

**OCTOBER 2021**

## CLASS 8





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# PREFACE

## What is Knowledge Bytes ?

Knowledge Bytes is a collection of riddles, interesting facts, mnemonics, and puzzles that will make your learning fun and engaging.

We want you to be delighted about studying. Knowledge Bytes helps you to know more about the subject in a fun, motivating and educational way and helps to implement what you learn in a creative way.

### Benefits



Saves Time



Develops Learning Skills



Stimulates Interest



Leads to Increased Comprehension

## EXPLORE

- |   |       |
|---|-------|
| 1. Algebraic Expressions and Identities | 1-5   |
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### According to euclid's division of polynomials

Polynomials are denoted as  $f(x)$ ,  $g(x)$ ,  $h(x)$ ,  $p(x)$  etc.

where

$f(x)$  is dividend

$g(x)$  is divisor

$q(x)$  is quotient

$r(x)$  is remainder



1.  $0 \leq \text{degree of } r(x) < \text{degree of } g(x)$

divisor

2. degree of  $g(x) \leq$  degree of  $f(x)$

dividend



Divide  $9x - 3x^2 + x^3 - 4$  by  $(x - 2)$

Remember, we have to continue the process till we get degree of remainder less than degree of divisor.

### Step-1

Write the dividend in the standard form i.e. either in the ascending order or descending order of exponents of 'x'.

i.e.  $x^3 - 3x^2 + 9x - 4 \Rightarrow x - 2 \overline{) x^3 - 3x^2 + 9x - 4}$

### Step-2

Divide  $x^3$  by  $x$  to get the first term of the quotient.

i.e.  $\frac{x^3}{x} = x^2$

Multiply  $x^2$  by  $(x - 2)$  and subtract the answer from dividend of step 1.

$$\begin{array}{r} x - 2 \overline{) x^3 - 3x^2 + 9x - 4} \quad x^2 \\ \underline{x^3 - 2x^2} \phantom{+ 9x - 4} \\ + \phantom{x^3 - 2x^2} \\ \hline -x^2 + 9x - 4 \end{array}$$

### Step-3

Resultant of step 2 is dividend of next step.

Again divide first term of dividend by  $x$  to find next term of the quotient.

i.e.  $\frac{-x^2}{x} = -x$

Multiply  $-x$  by  $(x - 2)$  and subtract the answer from dividend of step-3.

$$\begin{array}{r} x - 2 \overline{) -x^2 + 9x - 4} \quad -x \\ \underline{-x^2 + 2x} \phantom{- 4} \\ - \phantom{-x^2 + 2x} \\ \hline 7x - 4 \end{array}$$

### Step-4

Now divide  $7x - 4$  by  $x - 2$

For quotient, divide  $7x$  by  $x$

i.e.  $\frac{7x}{x} = 7$  (next term of quotient)

$$\begin{array}{r} x-2 \overline{) 7x-4} \phantom{7} \\ \underline{7x-14} \phantom{7} \\ 10 \end{array}$$

Product of 7 and  $(x - 2)$  subtracted from dividend of step 4

As degree of remainder is less than degree of divisor, so we will stop the process.

### Complete Process

$$\begin{array}{r} x-2 \overline{) x^3-3x^2+9x-4} \phantom{x^2-x+7} \\ \underline{x^3-2x^2} \phantom{x^2-x+7} \\ -x^2+9x-4 \phantom{x^2-x+7} \\ \underline{-x^2+2x} \phantom{x^2-x+7} \\ 7x-4 \phantom{x^2-x+7} \\ \underline{7x-14} \phantom{x^2-x+7} \\ 10 \end{array}$$

