

Class X - Social Science

Minerals and Energy Resources

CBSE NOTES

Minerals and Energy Resources - Practice Worksheet

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Practice Questions

1. Define minerals and explain their importance in daily life.

Hint: Refer to the definition of minerals and their uses in various sectors.

Solution: Minerals are homogenous, naturally occurring substances with a definable internal structure. They are found in various forms, from the hardest diamond to the softest talc. Minerals are indispensable in our daily lives, used in everything from a tiny pin to towering buildings and big ships. They are crucial in the manufacturing of railway lines, roads, machinery, and vehicles like cars, buses, and trains. Minerals also play a vital role in the food we eat and are used in decorations, festivities, and religious rites. Their importance is highlighted by their use in various industries, including electrical, construction, and manufacturing, making them a cornerstone of modern civilization.

2. Describe the different modes of occurrence of minerals.

Hint: Think about the geological processes that lead to the formation of minerals in different rocks.

Solution: Minerals occur in various forms in nature, primarily in igneous and metamorphic rocks where they are found in cracks, crevices, faults, or joints. These occurrences are called veins and lodes, formed when minerals in liquid or gaseous forms are forced upward through cavities. Sedimentary rocks contain minerals in beds or layers, formed through deposition and concentration over time. Minerals like coal and iron ore are examples. Another mode is the decomposition of surface rocks, leaving residual masses like bauxite. Placer deposits, found in sands of valley floors, contain minerals like gold and tin. Ocean waters also hold minerals, though most are too diffused to be economically significant, except for common salt and magnesium.

3. Explain the distribution of iron ore in India.

Hint: Focus on the major iron ore belts and their significance.

Solution: India is rich in iron ore resources, with major deposits in Odisha, Jharkhand, Chhattisgarh, and Karnataka. The Odisha-Jharkhand belt is known for high-grade hematite ore found in Badampahar mines. The Durg-Bastar-Chandrapur belt in Chhattisgarh and Maharashtra contains super high-grade hematite, especially in the Bailadila range. Karnataka's Ballari-Chitradurga-Chikkamagaluru-Tumakuru belt has large reserves, with Kudremukh mines being a significant export unit. The Maharashtra-Goa belt, though not of the highest quality, efficiently exploits iron ore for export. These deposits are crucial for India's steel industry and industrial development.

4. What are the hazards of mining?

Hint: Consider the health risks for miners and the environmental degradation caused by mining.

Solution: Mining poses several hazards to both miners and the environment. Miners are exposed to dust and noxious fumes, leading to pulmonary diseases. Risks include collapsing mine roofs, inundation, and fires. Mining contaminates water sources and degrades land and soil through waste dumping. It increases stream and river pollution, affecting local ecosystems. The environmental impact includes air pollution from dust generation and the disruption of landscapes. Stricter safety regulations and environmental laws are essential to mitigate these risks and prevent mining from becoming a 'killer industry'.

5. Discuss the conservation of mineral resources.

Hint: Think about the finite nature of minerals and the need for sustainable practices.

Solution: Conserving mineral resources is vital as they are finite and non-renewable. The geological processes forming minerals are slow, making replenishment rates insignificant compared to consumption. Continued extraction leads to higher costs and lower quality. Sustainable practices include using low-grade ores efficiently, recycling metals, and finding substitutes. Improved technologies can reduce extraction costs and environmental impact. Public awareness and government policies promoting energy conservation and renewable energy sources are crucial. By adopting these measures, we can ensure the judicious use of mineral resources for future generations.

6. Compare conventional and non-conventional sources of energy.

Hint: Focus on the differences in renewability and environmental impact.

Solution: Conventional energy sources include coal, petroleum, natural gas, and electricity from hydel and thermal power. These are non-renewable and cause environmental pollution. Non-conventional sources like solar, wind, tidal, geothermal, and biogas are renewable and environmentally friendly. Solar energy harnesses sunlight, wind energy uses wind farms, and tidal energy utilizes oceanic tides. Geothermal energy exploits the Earth's heat, while biogas is produced from organic waste. Non-conventional sources are sustainable and reduce dependence on fossil fuels, mitigating environmental impact and ensuring energy security.

7. Describe the distribution of coal in India.

Hint: Consider the geographical and geological distribution of coal reserves.

Solution: Coal in India is primarily found in two geological ages: Gondwana and tertiary. Gondwana coal, about 200 million years old, is located in Damodar valley (West Bengal-Jharkhand), including Jharia, Raniganj, and Bokaro. The Godavari, Mahanadi, Son, and Wardha valleys also contain coal deposits. Tertiary coal, about 55 million years old, is found in Meghalaya, Assam, Arunachal Pradesh, and Nagaland. Coal is a bulky material, so heavy industries and thermal power stations are located near coalfields to minimize transportation costs. India's coal reserves are crucial for meeting its energy needs and industrial development.

8. Why does solar energy have a bright future in India?

Hint: Think about India's geographical advantage and government policies supporting solar energy.

Solution: Solar energy has a bright future in India due to its tropical location, providing abundant sunlight. Photovoltaic technology converts sunlight directly into electricity, making it a viable renewable energy source. Solar energy is becoming popular in rural and remote areas, reducing dependence on firewood and dung cakes. Large solar power plants are being established, contributing to environmental conservation and sustainable development. Government initiatives and subsidies promote solar energy adoption, ensuring energy security and reducing greenhouse gas emissions. With increasing awareness and technological advancements, solar energy is set to play a pivotal role in India's energy landscape.

9. Explain the significance of natural gas in India.

Hint: Consider the uses of natural gas and its role in reducing pollution.

Solution: Natural gas is a significant energy resource in India, found with petroleum deposits. It is used as a domestic and industrial fuel, in power generation, and as a raw material in chemical and fertilizer industries. Major reserves are in Mumbai High, Gujarat, and Assam. The Hazira-Vijaipur-Jagdishpur pipeline links gas fields with industrial complexes, boosting the gas market. Natural gas is emerging as a preferred transport fuel (CNG) and cooking fuel (PNG), reducing pollution. With expanding gas infrastructure, natural gas is becoming a key component of India's energy mix, ensuring cleaner and more efficient energy use.

10. What are the advantages of using biogas?

Hint: Focus on the renewable nature of biogas and its benefits for rural areas.

Solution: Biogas, produced from shrubs, farm waste, and animal/human waste, offers several advantages. It is a renewable energy source, improving rural household energy needs. Biogas plants, like Gobar gas plants, provide energy and high-quality manure, enhancing agricultural productivity. Biogas has higher thermal efficiency compared to kerosene, dung cakes, and charcoal. It reduces deforestation by decreasing the need for firewood and mitigates pollution by replacing traditional fuels. Biogas is a sustainable and eco-friendly energy solution, promoting rural development and environmental conservation.

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