

Chapter 5 - Minerals and Energy Resources

You have studied that the earth's crust is made up of different minerals embedded in the rocks. Various metals are extracted from these minerals after refinement. In all stages of development, human beings use minerals for their livelihood, decoration, festivities, religious and ceremonial rites. In this chapter, you will learn about minerals, their classification, how to conserve minerals, different types of energy resources and how we can conserve these energy resources. We have compiled all these important topics in [CBSE Notes Class 10 Geography Chapter 5 - Minerals and Energy Resources](#).

What is a Mineral?

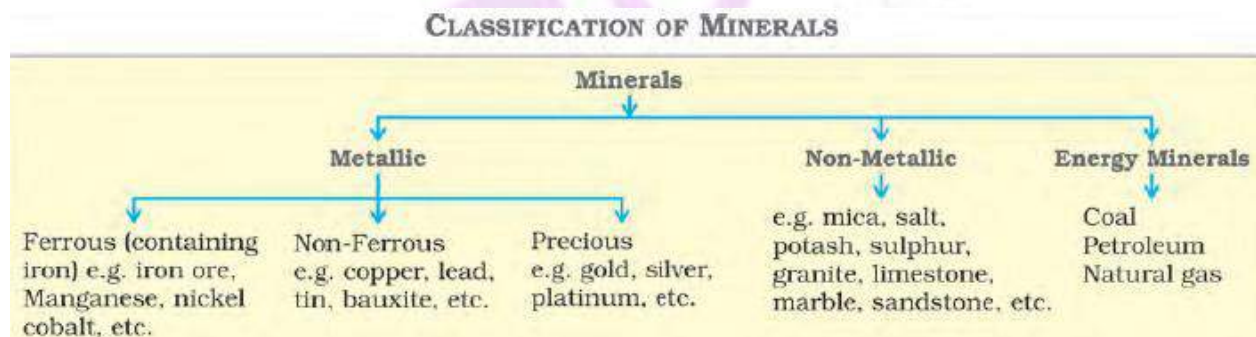
Mineral is defined as a "homogenous, naturally occurring substance with a definable internal structure." Minerals are found in varied forms in nature, ranging from the hardest diamond to the softest talc. Rocks are combinations of homogeneous substances called minerals.

Mode of Occurrence of Minerals

Minerals are usually found in "ores". The term ore is used to describe an accumulation of any mineral mixed with other elements. Minerals generally occur in the following forms:

- In igneous and metamorphic rocks, minerals may occur in the cracks, crevices, faults or joints.
- In sedimentary rocks, a number of minerals occur in beds or layers.
- The decomposition of surface rocks and the removal of soluble constituents also forms the minerals.
- Minerals also occur as alluvial deposits in sands of valley floors and the base of hills.
- The ocean waters contain vast quantities of minerals.

Classification of Minerals



Ferrous Minerals

Ferrous minerals account for about three-fourths of the total value of the production of metallic minerals.

Iron Ore

1. India is endowed with fairly abundant resources of iron ore.
2. **Magnetite** is the finest iron ore with a very high content of iron, up to 70%. It has excellent magnetic qualities.

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3. **Hematite** ore is the most important industrial iron ore. It contains 50 to 60% iron.

The major iron ore belts in India are:

- Odisha-Jharkhand belt
- Durg-Bastar-Chandrapur belt
- Ballari-Chitradurga-Chikkamagaluru-Tumakuru belt
- Maharashtra-Goa belt

Manganese

1. It is mainly used in the manufacturing of **steel and ferro-manganese** alloy.
2. Nearly 10 kg of manganese is required to manufacture 1 tonne of steel.
3. It is also used in manufacturing bleaching powder, insecticides and paints.

Non-Ferrous Minerals

Non-ferrous minerals include copper, bauxite, lead, zinc and gold. These minerals play a vital role in a number of metallurgical, engineering and electrical industries.

Copper

1. Malleable, ductile and good conductor of heat and electricity.
2. Mainly used in electrical cables, electronics and chemical industries.
3. The Balaghat mines in Madhya Pradesh, Khetri mines in Rajasthan and Singhbhum district of Jharkhand are leading producers of copper.

Bauxite

1. Bauxite deposits are formed by the decomposition of a wide variety of rocks rich in aluminium silicates.
2. Aluminium is obtained from bauxite. Aluminium has good conductivity and great malleability.
3. Deposits are mainly found in the Amarkantak plateau, Maikal hills and the plateau region of Bilaspur-Katni.

