

Types of Rocks

THINK AND ANSWER

Why is diamond clear and hard while graphite is soft ? Why is coal hard and chunky ?

Answer:

Carbon atoms in diamond are bonded in a strong tetrahedron pattern making it hard and clear whereas carbon atoms in graphite are bonded in weak covalent bonds making it soft and black. Coal is a combustible sedimentary rock occurring in rock strata in layers or veins called coal beds. Because of pressure and elevated temperature the carbon becomes hard and chunky.

Discuss

Discuss the importance of rocks for the construction business.

Answer:

Rocks such as marble and granite are used in construction industries. They are cut into stones and are used for building houses, dams, roads, etc. Rocks also provide raw materials such as limestone and gypsum used in the manufacturing of cement.

VALUES & LIFE SKILLS

Rocks and minerals play a very important role in our lives.

Can you imagine modern life without minerals ?

What problems would you face in their absence ?

Answer:

Life without rocks and minerals would be disastrous –

Rocks are of great value to us. Some of the main benefits of- rocks are listed below :

- Soil is formed when rocks gradually break up and disintegrated by mechanical and chemical processes.
- Rocks contain a great variety of minerals that yield metals such as iron, manganese, and copper, which are important raw materials for mineral-based manufacturing industries.

We shall face many problems if rocks and minerals get diminished.

The following problems may exist:

1. Human life will come to an end, as soil is essential for food production and if rocks diminished, it would lead to non-availability of soil.
2. Mineral-based manufacturing industries will also come to an end.

EXERCISES

1. Granite is an example of intrusive **igneous** rocks.
2. A category of rock which is formed by the alteration of the parent rock due to heat and pressure is called: **metamorphic rocks**.
3. Conglomerate is an example of **sedimentary** rocks. .
4. Sedimentary rocks are formed from **sediments** accumulated over long periods.
5. Sedimentary rock such as limestone change into **marble**.

B. Write True or False. Rewrite the false statements correctly :

1. Minerals are organic substances.

Answer. False.

Correct : Minerals are inorganic substances.

2. Basalt is an example of an intrusive igneous rock.

Answer. False.

Correct : Basalt is an example of an extrusive igneous rock.

3. Sedimentary rocks are formed by the cooling and solidification of molten rock called magma.

Answer. False.

Correct : Igneous rocks are formed by the cooling and solidification of molten rock called magma.

4. Igneous and sedimentary rocks can change into metamorphic rocks.

Answer. True.

5. Rocks are used in construction industries.

Answer. True.

C. Answer the following questions in brief:

Question 1.

What is crust ?

Answer:

The outermost layer of the Earth is the crust. Crust is the thinnest layer of the earth.

Question 2.

Differentiate between **SIAL** and **SIMA**.

Answer:

SIAL

1. It is the upper layer of the earth.
2. It is made up of silica and aluminium.

SIMA

1. It is the lower layer of the earth.
2. It is made up of magnesium and silica.

Question 3.

State two characteristics of the mantle.

Answer:

1. The mantle is semi-solid.
2. It is rich in iron and magnesium.
3. This layer is about 2,850 km wide. Its average density is between 3.5 and 5.5.

Question 4.

What is the difference between the inner and the outer core ?

Answer:

Inner core

1. Inner most layer of the Earth.
2. Solid ball of iron and nickel.
3. Has a radius of 1220 km.

Outer core

1. Surrounds the inner core.
2. Made of liquid iron and nickel.
3. Has a radius of Approx. 2300 km.

Question 5.

What are minerals?

Answer:

Minerals are natural inorganic substances having a crystalline form with definite physical and chemical properties. The most common minerals in the earth's crust are silica, quartz, feldspar, mica, calcite, dolomite, gypsum, etc. There are about 2,000 minerals in the earth's crust and these combine differently to form various kinds of rocks.

Question 6.

Give an example of an intrusive igneous rock.

Answer:

Intrusive rocks, which form large crystals at some depth in the earth's crust example : granite, basalt.

Question 7.

Classify the following rocks as igneous, sedimentary, and metamorphic: gneiss, coal, shale, granite, gypsum, marble, sandstone, basalt, limestone, schist

Answer:

Minerals — Rocks

Gneiss — Metamorphic

Coal — Sedimentary

Shale — Sedimentary

Granite — Igneous

Gypsum — Sedimentary

Marble — Metamorphic

Sandstone — Sedimentary

Basalt — Igneous

Limestone — Sedimentary

Schist — Metamorphic

D. Answer the following questions in one or two paragraphs :

Question 1.

