of Large-Scale Deforestation:

- Soil erosion — roots no longer hold the soil, leading to landslides and floods.
- Loss of habitat — animals, birds, and insects lose their natural home.
- Climate change — fewer trees mean less CO₂ is absorbed, increasing global warming.
- Disruption of water cycle — less transpiration leads to reduced rainfall.
- Loss of biodiversity — many plant and animal species may become extinct.
- Loss of livelihood — tribal communities and forest-dwellers lose their source of income and food.

Sacred Groves


Patches of forests that have been traditionally protected by local communities as sacred areas. They play an important role in conserving biodiversity.


06 Soil, Rocks and Minerals

Soil — A Precious Treasure

Soil is formed by the disintegration (breaking apart) of rocks by actions of the Sun, water, and living organisms over a long time (thousands of years). There are different types of soils — some are good for growing certain types of plants while some are good for making bricks for buildings. Forests have a variety of soils. The space between soil particles provides sufficient air and room for plant roots to grow easily. Earthworms are natural agents that help in turning and loosening the soil. Soil supports biodiversity and is a precious natural treasure.

Soil contains many things such as sand, insects, worms, and even tiny organisms invisible to the naked eye. Plants and animals also become part of the soil as they decompose and decay. Soils collected from different places may have different colours because they contain different materials.

 **Soil Investigation (Activity 11.4):** Students are encouraged to collect soil samples from different areas, observe their colour and texture with the naked eye and magnifying lens, and record differences. This helps understand the diversity and composition of soil.

 **Activity 11.4 — Investigation Guide:** Collect soil from different locations (garden, playground, roadside, farm). Record: (1) Location of collection, (2) Your initial guess about the soil, (3) Observation with naked eye — colour, texture, (4) Observation with magnifying lens. You will notice differences in colour, texture, and composition. Soils from different places contain different materials — some have more sand, some have more clay, and some have more decayed organic matter.

Rocks and Their Uses


Rocks are found everywhere in our surroundings and have many uses. They are used in the construction of houses, buildings, temples, roads, dams, and table tops. Human beings have been using rocks to make tools such as hand axes and arrowheads for thousands of years.

ROCK / MATERIAL	USES
Granite	Construction of buildings, floors, monuments, and countertops
Sandstone	Building material, decorative architecture
Marble	Construction, sculptures, flooring (e.g., Taj Mahal)
Slate	Roofing material
Laterite	Used as building bricks

Minerals and Metals

Rocks are made up of minerals. Important metals such as aluminium, gold, copper, and iron are extracted from minerals. Minerals are used in the manufacturing of airplanes, cars, jewellery, cosmetics, and electrical and electronic equipment. A basic mobile phone contains about a dozen minerals including gold, silver, copper, and cobalt. Rocks take thousands to millions of years to form, so it is important to conserve and use them responsibly.

METAL	EXTRACTED FROM	COMMON USES
Aluminium	Bauxite ore	Aircraft, utensils, foil, cans
Gold	Gold ore/quartz veins	Jewellery, electronics, coins
Copper	Copper ore (chalcopyrite)	Electrical wires, plumbing, coins
Iron	Iron ore (haematite)	Construction (steel), vehicles, tools, bridges
Silver	Silver ore	Jewellery, electronics, photography
Cobalt	Cobalt ore	Batteries, magnets, mobile phones

 **Fun Fact:** A basic mobile phone contains about a dozen minerals including gold, silver, copper, and cobalt. This shows how dependent our modern technology is on minerals extracted from rocks. Since it takes thousands to millions of years for rocks to form, we must use these resources responsibly and recycle electronic waste.

Minerals

Naturally occurring substances that make up rocks. Important metals like gold, silver, copper, iron, and aluminium are extracted from minerals.

Disintegration

The process of breaking apart. Soil is formed by the disintegration of rocks due to the actions of the Sun, water, and living organisms over thousands of years.

07 Fossil Fuels & Natural Resources

What are Fossil Fuels?

Petrol and diesel are the two most widely used fuels for vehicles. Petrol, diesel, and kerosene are obtained from petroleum. Petroleum, along with natural gas and coal, are commonly called fossil fuels. They are formed essentially from the remains of microorganisms and plants that got buried deep inside the Earth, and were converted into petroleum, natural gas, and coal. This process takes millions of years.

