



Notes

5**FUEL OF THE FUTURE**

Do you know of a source of energy that is clean, renewable and totally free? Read and find out.

**OBJECTIVES**

At the end of this lesson you will be able to:

- read and understand a piece of scientific writing;
- use the passive voice;
- make notes; and
- ask for and supply information in speech.

5.1 SECTION I

The buzzword today is clean energy – something that we can reap from nature. And, the search has led man to the sun (solar), the wind, the tides (tidal), water (hydro) and even biogas. The good news is that we, in India, have reasons to be proud. Not only do we have the world’s only Ministry for Renewable Energy Sources, but we are also the world’s fifth largest producer of wind energy.

“Wind energy” is derived through a process where wind is used to generate mechanical power or electricity. Wind turbines convert the kinetic energy in the wind into mechanical power, which can be used for specific tasks (such as grinding grain or pumping water). A generator converts this mechanical power into electricity.



Notes

Since recorded history, wind power has been used to move ships, grind grain and pump water. There is evidence that wind energy was used to propel boats along the Nile as early as 5,000 B.C.

**INTEXT QUESTIONS 5.1**

1. Complete the following sentences by using a word from the passage above for each blank:
 - i. The passage is about a _____ of energy of the future.
 - ii. A great deal of importance is given today to _____ non-polluting energy.
 - iii. Some of the alternative sources of clean, non-polluting energy are: the _____, the _____, the _____ and _____.
 - iv. Wind energy is the _____ by which wind is used to generate electricity.
 - v. Wind _____ are used to convert wind energy into mechanical power.
 - vi. Subsequently, a _____ is used to convert the mechanical power into electricity.
2. When and where was wind energy first used?

5.2 SECTION II

What has been the history of man's use of wind energy? Where and how is wind energy used in India?

In the United States, millions of windmills were erected as the American West was developed during the late 19th century. Most of them were used to pump water for farms and ranches. By 1910, wind turbine generators were producing electricity in many European countries. And while today, one associates windmills with the Netherlands where they are used for pumping water, it is in Denmark that wind is an effective source of energy.

Close to home, Tamil Nadu was among the first in India to give a fillip to wind energy over 10 years ago and continues to be a leader. Nearly half of India's nearly 2000 Mw of installed capacity from wind energy comes from Tamil Nadu. Wind turbines have been "decorating" our landscape near Madurai and beyond.

In Chennai at the Centre for Wind Energy Technology, research is done to check out various wind sites where wind energy can be tapped. And, wind turbines of various sizes are checked to see if they are delivering what they promised to do. Wind energy is also abundant in many parts of India from Gujarat, Andhra Pradesh and Kerala to the hilly regions in Maharashtra.



INTEXT QUESTIONS 5.2

1. Answer the following questions briefly:
 - i) Name the European countries that use wind energy?
 - ii) When and what purpose were windmills used in America?
 - iii) Name the first Indian state that used wind energy. Can it be used elsewhere? Is so, where?
 - iv) How does research help in popularizing the use of wind energy?

5.3 SECTION III

Is wind energy popularly used? What are its advantages? Does it have any drawbacks?

In the west, surveys have consistently shown that the public prefers wind and other renewable energy forms over conventional sources of generation. Wind energy is free, renewable resource, so no matter how much is used today, there will still be the same supply in the future. Wind energy is also a source of clean, non-polluting electricity. Unlike conventional power plants, wind plants emit no air pollutants or greenhouse gases.

In 1990, California's wind power plants offset the emission of more than 2.5 billion pounds of carbon dioxide, and 15 million pounds of other pollutants that would have otherwise been produced. It would take a forest of 90 million to 175 million trees to provide the same air quality.

Some have voiced concern over the noise produced by rotor blades, aesthetic impact, and the plight of birds that fly into the rotors. Most of these problems do not exist in India as wind farms are located in remote areas or the problems have already been resolved through technological development.

The major challenge to use wind as a source of power is that it is intermittent and it does not always blow when electricity is needed. The fact remains that wind is the fastest growing source of electricity generation in the world. And who knows, might even be a lucrative career for many.



INTEXT QUESTIONS 5.3

1. Say whether the following statements are True (T) or False (F). Correct the false ones.
 - i) People prefer conventional sources of energy to wind energy.



Notes



Notes

- ii) Like oil, wind energy will one day be totally used up.
 - iii) California’s wind power plants are able to negate the bad influence of the enormous amount of pollutants its factories create.
 - iv) A large number of trees are cut down to create space for wind power plants.
 - v) Wind power plants operate noiselessly
2. Given below are some headings. Fill in the blanks against each heading with points from this section. Do not write long sentences. Write in point form.

WIND ENERGY

Advantages:

-
-
-

Weakness:

-
-
-

Solutions:

-
-
-



OVERALL QUESTIONS

1. Name some sources of clean renewable energy.
2. What unique place does India have in relation to wind energy?
3. What are the advantages of using wind energy?
4. What major challenge does the use of wind energy pose to man?

GRAMMAR

The passive voice

We use the active voice to say what the subject does:

- Wind turbines convert the kinetic energy in the wind.
- Surveys have shown that the public prefers wind energy.