Non-Metallic Minerals

1. **Mica** is a mineral made up of a series of plates or leaves. It can be clear, black, green, red, yellow or brown.
2. Mica is the most indispensable minerals used in electric and electronic industries.
3. It has excellent di-electric strength, low power loss factor, insulating properties and resistance to high voltage.
4. Mica deposits are found in the northern edge of the Chota Nagpur plateau.

Rock Minerals

1. Limestone is found in rocks composed of calcium carbonates or calcium and magnesium carbonates.

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2. It is the basic raw material for the cement industry and essential for smelting iron ore in the blast furnace.

Conservation of Minerals

Minerals are a non-renewable resource. It takes thousands of years for the formation and concentration of minerals. Continued extraction of ores leads to the depletion of minerals. So, it's important to take the necessary steps so that mineral resources can be used in a planned and sustainable manner.

Energy Resources

Energy resources can be classified as

1. **Conventional Sources:** It includes firewood, cattle dung cake, coal, petroleum, natural gas and electricity.
2. **Non-Conventional Sources:** It includes solar, wind, tidal, geothermal, biogas and atomic energy

Let us discuss each of them in detail.

Conventional Sources of Energy

Coal:

1. It is the most abundantly available fossil fuel.
2. It is used for power generation, to supply energy to the industry as well as for domestic needs.
3. **Lignite** is a low grade brown coal, which is soft with high moisture content.
4. Coal that has been buried deep and subjected to increased temperatures is **bituminous coal**.
5. **Anthracite** is the highest quality of hard coal.
6. Jharia, Raniganj, Bokaro are important coalfields.

Petroleum

1. It provides fuel for heat and lighting, lubricants for machinery and raw materials for a number of manufacturing industries.
2. Petroleum refineries act as a "nodal industry" for synthetic textile, fertiliser and numerous chemical industries.
3. Mumbai High, Gujarat and Assam are major petroleum production areas in India.

Natural Gas

1. Natural gas is an important clean energy resource. It is considered an environment-friendly fuel.
2. The power and fertilizer industries are the key users of natural gas.
3. Compressed Natural Gas (CNG) is used in vehicles to replace liquid fuels.
4. Large reserves of natural gas have been discovered in the Krishna-Godavari basin

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Electricity

Electricity is generated mainly in 2 ways:

1. By running water which drives hydro turbines to generate **Hydro Electricity**. It is a renewable resource of energy. India has a number of multi-purpose projects like the Bhakra Nangal, Damodar Valley Corporation, the Kopili Hydel Project.
2. By burning other fuels such as coal, petroleum and natural gas to drive turbines to produce **Thermal Power**. It uses non-renewable fossil fuels for generating electricity.

Non-Conventional Sources of Energy

The renewable energy sources like solar energy, wind, tide, biomass and energy from waste material are called **Non-Conventional Energy Sources**. Let's discuss them one by one.

Nuclear or Atomic Energy

Nuclear Energy is obtained by altering the structure of atoms. Uranium and Thorium are used for generating atomic or nuclear power.

Solar Energy

Solar energy is produced by the Sun's light. Photovoltaic technology converts sunlight directly into electricity.

Wind Power

Wind Energy or Power is the use of wind to generate electricity. Wind turbines are used for this purpose. The largest wind farm cluster is located in Tamil Nadu from Nagarcoil to Madurai.

Biogas

Biogas is a type of biofuel that is naturally produced from the decomposition of organic waste. Biogas is the most efficient use of cattle dung. It improves the quality of manure.

Tidal Energy

Tidal energy is the form of hydropower that converts the energy obtained from tides into useful forms of power, mainly electricity. In India, the Gulf of Khambhat, the Gulf of Kachchh in Gujarat on the western coast and Gangetic delta in Sunderban regions of West Bengal provide ideal conditions for utilising tidal energy.

Geo-Thermal Energy

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When heat and electricity are produced by using the heat from the interior of the earth, it is known as Geo-Thermal Energy. In India, geothermal energy is harnessed from Parvati valley near Manikarn in Himachal Pradesh and from Puga Valley, Ladakh.

Conservation of Energy Resources

Every sector of the national economy – agriculture, industry, transport, commercial and domestic - needs inputs of energy. There is an urgent need to develop a sustainable path for energy development. Here are some ways that each one of us can contribute to save energy resources:

- Using public transport systems instead of individual vehicles
- Switching off electricity when not in use
- Using power-saving devices.
- Using non-conventional sources of energy