FOSSIL FUEL	OBTAINED FROM	MAIN USES
Petrol	Petroleum	Fuel for two-wheelers, cars
Diesel	Petroleum	Fuel for buses, trucks, trains
Kerosene	Petroleum	Cooking, lighting (in some areas)
LPG	Petroleum/Natural gas	Domestic cooking fuel
CNG	Natural gas (compressed)	Cleaner fuel for vehicles
Coal	Mined from Earth	Electricity production
Natural Gas	Found underground	Cooking, generating electricity, vehicle fuel (CNG)

⚠ Problem with Fossil Fuels: Fossil fuels are found in limited quantities and take millions of years to form. When burnt, they produce smoke and carbon dioxide gas, which pollutes the air. Over-dependence on fossil fuels has resulted in large-scale air pollution.


Renewable vs Non-Renewable Resources


Resources which we get from nature are called natural resources. Resources created by human beings for convenience (like electric bulbs, furniture, solar panels, bicycles) are called human-made resources. Natural resources can be classified into two types based on their ability to be replenished.


FEATURE	RENEWABLE RESOURCES	NON-RENEWABLE RESOURCES
Definition	Resources that get renewed, replenished, or restored within a reasonable period of time	Resources found in limited quantities that are not replenished within a reasonable period
Examples	Air, water, forests, solar energy, wind energy	Coal, petroleum, natural gas, minerals, rocks, soil
Availability	Can be regenerated by nature	Once used, they get exhausted
Time to form	Relatively short period	Millions of years
Conservation	Use judiciously and protect from pollution	Must conserve strictly; find alternatives

★ Ways to Conserve Fossil Fuels

- ★ Walk or cycle to nearby places
- ★ Use public transport instead of private vehicles
- ★ Switch to electric vehicles that cause less pollution
- ★ Use solar energy, wind energy, and other renewable sources
- ★ Turn off engines when stuck in traffic for a long time

 **Earlier vs Now:** Earlier, coal, wood, and dung cakes were used as fuels for cooking. Nowadays, less polluting natural gas and Liquefied Petroleum Gas (LPG) have gradually replaced these domestic fuels.

 **Activity 11.5 — Vehicle Survey:** Conduct a survey of vehicles in your neighbourhood. Record the type of vehicle (car, bus, bike, auto, truck) and the type of fuel it uses (petrol, diesel, CNG, electric). You will find that petrol and diesel are the most common fuels used by vehicles. This shows our heavy dependence on fossil fuels for transportation.

 **Activity 11.6 — Natural Resources in Daily Life:** Make a list of activities you do daily and the natural resources used. Examples: Washing clothes → Water; Making clay toys → Soil, Water; Collecting firewood → Forest; Making kites → Wood (bamboo), Air (to fly); Having breakfast → Soil (crops), Water, Sunlight. This activity helps us realise how deeply we depend on natural resources in every aspect of life.

Natural Resources

Resources that we get from nature, such as air, water, sunlight, forests, soil, rocks, minerals, and fossil fuels.

Human-Made Resources

Resources created by human beings using natural resources, such as electric bulbs, furniture, solar panels, and bicycles.

Renewable Resources


Resources that get renewed, replenished, or restored by natural processes within a reasonable period of time. Examples: air, water, forests.


Non-Renewable Resources

Resources found in limited quantities that are not produced or replenished within a reasonable period. Examples: coal, petroleum, natural gas, minerals.

Fossil Fuels

Fuels formed from the remains of ancient organisms (microorganisms and plants) that got buried deep inside the Earth and transformed over millions of years. Includes coal, petroleum, and natural gas.

 **Gandhiji's Wisdom:** "Earth provides enough to satisfy every man's need but not for every man's greed." — M. K. Gandhi. This reminds us that nature has enough resources for all living beings if we use them wisely and responsibly, without being greedy or wasteful.

 **Recycling in Nature:** Nature recycles its own resources. For example, in forests, fallen leaves decay and enrich the soil with nutrients. New plants use this enriched soil to grow. The roots of plants hold the soil firmly and prevent erosion. When animals eat plants and produce droppings, the seeds in the droppings help grow new plants. This natural recycling ensures sustainability.