We use the passive voice to say what happens to the subject:

- Wind energy was used to propel boats along the Nile.
- In the United States, millions of windmills were erected.

The passive is be (is/was/ have been, etc) + the past participle (done/seen/cleaned, etc)

When we use the passive, who or what causes the action is often unknown or unimportant.



INTEXT QUESTIONS 5.4

1. Find three instances where passive voice has been used in the passage. Write down the sentences.
2. Fill in the blanks using the Passive form of the verbs given in bracket.

A. How butter is made

Cream _____ (churn) and milkfat _____ (collect). The remaining liquid is called butter milk. The milk fat _____ (whip) and the water in it, if any _____ (throw) away. A pinch of salt _____ (add) to the ball of whipped fat and _____ (keep) in a butter dish.

B. How an electric iron is repaired

To replace the heating element of an iron, the handle along with the top cover _____ (remove). In modern automatic irons, these are often removable in one piece, but in other designs two nuts secure the handle and when these _____ (remove), the handle can be removed. Then the cover _____ (withdraw) and the iron weight _____ (disclose), which can be raised to find the heating element. The heating element _____ (contain) between two layers of a mica sheet.



LET'S TALK

Worksheet

Listen to conversation on seeking and supplying information. Then fill in the blanks below:

- 1) _____ met with an accident.
- 2) The accident happed on a _____
- 3) _____ had gone on an _____ with his English teacher.
- 4) He slipped while _____
- 5) He hurt his _____
- 6) _____ is taking _____ for relief.



Notes



Notes

LET'S WRITE

Read the passage and make notes with the help of the clues given under it. Use short forms (abbreviations) wherever possible. Give your notes a suitable title.

Obesity-linked diabetes is for the first time being reported in children and adolescents in the UK and many other countries. A 1986 landmark study of obesity and television viewing found a clear association between the number of hours of television a child watched and the risk of that child becoming obese or overweight.

In 12 to 17-year-olds, the prevalence of obesity increased by two per cent for every hour of weekly television time. A more recent study found that, while eight per cent of children watching one hour or less of television a day were obese, 18 per cent of children watching four or more hours were obese.

The more television children watch, the more they eat. (By comparison even reading is a workout, at least in studies that have been done with obese children, perhaps because it engages their minds a bit more emphatically). Television viewing prompts children to consume food while they consume less energy, an ideal recipe for obesity. Marketing soft, sweet and salty foods on television is good business, and children are the most vulnerable targets.

Childhood obesity rates are highest in countries where advertising on children's television programmes is least regulated – in Australia, the US and England. Sweden and Norway maintain a virtual ban on advertising to children, and have consistently low levels of childhood obesity. Ireland, Belgium, Italy and Denmark pose restrictions on children's advertising, and are pressing the other states of the European Union to do the same.

Title _____

1. Link between T.V. viewing and Obesity

	Age	hrs.	% increase in obesity
Earlier findings	12-17	1/week	2
Recent findings	12-17	_____	_____

Reasons

- 1) _____
- 2) _____
- 3) _____

Advertisements regulated

- (1) Countries ban ads to children – less obesity Australia _____

(2) Countries restrict ads

Ireland _____

Key to abbreviations used



Notes



CHECK YOUR ANSWERS

Intext Questions 5.1

- | | |
|---|---------------|
| i) source | ii) clean |
| iii) the sun, the wind, the tides, water and biogas | iv) process |
| v) turbines | vi) generator |
- In Egypt in 5000 BC to (move) propel boats along the Nile.

Intext Questions 5.2

- (i) the Netherland and Denmark
- (ii) During the late 19th century windmills were used in the American West to pump water for farms and ranches.
- (iii) The first state to use wind energy is Tamil Nadu. Yes, it can also be used in parts of Gujarat, Andhra Pradesh, Kerala and Maharashtra.
- (iv) It finds new sites where wind energy can be used. Research also checks out existing sites.

Intext Questions 5.3

- | |
|---|
| i) False. Surveys show that the public prefers wind and other renewable energy forms over conventional sources. |
| ii) False. Wind energy is a free, renewable source. |
| iii) True |
| iv) False. A large number of trees would need to be cut to lessen the harm caused by pollutants in the air in California. |
| v) False. Wind power plants produce noise. |



Notes

2. Advantages
- Clean energy – no pollutants
 - Free
 - Renewable

Weaknesses:

- noisy
- not good to look at
- kills birds
- intermittent supply

Solutions:

- locate in remote areas
- use modern technology

OVERALL QUESTIONS

1. wind, sun, tides, water and biogas.
2. India has the world’s only Ministry for renewable energy. Also, India is the world’s fifth largest producer of wind energy.
3. It generates cheap, non-polluting, free and renewable energy.
4. The supply is intermittent. Wind does not always blow when electricity is needed.

Intext Questions 5.4

- (i) so no matter how much is used today
 - (ii) Most of their problems as wind farms are located in remote areas.
 - (iii) the problems have already been resolved though technological development.
2. A. i) is churned ii) is collected iii) is whipped
 iv) is thrown v) is added vi) is kept
- B. i) is removed ii) are removed iii) is withdrawn
 iv) is disclosed v) is contained.