Lesson-1: Rocks and Minerals

10 Periods (40 minutes each)

Learn better (Main Course Book), Stay Ahead (Workbook), CRM signs, Book of Holistic Teaching, Book of Project Ideas, CRM signs

Animation, Animated Activities, Concept Map, Dictionary, eBook, I Explain, Infographic, Quiz, Slideshow, Video

Confirming better: I find happiness in little things.

Curricular Goals and Objectives (NCF)

To enable the students:

- to explore and classify rocks.
- to engage in hands-on exploration about rocks and minerals.
- to connect rocks to Indian knowledge systems.
- to develop critical and creative thinking.
- to create and collaborate on scientific projects.

Methodology

Period 1

SHOULD DO 05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Great. Before we dive into our lesson, let us take a moment to relax and focus our minds with a short meditation. Ready?

Teacher: Sit comfortably in your chair, with your back straight and feet flat on the ground. Close your eyes gently and take a deep breath through your nose. Hold it for a moment, then slowly breathe out through your mouth.

Let us do these three more times. Breathe in... and breathe out. As you breathe, imagine your mind becoming clear and ready to learn.

Open your eyes and smile at your friends. Let us start our lesson with positive energy.

Teacher: Before we start the chapter, let us all say together, 'I find happiness in little things.' Repeat after me: 'I find happiness in little things.'

MUST DO 05 MIN.

Teacher: Today, we will begin a new chapter on Rocks and Minerals. We are going to use a KWL chart to help us organize our thoughts and learning. I have made a KWL format on the blackboard. Please take out your notebooks and draw the same format.

K	W	L

Teacher: The KWL chart has three columns. The first column is labeled 'K,' the second column is labeled 'W,' and the third column is labeled 'L.'

Teacher: In the 'K' column, I want you to write down what you already know about the topic we are going to discuss today. This could be any facts, ideas, or information you already have.

Teacher: In the 'W' column, write down what you want to learn about the topic. Think about any questions you have or things you are curious about.

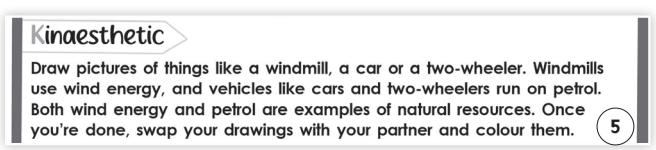
Teacher: Finally, in the 'L' column, you will write down what you have learned after we finish the lesson. This will help you reflect on the new information you have gained.

Teacher: Let us start by filling out the 'K' and 'L' column. Take a few minutes to think and write. If you have any questions, feel free to ask.

Kinaesthetic

MUST DO 10 MIN.

Teacher: Before we dive the chapter, let us do a quick Re-KAP. Does anyone know what Re-KAP means?



Teacher: Yes, that is right. Re-KAP is where we revisit our previous knowledge through creative, multi-sensory activities. We will use Kinaesthetic, Auditory and Pictorial activities to make our learning engaging and interactive. Kinaesthetic is a hands-on activity to provide a physical, contextualised experience. Auditory is a listening activity for concept retention and recall. Pictorial is a picture-

based activity for concept recall. Let us start with a kinaesthetic activity to get us warmed up and ready for the new topic.

Teacher: Let us start a fun kinaesthetic activity. I want you to draw pictures of things like a windmill, a car or a two-wheeler.

Windmills use wind energy and vehicles like cars and two-wheelers run on petrol. Both are examples of natural resources. Does everyone understand the activity? Great. Let us get started with your drawings.

Teacher: Fantastic work, everyone. I can see so many creative windmills, cars and two-wheelers. You did an amazing job showing how natural resources are used in these objects. Once you have drawn, swap your pictures with your partner and colour them.

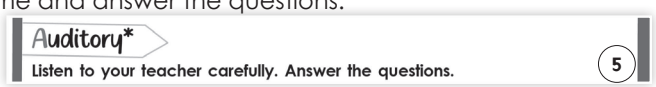
Teacher: Great job, everyone. I am really impressed with how creatively you have shown the use of natural resources in your drawings. You did an amazing job colouring them too.

Auditory

Teacher: Let us move to auditory activity. I am going to talk about Rocks and Minerals. Listen carefully to me and answer the questions.

MUST DO

10 MIN.



Teacher: Rocks and minerals are natural materials found on Earth. Rocks are made up of one or more minerals and they come in many shapes, sizes and colours. Minerals are solid substances that have a specific chemical structure, like quartz or diamond. Some rocks, like granite, are very hard, while others, like sandstone, are softer.

Teacher: Can anyone tell me, what kind of structure minerals have?

(Accept and appreciate all relevant responses)

Teacher: That is correct. Minerals have a specific chemical structure. Well done.

Teacher: Now, can someone name a rock that is soft in nature?

Teacher: Excellent. Sandstone is a soft rock. Great job, everyone. Let us continue exploring rocks and minerals.

Pictorial

Teacher: Let us do a fun pictorial activity. Ready?

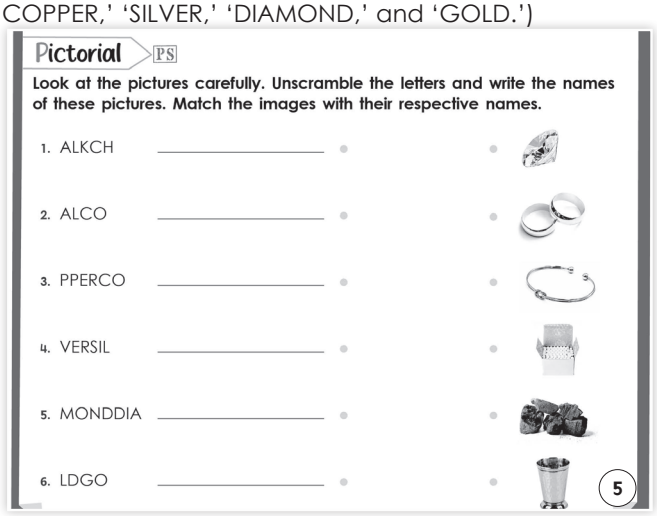
MUST DO

10 MIN.

Teacher: Look at the pictures given on page 5 under the Pictorial section. Unscramble the letters to form the correct names. Write the word and match it with the picture. Let us start with 'ALKCH'—what is the word?

Teacher: That is right, 'CHALK'. Now, let us try 'ALCO,' 'PPERCO,' 'VERSIL,' 'MONDDIA,' and 'LDGO.' Take your time and unscramble each one.

(Guide students as they work through the words: 'COAL,' 'COPPER,' 'SILVER,' 'DIAMOND,' and 'GOLD.')



Teacher: Once you have matched all the words with the pictures, swap your work with a partner to review each other's answers.

Teacher: Great teamwork, everyone. You all have done an amazing job with each activity. Before we wrap up, let us quickly recap what we learned:

We began with a kinaesthetic activity, drawing and colouring to understand natural resources like wind and petrol. Then, we explored rocks and minerals through an auditory activity and answered related questions. Finally, we unscrambled letters in a pictorial activity to identify objects like chalk, coal and gold.

Differentiated Activities

110 km/hr

Unscramble the letters 'BELARM' to form a rock and write it down in the notebook. It is a soft rock used in sculptures and floors.

80 km/hr

Write the name of the stone that is used to make chalk for writing on the blackboard.

40 km/hr

How is gold used in our daily lives? Write two sentences.

Home Task

Draw one object that uses natural resources for providing energy (e.g., windmill or thermal power-plant) and write five sentences about the natural resource that is used (e.g., windmill or coal).

Period 2

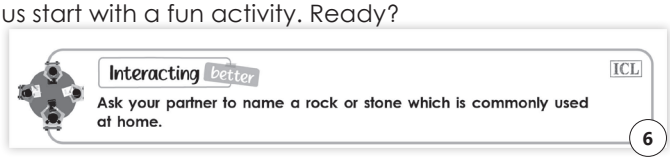
Interacting better

Teacher: Good morning students. How are you all today?

MUST DO

10 MIN.

Teacher: Today, we are going to learn about different types of rocks and stones that we use in our daily lives. Let us start with a fun activity. Ready?



Teacher: Great. Pair up with the person next to you.

Teacher: Once you are in pairs, take turns asking each other the question: 'Can you name a rock or stone that is commonly used at home?'

(Encourage students to discuss with each other and invite some volunteers to share their answers)

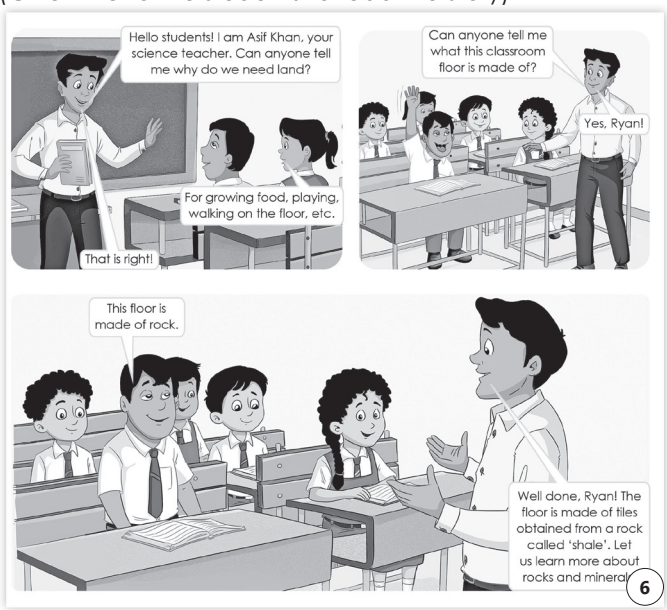
(Use CRM Signs to settle the class.)

Teacher: Great job, everyone. I loved hearing all the interesting answers about rocks and stones we commonly use at home. Give yourselves a round of applause for your wonderful participation and teamwork.

Teacher: It is story time. Let us start an interesting story from your book about rocks and minerals. Are you ready to learn something fascinating?

Teacher: Great. Turn to page number six of your textbooks. Take a few minutes to read the story silently on your own and try to understand it. As you read, imagine the characters and events in your mind. Pay close attention to the details—this will help you enjoy the story and answer questions later.

(Give time to the students to read the story)



Teacher: So, did you enjoy the story?

Teacher: Great. I am glad you liked it. Can anyone tell me the name of the rock that is used to make the tiles for the floor?

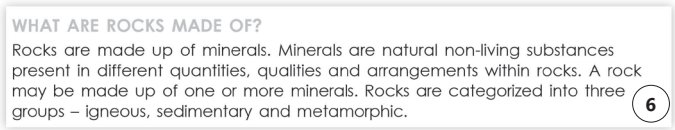
Teacher: That is right. Excellent job, everyone. Shale is the rock used to make floor tiles.

MUST DO
15 MIN.

Teacher: Now, we are going to learn about rocks and what they are made of.

(The teacher will read the last paragraph of page 6 aloud and provide explanations to ensure that the students understand the content.)

Teacher: Let us begin with a question. What do you think rocks are made of?



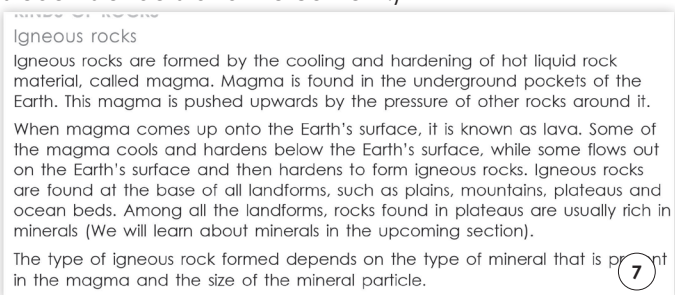
Teacher: That is right. Rocks are made up of minerals. Minerals are natural, non-living substances. They are present in different quantities, qualities and arrangements within rocks. Now, can a rock be made up of just one mineral, or does it always have many?

Teacher: Excellent thinking. A rock may be made up of one or more minerals. Now, we categorise rocks into three groups. Can anyone try and guess what these groups might be?

Teacher: Very well done. Rocks are classified into three groups—igneous, sedimentary and metamorphic. Today, we will focus on igneous rocks.

Teacher: Now we are going to learn about igneous rocks.

(The teacher will read the first two paragraphs of page 7 aloud and provide explanations to ensure that the students understand the content.)



Teacher: Igneous rocks are formed when hot liquid rock material cools and hardens. Does anyone know what this hot liquid rock is called?

Teacher: Great answer. It is called magma. Magma is found deep underground in pockets within the Earth. What do you think happens when the pressure from other rocks pushes magma upwards?

Teacher: Yes, exactly. When magma reaches the surface, we call it lava. Some of the magma cools and hardens below the Earth's surface, while some flows out onto the surface before hardening. When it hardens, it forms igneous rocks.

Teacher: Can you think of places where we might find igneous rocks?

Teacher: That is absolutely right. Igneous rocks are found at the base of all landforms, including plains, mountains, plateaus and ocean beds. Now, here is an interesting fact. Among all landforms, the rocks found in plateaus are usually rich in minerals. Can you think of why that might be?

Teacher: Very insightful. We will learn more about minerals in the upcoming section. Before we move forward, let me ask you one more question. What do you think determines the type of igneous rock that is formed?

Teacher: That is correct. The type of igneous rock formed depends on the type of mineral present in the magma and the size of the mineral particles. Well done, everyone.

You may show the **Animation**, **Dictionary** and **eBook** on the digital platform.

Differentiated Activities

110 km/hr

How are igneous rocks formed?

80 km/hr

What is magma called when it reaches the Earth's surface?

40 km/hr

What are rocks made of?

Home Task

Write a short paragraph explaining how igneous rocks are formed. Include the terms 'magma' and 'lava' in your explanation.

Period 3

SHOULD DO 05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: That is wonderful to hear. Let us begin today's lesson with a fun warm-up. I will ask some questions and you can try to answer them.

Teacher: What are rocks made of? (Minerals)

Teacher: Can a rock be made of just one mineral, or does it always have many? (A rock may be made of one or more minerals.)

Teacher: What are the three main types of rocks? (Igneous, sedimentary and metamorphic)

Teacher: What is the name of the force that helps objects float in water? (Buoyant force)

Teacher: When magma reaches the Earth's surface, what is it called? (Lava)

Teacher: Can you name a rock that is soft in nature? (Sandstone)

Teacher: Excellent responses, everyone. You all have been learning so well. Let us now continue with today's lesson.

Teacher: Today, we are diving into the fascinating world of the different types of igneous rocks. The type of igneous rock formed depends on the minerals present in the magma and the size of the mineral particles.

Teacher: Here is table 1.1 on page 7 of your book showing examples of igneous rocks, what they are made of, their colours and their uses.

(The teacher will read table 1.1 of page 7 aloud and provide explanations to ensure that the students understand the content.)

MUST DO 15 MIN.