Resources We Use Daily (Section 11.8)

We use many natural resources in our everyday life. When Bhoomi and Surya return to the city from Ajji's village, they notice that the city has fewer trees, more smoke from vehicles, and polluted air compared to the village. This shows how over-use of resources and lack of trees affects our environment. We must conserve our natural resources and use them responsibly without wasting them, so that we can continue to fulfil our present needs while also saving for the future, without harming the environment. Simple alternatives like electric vehicles can help reduce pollution.

Alternatives for Reducing Air Pollution:

- Use electric vehicles (EVs) — they do not release any smoke.
- Walk or cycle to nearby places instead of using motor vehicles.
- Use public transport (buses, metros) to reduce the number of vehicles on roads.
- Plant more trees — they absorb CO₂ and release oxygen, cleaning the air.
- Use CNG or LPG instead of petrol/diesel — they produce less pollution.
- Use solar and wind energy for electricity generation instead of burning coal.

DAILY ACTIVITY	NATURAL RESOURCE USED	HOW TO REDUCE/CONSERVE
Washing clothes	Water	Use bucket instead of running water; reuse rinse water for mopping
Making clay toys	Soil (clay), Water	Use clay from sustainable sources; recycle dried clay
Collecting firewood	Forest (trees/wood)	Switch to LPG/solar cooking; use only fallen branches
Making kites	Wood (bamboo), Paper (trees)	Use recycled paper; use biodegradable materials
Having breakfast	Soil, Water, Sunlight (for crops)	Avoid food wastage; eat locally grown seasonal food

08 Glossary of Key Terms

Natural Resources

Resources obtained from nature such as air, water, sunlight, forests, soil, rocks, minerals, and fossil fuels.

Renewable Resources

Resources that get renewed, replenished, or restored by natural processes within a reasonable period. E.g., air, water, forests.

Non-Renewable Resources

Resources found in limited quantities that are not replenished within a reasonable time. E.g., coal, petroleum, natural gas, minerals.

Fossil Fuels

Fuels formed from remains of ancient organisms buried deep underground over millions of years. Includes coal, petroleum, and natural gas.

Rainwater Harvesting

The method of collecting and storing rainwater for later use. An age-old practice in India, using structures like stepwells (Bawadi/Vav).

Wind

Moving air. It can blow fast (storm) or gently (breeze). Wind energy is harnessed using windmills to generate electricity.

Minerals

Naturally occurring substances that make up rocks. Metals like gold, silver, copper, iron, and aluminium are extracted from minerals.

Human-Made Resources

Resources created by human beings using natural resources for convenience. Examples: furniture, electric bulbs, solar panels, bicycles.

Petroleum

A fossil fuel found underground from which petrol, diesel, and kerosene are obtained. Also called "black gold" due to its importance.

Disintegration

The process of breaking apart. Soil is formed by the disintegration of rocks due to actions of Sun, water, and living organisms.

Chipko Movement

A forest conservation movement started in the early 1970s in Uttarakhand where local women hugged trees to protect them from being felled.

Van Mahotsav

A weeklong tree-planting festival celebrated across India in July to increase green cover and raise awareness about protecting forests.

Solar Energy

Energy from the Sun used for electricity (solar panels), cooking (solar cooker), heating water (solar water heater), and drying.

Saline Water

Salty water found in oceans and seas. It is not fit for domestic, agricultural, or industrial use.

CNG

Compressed Natural Gas — a cleaner fuel for vehicles made by compressing natural gas. It produces less pollution than petrol or diesel.

LPG

Liquefied Petroleum Gas — a clean cooking fuel that has replaced traditional fuels like coal, wood, and dung cakes in most Indian households.

Biodiversity

The variety of living organisms (plants, animals, microorganisms) found in a particular area. Forests and fertile soils support rich biodiversity.

09 Q&A, MCQs & Case Studies**NCERT Exercise Questions with Answers**

Q1. Fig. 11.9 shows items related to natural resources. Match them with their jumbled up names. Classify these resources as renewable or non-renewable.

Matching: ocrk → Rock; refost → Forest; ndiw → Wind; atwre → Water.

Classification:

Renewable Resources: Forest, Wind, Water — These get renewed or replenished by natural processes within a reasonable period of time.

Non-Renewable Resources: Rock — Rocks take thousands to millions of years to form and are not replenished within a reasonable period.

Q2. State whether the following statements are True or False. If False, correct them.

