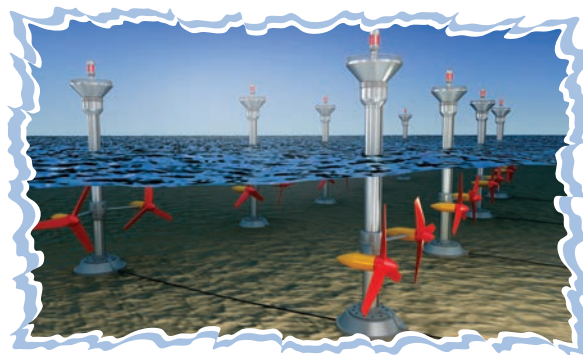




Green Energy

Just imagine if the earth uses all its coal, petroleum, oil, and natural gas reserves. How will cars, planes, trains, and all other vehicles run? How will we cook our food? How will generators and heavy machinery work? We need to harness and develop the renewable energy sources present in nature. Let's read about some sources of renewable energy.

Tidal power means to a form of renewable energy. Tidal action in the ocean is converted to electric power. One of the ways to harness tidal power between high tides and low tides is by using a dam to block receding water during the time when the tide flows out from the land. During low tide, water stored in the dam is released, and the water passes through a turbine generate electricity.



Biomass energy is obtained from landfill or waste dumps. Most of the waste that we dump is buried in the ground. It rots and generates a gas, which can be used as renewable or 'green' energy. This gas is used to produce electricity. In many Indian villages and towns, biomass energy is used for cooking, lighting, and other power needs.

Solar energy is procured from the sun's rays that reach the earth. The sun's energy can be transformed into thermal (or heat) energy, and used in homes for heating purposes. It can also be used to provide electricity using photovoltaic cells or solar power plants.



TEACHER'S NOTE

Green Energy is also known for sustainable resources. Discuss various forms of renewable resources with the students with the help of this chapter.



Since ancient times, people have tried to harness **wind energy** to pump water, to cut wood. Now a days grind the crops. Windmills are used to generate electricity in many countries.

Let Me Answer

- * Which country has the world's largest ethanol-mixed gasoline programmes?

Geothermal energy is obtained when water flows over hot rocks underground, hot water and steam are made which escape to the earth's surface through mud pools, hot springs, and geysers. This hot water and steam created electricity.



Renewable energy can also be derived from **agricultural crops**. In some areas, corn, cornstalks, sugar beets, sugar cane and switchgrass are grown, produce ethanol. It is a liquid which can be used in internal combustion engines and fuel cells.

Info-Bits

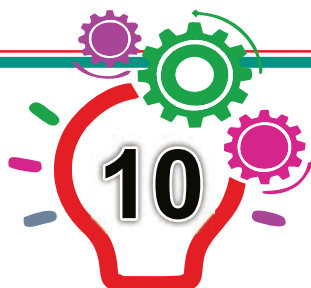
Renewable energy is non-polluting as well!



Quiz Time

Answer the following questions :

- Which of the following is not a source of renewable energy?
(a) wind (b) gasoline (c) water
- Which among the following is not a greenhouse gas?
(a) carbon dioxide (b) ozone (c) nitrogen
- Which of the following best describes renewable energy resources?
(a) pollute the environment (b) are constantly renewed by nature
(c) contribute to global warming
- This source of renewable energy does not depend on the weather.
(a) geothermal (b) hydropower (c) solar energy



Men of Science

Name the scientists with the help of the help list:

1. a) He made important contributions in the field of electrodynamics.
 b) He wrote book called "Theorie des phenomenes electro-dynamicques" in 1826.
 c) He worked on 'refraction of light'.
 d) He invented astatic needle.
2. a) He discovered the principle related to water (liquid) displacement.
 b) He shouted "Eureka, Eureka!"
 c) He evolved the principle of levers.
 d) He invented water screw.
3. a) He gave the fundamental law of chemistry.
 b) He worked also on thermal expansion
 c) His law was published in journal de-physique.
 d) He determined the number of molecules as 6.022×10^{23} .
4. a) He synthesised indigo.
 b) He stated the chemical nature of triphenyl methane.
 d) He received the Nobel Prize in 1905.
 c) He synthesised uric acid.
5. a) He invented a harmonic telegraph.
 b) He invented the workable telephone.
 c) He invented the gramophone.
 d) He invented photo phone for the deaf.
6. a) He gave the theory of natural selection.
 b) He published a book called "The Origin of Species."
 c) He worked on variation.
 d) He worked on pollination.



Let Me Answer

- * When was the steamboat invented?

Info-Bits

Percy Spencer was an American engineer who invented microwave oven.

Help List

Alexander Graham Bell, Charles Darwin, Archimedes, Andre Marie Ampere, Adolf Von Baeyer, Antoine Lavoisier

TEACHER'S NOTE

People always think of innovative ideas and bring them to existence with their hard work. Let students know about some of the amazing scientists and their inventions through the given exercises.



Complete the table by writing the names of inventors with the help of the help list.

