

Coal And Petroleum  
SUMMARY**Natural Resources**

**Resources** supplied by **nature** are called **natural resources**. The **sun, air, water, soil, trees and forests, wildlife, coal, petroleum, natural gas and minerals** are all **natural resources**.

Many **industries**, like **fishing, mining, hunting, agriculture and forestry**, revolve around the **sensible use of natural resources**.

**Natural resources** are **classified** as **renewable and non-renewable resources**.

**Renewable resources** are those that are **present in unlimited quantity** in nature or those that will **replace themselves** over time.

These resources are not likely to be **exhausted by human activities**.

As they are **unlimited**, they are also called **inexhaustible resources**.

**Non-renewable resources** are those that are **limited in nature** and will **not replace themselves**. They can be **exhausted by human activities**.

As they are limited, they are also called **exhaustible resources**.

**Coal, petroleum and natural gas** are **exhaustible fossil fuels**, which **cannot be prepared in the laboratory**. It takes **millions of years** for **dead organisms** to get converted into these fuels.

**Studies** show that the **known reserves** of these **fuels are fast depleting**.

Burning of these fuels is also a major cause for **air pollution** and, along with **cutting down of trees**, is contributing to **global warming**.

The **Petroleum Conservation Research Association (PCRA)** of **India** has some **tips for people** on how to save **petrol/ diesel** while **driving**:

- **Drive vehicles** at a **constant and moderate speed**.
- While **waiting** or at a **traffic junction**, **switch off the engine**.
- Ensure **correct tyre pressure**.
- Ensure **regular maintenance checks** of the **vehicle**.

Tips for **conserving energy** at **home** and **school**:

- **Switch off lights** and **electrical appliances** when **not in use**.
- **Turn off air conditioning** when **leaving the room**.
- Do not let the **tap run** while you **brush your teeth** or **soap your hands**.
- Check all **leaky taps**.
- Take **shorter showers**.
- Buy **rechargeable batteries** and a **charger** for them.
- Avoid **plastic bags**.
- **Recycle** your **newspapers**.

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SUMMARY**Coal**

During the **carboniferous age**, the **earth** had large amounts of **plant life** and **dense forests** in **swampy** and **low-lying wetland areas**. **Plants** and **other life forms**, after their death, drifted down to the **bottom of the swamps**, where they were **compressed** and **decomposed** to form **peat**. **Coal** was formed due to the **compression of the peat** at **high temperature and pressure**.

As **coal** was formed from the **remains of vegetation**, it is called a **fossil fuel**.

**Carbonisation** is the **slow process of conversion of dead vegetation** into **coal**.

**Coal** is primarily made up of **carbon**, also **hydrogen, oxygen, nitrogen** and some amounts of **sulphur**.

**Surface mining** is used when coal is found close to the **surface or hillsides**. **Underground mining** is used to **extract coal** that is **deep beneath the surface** of the earth.

**Coal** is **processed in the industry** to get **useful products coke, coal tar and coal gas**. **Coke** is an almost **pure form of carbon** that is used in the **manufacture of steel** and **extraction of metals**.

**Coal tar** is a **black, thick mixture** of almost 200 substances. It is used as a **starting material** for **manufacturing synthetic dyes, explosives, perfumes, drugs and plastics, synthetic resins, paints and stains**.

**Naphthalene balls**, which are used to **repel moths** and other **insects**, are also obtained from **coal tar**.

**Bitumen**, a **petroleum product**, is now used in place of **coal tar** for **surfacing roads**.

**Coal gas** is obtained during the **processing of coal** to get **coke**. It is mainly **used as a fuel** in **industries** around **coal processing plants**.

**Uses of coal:**

- Coal is the **largest source of fuel** used to **generate electricity** world-wide.
- Coal is used in **manufacturing industries** for **heat** and **power applications**.
- Coal is used to **make steam for heating**.
- It is also used as **coke in steel making**.

**Petroleum**

**Petroleum**, a **natural resource** formed from **organisms living in the sea**, is a **dark and oily liquid mixture** with a very **unpleasant odour**.

