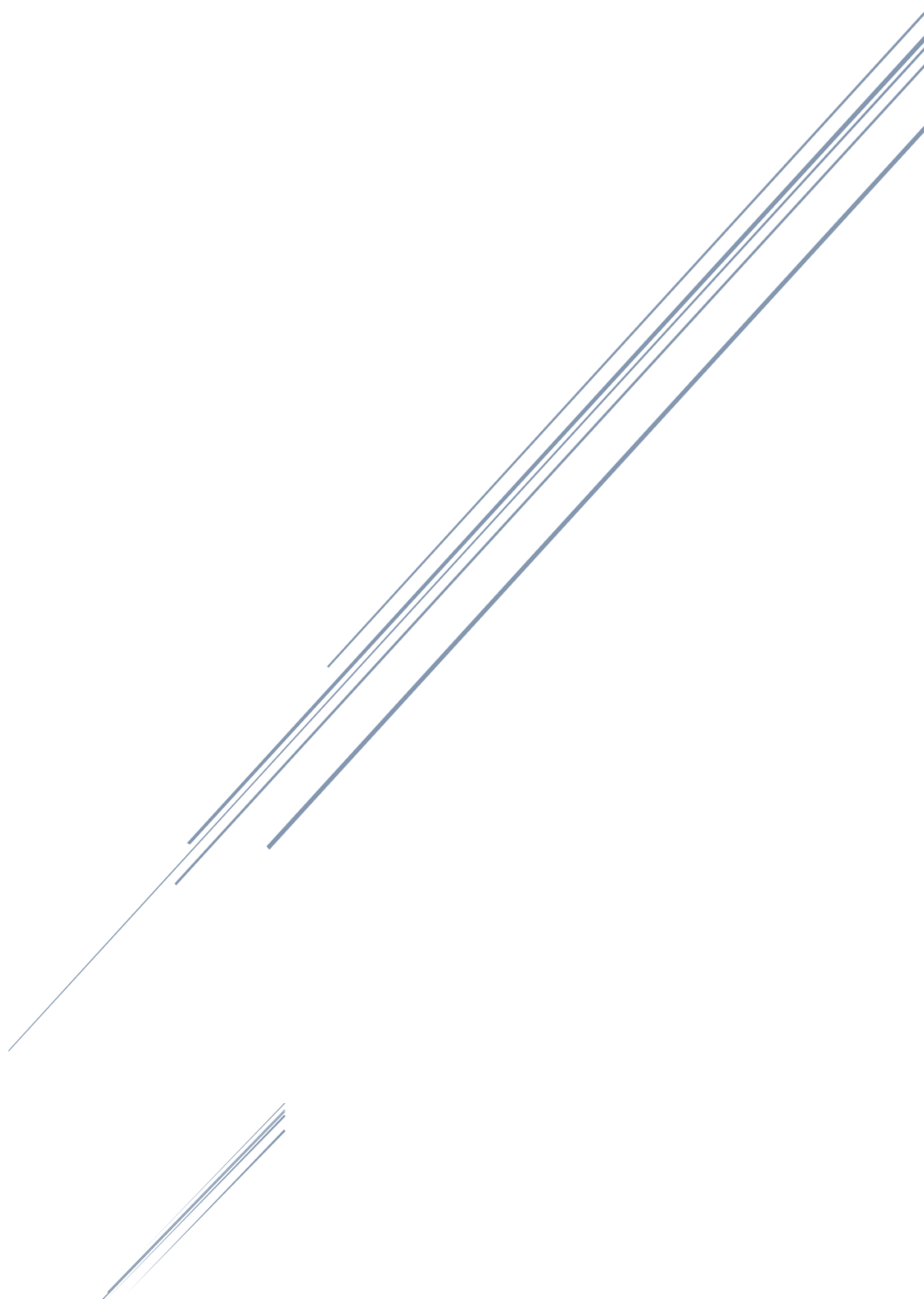


NATURAL FORCES

SESSION 12

TOPICS

- Describing the environment
- Describing systems
- Describing positions and movement