- (i) Nature has all the resources to meet human needs. — **True**. Nature provides all essential resources like air, water, sunlight, soil, minerals, and forests for our survival.
- (ii) Machines are a resource found in nature. — **False**. Machines are not found in nature. They are human-made resources created by human beings using natural resources.
- (iii) Natural gas is a non-renewable resource. — **True**. Natural gas takes millions of years to form and is found in limited quantities. Once exhausted, it cannot be replenished within a reasonable time.
- (iv) Air is a renewable resource. — **True**. Air gets renewed and replenished by natural processes within a reasonable period of time.

Q3. Fill in the blanks: (i) A fuel commonly used in two wheelers is _____. (ii) An example of a renewable resource is _____.

- (i) A fuel that is commonly used in two wheelers like scooters or bikes is **(b) Petrol**. Petrol is the most commonly used fuel for two-wheelers in India.
- (ii) An example of a renewable resource is **(b) Water**. Water gets renewed through the water cycle (evaporation, condensation, and precipitation). Coal, natural gas, and petrol are all non-renewable resources.

Q4. Classify the following as renewable or non-renewable resources — coal, natural gas, forests and minerals.

Renewable Resources: Forests — Forests can be regrown over a period of time through natural regeneration and tree planting, although it takes many years.

Non-Renewable Resources: Coal, Natural Gas, and Minerals — These take millions of years to form and are found in limited quantities. Once used, they get exhausted and are not replenished within a reasonable period of time.

Q5. Why do we say that petroleum is a non-renewable resource?

Petroleum is called a non-renewable resource because:

- (a) It is formed from the remains of microorganisms and plants that got buried deep inside the Earth millions of years ago.
- (b) It takes millions of years for petroleum to form naturally.
- (c) It is found in limited quantities on Earth.
- (d) Once extracted and used, it gets exhausted and cannot be replenished within a reasonable period of time.
- Therefore, petroleum is classified as a non-renewable resource and must be conserved carefully.

Q6. It is difficult to regrow forests. Justify this statement.

It is difficult to regrow forests because:

- (a) A forest is not just a collection of trees — it is a complex ecosystem with a large variety of herbs, shrubs, trees, animals, birds, insects, and microorganisms that depend on each other.
- (b) It takes many years (often decades or centuries) for trees to grow to their full size.
- (c) The rich biodiversity of a natural forest — with its unique soil composition, fallen leaf nutrients, and interconnected food chains — takes a very long time to develop naturally.
- (d) Once the forest cover is lost, the soil gets eroded by wind and water, making it even harder for new plants to grow.

Therefore, we must preserve forests responsibly and allow them enough time to regenerate.

Q7. Make a list of five daily activities in which you use natural resources. Suggest ways to reduce their use.

- 1. Drinking/Cooking (Water):** Use only the required amount of water; do not let taps run unnecessarily.
- 2. Travelling by vehicle (Petroleum/Diesel):** Walk or cycle to nearby places; use public transport to save fuel.
- 3. Using electricity (Coal/Solar):** Switch off lights and fans when not in use; use energy-efficient appliances.
- 4. Eating food (Soil, Water, Sunlight):** Avoid wasting food; eat fresh and local produce to reduce transportation needs.
- 5. Using paper/notebooks (Forests):** Use both sides of paper; recycle old newspapers and notebooks.

Q8. List four activities that are possible due to the presence of air.

Four activities that are possible due to the presence of air are:

- (a) **Breathing:** All living beings (including humans, animals, and plants) need oxygen from air to survive and carry out their life processes.
- (b) **Burning/Combustion:** Oxygen present in air supports burning of fuels for cooking, heating, and running engines.
- (c) **Wind energy generation:** Moving air (wind) is used to rotate windmill blades and generate electricity.
- (d) **Pollination and seed dispersal:** Wind helps in pollination of flowers and dispersal of seeds of many plants, supporting biodiversity.

Q9. How can you contribute towards enhancing the green cover of your locality? Make a list of actions.

Actions to enhance the green cover of our locality:

- (a) Plant trees and shrubs in empty spaces around our home, school, and neighbourhood.
- (b) Participate in Van Mahotsav and other community tree-planting drives.
- (c) Take care of existing plants by watering them regularly and protecting them from damage.
- (d) Spread awareness among family and friends about the importance of forests and green cover.
- (e) Avoid cutting trees unnecessarily; if a tree must be cut, plant at least two new trees in its place.
- (f) Create small kitchen gardens or terrace gardens at home.