YEARS		INVENTIONS	INVENTORS
1.	1450	Printing Press	_____
2.	1642	Calculating machine	_____
3.	1657	Pendulum clock	_____
4.	1644	Barometer	_____
5.	1712	Steam engine (piston)	_____
6.	1725	Clock (mechanical)	_____
7.	1765	Steam engine (condenser)	_____
8.	1769	Spinning frame	_____
9.	1783	Hot air balloon	_____
10.	1807	Steamboat	_____

Help List

Christiaan Huygens, Johannes Gutenberg, Evangelista Torricelli, Thomas Newcomen, Joseph and Jacques Montgolfier, Robert Fulton, Blaise Pascal, James Watt, Richard Arkwright, I Hsing and Liang Ting Tsan

Info-Bits



World biggest light bulb 13.5 ft sits on the top of Edison Memorial Tower.





Foods

Fill in the blanks with the help of the help list:

1. _____ in your food is the main source of energy.
2. Plants make carbohydrates when they take energy form _____ .
3. _____ such as glucose, fructose and sucrose are sweet and soluble.
4. _____ such as starch are made up of molecules of simple carbohydrates.
5. An _____ needs 2,000 to 4,000 calories per day of carbohydrates.
6. Fats contain _____ as much energy as carbohydrates.
7. Fats called _____ are stored around the body as adipose tissue.
8. Fats called _____ are used to build body cells.
9. Fat is needed for absorption of _____ Vitamins A, D, E and K.

Help List

Polysaccharides, Carbohydrates, Triglycerides, Sunlight, Twice, Simple carbohydrates, Adult, Phospholipids, Fat-Soluble

Info-Bits

Carbohydrates contain carbon, oxygen and hydrogen.

Let Me Answer

* Why do we need carbohydrates?

TEACHER'S NOTE

Motivate learners to have an open discussion on the different food items and their importance.



Miracles of Nature

Read and learn about some miracles of nature :

Aloe vera is used to help people health. It has a positive effect on the skin. The juice of this plant is used in cosmetics and medicines for treating burns.



Sandalwood also called chandan is used to cure different skin disorders, treat patients with urinary tract infection and soothe burning sensations in households.

Holy basil also known as tulsi is medicinal herb. It is used for treating cold, asthma, as well as skin and respiratory problems.



Indian gooseberry is known as amla in India is a rich source of vitamin C. It is used to treat jaundice and diarrhoea. It also helps to get rid of cough and cold.

TEACHER'S NOTE

There are many useful herbs in nature gifted to us. Talk about different useful herbs that are not less than any miracle.



Wild turmeric (haldi) is a medicinal herb with special antibiotic and antiseptic properties.

Info-Bits

***Black pepper** is a type of spice native to the Malabar Coast of India. It is known to boost the white blood cells that help our bodies to fight off bacteria and viruses.*

Let Me Answer

- * Which medicinal herb helps in treating digestive and liver problems, wounds and skin diseases?



Quiz Time



Answer the following questions.

1. Of the four systems of medicine-Ayurveda, Allopathy, Unani and Siddha which system does not entirely depend on the medicinal properties of plants?

2. Match the medicinal plants with the diseases they are commonly used to treat by writing the correct letters in the given boxes.

Plant	Remedy for
(a) Bhringraj	(i) skin diseases
(b) Amla	(ii) respiratory and digestive ailments
(c) Cinnamon	(iii) hair loss
(d) Isabgol	(iv) scurvy
(e) Neem	(v) toothache
(f) Clove	(vi) constipation



The Space and the Unknown

Fill in the blanks with the help of the help list:

1. _____ is the nearest planet to the sun.
2. Mercury is the smallest and fastest planet in the Solar System orbiting the sun once in every _____ .
3. Surface temperature on mercury ranges from about _____ .
4. The _____ are largely made of rocks.
5. Beethoven, Tolstoy, _____ are the names of craters on Mercury.
6. _____ is the second planet from the Sun.
7. Venus shines like a star in the night sky because its atmosphere _____ well.
8. Venus is also called _____ because it can be seen from the Earth in the evening.
9. Venus is the hottest planet with temperature _____ .
10. Venus is so hot because of _____ in its atmosphere.

Let Me Answer

- * Which celestial object used to be considered a planet before?

Help List

Reflects sunlight, Carbon dioxide, 464°C,
Evening star, 88 days, Crust and Mantle,
-173°C to 427°C, Venus, Mercury, Shakespeare

Info-Bits

Atmospheric pressure on the surface of Venus is 90 times greater than the Earth.

TEACHER'S NOTE

Inform learners about the different incredible celestial bodies and their trivias.



Fill in the blanks with the help of the help list:

1. Space is explored in two ways— by studying it from Earth using powerful telescopes and by _____ .
2. Most space exploration is _____ .
3. No _____ has ever come back from another planet.
4. _____ are special places where astronomers study space.
5. One of the largest observatory complexes 4,200 m above sea level, in a Crater of extinct Hawaiian volcano is _____ .
6. The first _____ was Salyut 1, stayed up only five months.
7. The longest serving station was _____ , it made more than 76,000 orbits of the Earth.
8. A _____ is a reusable spacecraft, made up of a 37.2 m long orbiter, two big solid rocket boosters and three main engines.
9. _____ are objects that orbit planets and other space objects.
10. _____ is the first man-made satellite in space.

Help List

Observatories, Space Shuttle, Mauna Kea, Mir, Launching Spacecraft, Space Station, Satellites, Unmanned Space Probes, Sputnik, Space Probe

Info-Bits



Escape velocity on the surface of the Earth is about 11.2 Km/ sec.

Let Me Answer

- * Which is the nearest natural satellite to the earth?