Table 1.1: Examples of igneous rocks

rock	made up of	colour	usage	image
granite	cooled magma	grey or pink	for making buildings, statues and streets	
pumice	lava rock with gases	light-grey or cream	for foot care	
obsidian	lava rock	black glass	for making or cutting tools	
basalt	lava	dark grey	for construction and making cobblestones	

7

Teacher: Let us hear some answers. Who can tell me what granite is made of and what is used for it?

Teacher: Excellent. Granite is made of cooled magma and it is used for making buildings and streets. Can someone else describe pumice and tell us its use?

Teacher: Great job. Pumice is a lava rock with gases and it is used for foot care. Now, who can describe obsidian and tell us one of its uses?

Teacher: Fantastic. Obsidian is indeed like nature's glass and it has been used for tools since ancient times. What about basalt? Can someone explain what basalt is made of and where it is used?

Teacher: Excellent. Basalt is strong and durable, making it perfect for these purposes. Great work, everyone. Now, we will learn about sedimentary rocks.

Teacher: Now, we are going to explore Sedimentary rock. (The teacher will read the fourth, fifth and sixth paragraph and table 1.2 of page 7 aloud and provide explanations to ensure that the students understand the content.)

Table 1.2: Examples of sedimentary rocks

rock	made up of	colour	usage	image
shale	mud and clay particles	black or grey	for making bricks and tiles	
sandstone	sand particles	yellow, brown, pink or red	for making buildings, statues or fountains	

7

Teacher: What kind of rock is formed when layers of materials like sand, mud or pebbles pile up and are pressed together over time?

MUST DO 20 MIN.

Teacher: Right. These are called sedimentary rocks. Imagine standing on a beach and watching sand, pebbles and mud getting washed ashore by waves. Have you ever noticed how these materials gather in layers over time?

Teacher: These materials pile up, one on top of the other and over millions of years, they are pressed together. What do you think happens next?

Teacher: That is right. The layers get cemented together by minerals, forming sedimentary rocks. Some of these rocks are even made from the shells of tiny sea creatures. Can you think of any examples of such creatures?

Teacher: Exactly. These shells, along with dissolved minerals, settle on the ocean floor or sides of the ocean and harden into rock. How amazing is that?

Teacher: Can anyone tell me what shale is made of, its colour and its use?

Teacher: Great. shale is made of mud and clay particles, is black or grey in colour and is used for making bricks and tiles.

Teacher: Now, let us talk about sandstone. Who can describe what it is made of, its colour and where it is used?

Teacher: Excellent. Sandstone is made of sand particles, comes in yellow, brown, pink or red shades and is used for making buildings, statues and fountains.

Teacher: Moving on to conglomerate. Can someone share its composition, colour and use?

Teacher: Well done. Conglomerate is made of pebbles and gravels, is orange and grey in colour and is used for filling materials in roads and construction.

Teacher: Lastly, let us discuss limestone. Can anyone explain its composition, colour and use?

Teacher: Brilliant. Limestone is made of calcite, is grey or white and is used for making roads and buildings.

Teacher: That was a wonderful discussion. We will learn about metamorphic rocks in the next period.

Differentiated Activities

110 km/hr

Explain how the mineral composition of magma affects the type of igneous rock that forms. Provide examples of rocks with different compositions.

80 km/hr

Create two columns, one for igneous rocks and one for sedimentary rocks. Write four examples under each category.

40 km/hr

What is the main difference between how igneous and sedimentary rocks are formed?

You may show the **Infographic** from the digital platform.

Home Task

Create a comparison chart for igneous and sedimentary rocks, listing their characteristics, formation processes and uses.

Period 4

SHOULD DO

05 MIN.

Teacher: Good morning, my amazing learners. How are you all today?

Teacher: Great. Today, we are going to start our class with a quick revision quiz activity. Are you ready to test your knowledge about igneous and sedimentary rocks?

Teacher: Let us begin. First question: What are igneous rocks formed from?

Teacher: Excellent. Igneous rocks are formed from the cooling and hardening of magma.

Teacher: What is granite made of and what is it used for?

Teacher: Correct. Granite is made of cooled magma and is used for making buildings and streets.

Teacher: How are sedimentary rocks formed?

Teacher: Yes. Sedimentary rocks are formed when layers of materials like sand, mud or pebbles pile up and are pressed together over time.

MUST DO

20 MIN.

Teacher: Great job, everyone. You all did an amazing job with the quiz. Now, let us move on to our lesson for today.

Teacher: Today, we are going to explore the fascinating world of metamorphic rocks.

(The teacher will read the first and second paragraphs of page 8 aloud and provide explanations to ensure that the students understand the content.)

Metamorphic rocks

Metamorphic rocks are formed by the transformation of already existing rocks through a process called metamorphism. Most metamorphic rocks were once either igneous or sedimentary rocks. These rocks came under tons of pressure that led to heat build up, and finally, they underwent metamorphosis.

In some rocks, the minerals are broken down into smaller particles, whereas in others, the minerals are stretched into flat particles.

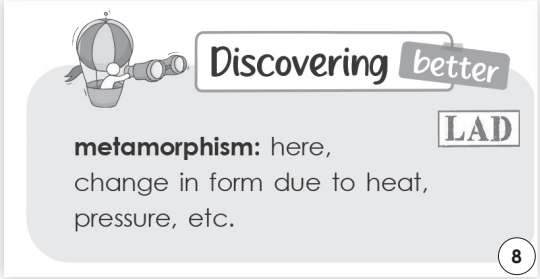
8

Teacher: Can anyone tell me what metamorphic rocks are?

Teacher: Excellent. Metamorphic rocks are formed by the transformation of already existing rocks through a process called metamorphism. Most metamorphic rocks were once either igneous or sedimentary rocks.

Discovering better

Teacher: We are going to discover something fascinating about rocks. Has anyone heard the word 'metamorphism' before?



Teacher: Great. 'Metamorphism' refers to the change in form that rocks undergo due to heat, pressure, or both. For example, a rock can transform into a completely different form because of these forces.

Teacher: Now, let us dive deeper into how this transformation happens. Imagine a rock buried deep within the Earth. What do you think happens to it under tons of pressure and heat?

Teacher: That is right. The rock undergoes metamorphosis. This means it changes form due to the intense pressure and heat.

Teacher: Here is an interesting fact: In some metamorphic rocks, the minerals are broken down into smaller particles, whereas in others, the minerals are stretched into flat particles.

Teacher: Now, we are going to learn about the examples of metamorphic rocks.

MUST DO
15 MIN.

(The teacher will read table 1.3 of page 8 aloud and provide explanations to ensure that the students understand the content.)

Table 1.3: Examples of metamorphic rocks

rock	made up of	colour	usage	image
gneiss	granite	black or light grey with stripes	for flooring, ornamental stones or gravestones	
slate	shale	grey	for flooring, roofing and wall cladding	
quartzite	sandstone	white and grey	for roofing, flooring or stairsteps	
marble	limestone	white, yellow, and grey to blue, beige and cream	for making buildings, monuments, table tops and other interior decorations	

8

Teacher: Let us discuss what we have learned. Let us begin with gneiss. It is made from granite and has black or light grey stripes. Can anyone suggest where it might be used?

Teacher: Correct. It is often used for flooring, ornamental stones and gravestones. Now, moving on to slate. Who can tell me what it is made of and its colour?

Teacher: Excellent. Slate is made from shale and is grey. Can you think of any uses for it?

Teacher: Well done. It is used for flooring, roofing and wall cladding. Next, let us talk about quartzite. What is quartzite made of?

Teacher: That is right. It is made from sandstone and comes in white and grey. Where do you think it is used?

Teacher: Fantastic. It is used for roofing, flooring and stair steps. Finally, let us discuss marble. Can anyone tell me what marble is made of and describe its colours?

Teacher: Exactly. It is made from limestone and can be white, yellow, grey, blue, beige or cream. Where do you think marble is commonly used?

Teacher: Brilliant answers. It is used for making buildings, monuments, tabletops and interior decorations. Excellent participation today, everyone.

Differentiated Activities

110 km/hr

How can an igneous rock become a metamorphic rock?

80 km/hr

What are the main differences between igneous, sedimentary and metamorphic rocks in terms of their formation and characteristics?

40 km/hr

Make two columns for metallic and non-metallic minerals. Write four examples under each category.

Home Task

Look around your home and identify three different items made from metamorphic rocks. Write their names and describe where they are used

Period 5

SHOULD DO
05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: That is wonderful. Let us begin today's lesson with a fun warm-up. I will ask some questions and you can try to answer them.

Teacher: Which type of rock is often found at the base of mountains and ocean beds? (Igneous rock)

Teacher: What happens when magma cools slowly under the Earth's surface? (It forms large mineral crystals in igneous rocks.)

Teacher: Why do sedimentary rocks have layers? (Because they form from materials that settle and get compressed over time.)

Teacher: What kind of rock is formed when limestone undergoes heat and pressure? (Marble)

Teacher: Can you name a rock that is formed from volcanic lava and is so light that it can float on water? (Pumice)

Teacher: Excellent responses. Now, let us move on to the next part of our lesson.

Teacher: Today, we are going to explore the fascinating world of minerals.

(The teacher will read the third and fourth paragraphs of page 8 and first to the fourth paragraph of page 9 aloud and provide explanations to ensure that the students understand the content.)

MINERALS

We already know that rocks are made up of minerals. These minerals can be either metallic or non-metallic in nature.

Metallic minerals

Metallic minerals are used to obtain metals. The minerals from which metals can be profitably obtained are called ores. For example, haematite, bauxite, calamine and pyrite are some ores. We get iron, aluminium, zinc and copp respectively, from these ores. These metals are generally used to make furniture,

8

coins, machines, utensils, etc. Precious metals such as gold, platinum and silver are used to make jewellery.

Non-metallic minerals

Fossil fuels* such as coal and petroleum are valuable resources that are found underground. They play a crucial role in providing energy.

Coal is one of the most valuable minerals found under the Earth's surface. It was formed thousands of years ago, when the land was low-lying and covered with thick swampy forest. As the plants died, they fell into the swamp and started to decay. The extreme pressure of the new vegetation over the dead plants at the bottom converted the vegetable matter to peat, lignite and coal.

Coal is extracted from coal mines. These coal mines are situated in Singrauli (Madhya Pradesh), Talcher (Odisha), Neyveli (Tamil Nadu) and Singareni (Telangana). In India, the largest coal-producer state is Jharkhand whereas the oldest coal mine is located at **Raniganj** (West Bengal). Gevra coal mine is the largest coal-producing mine in Asia.

Earlier, coal was generally used as a fuel for cooking, heating houses and buildings. Coal is also used for producing electricity in power plants and in the steel industry for blast furnaces.

9

Teacher: Can anyone tell me what minerals are?

Teacher: Excellent. Minerals are the building blocks of rocks. What do you think the minerals from which metals can be profitably extracted are called?

MUST DO 25 MIN.

Teacher: That is correct. They are called ores. Can you think of items made from these metals?

Teacher: Wonderful. These metals are used for making furniture, coins, machines, utensils and even jewellery.

Teacher: Now, let us talk about non-metallic minerals. A very important category under this is fossil fuels.

Teacher: Can anyone name some fossil fuels?

Teacher: Perfect. Coal and petroleum are examples of fossil fuels. Let us focus on coal. Do you know how coal is extracted?

Teacher: That is right. Coal is extracted from coal mines.

Teacher: In India, which state produces the largest amount of coal and where is the oldest coal mine located?

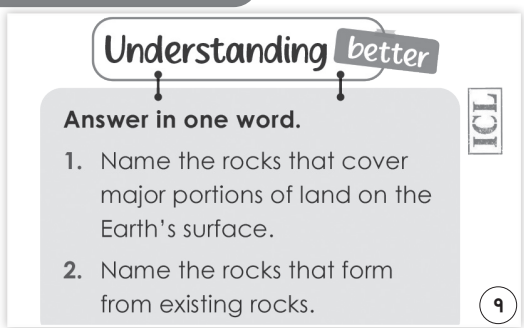
Teacher: Fantastic. Raniganj in West Bengal is home to the oldest coal mine.

Teacher: Lastly, let us discuss the uses of coal. Today, where do you think coal is primarily used?

Teacher: Brilliant answers. Coal is used for producing electricity in power plants and in the steel industry for blast furnaces. Great participation everyone.

MUST DO 10 MIN.

Understanding better


Understanding better

Answer in one word.

1. Name the rocks that cover major portions of land on the Earth's surface.
2. Name the rocks that form from existing rocks.

ICL

9

Teacher: I will ask you two questions and you will answer them based on what we have learned.

Teacher: The first question is: Name the rocks that cover major portions of land on the Earth's surface.

Teacher: And the second question is: Name the rocks that form from existing rocks.

Teacher: Write down your answers in your notebook.

(Discuss the correct answer with the class.)

You may show the **I Explain** and **Video** on the digital platform

Differentiated Activities

110 km/hr

Explain the process by which bauxite is converted into aluminium.

80 km/hr

Categorise the following into metallic and non-metallic minerals: haematite, coal, pyrite, bauxite, petroleum and calamine.

40 km/hr

Describe the difference between metallic and non-metallic minerals in two to three sentences. Provide one example of each.

Home Task

Write about two items at home made from metallic minerals and explain which metal they are made from.

Period 6

Teacher: Good morning, my enthusiastic learners. How are you all doing today?

SHOULD DO 05 MIN.

Teacher: Fantastic.

Teacher: Let us start with another quick warm-up before we continue with our learning. Try to answer these questions.

Teacher: Which rock is often used for making statues and sculptures because it is easy to carve? (Marble)

Teacher: What is the main characteristic of metamorphic rocks that makes them different from igneous and sedimentary rocks? (They change form due to heat and pressure.)

Teacher: Which rock is used to make blackboards and roofing materials? (Slate)

Teacher: Which type of rock is formed due to extreme heat and pressure inside the Earth? (Metamorphic rock)

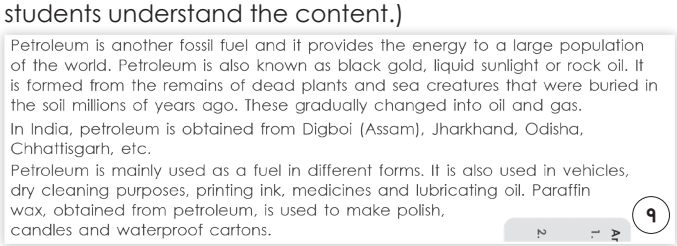
Teacher: How do small pebbles and sand become sedimentary rocks over time? (They are compressed and cemented together by minerals.)

Teacher: Well done. You are all thinking deeply and recalling what we have learned. Let us now move forward with today's lesson.

Teacher: Today, we are going to start the important topic of petroleum.

MUST DO 10 MIN.

(The teacher will read the fifth and sixth paragraphs of page 9 aloud and provide explanations to ensure that the students understand the content.)