Q10. In the given illustration, food is being cooked. (i) What type of energy is being used? (ii) Name one benefit and one drawback.

(i) The type of energy being used for cooking is **energy from burning wood/firewood** (biomass energy). The illustration shows food being cooked on a traditional chulha using wood as fuel.

(ii) **Benefit:** Wood is easily available in rural areas and does not require any modern equipment or technology to use for cooking.

Drawback: Burning wood produces a lot of smoke, which causes air pollution and leads to respiratory health problems. It also contributes to deforestation as trees are cut for firewood.

Q11. Cutting down trees on a large scale impacts the quality of the soil. Why?

Cutting down trees on a large scale (deforestation) impacts the quality of soil because:

(a) **Soil erosion:** The roots of trees hold the soil firmly in place. When trees are cut, the soil becomes loose and gets easily washed away by rainwater or blown away by wind.

(b) **Loss of nutrients:** Fallen leaves from trees decay and enrich the soil with nutrients. Without trees, the soil loses this natural source of nutrients and becomes less fertile.

(c) **Loss of moisture:** Trees help retain moisture in the soil. Without tree cover, the soil dries out quickly.

(d) **Loss of organisms:** Earthworms and other soil organisms that help in aerating and enriching the soil lose their habitat when forests are destroyed.

Thus, deforestation leads to soil erosion, loss of fertility, and overall degradation of soil quality.

Q12. Explain two ways in which human activities pollute the air. Propose one action to reduce air pollution.

Two ways human activities pollute the air:

(a) **Burning fossil fuels in vehicles:** Cars, buses, bikes, and trucks that run on petrol and diesel release smoke containing harmful gases like carbon dioxide, carbon monoxide, and other pollutants into the air.

(b) **Industrial emissions:** Factories and industries burn fossil fuels and release smoke, dust particles, and toxic gases into the atmosphere, causing severe air pollution.

One action to reduce air pollution: We can use electric vehicles instead of petrol/diesel vehicles. Electric vehicles do not release any smoke and help reduce air pollution significantly. Additionally, using public transport, cycling, or walking for short distances also reduces the number of polluting vehicles on the road.

Q13. A family uses solar panels for electricity, a gas stove for cooking, and a windmill for pumping water. What would happen if there were no sunlight for a week?

If there were no sunlight for a week:

(a) **Solar panels would stop generating electricity**, so the family would have no electricity for lighting, fans, and other appliances. They would need to depend on alternative sources like batteries or grid electricity.

(b) **The gas stove would continue to work** as it uses LPG/natural gas, which does not directly depend on sunlight. So cooking would not be affected immediately.

(c) **The windmill might still work** if there is wind, as wind does not directly depend on immediate sunlight. However, wind patterns may be affected if the lack of sunlight continues for a long time.

(d) **Plants would not be able to make food** through photosynthesis, which would affect the food supply for animals and humans.

(e) The temperature would drop significantly, making it very cold.

Q14. Fill up the blanks in the concept map using the terms: fossil fuels, forest, air, petroleum, coal, water, non-renewable resource.

The concept map shows Natural Resources divided into Renewable Resources and Non-Renewable Resources.

Renewable Resources: Air, Water, Forest

Non-Renewable Resources (Fossil Fuels): Coal, Petroleum, Natural Gas

So the blanks are filled as: The top level is *Natural Resources*, which splits into *Renewable Resources* (air, water, forest) and *Non-renewable resources*. Under non-renewable resources, we have *fossil fuels* which include *coal*, *petroleum*, and natural gas.

Q15. There is an increasing demand of trees for industries and housing. Therefore, trees are being felled. Is it justified?

No, cutting down trees on a large scale is not justified because:

- (a) Forests provide oxygen, food, shelter, and resources to countless living beings.
- (b) Trees prevent soil erosion and maintain the fertility of the soil.
- (c) Forests play a crucial role in maintaining the water cycle and climate balance.
- (d) Loss of forests leads to loss of biodiversity — many animal and plant species lose their natural habitat.
- (e) It takes many years (even decades) to regrow a forest, so once destroyed, the damage is long-lasting.

