



Biology Facts

Biology is the scientific study of life and living organisms. It is the study of various life forms and their relationships with the environment.

Complete the following with the help of the help list:

1. The study of beauty is called _____.
2. The strongest part in the body is the _____.
3. The study of dreams is called _____.
4. The fastest nerve impulse travels at _____.
5. The weight of the kidney is approximately _____.
6. The blood circulation inside the body takes approximately _____.
7. The human head contains _____.
8. The length of the small intestine is approximately _____ and its diameter is 2.5 centimetre approximately.
9. _____ is the only muscle attached at one end.
10. Penicillin is the antibiotic that is obtained from _____ fungus.

Info-Bits

The right lung is slightly larger than the left lung.

Help List

22 Bones, Penicillium, 150 grams, Tongue, 432 km/h, 60 seconds, Oneirology, Enamel, 7 metre, Kalology

Let Me Answer

- What is the name of the largest and smallest bones in the human body and where are they present?

TEACHER'S NOTE

Guide the students to understand the various biological facts. Make it interesting by giving some examples.



Mathematics

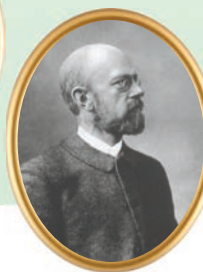
Mathematics is the important subject of numbers and equations.

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

1. The Babylonians used clay tablets and _____ system to solve quadratic equations and evaluate roots.
2. The _____ is an algorithm which can be used to find all the prime numbers up to a particular integer.
3. _____ were used to store numerical data for counting by the Incas.
4. _____ by Euclid has been hailed as one of the most important book in any subject of all times.
5. _____ was a German mathematician who laid the foundation of set theory.
6. _____ was famous Greek philosopher and was the first person to enunciate the laws of logic.
7. _____, a German mathematician and _____ an English mathematician both claimed to have been the first to discuss calculus.
8. Hilbert's problems, not solved since 1900 and remain in focus of most of mathematics till today are named after _____.

Let Me Answer

- What is the only even prime number?
- Is Pi a rational or irrational number?



Info-Bits

Srinivasa Ramanujan was an Indian mathematician who lived during the British Rule in India. He made substantial contributions to mathematics.

Help List

Isaac Newton, Georg Cantor, David Hilbert, Aristotle, Quipu, Sieve of Eratosthenes, Sexagesimal, Elements, Gottfried Leibniz

TEACHER'S NOTE

Guide students to understand the various mathematical facts. Make it interesting by giving examples. Tell them about some great mathematicians.



Plant Ecology

Plants are very important for life on Earth. They live in different environments and develop adaptations to live in these environments. Because of these adaptations, they have special group names.

Complete the following by writing the special group names of the following plants with the help of the help list:

1. The plants growing in dry conditions are called _____.
2. The plants growing in the soil of more concentration are called _____.
3. The plants growing under average conditions of temperature and moisture are called _____.
4. The plants growing in acid soil are called _____.
5. The plants growing on the sand are called _____.
6. The plants growing in water are called _____.
7. The plants growing on the rocks are called _____.



Let Me Answer

- Can you give five examples of plants found in the deserts?

Help List

Helophytes, Xerophytes, Hydrophytes, Lithophytes, Mesophytes, Psammophytes, Oxylophytes

Info-Bits

The Saguaro Cactus of the Arizona Desert grows less than 2.5 cm in its first 8 years.

TEACHER'S NOTE

Help students to know about the plants found in different environments. Use pictures and examples to make learning easy.



Inventions by Chance

Some of the world's greatest inventions were achieved through accidents. Learn more about how some experiments that seemed to go wrong resulted in products that changed our lives.

1. Percy Spencer, who was an engineer at a company called Raytheon, invented the microwave oven. Working with electric and magnetic waves noticed that the chocolate bar in his pocket had melted because of the heat produced. He thus made the first **microwave** by passing these waves through a closed metal box.



2. George de Mestral, a Swiss engineer, discovered **velcro** after he noticed how some sticky seeds stuck to his dog's collar when he took him out for a walk. After studying under a microscope how the seeds had tiny hooks to grip on to clothes, he applied the same principle to develop Velcro. It is used as a fastener for clothes, bags and other items.



3. US Chemist, Leo Baekland, was experimenting with synthetic substances. He discovered that if he heated it and let it cool, it formed a solid which did not dissolve in water and not soften easily when heated. He named this material Bakelite, which was derived from his name itself, and it was later renamed as **plastic**.

Let Me Answer

- Can you name the scientist who invented radium?