Petroleum is another fossil fuel and it provides the energy to a large population of the world. Petroleum is also known as black gold, liquid sunlight or rock oil. It is formed from the remains of dead plants and sea creatures that were buried in the soil millions of years ago. These gradually changed into oil and gas.

In India, petroleum is obtained from Digboi (Assam), Jharkhand, Odisha, Chhattisgarh, etc.

Petroleum is mainly used as a fuel in different forms. It is also used in vehicles, dry cleaning purposes, printing ink, medicines and lubricating oil. Paraffin wax, obtained from petroleum, is used to make polish, candles and waterproof cartons.

9

Teacher: Can anyone tell why it is also called 'black gold'?

Teacher: That is correct. It is called 'black gold' because it is extremely valuable and has many uses. Now, can anyone tell how petroleum is formed?

Teacher: Great. It is formed from the remains of plants and sea creatures buried millions of years ago. These remains gradually changed into oil and gas over time. Can anyone name a place in India where we get petroleum?

Teacher: Assam is correct. Can anyone tell me what paraffin wax, obtained from petroleum, is used for?

Teacher: Great. Paraffin wax, obtained from petroleum, is used to make polish, candles and waterproof cartons.

Teacher: Let us talk about conserving natural resources.

MUST DO

10 MIN.

(The teacher will read the last paragraph of page 9 aloud and provide explanations to ensure that the students understand the content.)

CONSERVATION OF NATURAL RESOURCES

The increase in population has resulted in increased consumption of natural resources.

We must adopt measures to conserve natural resources so that they are available for our future generations as well.

We should use coal and petroleum wisely because these are non-renewable resources*. Vehicles which use petroleum can be substituted with electric vehicles. Electric vehicles help in reducing air pollution and have high energy efficiency. Using solar energy, wind energy, etc., also help in reducing pollution.

9

Teacher: Why do you think we need to conserve resources like petroleum and coal?

Teacher: That is right. These are non-renewable resources and if we use them carelessly, they will not be available for future generations. Can you think of ways we can reduce the use of petroleum?

Teacher: Excellent. Electric vehicles are a great alternative. What other renewable energy sources can we use instead of fossil fuels?

Teacher: That is right. Using solar energy, wind energy, etc., also helps in reducing pollution.

Teacher: Let us do an 'Understanding better' activity mentioned at the bottom of page number nine in your main course book. We will answer two simple questions with just one word each. Let us begin.

MUST DO

15 MIN.

Understanding better

Answer in one word.

1. Name one precious metal that is yellowish-brown in colour and is used to make jewellery.
2. What do we call minerals from which metals can be obtained?

ICL

9

Teacher: Here is the first question: 'Name one precious metal that is yellowish-brown in colour and is used to make jewellery.' Can anyone guess the answer?

Teacher: Excellent. Gold is correct. It is a precious metal often used in making jewellery. Now, here is the second question: What do we call minerals from which metals can be obtained?

Teacher: That is right. Minerals from which metals can be obtained are called ores.

You may show the **Slideshow** and **Animated Activities** on the digital platform.

Differentiated Activities

110 km/hr

Why is petroleum called 'black gold'?

80 km/hr

How is paraffin wax obtained from petroleum used in our daily lives? Write two examples.

40 km/hr

Name one renewable energy source we can use instead of petroleum.

Home Task

Draw a poster showing one way to conserve natural resources like petroleum. Use colours to make it attractive and include a catchy slogan.

Period 7

SHOULD DO

05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Fantastic. Let us begin today's lesson with a fun warm-up. I will ask some questions and you can try to answer them.

Teacher: What is the difference between rocks and minerals? (Rocks are made of one or more minerals, while minerals are solid substances with a specific chemical structure.)

Teacher: Which type of rock is formed when magma or lava cools and hardens? (Igneous rock)

Teacher: Can you name a rock that is formed by layers of compressed materials like sand and pebbles? (Sedimentary rock)

Teacher: What is the process called when heat and pressure transform rocks into a different type? (Metamorphism)

Teacher: Which rock, often used for flooring and monuments, is formed from limestone? (Marble)

Teacher: Wonderful responses. You all remember so much from our lessons. Now, let us continue with today's lesson.

Connecting better

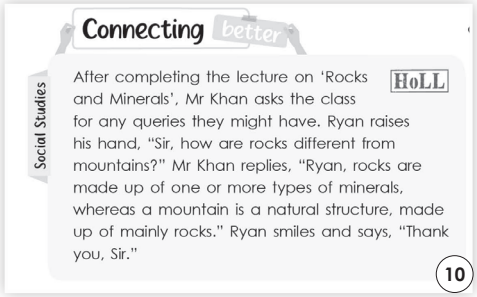
MUST DO

05 MIN.

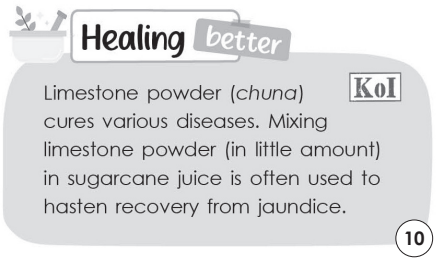
Teacher: Let us start the connecting better activity. Ready?

Teacher: Can anyone tell me how rocks are different from mountains?

Teacher: Yes, exactly. Rocks are made up of one or more types of minerals, whereas a mountain is a natural structure, made up of mainly rocks.



Healing better



Teacher: Did you know limestone powder or chuna, can cure various diseases?

MUST DO
05 MIN.

Teacher: That is wonderful. Mixing a little limestone powder in sugar cane juice helps recover from jaundice. Has anyone heard of this remedy?

Teacher: Great.

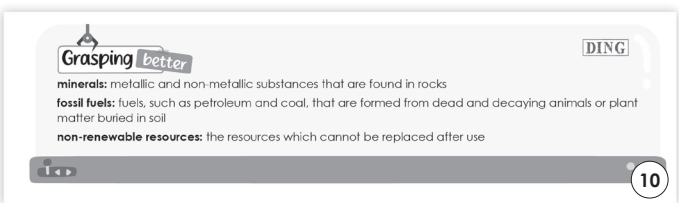
Laughing better

Teacher: Now, it is joke time. Why do you think some people find geologists' choice of music boring?

MUST DO
05 MIN.

Teacher: Because they only listen to rock and roll.

Grasping better



Teacher: Can anyone tell me what minerals are?

Teacher: Yes. Minerals are metallic and non-metallic substances found in rocks. What about fossil fuels?

Teacher: Correct. Fossil fuels are formed from dead and decaying animals or plant matter buried in soil. Now, who can explain non-renewable resources?

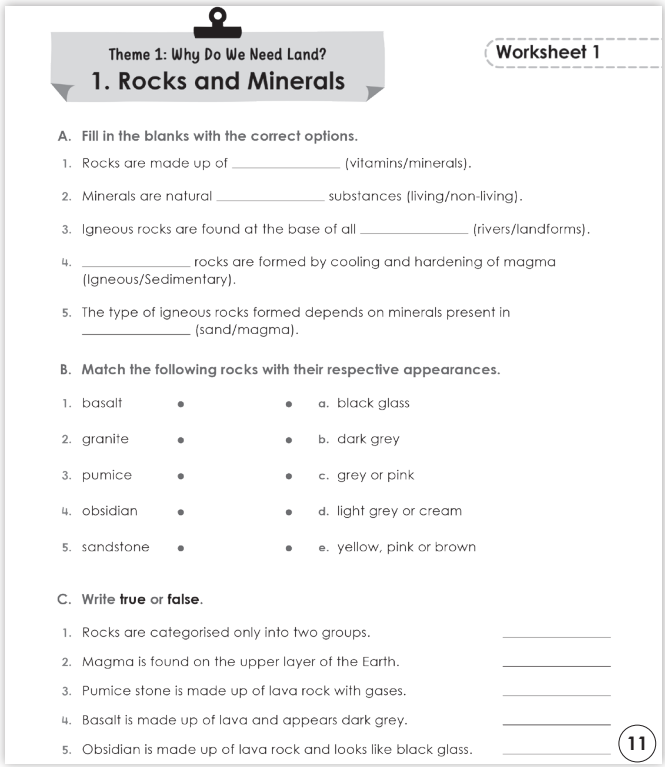
MUST DO
05 MIN.

Teacher: Exactly. Great job, everyone.

Worksheet - 1

Teacher: Let us do some activities from the workbook. Everybody, please open page number 11 of your workbook and answer the questions given in worksheet - 1.

MUST DO
15 MIN.


Theme 1: Why Do We Need Land?

1. Rocks and Minerals

Worksheet 1

A. Fill in the blanks with the correct options.

1. Rocks are made up of _____ (vitamins/minerals).
2. Minerals are natural _____ substances (living/non-living).
3. Igneous rocks are found at the base of all _____ (rivers/landforms).
4. _____ rocks are formed by cooling and hardening of magma (Igneous/Sedimentary).
5. The type of igneous rocks formed depends on minerals present in _____ (sand/magma).

B. Match the following rocks with their respective appearances.

1. basalt	•	•	a. black glass
2. granite	•	•	b. dark grey
3. pumice	•	•	c. grey or pink
4. obsidian	•	•	d. light grey or cream
5. sandstone	•	•	e. yellow, pink or brown

C. Write true or false.

1. Rocks are categorised only into two groups. _____
2. Magma is found on the upper layer of the Earth. _____
3. Pumice stone is made up of lava rock with gases. _____
4. Basalt is made up of lava and appears dark grey. _____
5. Obsidian is made up of lava rock and looks like black glass. _____

11

(Let the students answer the questions on their own. Then discuss the answer by writing the correct answer on the blackboard.)

You may show the **Concept Map** on the digital platform

Differentiated Activities

110 km/hr

List the steps to make a simple metal detector.

80 km/hr

Describe two non-renewable resources and explain why they cannot be replaced after use.

40 km/hr

What are the main differences between rocks and mountains?

Home Task

The 'Trying better' (Let us make a metal detector) activity given on page 10 of the Main Course Book.

Period 8

SHOULD DO
05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: That is wonderful. Let us begin today's lesson with a fun warm-up. I will ask some questions and you can try to answer them.

Teacher: What are the three types of rocks we have learned about? (Igneous, sedimentary and metamorphic)

Teacher: Which type of rock is formed when magma cools and hardens? (Igneous rock)

Teacher: What are minerals from which metals can be extracted profitably called? (Ores)

Teacher: Can you name a fossil fuel that is used to generate electricity? (Coal)

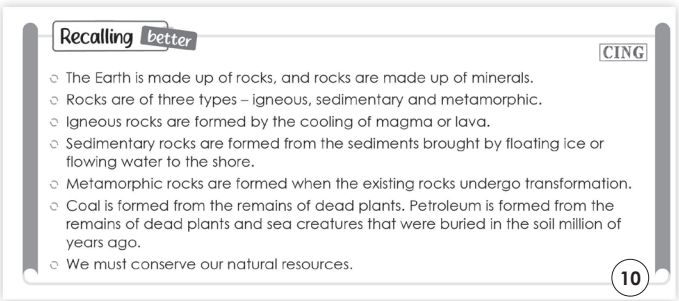
Teacher: Why is petroleum also called 'black gold'? (Because it is highly valuable and has many uses)

Teacher: Fantastic responses, everyone. You are remembering everything well. Let us now move on to today's lesson.

Recalling better

MUST DO
05 MIN.

Teacher: Today, we are going to recall our learnings about rocks and natural resources. Can anyone tell me what the Earth is made up of?



Recalling better

CING

- The Earth is made up of rocks, and rocks are made up of minerals.
- Rocks are of three types – igneous, sedimentary and metamorphic.
- Igneous rocks are formed by the cooling of magma or lava.
- Sedimentary rocks are formed from the sediments brought by floating ice or flowing water to the shore.
- Metamorphic rocks are formed when the existing rocks undergo transformation.
- Coal is formed from the remains of dead plants. Petroleum is formed from the remains of dead plants and sea creatures that were buried in the soil million of years ago.
- We must conserve our natural resources.

10

Teacher: Excellent. The Earth is made up of rocks, which are made of minerals. Rocks are of three types. Who can name them?

Teacher: Very good. Igneous, sedimentary and metamorphic rocks. Can someone explain how igneous rocks are formed?

Teacher: Right. They are formed by the cooling of magma or lava. What about sedimentary rocks?

Teacher: Exactly. They are formed from sediments brought by floating ice or flowing water. And what are metamorphic rocks?

Teacher: Brilliant. They are formed when existing rocks transform. Now, who can tell me how coal and petroleum are formed?

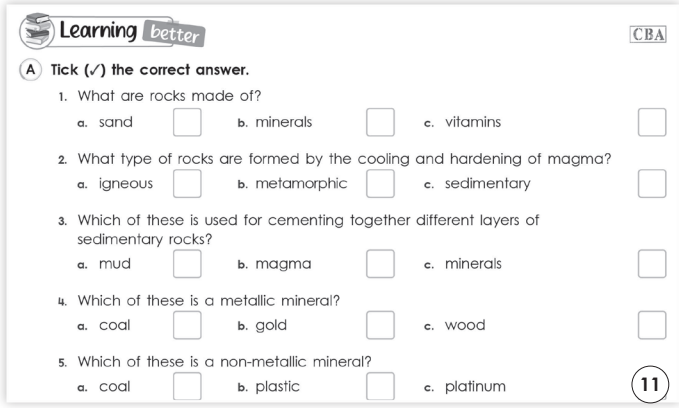
Teacher: Well said. Coal comes from dead plants and petroleum comes from the remains of dead plants and sea creatures buried millions of years ago. Finally, why is conserving natural resources important?

Teacher: Yes. To save them for future generations because they are limited. Excellent understanding. You all have done a fantastic job today.

Learning better

Teacher: Everyone please open the page number eleven of your book. We have an exercise called 'Learning better.' In part 'A' of 'Learning better' you have to tick the correct answer. Are you ready to get started?

MUST DO
05 MIN.



Learning better

CBA

A Tick (✓) the correct answer.