Alternative approaches: Instead of cutting forests, we should use recycled materials, develop sustainable alternatives, practise afforestation (planting new trees), and use resources efficiently. If trees must be cut for essential needs, new trees should be planted to replace them.

Q16. Propose a plan to use less water in your school. What steps would you take and how would it help the environment?

Plan to use less water in school:

- (a) **Fix leaking taps and pipes** immediately to prevent continuous water wastage.
- (b) **Install water-saving taps** (sensor-based or push taps) in washrooms that automatically stop water flow.
- (c) **Collect rainwater** through rainwater harvesting systems on the school building and use it for gardening and cleaning.
- (d) **Water the school garden** in the early morning or evening to reduce evaporation loss; use drip irrigation if possible.
- (e) **Put up awareness posters** near water taps reminding students to turn off taps after use.
- (f) **Reuse water** from RO purifiers for mopping floors and watering plants.

How it helps the environment: Saving water conserves a precious natural resource, ensures availability for future generations, reduces the energy used in water treatment, and protects freshwater ecosystems from being over-exploited.

Additional Short Answer Questions

Q17. What is the composition of air? State the percentage of each major component.

Air is a mixture of gases. It contains Nitrogen (78%), Oxygen (21%), and a combination of Argon, Carbon dioxide, and other gases (1%). Nitrogen is the most abundant gas in the atmosphere, while oxygen is essential for the breathing and survival of most living organisms.

Q18. What is the difference between natural resources and human-made resources? Give two examples of each.

Natural resources are those that we get from nature, such as air, water, sunlight, forests, soil, and minerals.

Human-made resources are those created by human beings using natural resources for convenience, such as furniture (made from wood), electric bulbs (made from glass and metals), bicycles (made from metals), and solar panels (made using minerals). The key difference is that natural resources exist in nature without human intervention, while human-made resources are manufactured by humans.

Q19. What is rainwater harvesting? Mention two traditional methods of water harvesting in India.

Rainwater harvesting is the method of collecting and storing rainwater for later use. It is an age-old practice in India. Two traditional methods are: (a) **Bawadi (Stepwells)** in Rajasthan — these structures store rainwater as well as water seeping from nearby lakes and rivers. The walls of trenches are lined with stone blocks to allow water seepage. (b) **Vav (Stepwells)** in Gujarat — similar to Bawadi, these are also used to harvest and store water, especially in water-scarce regions. Toorji ka Jhalra in Jodhpur is a famous example of a Bawadi.

Q20. How does the Sun help in the water cycle?

The Sun plays a crucial role in the water cycle by providing heat energy that causes evaporation. When the Sun heats the surface of water bodies (oceans, rivers, lakes), water evaporates and turns into water vapour, which rises into the atmosphere. This water vapour cools and condenses to form clouds, which eventually lead to precipitation (rain, snow). The rainwater flows back into rivers, lakes, and oceans, completing the cycle. Without the Sun's energy, evaporation would not occur, and the entire water cycle would stop.

Q21. Why should we conserve natural resources? Give any three reasons.

We should conserve natural resources because: (a) Natural resources are essential for the survival of all living beings — without air, water, and food, life is not possible. (b) Many natural resources like fossil fuels, minerals, and rocks are non-renewable — once exhausted, they cannot be replaced within our lifetime. (c) Overuse and wastage of resources leads to pollution, environmental degradation, and climate change, which affects the health of all living beings. We must use resources judiciously to fulfil our present needs while also saving them for future generations.

Q22. What is a windmill farm? Name any two windmill farms in India.

A windmill farm is an area that has a large number of windmills which use the energy of the wind to generate electricity. Wind rotates the wings (blades) of the windmills, and this mechanical energy is converted into electrical energy. Two important windmill farms in India are: (a) Muppandal Wind Farm in Tamil Nadu, and (b) Jaisalmer Wind Park in Rajasthan. Brahmanvel Wind Farm in Maharashtra is another leading windmill farm in the country.