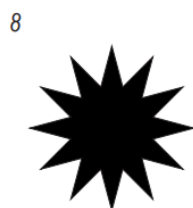
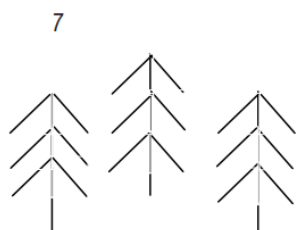
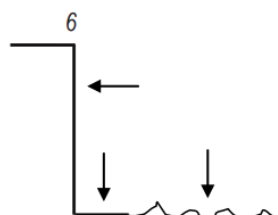
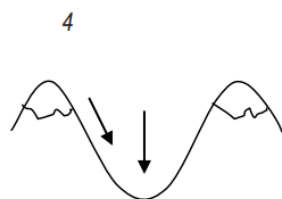
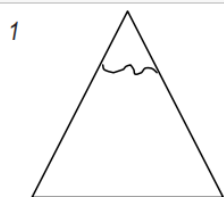


Input 12.1A
Natural features – Part 1

Description	Feature
A mountain, with a crater or vent through which lava, and gas erupt from the earth's crust	Volcano
An area that has one or more volcanoes	Volcanic
An elevated surface of the earth, not as high as a mountain	Hill
We say that land with lots of hills is very...?	Hilly
A low area of land between hills or mountains	Valley
A large stream of water going through a channel into the sea	River
A large area of water surrounded by land	Lake
A large area filled with trees and animals	Forest
A big forest that is wet most of the time	Rain forest
A small, narrow river	Stream
Fast flowing river falling from a height	Waterfalls
A large area of flat land	Plain
A very hot plain with very little water and plants	Desert
A low-lying area where water collects	Swamp/ Marsh
The line between the land and the sea	Coast
Vertical rocks along the coast	Cliffs
If there's sand along the coast, this is called a...?	Beach

Input 12.1B

Natural features – Part 2



Input 12.1C**Pronunciation practice**

For the pairs of words below, is the pronunciation of these sounds the same (S) or different (D)? Listen to your partner, discuss, and mark the boxes.

- | | | |
|-----------------------------------|----------------------------|----------------------------|
| 1. mount ai n plain | <input type="checkbox"/> S | <input type="checkbox"/> D |
| 2. la ke vol ca no | <input type="checkbox"/> S | <input type="checkbox"/> D |
| 3. stre ea m oce an | <input type="checkbox"/> S | <input type="checkbox"/> D |
| 4. sea be ach | <input type="checkbox"/> S | <input type="checkbox"/> D |
| 5. cliff r iv er | <input type="checkbox"/> S | <input type="checkbox"/> D |
| 6. des ert fore st | <input type="checkbox"/> S | <input type="checkbox"/> D |

Input 12.1D**Natural superpowers**

When we think about where money is made, we usually think of urban environments – offices, factories and shopping malls.

However, most of our basic economic resources are found in the natural environment: in the wood that grows in forests, the oil beneath the deserts and oceans, and the minerals under the hills.

Nature has another sort of economic value, and one that's growing fast: renewable energy. Solar panels, wind turbines and hydroelectric power stations are proliferating. As a result, the wild places with the potential to power them – sun-baked deserts, windswept plains and mountain streams – could become the new El Dorado (a legendary city made of gold). So which countries have the best geography to fully exploit the forces of nature? Who will be the "natural superpowers" of the new, renewable world?

I Look at the descriptions of places below. Match them to examples of types of places mentioned in the article. (Sometimes, more than one place is possible.)

1. where a lot of wood grows
2. where there's a lot of sunshine, suitable for solar power
3. where a lot of the world's oil is found
4. where it's windy, but not inaccessible, so good for wind turbines
5. where there are streams that can provide hydroelectric power

II Discuss these questions with your group

What point is made with the words, "forests", "oceans" and "hills"?

What's renewable energy? What examples of renewable energy are given?

What point is made with, "deserts", "plains" and "mountain streams"?

Does our country have the potential to be a natural superpower of renewable energy? Why or why not?



Input 12.1E

Language summary

The Pacific is the world's largest **ocean**.