1. What are rocks made of?
   a. sand ☐ b. minerals ☐ c. vitamins ☐
2. What type of rocks are formed by the cooling and hardening of magma?
   a. igneous ☐ b. metamorphic ☐ c. sedimentary ☐
3. Which of these is used for cementing together different layers of sedimentary rocks?
   a. mud ☐ b. magma ☐ c. minerals ☐
4. Which of these is a metallic mineral?
   a. coal ☐ b. gold ☐ c. wood ☐
5. Which of these is a non-metallic mineral?
   a. coal ☐ b. plastic ☐ c. platinum ☐

11

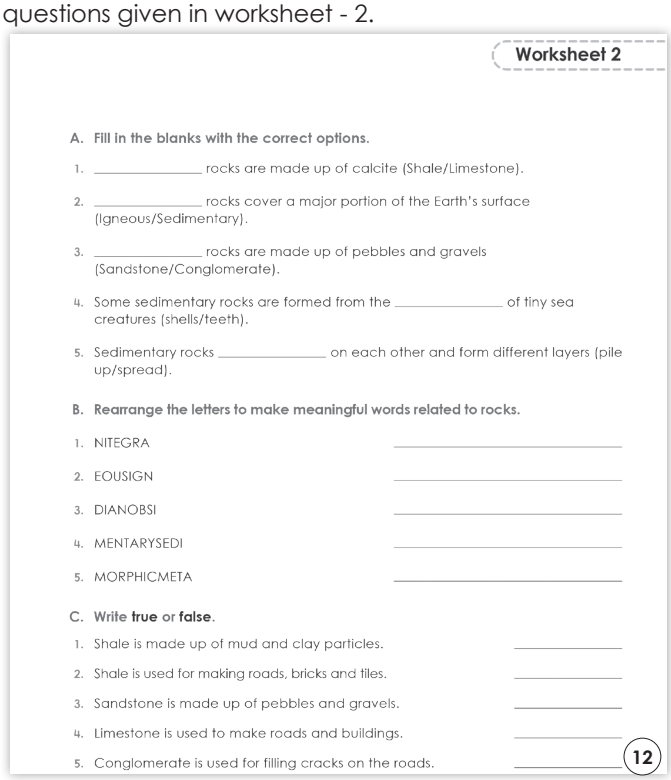
Teacher: Great. Let us begin with the first question. What are rocks made of?

Teacher: The correct answer is minerals. Well done. (Similarly complete all five questions)

Worksheet - 2

MUST DO
15 MIN.

Teacher: Let us do some activities from the workbook. Everybody, please open page number 12 of your workbook and answer the questions given in worksheet - 2.



Worksheet 2

A. Fill in the blanks with the correct options.

1. _____ rocks are made up of calcite (Shale/Limestone).
2. _____ rocks cover a major portion of the Earth's surface (Igneous/Sedimentary).
3. _____ rocks are made up of pebbles and gravels (Sandstone/Conglomerate).
4. Some sedimentary rocks are formed from the _____ of tiny sea creatures (shells/teeth).
5. Sedimentary rocks _____ on each other and form different layers (pile up/spread).

B. Rearrange the letters to make meaningful words related to rocks.

1. NITEGRA _____
2. EOUSIGN _____
3. DIANOBSI _____
4. MENTARYSEDI _____
5. MORPHICMETA _____

C. Write **true** or **false**.

1. Shale is made up of mud and clay particles. _____
2. Shale is used for making roads, bricks and tiles. _____
3. Sandstone is made up of pebbles and gravels. _____
4. Limestone is used to make roads and buildings. _____
5. Conglomerate is used for filling cracks on the roads. _____

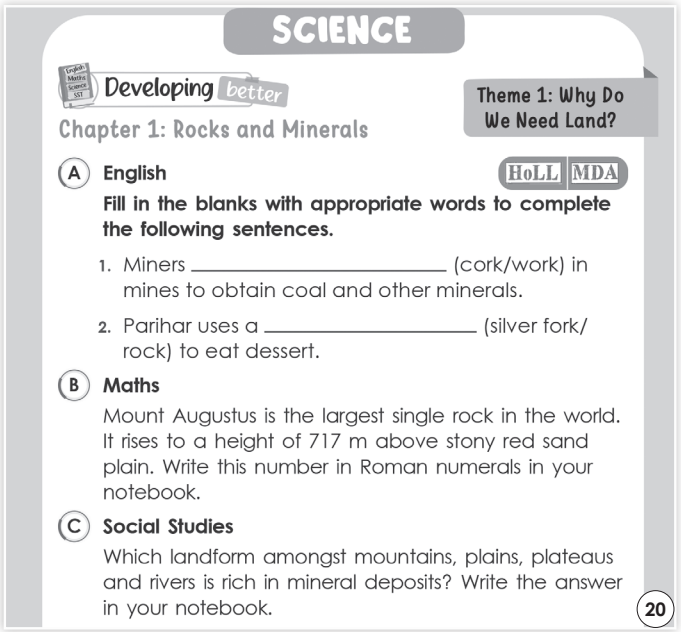
12

(Let the students answer the questions on their own. Then discuss the answer by writing the correct answer on the blackboard.)

Book of Holistic Teaching

COULD DO
10 MIN.

(Refer to the Book of Holistic Teaching, page number 20 under the title 'Rocks and Minerals.' Complete the activities mentioned in this section and ensure that the students complete them. These activities are designed to enhance their holistic understanding and engagement with the topic. Provide any necessary support and materials to help the students successfully finish the activities.)



SCIENCE

Developing better

Theme 1: Why Do We Need Land?

Chapter 1: Rocks and Minerals

(A) English — HoLL MDA

Fill in the blanks with appropriate words to complete the following sentences.

1. Miners _____ (cork/work) in mines to obtain coal and other minerals.
2. Parihar uses a _____ (silver fork/ rock) to eat dessert.

(B) **Maths**

Mount Augustus is the largest single rock in the world. It rises to a height of 717 m above stony red sand plain. Write this number in Roman numerals in your notebook.

(C) **Social Studies**

Which landform amongst mountains, plains, plateaus and rivers is rich in mineral deposits? Write the answer in your notebook.

20

You may show the **Quiz** on the digital platform

Differentiated Activities

110 km/hr

What is the key difference between igneous and metamorphic rocks?

80 km/hr

Give two examples of sedimentary rocks.

40 km/hr

What are rocks made of?

Home Task

The project Ideas given in the book of Project Ideas, page 13, under the title 'Rocks and Minerals.' This project should be assigned to the students to work on. Ensure that the students understand the project requirements and provide any necessary guidance or materials they might need. Encourage them to explore and learn about rocks and minerals through this engaging project.

Period 9

SHOULD DO
05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: That is wonderful. Let us begin today's lesson with a fun warm-up. I will ask some questions and you can try to answer them.

Teacher: What are the three types of rocks we have learned about? (Igneous, sedimentary and metamorphic)

Teacher: How are sedimentary rocks formed? (They are formed by the compression of sediments over time.)

Teacher: What is petroleum commonly known as and why? (Black gold because of its high value and multiple uses.)

Teacher: Which rock is used to make buildings and monuments and can be white, grey, or beige in colour? (Marble)

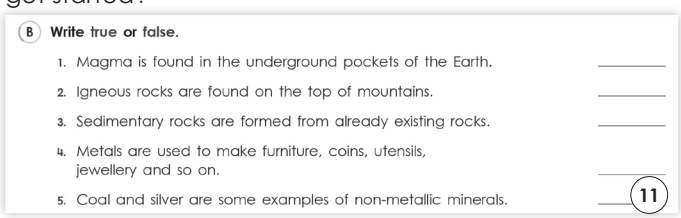
Teacher: Why do we need to conserve natural resources like coal and petroleum? (Because they are non-renewable and take millions of years to form.)

Teacher: Fantastic responses, everyone. You have remembered a lot from our lessons. Let us now move on to today's topic.

Learning better

Teacher: Today, we will dive into some exciting questions about rocks and minerals. Everyone please open the page number eleven of your book. We have an exercise called 'Learning better.' In part 'B' of 'Learning better' section, you have to write 'true' or 'false'. Are you ready to get started?

MUST DO
05 MIN.



(B) **Write true or false.**

1. Magma is found in the underground pockets of the Earth. _____
2. Igneous rocks are found on the top of mountains. _____
3. Sedimentary rocks are formed from already existing rocks. _____
4. Metals are used to make furniture, coins, utensils, jewellery and so on. _____
5. Coal and silver are some examples of non-metallic minerals. _____

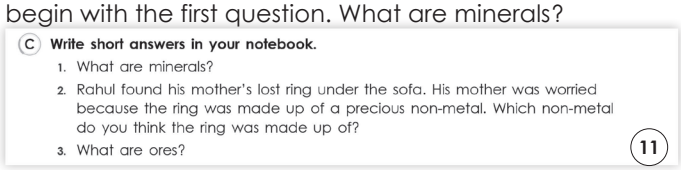
11

Teacher: Great. Let us begin with the first question. Magma is found in underground pockets of the Earth. Think carefully and write true or false in the space given in front of the statement.

(Similarly complete all five questions)

MUST DO
10 MIN.

Teacher: Great. Now, let us explore some short-answer questions. Let us begin with the first question. What are minerals?



(C) **Write short answers in your notebook.**

1. What are minerals?
2. Rahul found his mother's lost ring under the sofa. His mother was worried because the ring was made up of a precious non-metal. Which non-metal do you think the ring was made up of?
3. What are ores?

11

(Students have to write the answers for the given questions in about 40 to 50 words in their notebook. Wait for the students to write the answers.)

Teacher: Here is a fun question. Rahul found his mother's lost ring under the sofa. His mother was worried because it was made of a precious non-metal. Which non-metal do you think the ring was made up of?
(Wait for the students to write the answers.)
Teacher: Finally, the third question is, What are ores?
Teacher: After you finish writing your answers, please exchange them with a friend sitting beside you.
Teacher: Great. Let us explore some long-answer questions. Let us begin with the first question. Differentiate between igneous, sedimentary and metamorphic rocks. Give one example of each.

MUST DO
10 MIN.

D **Write long answers in your notebook.**
1. Differentiate between igneous, sedimentary and metamorphic rocks. Give one example of each.
2. Differentiate between metallic and non-metallic minerals.

11

(Students have to write the answers for the given questions in about 100 to 150 words in their notebook. Wait for the students to write the answers.)
Teacher: Great. Let us begin with the second question. Differentiate between metallic and non-metallic minerals.
(Wait for the students to write the answers.)
Teacher: After you finish writing your answers, please exchange them with a friend beside you.

Worksheet - 3

Teacher: Let us do some activities from the workbook. Everybody, please open page number 13 of your workbook and answer the questions given in worksheet - 3.

MUST DO
10 MIN.

(Let the students answer the questions on their own. Then discuss the answer by writing the correct answer on the blackboard.)

Worksheet 3

A. **Answer the following.**
1. What are rocks?
2. What is magma?
3. What are minerals?
4. Name the three types of rocks.
5. How do metamorphic rocks form?

B. **Match the columns.**

Column A		Column B
1. slate	•	• a. granite
2. gneiss	•	• b. sandstone
3. marble	•	• c. shale
4. quartzite	•	• d. lava
5. basalt	•	• e. limestone

C. **Write true or false.**
1. The colour of gneiss rock is yellow. _____
2. Slate is used for flooring, roofing and wall cladding. _____
3. Metamorphic rocks are formed by transformation of existing rocks. _____
4. Marble is used for making buildings, interior decorations and monuments. _____
5. Metamorphic rocks were once either igneous or sedimentary rocks. _____

13

(Instruct the students to bring their Little Book in their next class.)

Differentiated Activities

110 km/hr

What is the primary component of sedimentary rocks that cements different layers together in their formation?

80 km/hr

Name the type of rocks formed by the cooling of magma.

40 km/hr

What are minerals?

Home Task

(Assign the 'Creating better' activity mentioned on page 12 as a home task)

Period 10

SHOULD DO
05 MIN.

Teacher: Good morning, students. How are you all today?
Teacher: That is wonderful. Let us begin today's lesson with a fun warm-up. I will ask some questions and you can try to answer them.
Teacher: What are the three types of rocks we have studied so far? (Igneous, sedimentary and metamorphic)
Teacher: What process forms metamorphic rocks? (Heat and pressure)
Teacher: What is the primary source of coal and petroleum? (Dead plants and sea creatures buried over millions of years)
Teacher: What is the difference between metallic and non-metallic minerals? (Metallic minerals contain metals, while non-metallic minerals do not)
Teacher: Why do we need to conserve petroleum and coal? (Because they are non-renewable resources and take millions of years to form)
Teacher: Fantastic responses, everyone. You are doing a great job remembering everything we have learned. Let us now move on to today's lesson.

Thinking better

Thinking better — 21st CS HOTS

Think and write the answer in your notebook.
Why do you think rocks are so hard and strong? Can you explain how they are different from sand or soil?

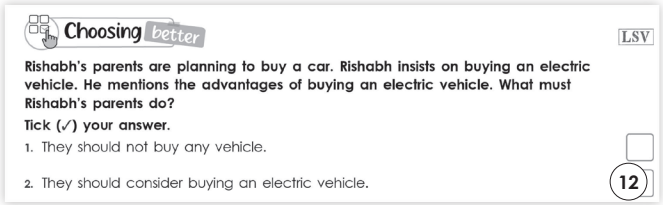
12

Teacher: Today, we have some interesting activities to work on. Let us start with a thinking activity. Why do you think rocks are so hard and strong? How are they different from sand or soil? Write

MUST DO
05 MIN.

your answers in your notebooks and do not forget to explain your reasoning.
(Give students time to think and write their answers in their notebooks.)
Teacher: After you finish writing your answers, please exchange them with a friend beside you.

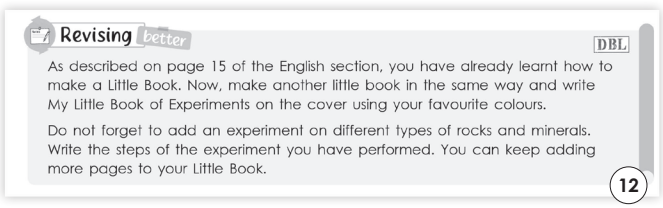
Choosing better


Choosing better LSV
Rishabh's parents are planning to buy a car. Rishabh insists on buying an electric vehicle. He mentions the advantages of buying an electric vehicle. What must Rishabh's parents do?
Tick (✓) your answer.
1. They should not buy any vehicle.
2. They should consider buying an electric vehicle.
12

MUST DO
05 MIN.

Teacher: Now, let us move on to a 'Choosing better' activity. Rishabh's parents are planning to buy a car. Rishabh insists on buying an electric vehicle. He mentions the advantages of buying an electric vehicle. What must Rishabh's parents do?
Teacher: Great points. Tick your answers on the sheet provided and discuss your choice with a friend.

Revising better


Revising better DBL
As described on page 15 of the English section, you have already learnt how to make a Little Book. Now, make another little book in the same way and write My Little Book of Experiments on the cover using your favourite colours.
Do not forget to add an experiment on different types of rocks and minerals. Write the steps of the experiment you have performed. You can keep adding more pages to your Little Book.
12

MUST DO
10 MIN.

Teacher: Finally, let us do a revising activity. You all learned how to make a Little Book in your English class. Now, I want you to create another Little Book, but this time, it is going to be called 'My Little Book of Experiments.' Decorate the cover with your favourite colours.
Teacher: You could do an experiment to test the porosity of different rocks. First, weigh each rock and record its mass. Then, submerge the rocks in water for 10 minutes. After soaking, remove the rocks, shake off excess water and weigh them again. Compare the weights before and after soaking to see which rocks absorbed water. This will help us understand the porosity of rocks and their ability to absorb water. Make sure to write down each step and your observations in your Book of Experiments. Happy experimenting.
Teacher: Fantastic ideas. Make sure to write down the steps of your experiment in your Little Book. You can keep adding more experiments as we learn about different topics.