Multiple Choice Questions (MCQs)

1. A fuel that is commonly used in two wheelers like scooters or bikes is:

- (a) Kerosene
- (b) Petrol
- (c) Diesel
- (d) LPG

Answer: (b) Petrol

2. An example of a renewable resource is:

- (a) Coal
- (b) Water
- (c) Natural gas
- (d) Petrol

Answer: (b) Water

3. The most abundant gas in the atmosphere is:

- (a) Oxygen
- (b) Carbon dioxide
- (c) Nitrogen
- (d) Argon

Answer: (c) Nitrogen (78%)

4. Which of the following is a non-renewable resource?

- (a) Forest
- (b) Air
- (c) Coal
- (d) Water

Answer: (c) Coal

5. Rainwater harvesting structures called Bawadi are found in:

- (a) Kerala
- (b) Rajasthan
- (c) Tamil Nadu
- (d) West Bengal

Answer: (b) Rajasthan

6. The Chipko Movement was aimed at protecting:

- (a) Rivers from pollution
- (b) Forests from being cut

- (c) Air from pollution
- (d) Minerals from over-mining

✔ Answer: (b) Forests from being cut

7. Which of the following is the main source of energy on Earth?

- (a) Wind
- (b) Water
- (c) The Sun
- (d) Coal

✔ Answer: (c) The Sun

8. Petrol, diesel and kerosene are obtained from:

- (a) Coal
- (b) Natural gas
- (c) Petroleum
- (d) Minerals

✔ Answer: (c) Petroleum

9. Which of the following is a cleaner fuel for vehicles compared to petrol and diesel?

- (a) Coal
- (b) Kerosene
- (c) CNG (Compressed Natural Gas)
- (d) Wood

✔ Answer: (c) CNG (Compressed Natural Gas)

10. Soil is formed by the disintegration of rocks over:

- (a) A few days
- (b) A few months
- (c) A few years
- (d) Thousands of years

✔ Answer: (d) Thousands of years

11. World Water Day is observed on:

- (a) 22nd March
- (b) 5th June
- (c) 22nd April
- (d) 21st March

✔ Answer: (a) 22nd March

12. Which organism helps in turning and loosening the soil naturally?

- (a) Butterfly
- (b) Earthworm
- (c) Frog
- (d) Ant

Answer: (b) Earthworm

13. Van Mahotsav is celebrated in which month?

- (a) January
- (b) March
- (c) July
- (d) October

Answer: (c) July

14. Which of the following is NOT a fossil fuel?

- (a) Coal
- (b) Petroleum
- (c) Wood
- (d) Natural gas

Answer: (c) Wood — Wood is a biomass fuel obtained from trees, not from ancient buried organisms.

15. Water covers approximately what fraction of the Earth's surface?

- (a) One-third
- (b) One-half
- (c) Two-thirds
- (d) Three-fourths

Answer: (c) Two-thirds

Case-Based Questions

Case Study 1: The Village Near the Forest

Bhoomi and Surya visit their grandmother Ajji in a village on the edge of a forest in the Western Ghats. The air in the village is fresh and cooler than in the city. They can see beautiful hills, streams, and many interesting plants, animals, and birds around them. Ajji says that the place has several treasures of nature that enrich their lives — pure air, fertile soil, plenty of sunlight, and trees that provide food and shelter to animals. When they return to the city, they notice the air smells different — they can smell smoke from vehicles and the air is polluted.

1. Why was the air in the village fresh and cooler than in the city?

2. List any three "treasures of nature" mentioned by Ajji.
3. Why did the air in the city smell different from the village?
4. Suggest two ways to reduce air pollution in cities.

Answers:

1. The village air was fresh and cooler because it was near a forest in the Western Ghats. Trees in the forest absorb carbon dioxide and release oxygen, making the air cleaner. The dense tree cover also provides shade and cools the surrounding area. There are very few vehicles in the village, so there is less pollution.
2. Three treasures of nature mentioned by Ajji are: (a) Pure air, (b) Fertile soil that supports a variety of living beings, and (c) Plenty of sunlight which is useful in many ways.
3. The air in the city smelled different because of air pollution caused by smoke from vehicles that use fossil fuels (petrol and diesel). The burning of fossil fuels releases smoke, carbon dioxide, and other harmful gases into the air. Also, there are very few trees in the city compared to the village.
4. Two ways to reduce air pollution in cities: (a) Use electric vehicles that do not release smoke, and (b) Plant more trees in cities to improve air quality and increase green cover.

 **Case Study 2: Water Conservation Challenge**

Riya's school is located in a town that faces water shortage during summer. The school uses a lot of water for drinking, washing, cleaning, and watering the garden. The school principal decided to install a rainwater harvesting system on the school roof. They also put up posters near all water taps asking students to conserve water. Within six months, the school was able to reduce its water bill by 30% and had enough stored rainwater to water the garden during summer.