The **sea** between Europe and Africa is called the Mediterranean.

Mount Everest is the world's highest **mountain**. It's in a **mountain range** called the Himalayas.

A **volcano** is a mountain that produces liquid rock (lava).

Hawaii is in a **volcanic region**.

A **hill** is like a mountain, but is smaller.

If a region has lots of hills, we say it's **hilly**.

A **valley** is an area of lower ground between mountains.

The Sahara, in Africa, is the world's biggest **desert**.

A very large area of flat land, with no hills or mountains, is called a **plain**.

A **river** is a long stretch of water flowing to the sea/ocean.

A small river is a **stream**.

When the water in a river or stream falls vertically, it's called a **waterfall**.

A large area of water that's surrounded by land is called a **lake**.

An area of land that's very wet is called a **marsh** or a **swamp**.

The line between the land and the sea/ocean is the **coast**.

Vertical rocks along the coast are called **cliffs**.

If there's sand along the coast, this is called a **beach**.

A very large area of trees is a **forest**.

The Amazon **rainforest** is the world's largest forest.

Input 12.2A(a)**Renewable energy ... a recent idea?**

It's easy to think that renewable energy is a recent idea. That's probably because systems such as wind turbines, hydroelectric generators, and solar panels (1)(use) to produce electricity – a relatively modern form of power. In fact, a lot of the 'green' electricity which (2).....(produce) today (3).....(generate) by systems that (4).....(invent) long ago. The idea of exploiting the power of the wind (5).....(think) of by the Greek engineer Heron of Alexandria, about 2,000 years ago. At the time, his system (6).....(give) the name, 'wind wheel'. From the 12th century, wind became one of the main ways to drive flour mills – the places where flour (7).....(make) from wheat. In past centuries, mills (8).....(power) by water, too. Watermills (9).....(build) next to rivers and used waterwheels that (10).....(drive) by the pressure of the flowing water. Today, hydroelectric stations use exactly the same principle.

Even solar energy is a relatively old idea. The non-electrical 'Climax Solar Water Heater' (11).....(invent) by the American Clarence Kemp in 1891. It was successful, too. In California, 1,600 heaters (12).....(sell) within a few years.

Input 12.2A(b)**Renewable energy ... a recent idea?**

It's easy to think that renewable energy is a recent idea. That's probably because systems such as wind turbines, hydroelectric generators and solar panels are used to produce electricity – a relatively modern form of power. In fact, a lot of the "green" electricity which is produced today is generated by systems that were invented long ago.

The idea of exploiting the power of the wind was thought of by the Greek engineer Heron of Alexandria, about 2,000 years ago. At the time, his system was given the name "wind wheel". From the 12th century, wind became one of the main ways to drive flour mills – the places where flour is made from wheat. In past centuries, mills were powered by water, too. Watermills were built next to rivers, and used waterwheels that were driven by the pressure of the flowing water. Today, hydroelectric stations use exactly the same principle.

Even solar energy is a relatively old idea. The non-electrical "Climax Solar Water Heater" was invented by the American Clarence Kemp in 1891. It was a commercial success, too. But the advent of the gas and electric industries made solar heating take a back seat for most of the 20th century.

Now with technological advancements in the solar industry solar water heaters, and other 'green' equipment are making a comeback.

Write the answers to these questions:

1. When was the idea of using the wind to power machines thought of first?

2. What name was given to the first windmills?

3. What were windmills used for?

4. Where were watermills built?

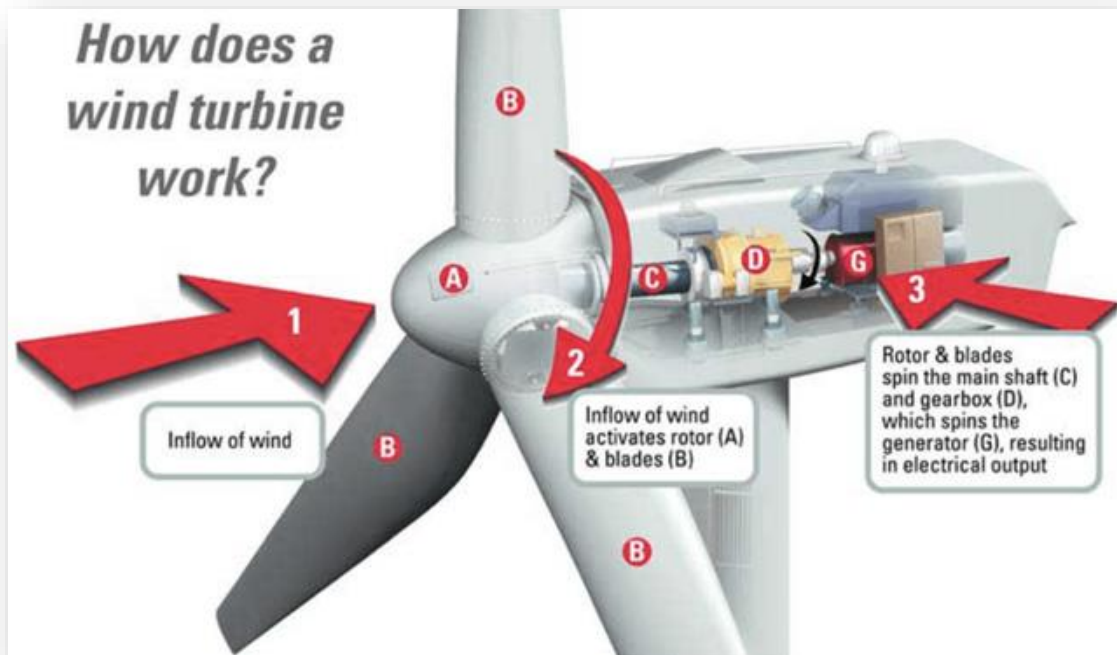
5. When was the first solar water heater invented?

6. What shows how successful the first water heaters were?

Input 12.2B

How does a wind turbine work?

Work with your partner and describe the process of generating electricity using a wind turbine.





Input 12.2C

Language summary

To describe systems and procedures, we often use the style in B, below.

A: Mills produce flour. Water drives hydroelectric stations.

B: Flour *is produced by* mills. Hydroelectric stations *are driven by* water.

To describe past systems and procedures, we use was/were instead of is/are.

In the past, flour was produced by windmills.

Watermills *were driven by* rivers.

To write about the sequence of a process we use:

first of all, firstly, to begin with

next, secondly, in the second stage

after that, later

finally, in the last stage, in the end

Input 12.3A

Cooling down

Depending on the amount of cooling required a typical IT company building uses about 25,000 units of electricity and 5,00,000 liters of water every day for air conditioning. Most air conditioning systems in India are water based. A substantial amount of energy is used to pump heat from inside the building to the outside air, and the medium of this heat transfer is water. The heat exchange takes place through a cooling tower which is kept next to the building. The cooling towers have large fans that rotate to cool down the water that has collected all the heat from the building beside it. But, in the cooling process most of the water is lost to the atmosphere through evaporation.

A “geothermal air conditioning” technique uses the cool ground to get rid of the heat. The ground beneath the surface after a certain depth is much cooler when compared to the atmosphere above the ground in a tropical country like India. In this system, the water from the building goes around a circuit of pipes. As the water goes along the pipes, the heat is discharged into a cooler temperature below the earth. The water is not wasted as it goes through the same loop after getting rid of the heat under the surface of the building and is reused by the system. Electricity bills are also reduced substantially.

Part 1 Read the article about geothermal heating. Underline words that are used to talk about position and movement.

Discuss the article with your partner. How is geothermal cooling different from normal air conditioning.

Part 2 Choose five of the underlined words in the text to complete the table below.

Word(s)	Opposite(s)
inside
above
away from	next to

Part 3 Use the underlined words in the article that are not in the table in Part 1 to complete 1-3.

- go via an opening or enclosed space – for example, a door, a tunnel, a pipe = go
- go in a straight line – for example, via a road, corridor, or pipe = go
- go in a line that’s not straight, or go in a circle = go

Input 12.3B

Language summary

We use these words to describe positions and movements