MUST DO
10 MIN.

Please discuss the project assigned in the period eight, focusing on helping students understand the objectives and addressing any challenges they faced.

SHOULD DO
05 MIN.

Teacher: Now, let us fill in the last column of the KWL chart.
Teacher: In this column, we will write what we have learned in this chapter.
Teacher: Think about the topics, we have learnt and write them in the `L' column of the chart.
(Wait for students to fill in the chart.)
Teacher: Let us all give a huge round of applause to everyone for their hard work and creativity. Great job, everyone. See you in the next class. Have a wonderful day ahead.

Differentiated Activities

110 km/hr

How does the cooling rate of magma affect the texture of igneous rocks?

80 km/hr

What is the main difference between igneous rocks and sedimentary rocks in terms of their formation?

40 km/hr

What are the two main types of minerals found in rocks? Give one example of each.

Home Task

Create a collage showing different types of rocks and minerals using magazine cutouts or coloured paper. Label each type of rock (igneous, sedimentary, and metamorphic) and include their uses.

Learning Outcomes

The students will:

Physical Development	• demonstrate fine motor skills by drawing and colouring images of objects that use natural resources, such as windmills and vehicles.
Socio-Emotional and Ethical Development	• develop collaboration skills by engaging in peer discussions and exchanging their drawings, fostering teamwork and appreciation for each other's contributions.
Cognitive Development	• develop classification and analytical skills by differentiating between igneous, sedimentary and metamorphic rocks based on their formation, composition and uses.
Language and Literacy Development	• improve vocabulary related to geology, such as 'igneous,' 'metamorphic,' 'sedimentary,' 'mineral,' and 'erosion.'
Aesthetic and Cultural Development	• appreciate the beauty and diversity of natural rock formations and mineral specimens.
Positive Learning Habits	• develop critical thinking skills by engaging in inquiry-based discussions, such as analysing why rocks are hard and different from sand or soil.

Starry Knights

How is the new group of learners?

_____

What will be your strategy to give the maximum learning experience to the learners?

_____

Give yourself a STAR.

Lesson-2: Force and Energy

10 Periods (40 minutes each)

Learn better (Main Course Book), Stay Ahead (Workbook), CRM signs, Book of Holistic Teaching, Book of Project Ideas, CRM signs.

Animation, Animated Activities, Concept Map, Dictionary, eBook, I Explain, Quiz, Slideshow.

I affirm: I am brave and strong.

Curricular Goals and Objectives (NCF)

To enable the students:

- to explore different types of force and energy through hands-on activities.
- to understand how forces act on objects and how energy is conserved.
- to recognise the importance of natural energy sources like sunlight.
- to improve communication through creative journaling and discussions.
- to develop problem-solving skills by applying force and energy concepts to real-life situations.

Methodology

Period 1

SHOULD DO — 05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Great. Before we dive into our lesson, let us take a moment to relax and focus our minds with a short meditation. Ready?

Teacher: Sit comfortably in your chair, with your back straight and feet flat on the ground. Close your eyes gently and take a deep breath through your nose. Hold it for a moment, then slowly breathe out through your mouth.

Let us do these three more times. Breathe in... and breathe out. As you breathe, imagine your mind becoming clear and ready to learn.

Open your eyes and smile at your friends. Let us start our lesson with positive energy.

Teacher: Before we start the class, let us all say together, 'I am brave and strong.' Repeat after me: 'I am brave and strong.'

Teacher: Great. Before we dive into our lesson, let us take a moment to relax and focus our minds with a short meditation. Ready?

Teacher: Sit comfortably in your chair, with your back straight and feet flat on the ground. Close your eyes gently and take a deep breath through your nose. Hold it for a moment, then slowly breathe out through your mouth.

Let us do these three more times. Breathe in... and breathe out. As you breathe, imagine your mind becoming clear and ready to learn.

Open your eyes and smile at your friends. Let us start our lesson with positive energy.

Teacher: Today, we are going to begin a new chapter on Force and Energy. We use a KWL chart to help us organize our thoughts and learning.

MUST DO — 05 MIN.

I have made a KWL format on the blackboard. Please take out your notebooks and draw the same format.

Teacher: The KWL chart has three columns. The first column is labeled 'K,' the second column is labeled 'W,' and the third column is labeled 'L.'

Teacher: Let us start by filling out the 'K' and 'L' column. Take a few minutes to think and write. If you have any questions, feel free to ask.

K	W	L

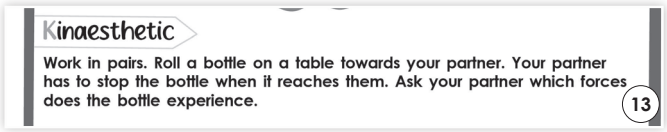
Teacher: Before we dive in the chapter, let us do a quick Re-KAP. Does anyone know what Re-KAP means?

Teacher: Yes, that is right. It involves revisiting our previous knowledge through creative activities using Kinaesthetic, Auditory and Pictorial methods to make our learning interactive and engaging.

Kinaesthetic

MUST DO — 10 MIN.

Teacher: Let us start a fun kinaesthetic activity. I want you to work in pairs. One of you will roll a bottle on the table towards your partner. Your partner's task will be to stop the bottle when it reaches them.



Teacher: Once the bottle has stopped, ask your partner: Which forces do you think the bottle experienced? Ready to begin? Let us go.

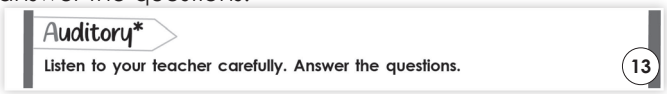
(Give time to the students to perform the activity.)

Teacher: Fantastic work, everyone.

Auditory

Teacher: Let us move into auditory activity. I am going to talk about Force and Energy. Listen to me carefully and answer the questions.

MUST DO
10 MIN.



Teacher: A force is a push or pull that can make an object move, stop or change direction. Different types of forces are used to perform different types of work. Like muscular force is used by our muscles to push or pull an object. The buoyant force is exerted by a liquid on an object due to which the object floats.

Teacher: Can anyone name the force applied by our muscles when we push or pull an object?

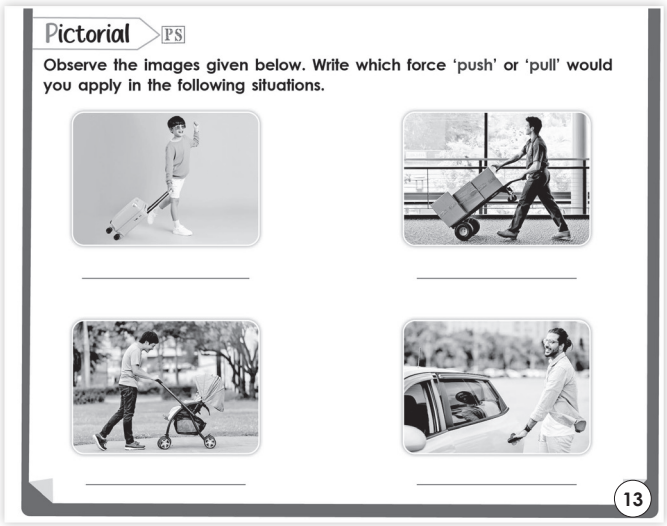
Teacher: Excellent. Now, can someone tell me the name of the force applied by liquids on an object?

Teacher: Great job, everyone. These forces play a crucial role in our daily lives. Let us continue to learn more about them.

Pictorial

Teacher: Let us do a fun pictorial activity. Ready?

MUST DO
10 MIN.



Teacher: Look at the pictures given on page 13 under the Pictorial section. Observe the images and write which force 'push' or 'pull' would you apply in the given situations below the given images.

Teacher: Excellent observations. Let us discuss your answers and understand why you chose 'push' or 'pull' for each image.

(Discuss the correct answer with the class. And explain why you chose 'push' or 'pull' for each image.)

Differentiated Activities

110 km/hr

What will happen if there is no force acting on a moving object?

80 km/hr

Name one activity where you use a push and one where you use a pull force.

40 km/hr

When you open a door, do you push or pull?

Home Task

Write down five examples from your daily life where you use a push or pull force. For each example, mention whether the force is a push or pull and describe its effect.

Period 2

Interacting better

Teacher: Good morning students. How are you all today?

MUST DO
10 MIN.

Teacher: Great. Today, we are going to learn about different types of force that we use in our daily lives. Let us start with a fun activity. Ready?

Teacher: Great. Pair up with the person next to you.

Teacher: Discuss what happens when no force is applied to an object.

Teacher: Take a few minutes to share your thoughts and observations with each other. Once you have finished, we will discuss your ideas as a class. Let us begin.

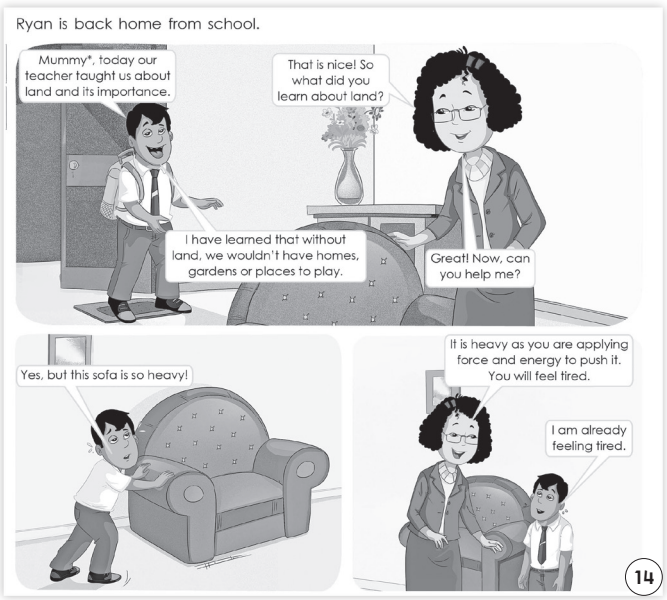
(Encourage students to discuss with each other and invite some volunteers to share their ideas)

(Use CRM signs to settle the class.)

Teacher: Great job, everyone. I loved hearing all the interesting ideas. Give yourselves a round of applause for your wonderful participation and teamwork.

MUST DO
20 MIN.

Teacher: It is time for a fun story-based discussion today. Open your books to page 14 with Ryan's story about land and force. Have a look at the pictures and try to understand what is happening. Take a minute to observe and think about it carefully.



(Give students time to read the story.)

Teacher: Alright. Now, let us talk about the first picture. Can you tell me why land is so important for us?

Teacher: Excellent thoughts. Land provides us with homes, gardens and even places to play. Now, look at the second picture. Ryan is trying to move the sofa. What do you notice here?

Teacher: Yes, Ryan is pushing the sofa. What do you think is making it difficult for him to move the sofa?

Teacher: Absolutely. Ryan is using force to push the sofa and it requires energy. Let us look at the third picture. What happens when you keep applying force for a long time?

Teacher: That is correct. Using force takes energy from our muscles and that is why we feel tired. This story teaches us how force and energy work in our daily lives. Well done, everyone.

SHOULD DO
10 MIN.

Teacher: Now, we will be doing a fun activity with Play-Doh.

Teacher: I would like each of you to take some play dough and make your favourite object.

Teacher: Once you have made your object, think about why you chose to make it out of Play-Doh.

Teacher: Excellent. Have you all noticed that force is applied to change the shape and size of the Play-Doh?

Teacher: Great. This is because force is a push or a pull that changes the state, speed, direction and shape of an object.

Teacher: Great job, everyone.

You may show the **Dictionary** and **eBook** on the digital platform.

Differentiated Activities

110 km/hr

Why do you think Ryan felt tired after pushing the sofa in the story?

80 km/hr

What kind of force is applied when you stretch a rubber band?

40 km/hr

Name one thing in your house that needs a lot of force to move.

Home Task

Using a small object like a toy car, try pushing it on different surfaces (e.g., floor, carpet, table). Write a few sentences about which surface needed the most force and why.

Period 3

SHOULD DO
05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: That is wonderful. Let us begin today's lesson with a fun warm-up. I will ask some questions and you can try to answer them.

Teacher: What is a force? (A push or pull that can make an object move, stop, or change direction.)

Teacher: Can you name a type of force that we use to move objects with our body? (Muscular force)

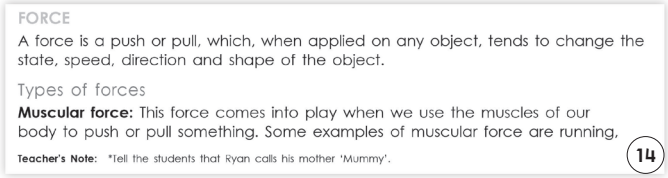
Teacher: Which force helps objects float on water? (Buoyant force)

Teacher: What do we call the force that opposes the motion of a moving object? (Frictional force)

Teacher: In the story we read, why did Ryan feel tired after pushing the sofa? (Because applying force requires energy.)

Teacher: Fantastic responses, everyone. You are remembering so much from our previous lessons. Let us now move on to today's lesson.

Teacher: Let us give ourselves a huge round of applause for all the energy we brought into the class.


FORCE

A force is a push or pull, which, when applied on any object, tends to change the state, speed, direction and shape of the object.

Types of forces

Muscular force: This force comes into play when we use the muscles of our body to push or pull something. Some examples of muscular force are running,

Teacher's Note: *Tell the students that Ryan calls his mother 'Mummy'.

14

Teacher: Today, we are going to learn about force and its types.

MUST DO
15 MIN.

walking and bending. To apply this force, our body needs to be in contact with the surface of the other object. Hence, muscular force is a type of contact force. 15

(The teacher will read the last two paragraphs of page 14 and the first of page 15 aloud and provide explanations to ensure that the students understand the content.)

Teacher: Who here can tell me what force is?

Teacher: Fantastic. Can anyone tell me what muscular force is?

Teacher: Yes, exactly. Muscular force comes into play when we use the muscles of our body to push or pull something. Can you give me some examples?

Teacher: Yes, running is a good example. Any other examples?

Teacher: Correct. Walking is another example. What else?

Teacher: Yes, bending is also an example of muscular force. Now, to apply this force, what does our body need to be in contact with?

Teacher: Exactly. Our body needs to be in contact with the surface of the other object. So, what type of force is muscular force?

Teacher: Yes, muscular force is a type of contact force. Well done, everyone.