1. What problem did the school face?
2. What is rainwater harvesting?
3. How did the rainwater harvesting system help the school?
4. Name a traditional water harvesting structure in India and the state where it is found.

Answers:

1. The school faced the problem of water shortage during summer, and it was using a lot of water for various daily activities like drinking, washing, cleaning, and gardening.
2. Rainwater harvesting is the method of collecting and storing rainwater for later use. It involves directing rainwater from rooftops or other surfaces into storage tanks or pits for future use.
3. The rainwater harvesting system helped the school by: (a) Reducing the school's water bill by 30%, saving money. (b) Providing stored rainwater to water the garden during summer months when there was a water shortage. This ensured the garden stayed green without wasting municipal water supply.

4. Bawadi (stepwells) is a traditional water harvesting structure found in Rajasthan. Another example is Vav, found in Gujarat. These structures store rainwater and water seeping from nearby water bodies.

Case Study 3: The Solar Village




A small village in Rajasthan installed solar panels on the rooftops of most houses. The village also has a community solar cooker that can cook food for 20 families at a time. A nearby windmill farm generates additional electricity. The villagers earlier used wood and dung cakes as cooking fuel, which produced a lot of smoke and caused health problems. After switching to solar energy, the air quality improved and the villagers saved money on fuel. However, during the monsoon season when there is less sunlight, they sometimes face electricity shortages.

1. What sources of energy does the village use?
2. Why did the villagers switch from wood and dung cakes to solar energy?
3. Classify solar energy and wind energy as renewable or non-renewable. Give reasons.
4. What problem do the villagers face during monsoon? Suggest a solution.

Answers:

1. The village uses two main sources of energy: (a) Solar energy — through solar panels on rooftops for electricity and a community solar cooker for cooking, and (b) Wind energy — from a nearby windmill farm for generating additional electricity.
2. The villagers switched from wood and dung cakes to solar energy because: (a) Burning wood and dung cakes produced a lot of smoke, causing air pollution and respiratory health problems. (b) Solar energy is clean — it does not produce any smoke or pollution. (c) Solar energy helped save money on fuel costs.
3. Both solar energy and wind energy are renewable resources because: (a) The Sun will continue to provide heat and light energy for billions of years — it gets renewed naturally. (b) Wind is moving air that is always available — it gets replenished naturally. Both can be used without getting exhausted.
4. During the monsoon, there is less sunlight, so solar panels generate less electricity. Solution: The village can store extra electricity generated during sunny days in batteries for use during cloudy/rainy days. They can also increase their dependence on the windmill farm during monsoon, as wind may still be available. Using a combination of solar and wind energy provides a more reliable supply.

Exam Tips — Nature's Treasures


-  Memorise the composition of air: Nitrogen 78%, Oxygen 21%, Other gases 1%. This is frequently asked in MCQs and fill-in-the-blanks.
-  Remember the difference between renewable and non-renewable resources with clear examples. Air, Water, Forests = Renewable. Coal, Petroleum, Natural Gas, Minerals = Non-renewable.
-  Know that fossil fuels take millions of years to form — this is the key reason they are non-renewable. Explain the formation process in answers.

- 🎯 For questions on water conservation, always mention specific methods: fix leaking taps, rainwater harvesting, recycling water, drip irrigation.
- 🎯 Chipko Movement (1970s, Uttarakhand, women hugged trees) and Van Mahotsav (July, tree-planting week) are important facts for short answer questions.
- 🎯 Remember traditional water harvesting: Bawadi (Rajasthan), Vav (Gujarat), Toorji ka Jhalra (Jodhpur). These are asked in case studies.
- 🎯 The Sun is the "main source of energy on Earth" — explain the energy chain: Sun → Plants → Animals → Humans for full marks in long answers.
- 🎯 For soil formation: remember it takes thousands of years through disintegration of rocks by Sun, water, and living organisms.
- 🎯 World Water Day = 22nd March. This is a common MCQ question. Also remember CNG is a cleaner fuel than petrol/diesel.
- 🎯 In long answer questions, always give specific examples and data (like 78% nitrogen, two-thirds Earth covered by water, Muppandal Wind Farm) to score higher marks.

UNIQUE STUDY POINT

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