**Petroleum** and **natural gas** are formed from **compressed organic matter**.

As petroleum and natural gas are **lighter than water**, the **deposits of petroleum and natural gas** occur **above that of water**.

The **first oil well in the world** was drilled in **Pennsylvania, USA**.

**Oil in India** is found in **Assam, Gujarat and Mumbai High**, and in the **river basins of Godavari and Krishna**.

Petroleum is a **mixture of various constituents** like **petroleum gas, petrol, diesel, lubricating oil, paraffin wax**, etc., and the **process of separating its many constituents** is called **refining**. It

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is refined in a **petroleum refinery**.

At the refinery, the **crude oil mixture** is '**fractionated**' into different **components** by **fractional distillation**.

**Light gases** are the **topmost fraction**, followed by **petrol** and **kerosene**. **Diesel** is the **heaviest**. The other **heavier fractions** are not useful and are usually used to make **asphalt** to **surface roads**.

**Constituents of petroleum and their uses:**

- LPG or petroleum gas is used as a fuel for home and industry.
- **Petrol** is used as a **motor fuel**, **aviation fuel** and a **solvent for dry cleaning**.
- **Kerosene** is used as a **fuel for stoves** and **lamps** and also in **jet aircraft**.
- **Diesel** is used as a **fuel for heavy motor vehicles** and **electric generators**.
- **Lubricating oil** is used for many **lubricating purposes**.
- **Paraffin wax** is used in **ointments**, **candles** and **Vaseline**.
- **Bitumen** is used in **paints** and also to **surface roads**.
- **Petrochemicals** are used in the **manufacture of detergents**, **polyester** and **nylon fibres**, **polythene** and other **man-made plastics**.

**Simple steps to reduce consumption of petrol/diesel:**

- Use **public transport**.
- **Combine many errands** into **one trip**.
- **Car pooling** to **school** and **work**.

**Burning petroleum** releases **carbon dioxide** into the air, which contributes to **global warming**.

**Oil spills at sea** are **devastating** to the **animal and plant life** in and **around the sea**.

### Natural Gases

**Natural gas** is another **fossil fuel**, like **coal** and **petroleum**. It is a **non-renewable fuel**.

Natural gas is used for **waste treatment** and **incineration**. **Gases** like **butane**, **ethane** and **propane** may be extracted from it and used as **feedstock** for **products** such as **fertilisers** and **pharmaceutical products**

**Natural gas** is one of the **most useful**, **clean** and **safe energy sources**.

It is a **colourless** and **odourless gas** in its **pure form**, and is made up of many gases, of which **methane** is the most prominent. The **chemical formula** for **methane** is **CH<sub>4</sub>**.

When **natural gas burns**, it gives off a great deal of **energy**, and unlike **other fossil fuels**, **leaves no ash**. It causes very little **air pollution**, as **methane** burns almost completely.

It is one of the **cleanest burning fuels** and produces mostly **heat**, **carbon dioxide** and **water vapour**. Thus, it is said that it contributes to a **cleaner and greener environment**.

Natural gas is **odourless**. To **detect gas leaks**, a **harmless but pungent odorant** that **smells like rotten eggs** is added to it, as a **safety measure**. It can be **smelt** in case of even a **small leak**.

Natural gas is measured in **British Thermal Units (BTU)**.

**Uses of natural gas:**

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To run **central heating and cooling systems** and **cloth dryers**.

For **electricity generation** through the use of **gas turbines** and **steam turbines**.

In the **manufacture of fabrics, glass, steel, plastics, paint** and **other products**.

Natural gas is **compressed** to a **high pressure** and stored in **hard cylindrical or spherical containers**, for distribution. It is then known as **Compressed Natural Gas or CNG**.

**CNG** is also distributed to **homes** and **industries** through **pipes**, For example, in **India**, such a **network of pipelines** exists in **Vadodara in Gujarat** and some parts of **Delhi**. CNG is now used as a **fuel for transport vehicles** - from **light duty trucks, auto rickshaws** and **taxi cabs** to **delivery vans** and **heavy duty vehicles** like **buses**.