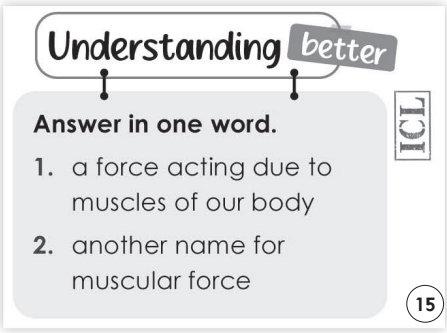
Teacher: Great thinking, everyone.

Understanding better

Teacher: Great job so far, everyone. Let us test our understanding of the concept of force with a quick activity. I will ask you two simple questions. You just need to answer them in one word. Ready?

Teacher: Let us start with the first one. Can anyone tell me what is the force called that is acting due to the muscles of our body?

MUST DO
10 MIN.



Teacher: Very good. Now, Let us move on to the next one. What is another name for muscular force?

Teacher: Excellent thinking, everyone. You are doing a fantastic work today.

(Discuss the correct answer with the class.)

Teacher: The next type of force is a gravitational force. Can anyone tell me what gravitational force is?

Teacher: Yes, every object in this universe attracts other objects with a force known as gravitational force. What happens when two bodies with some mass come close to each other?

Teacher: Correct, they pull or attract each other. Now, which body applies the gravitational force?

Teacher: Exactly, the body that applies the gravitational force is the body that always attracts the other body towards itself. Why are we able to stand, walk, sit and be on the Earth's surface?

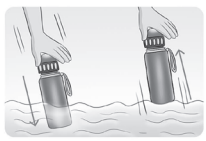
Teacher: Yes, it is due to the gravitational force exerted by the Earth on our body.

MUST DO
10 MIN.

Teacher: Now, let us talk about buoyant force, also known as upthrust.

(The teacher will read aloud the third paragraph of page 15 and provide explanations to ensure that the students understand the content.)

Buoyant force or upthrust: When any object floating on water is pushed down, the water exerts an upward push on the object. This upward push is called the buoyant force or upthrust. Human beings experience this force while entering a swimming pool as the water we displace by entering the swimming pool creates an upward force on your body. This force counteracts the force of gravity which pulls us downward. Hence, this makes us feel lighter in the water.


buoyant force

15

Teacher: What happens when any object floating on water is pushed down?

Teacher: Yes, the water exerts an upward push on the object. This upward push is called the buoyant force or upthrust. When do human beings experience this force?

Teacher: Correct, we experience this force while entering a swimming pool. What happens to the water when we enter the pool?

Teacher: Exactly, the water we displace by entering the swimming pool creates an upward force on our body. What does this force counteract?

Teacher: Yes, it counteracts the force of gravity which pulls us downward. How does this make us feel in the water?

Teacher: Right, it makes us feel lighter in the water. Well done, everyone.

Teacher: You all did a great job today. Now, let us do a quick activity to test our understanding. Get ready.

You may show the **I Explain** video from the digital platform.

Differentiated Activities

110 km/hr

What happens when you push a ball underwater?

80 km/hr

Give two examples of gravity in daily life.

40 km/hr

What force do muscles apply?

Home Task

Write the answers in your notebook.

Explain how gravitational force affects the motion of planets.

Period 4

SHOULD DO
05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Fantastic. Let us start today's lesson with an engaging warm-up activity. I will ask you some questions based on what we have learned so far. Are you ready?

Teacher: Here we go.

Teacher: What do we call the force that our muscles use to push or pull something? (Muscular force)

Teacher: Can anyone tell me the force that makes objects fall to the ground when we drop them? (Gravitational force)

Teacher: What is the name of the force that makes you feel lighter when you are in a swimming pool? (Buoyant force)

Teacher: When you push a bottle on a table, what type of force do you think you are using? (Muscular force)

Teacher: Great job, everyone. Now that we are warmed up, let us dive into today's lesson.

Frictional force: It is the force that opposes the motion of an object moving on a surface. When a body moves on any surface, the surface exerts a force in the direction opposite to the motion of the object. This eventually decreases the motion of object or stops the object. This is known as frictional force. Some examples of frictional force are skating and driving a vehicle on the road. In addition to this, frictional force makes walking on the plains easier than on rocky mountains.

a person doing skating

The friction between your shoes and the ground provides traction. Traction is the process in which friction appears between a surface and the object moving on it. It allows you to move with each step and maintain stability. On plains, where the ground is usually even and stable, traction is more consistent, making it easier to walk.

15

Teacher: Today, we will learn about frictional force.

(The teacher will read the fourth and fifth paragraph of page 15 aloud and provide explanations to ensure that the students understand the content.)

MUST DO
20 MIN.

Teacher: Now, what do you think causes the toy car to slow down and stop eventually?

Teacher: Exactly, that is frictional force. Can you think of any other examples where friction slows something down?

Teacher: Excellent examples. When you are skating or driving, friction between the wheels and the surface affects the motion. What do you think would happen if there was no friction when you are skating?

Teacher: Right, it would be very difficult to stop or control your movement. Now, think about walking. Why do you think it is easier to walk on flat ground compared to rocky mountains?

Teacher: That is correct. The friction between your shoes and the ground provides traction, which helps you move and stay stable. On flat plains, the ground is more even, so traction is more consistent.

Mechanical force: It is a contact force that acts between two bodies. When direct interaction takes place between two different objects then it results in the change in the configuration of objects. Some examples of mechanical force include bending of a nail using pliers and drilling a hole into wood through a hand drill.

15

Teacher: Now, we are going to explore mechanical force. But before we dive into the topic of mechanical force let us do the 'Discovering better' activity mentioned on page number 15.

MUST DO
15 MIN.

Discovering better

LAD

opposes: acts against something

configuration: arrangement of parts of something

15

Teacher: Let us start with the word 'opposes.' What do you think it means?

Teacher: Great. It means to act against something. Now, let us move on to the word 'configuration.' What do you think configuration means?

Teacher: Yes, it refers to the arrangement of parts of something. Now, let us start the topic of Mechanical force.

(The teacher will read the last paragraphs of page 15 aloud and provide explanations to ensure that the students understand the content.)

Teacher: Which force is applied when you bend a nail with pliers or drill a hole into wood?

Teacher: Exactly. That is an example of mechanical force. It is a contact force that acts between two bodies. What do you think happens when two objects interact directly with each other?

Teacher: Correct. It can result in a change in the shape or configuration of the objects. Can you think of any other examples where mechanical force is at work?

Teacher: Great examples. Using a hammer to drive a nail, or using a wrench to tighten a bolt, are both uses of mechanical force.

Differentiated Activities

110 km/hr

What kind of surface provides more traction for walking?

80 km/hr

What type of force causes a car to slow down when it stops?

40 km/hr

Name a surface where it is harder to walk due to less friction.

Home Task

Look up two examples of how friction is useful in everyday life. Write a brief explanation for each.

Period 5

SHOULD DO 05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Wonderful. Let us start today's lesson with a fun warm-up. I will ask you some questions based on what we have learned so far. Are you ready to answer?

Teacher: Here we go.

Teacher: What is the force called that we use to move an object by pushing or pulling it? (Muscular force)

Teacher: What type of force makes objects fall to the ground when dropped? (Gravitational force)

Teacher: When you are in a swimming pool, what force makes you feel lighter? (Buoyant force)

Teacher: What force slows down a toy car when it moves? (Frictional force)

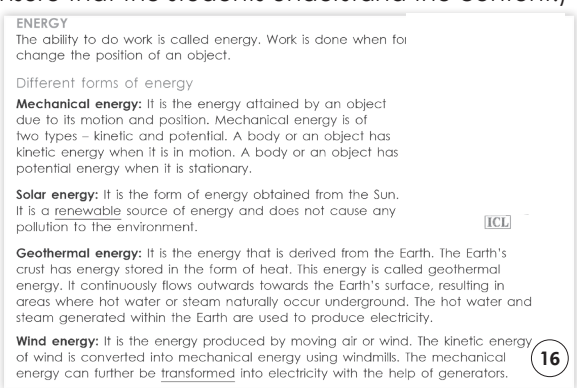
Teacher: Can anyone tell me what force is used when we use tools like pliers or a wrench to change the shape of an object? (Mechanical force)

Teacher: Great thinking, everyone. Now that we are warmed up, let us dive into today's lesson.

MUST DO 25 MIN.

Teacher: Today, we are going to explore the topic of energy.

(The teacher will read the first to fifth paragraphs of page 16 aloud and provide explanations to ensure that the students understand the content.)



ENERGY

The ability to do work is called energy. Work is done when for change the position of an object.

Different forms of energy

Mechanical energy: It is the energy attained by an object due to its motion and position. Mechanical energy is of two types – kinetic and potential. A body or an object has kinetic energy when it is in motion. A body or an object has potential energy when it is stationary.

Solar energy: It is the form of energy obtained from the Sun. It is a renewable source of energy and does not cause any pollution to the environment.

ICL

Geothermal energy: It is the energy that is derived from the Earth. The Earth's crust has energy stored in the form of heat. This energy is called geothermal energy. It continuously flows outwards towards the Earth's surface, resulting in areas where hot water or steam naturally occur underground. The hot water and steam generated within the Earth are used to produce electricity.

Wind energy: It is the energy produced by moving air or wind. The kinetic energy of wind is converted into mechanical energy using windmills. The mechanical energy can further be transformed into electricity with the help of generators.

16

(Include the 'Discovering better' activity to introduce the terms renewable and transformed)

Teacher: Now, can anyone tell me what energy is?

Teacher: Great. It is the ability to do work. Now, can you think of an example where work is done?

Teacher: Excellent. Work is done whenever force is able to change the position of an object. Now, let us talk about the different forms of energy. First up, we have mechanical energy. What are the two types of mechanical energy?

Teacher: Correct. Kinetic energy is when something is moving and potential energy is when it is stationary but has the potential to move. Can anyone give me an example of each?

Teacher: Very good. Moving on to solar energy. This energy comes from a very familiar source. Can anyone guess what it is?

Teacher: Exactly, the Sun. Solar energy is renewable and does not pollute the environment. Can anyone think of a way we use solar energy in our daily lives?

Teacher: Wonderful examples. Next, we have geothermal energy. It comes from within the Earth. Can anyone explain how geothermal energy is used?

Teacher: Right. The heat from beneath the Earth's surface can be harnessed to produce electricity. Now, what about wind energy? How is wind energy transformed into electricity?

Teacher: You got it. Wind energy involves converting the wind's kinetic energy into mechanical energy using windmills. From there, we generate electricity. Have any of you seen a windmill before?

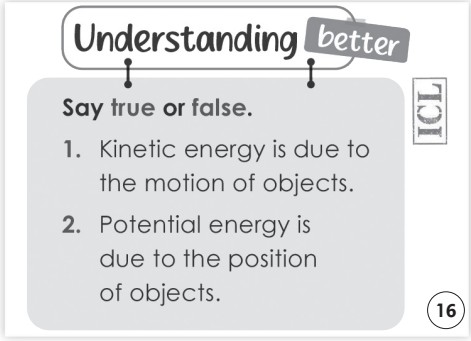
Teacher: Brilliant observations. Each form of energy we discussed today has its unique applications and benefits. Does anyone have any questions or thoughts about these forms of energy?

Teacher: Fantastic. You all have done a great job exploring the world of energy today. Keep observing the different ways we use energy around us.

Understanding better

MUST DO 10 MIN.

Teacher: Let us do the Understanding better activity mentioned in our page number 16.



Understanding better

Say true or false.

1. Kinetic energy is due to the motion of objects.
2. Potential energy is due to the position of objects.

ICL

16

Teacher: All right, class. Let us check your understanding of kinetic and potential energy with a quick activity. I will say a statement and you tell me whether it is true or false. Ready? Here we go.

Teacher: First statement: Kinetic energy is due to the motion of objects. True or false?

Teacher: Good. Now, the second statement: Potential energy is due to the position of objects. True or false?

Teacher: Excellent. You all are doing a fantastic job. These two forms of energy are crucial in understanding how things move and stay still.

Teacher: Brilliant. Keep up the great work and we will explore more about energy in our next session.

You may show the **Animation** on the digital platform.

Differentiated Activities

110 km/hr

What are two benefits of using renewable energy sources?

80 km/hr

Name two forms of mechanical energy.

40 km/hr

What kind of energy do windmills use to generate electricity?

Home Task

Briefly describe in your notebook why is solar energy considered renewable.

Period 6

SHOULD DO 05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Great. Let us start today's lesson with a fun warm-up. I will ask some questions based on what we have learned so far and you can try to answer them.

Teacher: What is the force called that our muscles use when we push or pull something? (Muscular force)

Teacher: Which force pulls objects towards the Earth when we drop them? (Gravitational force)

Teacher: Can anyone explain why you feel lighter when you are in a swimming pool? (Buoyant force)

Teacher: What type of force slows down the motion of objects, like when a toy car stops moving? (Frictional force)

Teacher: What is the energy that comes from the Sun and is used in many ways around us? (Solar energy)

Teacher: How do windmills use energy to produce electricity? (By converting wind energy into mechanical energy)

MUST DO 15 MIN.

Teacher: Great responses. Let us begin with today's lesson.

Teacher: Today, we are going to dive into the world of chemical and electrochemical energy.

(The teacher will read the sixth and seventh paragraphs of page 16 aloud and provide explanations to ensure that the students understand the content.)

Teacher: Now, tell me what chemical energy is?

Teacher: Correct. Chemical energy is stored in materials like food, fuel and batteries. When these materials react chemically, what happens?

Teacher: Exactly, it releases energy, producing heat or powering devices.

Electrochemical energy: When chemical energy changes into electrical energy, or electrical energy to chemical energy it is called electrochemical energy. It is a type of energy that is stored in batteries. It is created when chemical reactions inside the battery produce electricity. This electricity can be used to power different devices like toys, flashlights and phones.

16

Teacher: Now, let us move on to electrochemical energy. Does anyone know what happens when chemical energy changes into electrical energy?

Teacher: Right. That is electrochemical energy. It is stored in batteries. Can you name some devices that use this type of energy?

Teacher: Fantastic. Devices like toys, flashlights and phones rely on this energy.

Heat

MUST DO 20 MIN.

(The teacher will read the seventh and eighth paragraphs of page 16 and the first paragraph of page 17 aloud and provide explanations to ensure that the students understand the content.)

Heat is a form of energy that flows from a region of higher temperature to a region of lower temperature. It is a measure of the total kinetic energy (the energy acquired by an object due to its motion) of the particles within a substance. When a substance is heated, its particles gain kinetic energy, causing them to move more rapidly. This results in an increase in temperature.

Heat can be transferred through three main mechanisms:

Conduction: Heat transfer by direct contact between particles of an object or body of objects.

16

Convection: Heat transfer from one particle to another in liquids or gases. When a liquid or gas is heated, particles closer to the heat gain energy. This causes the heated particles to rise up and the particles away from the heat take the place of heated particles.

Radiation: Heat transfer through electromagnetic waves*, without the need for a medium.

17

Teacher: Can someone explain how heat flows?