Explain the structure of the earth's interior ?

Answer:

The earth's interior is divided into three main layers — the crust is the outermost layer, the mantle is the intermediate layer, and the core is the innermost layer of the earth.

Question 2.

How are rocks different from minerals?

Answer:

Minerals are natural inorganic substances having a crystalline form with definite physical and chemical properties whereas rocks are made up of a combination of different minerals compacted together. There are about 2,000 minerals in the earth's crust and these combine differently to form various kinds of rocks.

Question 3.

How are igneous rocks formed?

Answer:

Igneous rocks are formed by the cooling and solidification of molten rock called magma, which lies beneath the earth's crust. These rocks are crystalline and compact. They do not occur in layers or strata nor do they contain fossils.

The cooling and solidification may take place at some depth within the earth or at the surface. The molten magma that reaches the surface of the earth is called lava. Thus, there are two types of igneous rocks classified on the basis of their place of origin – intrusive rocks, which form at some depth in the earth's crust and extrusive rocks which form at or near the surface of the earth.

Question 4.

How do acidic igneous rocks differ from basic igneous rocks ?

Answer:

Igneous rocks may also be classified as acidic or basic depending on their composition. The acidic rocks contain more than 65% silica and very low percentage of oxides. These are Arundee's Self-Help to Voyage-7 less dense and light coloured. For example, granite. The basic rocks contain low percentage of silica and high percentage of oxides. These are dense and dark coloured. For example, basalt.

Question 5.

How are sedimentary rocks formed ?

Answer:

Sedimentary rocks are formed from sediments accumulated over long periods, usually under water on the floors of shallow seas, rivers and lakes. These rocks are non-crystalline and are found in layers or strata and contain fossils. Conglomerate, sandstone, limestone, chalk, calcite, and dolomite are example of sedimentary rocks. Sedimentary rocks are divided into various types depending on how they are formed.

1. **Mechanically formed sedimentary rocks :**

These rocks have been formed by the accumulation of materials derived from other rocks which have been cemented together.

Examples – conglomerate (rounded fragments), breccia (angular fragments).

2. **Organically formed sedimentary rocks :**

These rocks have been formed by the accumulation of the remains of living organisms.

Examples – calcareous rocks such as limestone and chalk.

3. **Chemically formed sedimentary rocks:**

These rocks have been commonly formed by the process of evaporation of water containing salts in solution.

Examples – rock salt, gypsum, potash, nitrates, calcite, and dolomite.

Question 6.

What are metamorphic rocks ?

Answer:

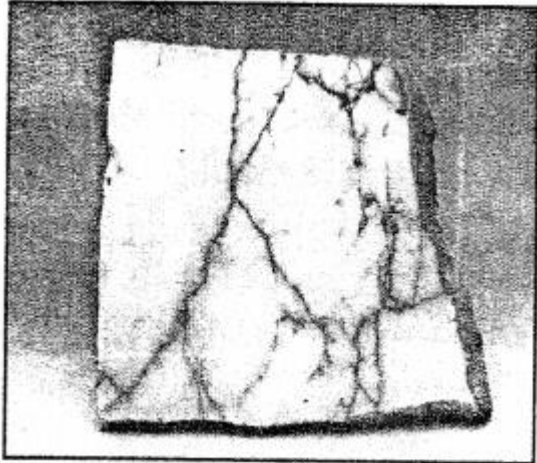
Metamorphic rocks are those rocks which are formed by the metamorphism of pre-existing rocks due to high temperature or pressure or both. Igneous and sedimentary rocks completely changes over long periods of time because of movements in the earth's crust and volcanic or mountain building activity.

Transformation of rocks due to high temperature is called thermal metamorphism.

Alteration of parent rock due to pressure exerted on rocks from the earth's movements is called dynamic metamorphism.

E. Picture study

The photograph shows you a type of rock that is widely used in the construction industry.



Question 1.

Name the type of rock.

Answer:

The type of rock is chemically formed sedimentary rock as limestone becomes marble. It is marble.

Question 2.

How is it formed ?

Answer:

Sedimentary rocks are formed from sediment accumulated over long periods, usually under water on the floors of shallow seas, rivers, and lakes. These rocks are formed by the process of evaporation of water containing in limestone which becomes marble.

LET'S DO SOMETHING

With the help of your teacher, collect different types of rocks such as granite, sandstone, limestone, marble, slate, graphite, etc. and prepare a chart containing information about their colour, hardness, texture, and permeability.

Answer:

Do it Yourself.