4. Russian chemist, Constantin Fahlberg, was experimenting with preservatives while eating a bread roll. He discovered that the bread had been sweetened because of the substance left on his hands. observation led to that discovery of the world's first **artificial sweetener**, also called saccharin.





5. Harry Brearley, a British metallurgist, was working on the task to find a metal that did not rust so that gun parts could be made to last longer. Most of his attempts failed, and his pile of scrap metal grew. It is believed that one day he chanced upon one piece in the pile that had not developed rust. This was the basis of the invention of **stainless steel**.



6. Alexander Fleming, a Scottish bacteriologist, invented **Penicillin**, a medicine used to fight bacteria in the body, when he accidentally left behind a laboratory dish with the influenza virus in the open and went on holiday. Upon his return, he saw a mould developed on the dish, around which the bacteria was not able to grow. This 'mould juice' secreted from the mould led to the discovery of penicillin.

7. American chemist, Herry Coover, was attempting to make transparent plastic gunsights to help soldiers in World War II improve their aim, when he made an extremely strong glue. This glue dried very quickly, thus leading to the invention of **super glue**.



Quiz Time

Name the inventors of the following.



X-Ray



Teflon



Fountain Pen



Safety Elevator

1. _____

2. _____

3. _____

4. _____

Help List

Elisha Graves Otis, Roy
J. Plunkett, Lewis
Waterman, Wilhelm
Conrad Roentgen

Info-Bits

In 1895, German physicist W.C. Roentgen was working with a tube of cathode rays. He accidentally found the unknown rays. He named it X-radiation signifying the unknown nature. He was awarded the Nobel Prize in physics in 1901.

TEACHER'S NOTE

Help students to know about the various types of inventions that make our lives easier. Also, tell them about the great scientists.



Chemistry Facts

We see so many chemicals in our daily life. Some scientists studied them and were able to explain the properties of these chemicals.

Complete the following with the help of the help list:

1. Name the French chemist who is known as the "Father of Modern Chemistry". _____
2. Name the Italian scientist who made the first electric cell. _____
3. Name the German chemist, who accidentally synthesized the first organic compound. _____
4. Name the Swedish chemist, who proposed the ionic theory and greenhouse effect. _____
5. Name the American chemist, who was the only person to win two unshared Nobel Prizes: Nobel Peace Prize and Nobel Prize in Chemistry. _____
6. Name the Russian chemist who published the first periodic table by arranging the known elements in rows and columns. _____
7. Name the German scientist who synthesised ammonia from nitrogen and hydrogen using a process which now bears his name. _____
8. Name the chemist of Indian origin, who for his work on the structure and function of the ribosome won the Nobel Prize in chemistry. _____



Info-Bits

John Dalton was an English chemist. He is known for introducing the atomic theory.

Help List

Venkatraman Ramakrishnan, Dimitri Mendeleev, Antoine Lavoisier, Fritz Haber, Alessandro Volta, Friedrich Wohler, Linus Pauling, Svante Arrhenius

Let Me Answer

- What is the "Green House Effect"?

TEACHER'S NOTE

Help students to know more about the various chemistry facts also tell them about the great achievements of people who practiced chemistry.



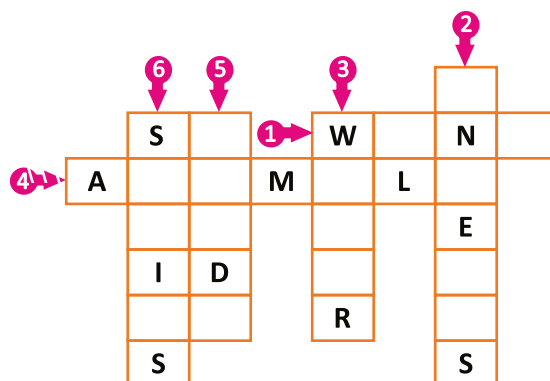
Plant Crossword

Pollination is the act of transferring pollen grains from the male anther of a flower to the female stigma of the same species. It occurs by various mediums. The goal of every living organism, including plants, is to create offspring for the next generation.

A. Using the clues, complete the crossword puzzle by the names of the medium:

Help List -1

- | | |
|-------------------|------------------|
| 1. Anemophilous | 2. Entomophilous |
| 3. Hydrophilous | 4. Zoophilous |
| 5. Ornithophilous | 6. Malacophilous |

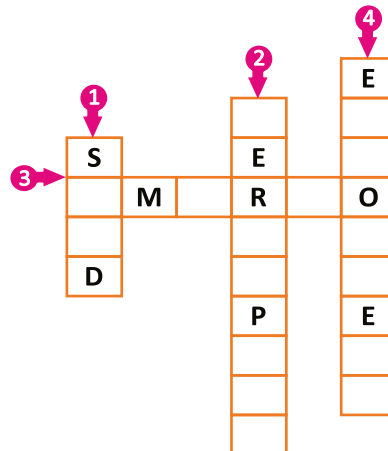


After pollination, fertilisation begins.