Teacher: Yes, heat flows from a region of higher temperature to a region of lower temperature. When we heat a substance, what happens to its particles?

Teacher: Correct, the particles gain kinetic energy and move more rapidly, increasing the temperature. Now, can anyone tell me the three main mechanisms of heat transfer?

Teacher: That's right. They are conduction, convection and radiation.

Teacher: Conduction is when heat is transferred by direct contact between the particles of an object or between two objects. Can anyone think of an example of conduction?

Teacher: Excellent. When you touch a metal spoon that is placed in a hot cup of tea, the heat from the tea travels into the spoon. This is an example of conduction. The heat moves from the hot tea to the spoon because they are in direct contact.

Teacher: Now, Let us move on to convection. Convection happens in liquids and gases. When a liquid or gas is heated, the particles that are closer to the heat gain energy and rise up. Can anyone think of an example of convection?

Teacher: Fantastic. When you boil water, the hot water rises to the top and the cooler water moves to the bottom. This movement of water is caused by convection.

Teacher: Lastly, we have radiation. Radiation is a bit different. Heat is transferred through electromagnetic waves and it does not need a medium like air or water to travel. Can anyone think of an example of radiation?

Teacher: Great thinking. The warmth we feel from the Sun is an example of radiation. The Sun's heat travels through space without needing air or any other substance to carry it.

Note for the teacher: Please arrange the material required for the 'Trying better' activity to be done in the next class.

Differentiated Activities

110 km/hr

Name two devices that use electrochemical energy.

80 km/hr

Give one example of conduction in daily life.

40 km/hr

What kind of energy do batteries store?

Home Task

Answer the following questions in your notebook.

Define chemical energy. What happens when chemical energy is released?

Period 7

SHOULD DO

05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Fantastic. Let us start today's lesson with an exciting warm-up activity. I will ask some questions and you can try to answer them.

Teacher: What kind of energy is stored in food, fuel and batteries? (Chemical energy)

Teacher: What do we call the energy stored in batteries that powers devices like toys and phones? (Electrochemical energy)

Teacher: How does heat flow from one place to another? (From a region of higher temperature to a region of lower temperature)

Teacher: What happens to the particles of a substance when it is heated? (The particles gain kinetic energy and move more rapidly)

Teacher: Can anyone name one device that uses electrochemical energy? (A toy, flashlight, or phone)

Teacher: Great responses, everyone. Let us now dive into today's lesson.

MUST DO

10 MIN.

Teacher: Excellent guesses, everyone. (The teacher will read the third and fourth paragraphsof page 17 aloud and provide explanations to ensure that the students understand the content.)

Light is another form of energy that travels in straight lines pointed away from the source towards the observer. **Sound** energy is a type of kinetic energy that is obtained from the vibration of matter. **Electrical energy** is generated due to the movement of electrical charges* from one point to another.

Law of conservation of energy

As per this law, we cannot create or destroy energy. It can only be transferred from one form to another. The total energy of an object always remains the same.

17

Teacher: Today, we are going to learn about different types of energy. Let us begin with light energy. Can anyone tell me what light energy is?

Teacher: That's right. Light is a form of energy that travels in straight lines, pointed away from the source, towards the observer. Can anyone think of an example of light energy in our everyday lives?

Teacher: Excellent. The light from the Sun or a lamp is a perfect example of light energy. Now, let us move on to sound energy. Who can tell me what sound energy is?

Teacher: Sound energy is a type of kinetic energy. It is created when something vibrates. Can anyone think of something that vibrates to produce sound?

Teacher: Great examples. When you strike a drum or pluck a guitar string, they vibrate and create sound energy. Now, let us talk about electrical energy.

Teacher: Electrical energy is generated when electrical charges move from one point to another. Can anyone think of a device that uses electrical energy?

Teacher: Well done. Devices like fans, televisions and computers all use electrical energy to function.

Teacher: Now, Let us talk about the law of conservation of energy. Can anyone guess what this law means?

Teacher: You are right. The law of conservation of energy states that we cannot create or destroy energy. It can only be transferred from one form to another. The total energy of an object always remains the same. Can anyone give an example of how energy changes from one form to another?

Teacher: Brilliant. When you rub your hands together, mechanical energy changes into heat energy.

Connecting better

Connecting better

Social Studies

Ryan goes to the park with his father. He tells him, "Appa*, today I got to know about solar energy." Appa replies, "That is great! Let me tell you an interesting fact. The South of the Antarctic circle experiences a 24-hour period of sunlight and can be a better region for utilising solar energy." "That is amazing!" says Ryan.

HoLL

17

MUST DO

05 MIN.

Teacher: Let us read the dialogue from our book about Ryan and his Appa discussing solar energy.

(Read aloud, emphasizing key points like solar energy potential in Antarctica.)

Teacher: Solar energy is clean and renewable. It powers lights, heaters and more. Now, can anyone tell me why the South of the Antarctic circle might be a better region for using solar energy?

Teacher: Yes, that's right. Since it experiences 24 hours of sunlight, there is more opportunity to harness solar energy.

Healing better

Teacher: Do you know that spending just 10 to 15 minutes in sunlight can be good for your health? Can anyone guess how?

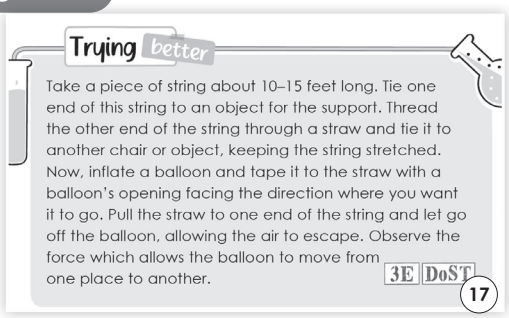
MUST DO
05 MIN.

Teacher: Sunlight helps our body make Vitamin D, which strengthens our bones. It also improves our mood and helps us sleep better. Who likes playing outdoors in the sun?

Teacher: But remember, too much sunlight can harm our skin. What can we do to protect ourselves while enjoying sunlight?

Teacher: Very good. Let us try to spend a few minutes in sunlight every day, especially in the morning. It is good for your body and mind.

Trying better



Teacher: Today, I am going to demonstrate an experiment that will help us understand how force works. First, I will take a piece of string about 10–15 feet long and tie one end to an object for support. The string will be stretched tightly across the room.

MUST DO
10 MIN.

Teacher: Next, I will thread the other end of the string through a straw and tie it to another chair, keeping the string stretched. Now, when the string is stretched, it has tension, which is a type of force. Can anyone guess what might happen when I pull on the string?

Teacher: Now, I will inflate a balloon and tape it to the straw, with the balloon's opening facing the direction where I want it to go. I will pull the straw to one end of the string and then let go of the balloon. Watch closely as the air escapes from the balloon.

Teacher: When the air escapes, it pushes the balloon in the opposite direction. This is an example of a force called thrust. The air pushing out of the balloon creates thrust, which moves the balloon along the string. The force applied by the escaping air allows the balloon to travel from one place to another.

Teacher: Well done, everyone. You just saw how force works in action. This is a great example of how forces, like thrust, can cause movement.

Giving better

Teacher: Before we end today's session, I want to talk to you about something very important: kindness and helping others. Imagine it is a very hot day and you are tired and thirsty, but there is no water nearby. How would you feel?

SHOULD DO
05 MIN.

Teacher: Exactly. Many people, like hawkers, delivery workers or helpers are outside all day in the heat. How can we make their day a little better?

Teacher: That's right. Offering water can make them feel refreshed and cared for. Now, how about this idea: we can also place a drinking water can outside our houses. What might happen if we do that?

Teacher: Brilliant thinking. It will help people like hawkers and others who are working outside to stay hydrated. By doing this, we are showing kindness and helping those around us. Keep up the great work, everyone.

(Instruct students to bring their workbook in their next period.)

You may show the **Concept Map** and **Slideshow** on the digital platform.

Differentiated Activities

110 km/hr

Name a device that uses electrical energy and transforms it into another form.

80 km/hr

What helps our body make Vitamin D?

40 km/hr

True or False: Energy can be created.

Home task

Explain the Law of Conservation of Energy in five sentences.

What kind of energy do batteries store?

Period 8

Teacher: Good morning, students. How are you all today?

SHOULD DO 05 MIN.

Teacher: Great. Let us start today's lesson with a fun warm-up. I will ask some questions based on what we have learned so far and you can try to answer them. Ready?

Teacher: What do we call the energy that powers devices like phones and flashlights? (Electrochemical energy)

Teacher: Which type of energy helps a plant grow by providing warmth and light? (Solar energy)

Teacher: What type of force causes objects to fall to the ground? (Gravitational force)

Teacher: Can anyone name the force that makes it harder to slide a toy car across a rough surface? (Frictional force)

Teacher: When you push a car or bicycle, which force are you applying? (Muscular force)

Teacher: What happens to the temperature of a substance when heat energy is added to it? (The particles gain energy and move faster)

Teacher: Wonderful responses, everyone. Now that we are warmed up, let us dive into today's lesson.

Laughing bettter

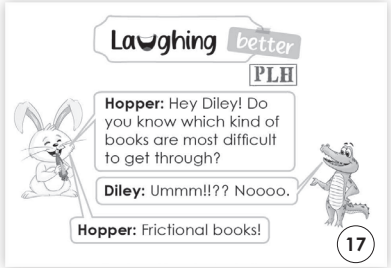
Teacher: Alright, class, Let us start with a little joke. I have a question for you today. Do you know which kind of books are most difficult to get through?

Pause for student responses.

Teacher: Those are some good guesses. The answer is... frictional books.

MUST DO 05 MIN.

(Let the students laugh)



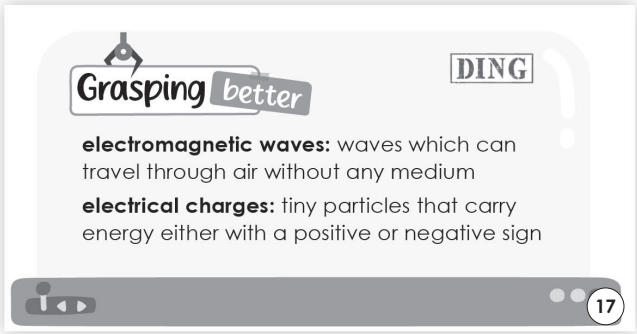
Grasping bettter

Teacher: Well, that was a fun start. Now, let us move on to our 'Grasping better' section. Today, we are going to revise about electromagnetic waves and electrical charges. Does anyone know what electromagnetic waves are?

Teacher: Electromagnetic waves are waves that can travel through air without any medium. Pretty fascinating, right? And what about electrical charges? What do you think they are?

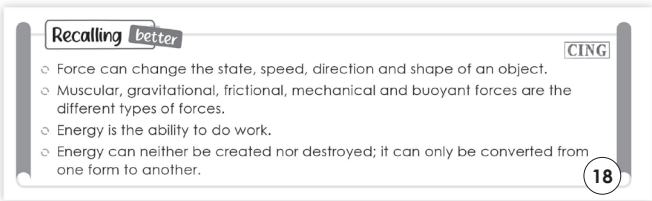
Teacher: Electrical charges are tiny particles that carry energy, either with a positive or a negative sign. Quite an interesting topic, isn't it?

MUST DO 05 MIN.



Recalling bettter

Teacher: Now, for our 'Recalling better' section. We will revise some important concepts about force and energy. Can anyone tell me how force can affect an object?



Teacher: Exactly. Force can change an object's state, speed, direction and shape. Can you name some different types of forces?

MUST DO 10 MIN.

Teacher: Right. Muscular, gravitational, frictional, mechanical and buoyant forces are all different types. And what is energy?

Teacher: Yes, energy is the ability to do work. One last question—can energy be created or destroyed?

Teacher: That's correct. Energy can neither be created nor destroyed; it can only be converted from one form to another. Great job, everyone. Check the 'Grasping better' section to understand these terms thoroughly.

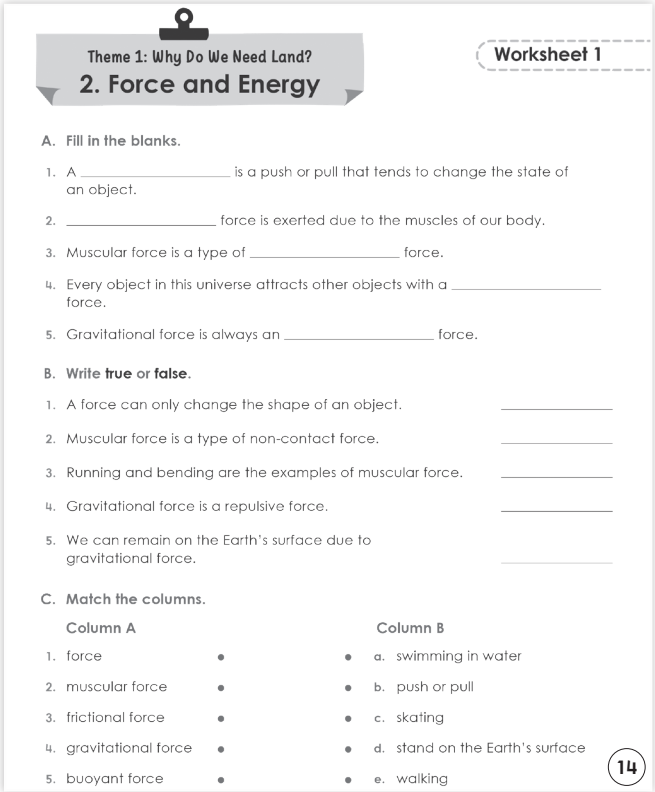
Worksheet - 1

MUST DO 15 MIN.

Teacher: Let us do some activities from the workbook. Everybody, please open page number 14 of your workbook and answer the questions given in worksheet - 1.

(Let the students answer the questions on their own. Then discuss the answer by writing the correct answer on the blackboard.)

You may start the **Quiz** and **Slideshow** on the digital platform.



Theme 1: Why Do We Need Land?

2. Force and Energy

Worksheet 1

A. Fill in the blanks.

1. A _____ is a push or pull that tends to change the state of an object.
2. _____ force is exerted due to the muscles of our body.
3. Muscular force is a type of _____ force.
4. Every object in this universe attracts other objects with a _____ force.
5. Gravitational force is always an _____ force.

B. Write true or false.

1. A force can only change the shape of an object. _____
2. Muscular force is a type of non-contact force. _____
3. Running and bending are the examples of muscular force. _____
4. Gravitational force is a repulsive force. _____
5. We can remain on the Earth's surface due to gravitational force. _____

C. Match the columns.

Column A		Column B
1. force	•	• a. swimming in water
2. muscular force	•	• b. push or pull
3. frictional force	•	• c. skating
4. gravitational force	•	• d. stand on the Earth's surface
5. buoyant force	•	• e. walking

14

Differentiated Activities

110 km/hr

Which force acts on a parachute when it descends?

80 km/hr

Name the type of energy that powers a battery.

40 km/hr

Which force helps us when we walk?

Home Task

The project Idea given in the book of Project Ideas, page 13 under the title 'Force and Energy.' This project should be assigned to the students to work on. Ensure that the students understand the project requirements and provide any necessary guidance or materials they might need. Encourage them to explore and learn about Force and Energy through this engaging project.

Period 9

SHOULD DO

05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Great. Let us start today's lesson with a fun warm-up activity. I will ask some questions and you can try to answer them.

Teacher: What type of force do we use when we push a door open? (Muscular force)

Teacher: Can anyone tell me what happens when you drop an object from a height? (It falls due to gravitational force)

Teacher: What type of energy is used by a windmill to generate electricity? (Wind energy)

Teacher: What is the energy that powers your phone when you charge it? (Electrochemical energy)

Teacher: When you swim, what force pushes you upwards in the water? (Buoyant force)

Teacher: What kind of energy do we use to cook our food using a gas stove? (Chemical energy)

Teacher: What force makes it difficult to slide something across the floor? (Frictional force)

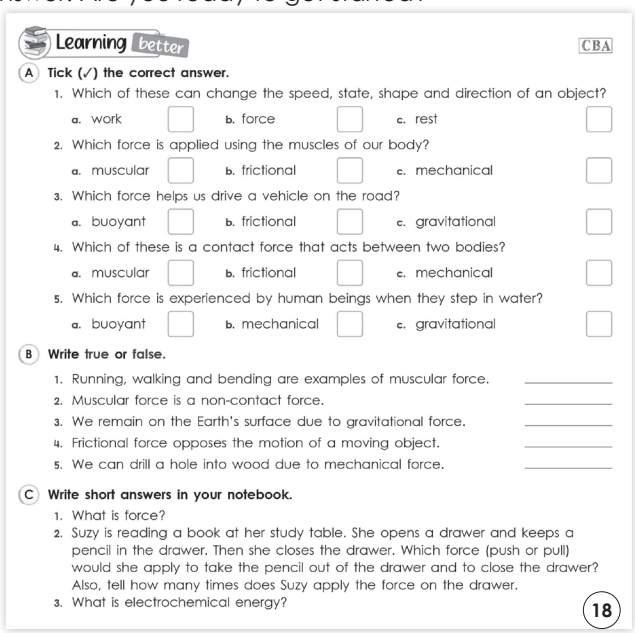
Teacher: Fantastic responses. Now, let us begin with today's lesson.

Learning better

MUST DO

05 MIN.

Teacher: Everyone please open the page number 18 of your book. In part 'A' of 'Learning better' you have to tick the correct answer. Are you ready to get started?



Learning better CBA

A. Tick (✓) the correct answer.

1. Which of these can change the speed, state, shape and direction of an object?
   a. work ☐ b. force ☐ c. rest ☐
2. Which force is applied using the muscles of our body?
   a. muscular ☐ b. frictional ☐ c. mechanical ☐
3. Which force helps us drive a vehicle on the road?
   a. buoyant ☐ b. frictional ☐ c. gravitational ☐
4. Which of these is a contact force that acts between two bodies?
   a. muscular ☐ b. frictional ☐ c. mechanical ☐
5. Which force is experienced by human beings when they step in water?
   a. buoyant ☐ b. mechanical ☐ c. gravitational ☐

B. Write true or false.

1. Running, walking and bending are examples of muscular force. _____
2. Muscular force is a non-contact force. _____
3. We remain on the Earth's surface due to gravitational force. _____
4. Frictional force opposes the motion of a moving object. _____
5. We can drill a hole into wood due to mechanical force. _____

C. Write short answers in your notebook.

1. What is force?
2. Suzy is reading a book at her study table. She opens a drawer and keeps a pencil in the drawer. Then she closes the drawer. Which force (push or pull) would she apply to take the pencil out of the drawer and to close the drawer? Also, tell how many times does Suzy apply the force on the drawer.
3. What is electrochemical energy?

18

Teacher: Great. Let us begin with the first question. Which of these can change the speed, state, shape and direction of an object?

Teacher: The correct answer is Force. Well done.

(Similarly complete all five questions)

Teacher: Now let us start part 'B' of 'Learning better' section, you have to write 'true' or 'false'. Are you ready to get started?

MUST DO

05 MIN.

Teacher: Great. Let us begin with the first question. Running, walking and bending are examples of muscular force. Think carefully and write true or false in the space given in front of the statement.

(Similarly complete all five questions)

Teacher: Great. Now, let us explore some short-answer questions. Let us begin with the first question. What is force?

(Students have to write the answers for the given questions in about 40 to 50 words in their notebook. Wait for the students to write the answers.)

MUST DO
10 MIN.

(Similarly complete all three questions)

Worksheet - 2

Teacher: Let us do some activities from the workbook. Everybody, please open page number 15 of your workbook and answer the questions given in worksheet - 1.

MUST DO
15 MIN.

(Let the students answer the questions on their own. Then discuss the answer by writing the correct answer on the blackboard.)

Worksheet 2

A. Fill in the blanks.

1. _____ force opposes the motion of a body moving on a surface.
2. In _____ force, a body applying force on another tends to change the state of another one.
3. Human beings experience _____ force while entering a swimming pool.
4. _____ is the ability to do work.
5. _____ is done when a force is able to move an object.

B. Rearrange the letters to make meaningful words related to force.

1. CULARMUS _____
2. TATIONALGRAVI _____
3. TIONALFRIC _____
4. ANICALMECH _____
5. THRUSTUP _____

C. Match the columns.

Column A		Column B
1. energy	•	• a. is done when force induces movement in a body
2. work	•	• b. temperature difference
3. heat	•	• c. travels in straight lines from source to viewer
4. light	•	• d. vibrations of different bodies
5. sound	•	• e. ability to do work

15

Differentiated Activities

110 km/hr

Name a force that acts against the motion of an object.

80 km/hr

Name a type of energy found in a battery.

40 km/hr

What kind of force acts on a falling apple?

Home Task

The 'Creating better' activity (making a balloon powered car) given on page 19 of the Main Course Book.

Period 10

SHOULD DO
05 MIN.

Teacher: Good morning, students. How are you all today?

Teacher: Fantastic. Let us start today's lesson with a fun warm-up activity. I will ask you some questions based on what we have learned so far. Are you ready?

Teacher: Here we go.

Teacher: Can anyone tell me what happens when two objects interact directly with each other? (It can result in a change in shape or configuration of the objects)

Teacher: What force helps us stay stable while walking on flat ground? (Friction)

Teacher: What type of energy is stored in food, fuel and batteries? (Chemical energy)

Teacher: When a balloon is inflated, which type of energy is stored in it? (Potential energy)

Teacher: Can anyone explain what happens to the energy in a rubber band when you stretch it and let go? (The potential energy is converted into kinetic energy)

Teacher: Excellent thinking, everyone. Now, let us begin with today's lesson.

Learning better

Teacher: Everyone please open the page number 19 of your book. We have an exercise called 'Learning better.' In part 'D' of 'Learning better' you have to some long-answer questions. Are you ready to get started?

MUST DO
10 MIN.

D **Write long answers in your notebook.**

1. Differentiate between gravitational force and buoyant force.
2. Explain mechanical, solar and geothermal energies with examples.

19

Teacher: Great. Let us begin with the first question. Differentiate between gravitational force and buoyant force.

(Students have to write the answers for the given questions in about 100 to 150 words in their notebook. Wait for the students to write the answers.)

Teacher: Great. Let us begin with the second question. Explain mechanical, solar and geothermal energies with examples.

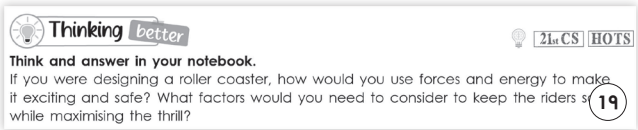
(Wait for the students to write the answers.)

Teacher: After you finish writing your answers, please exchange them with a friend beside you.

Thinking better

MUST DO
05 MIN.

Teacher: Let us start with a thinking activity. We have a very exciting challenge for you. Imagine you are designing a roller coaster. How would you use forces and energy to make it both thrilling and safe?


Thinking better
2Lit CS HOTS
Think and answer in your notebook.
If you were designing a roller coaster, how would you use forces and energy to make it exciting and safe? What factors would you need to consider to keep the riders s while maximising the thrill?
19

Teacher: Think about the different forces we have learned—gravitational, frictional and mechanical. How could these forces make the roller coaster exciting?

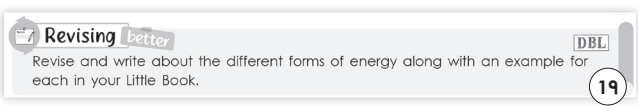
Teacher: Now, safety is very important. What factors do you think you would need to consider to keep the riders safe while still maximising the thrill?

Teacher: Excellent ideas. Be sure to write your thoughts in your notebook. Use what we have learned about forces and energy to explain your design choices. I am eager to see how you balance excitement with safety.

Revising better

MUST DO
05 MIN.

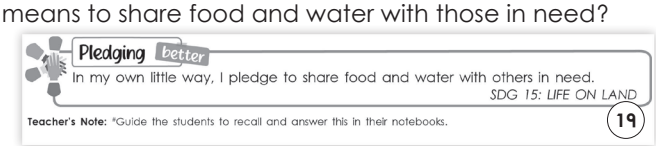
Teacher: Finally, let us do a revising activity. We are going to focus on revising what we have learned about the different forms of energy. Revise and write about the different forms of energy along with an example for each in your Little Book.


Revising better
DBL
Revise and write about the different forms of energy along with an example for each in your Little Book.
19

Pledging better

MUST DO
05 MIN.

Teacher: Excellent work. Now, Let us talk about something very important—sharing and caring for others. Who can explain what it means to share food and water with those in need?


Pledging better
In my own little way, I pledge to share food and water with others in need.
SDG 15: LIFE ON LAND
Teacher's Note: *Guide the students to recall and answer this in their notebooks.
19

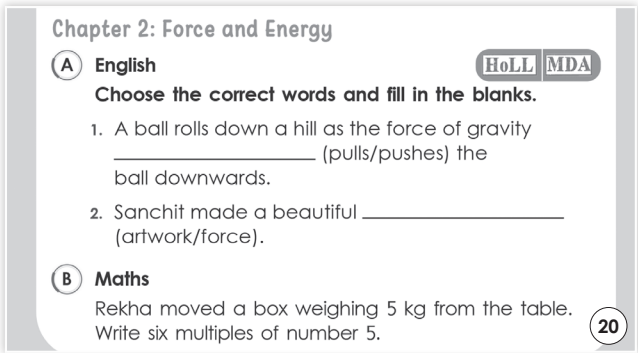
Teacher: Wonderful. Now, let us take this pledge together. Repeat after me: 'In my own little way, I pledge to share food and water with other in need.' Let us remember to act on this pledge and make a difference every day.

Teacher: Fantastic. Remember, our pledge is connected to SDG 15: Life on Land. By helping others, we contribute to making our planet a better place. Well done, everyone.

Book of Holistic Teaching

COULD DO
05 MIN.

Refer to the Book of Holistic Teaching, page 21 under the title 'Force and Energy.' Complete the activities mentioned in this section and ensure that the students complete them. These activities are designed to enhance their holistic understanding and engagement with the topic. Provide any necessary support and materials to help the students successfully finish the activities.


Chapter 2: Force and Energy

(A) **English** HoLL MDA

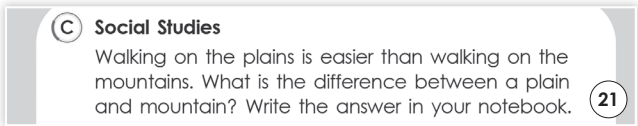
Choose the correct words and fill in the blanks.

1. A ball rolls down a hill as the force of gravity _____ (pulls/pushes) the ball downwards.
2. Sanchit made a beautiful _____ (artwork/force).

(B) **Maths**

Rekha moved a box weighing 5 kg from the table. Write six multiples of number 5.

20


(C) **Social Studies**

Walking on the plains is easier than walking on the mountains. What is the difference between a plain and mountain? Write the answer in your notebook.

21

Also discuss the project assigned as the home task in period eight, focusing on helping students understand the objectives and addressing any challenges they face.

SHOULD DO
05 MIN.

Teacher: Now, let us fill in the last column of the KWL chart.

Teacher: In this column, we will write what we have learned in this chapter.

Teacher: Think about the topics, we have learnt and write them in the 'L' column of the chart.

(Wait for students to fill in the chart.)

Teacher: Let us all give a huge round of applause to everyone for their hard work and creativity. Great job, everyone. See you in the next class. Have a wonderful day ahead.

You may start the **Animated Activities** on the digital platform.

Differentiated Activities

110 km/hr

How does the Law of Conservation of Energy explain the transformation of energy in daily activities, such as riding a bicycle or using a fan?

80 km/hr

What role does gravitational force play in how objects fall or move and can you give an example from your daily life?

40 km/hr

How does friction help or hinder movement in activities like walking or riding a bike? Can you think of a situation where friction is helpful?

Home Task

Worksheet - 3 from the workbook.

Worksheet 3

A. Define the following.

1. Muscular force

_____

2. Gravitational force

_____

3. Frictional force

_____

4. Mechanical force

_____

5. Upthrust

_____

B. Identify the force being applied in the following situations.

1. sitting on the ground _____
2. running on the ground _____
3. swimming in the pool _____
4. driving a car on the road _____
5. bending a nail using pliers _____

C. Write true or false.

1. Energy is the ability to do work. _____
2. Mechanical energy is of three types. _____
3. Kinetic energy is produced due to motion of objects. _____
4. Work is done when force cannot produce any movement in a body. _____
5. Potential energy is due to the stationary position of the objects. _____

16

Learning Outcomes

The students will:

Physical Development	• demonstrate the ability to apply physical forces, such as pushing, pulling and handling objects, in real-life activities and experiments.
Socio-Emotional and Ethical Development	• identify and discuss scenarios where kindness and helping others, such as picking up a banana peel to ensure safety, can contribute to a positive environment.
Cognitive Development	• explain and apply concepts like energy conservation, the effects of various forces and energy transformations in practical examples and problem-solving activities.
Language and Literacy Development	• express their understanding of force and energy by sharing observations, writing short responses and clearly explaining concepts in their own words.
Aesthetic and Cultural Development	• appreciate and describe the significance of natural forces and renewable energy sources, recognising their importance in improving the quality of life and the environment.
Positive Learning Habits	• engage in inquiry-based learning activities to explore forces and energy, fostering curiosity, critical thinking and a growth mindset.

Starry Knights

Are your learners efficient in saving energy for future? Which activities did you enjoy the most with them?

Give yourself a STAR.