B. Using the clues, fill the crossword by different stages of fertilisation:

Help List -2

- | |
|----------------------------------|
| 1. Ovule develops into it. |
| 2. Nucellus may develop into it. |
| 3. Egg cell. |
| 4. Triple fusion nucleus. |



Let Me Answer

- Can you give the names of different parts of a flower?

Info-Bits

Guava is a true fruit as it is produced from the fertilised ovary of the flower. This fruit is oval in shape with light green or yellow skin and contains edible seeds.

TEACHER'S NOTE

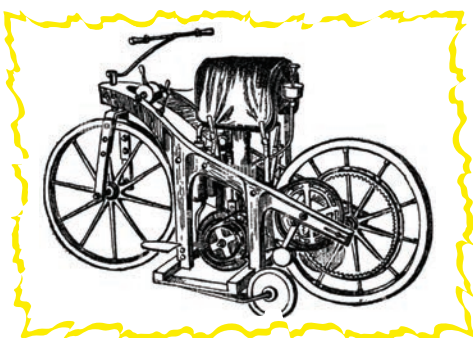
Help students to know about the plant reproduction system. Inform them about the various parts of the flower that take part in the reproduction.



Initial Inventions

Read and learn about some early inventions.

1. **Karl Benz**, from Germany, designed the first automobile powered by a petrol run engine in the year 1885. He named the automobile as 'Motorwagen'.



First petrol-powered Motorwagen by Karl Benz

2. Draisienne was invented in 1817, by **Baron Karl von Drais de Sauerbrun** and was considered by many as the first two-wheeled rider-propelled machines similar to the modern bicycles were produced.



A two-wheeled rider-propelled machine

3. **Richard Trevithick** of Britain built the first working railway engine in 1804. It was powered by steam. In the 1820s, George Stephenson designed and built the first steam locomotive to carry goods and passengers.



A model of Trevithick's engine built in 1803

4. The first commercial design of a motorcycle was created, by attaching a motor to a tricycle by Edward Vutler in 1884. The next year, **Gottlieb Daimler** of Germany attached a small petrol-run engine to a bicycle.



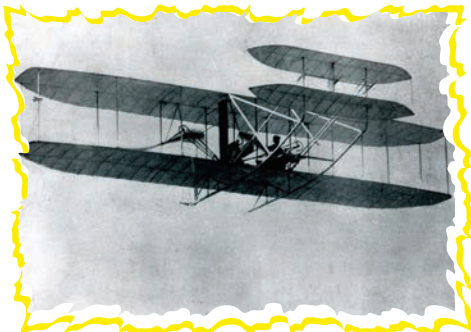
The first motorcycle by Gottlieb Daimler

Let Me Answer

- Name any four inventions that changed the world. Also, give the names of their inventors.

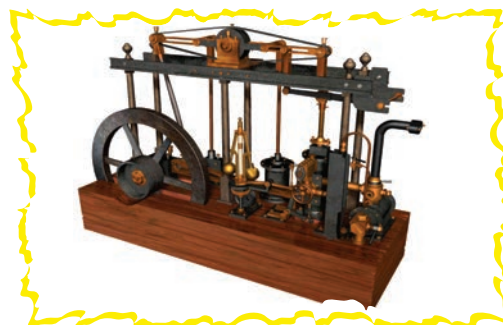


5. The world's first aeroplane was built by the two American brothers, Orville and Wilbur. They were also known as the **Wright Brothers**. They were the first to fly the plane for only 12 seconds and for a distance of 36 m!



The first flight of the Wright Brothers

6. **James Watt**, from Scotland, invented the steam engine in the 18th century. This invention brought about the industrial revolution in both his native Great Britain and the rest of the world.



3D rendition of James Watt Steam engine

Info-Bits

The pressure cooker first appeared in 1679 as Papin's Digester, named for its inventor, French-born physicist Denis Papin. The cooker heats water to produce very hot steam, which forces the temperature inside the pot to be as high as 266 °F (130 °C).



Quiz Time

Can you name these vehicles? Choose your answers from the help box.

1. A form transportation where a cabin hangs from one cable and is pulled by another cable. _____
2. This vehicle can travel over both land and water. _____
3. This vehicle is used by astronauts and space explorers. _____
4. This is a railway system where a train runs on a track with one rail only, either above or beneath the railway cars. _____



Help List

space shuttle, hovercraft, monorail, ropeway

TEACHER'S NOTE

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