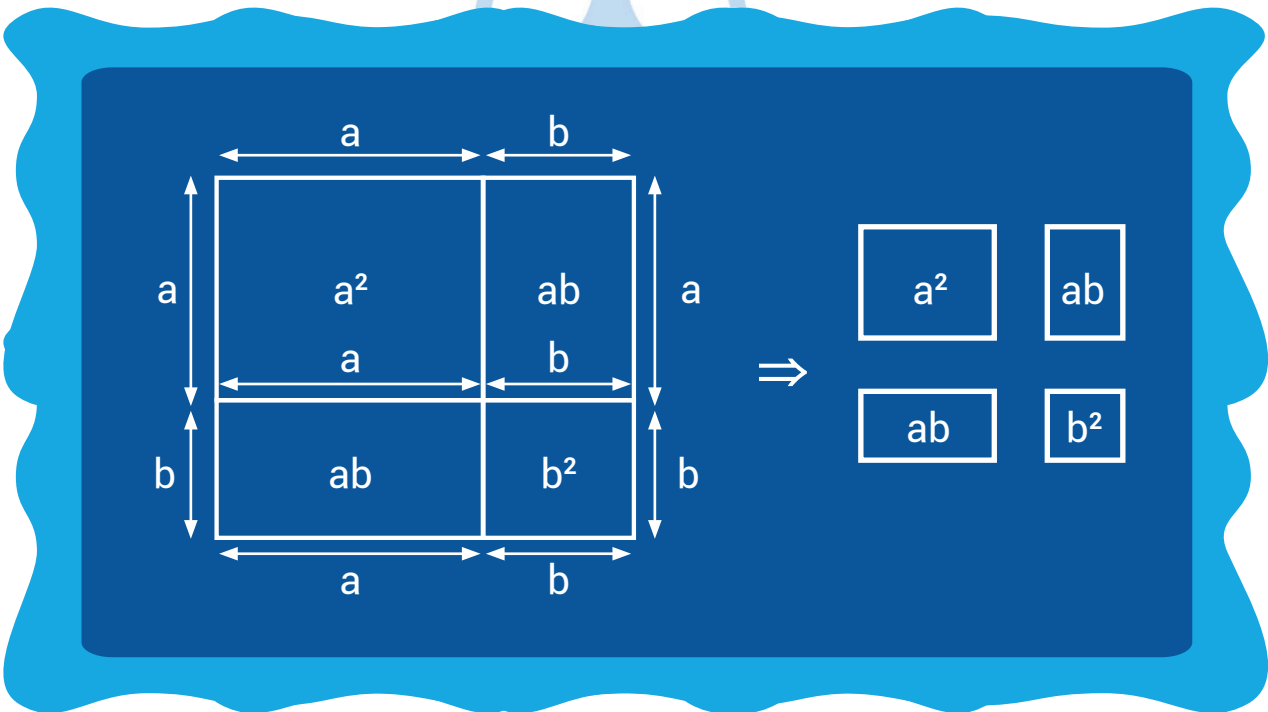
**Quotient** :  $x^2 - x + 7$

**Remainder** : 10

## Geometric Proof of Some algebraic Identities

(i)  $(a + b)^2 = a^2 + 2ab + b^2$

➡ In this square, we will draw two squares of side 'a' and 'b' units.



➡ From the figure, we see that there are two squares of area  $a^2$  and  $b^2$  and two rectangles with area  $ab$  and  $ab$ .

So,  $(a + b)^2 = a^2 + ab + ab + b^2$

$\therefore (a + b)^2 = a^2 + 2ab + b^2$

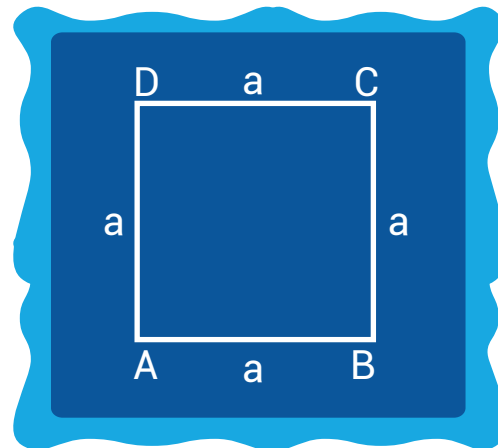




(ii)  $(a - b)^2 = a^2 - 2ab + b^2$

➡ Draw a square of side 'a' units.

Area of ABCD =  $a^2$



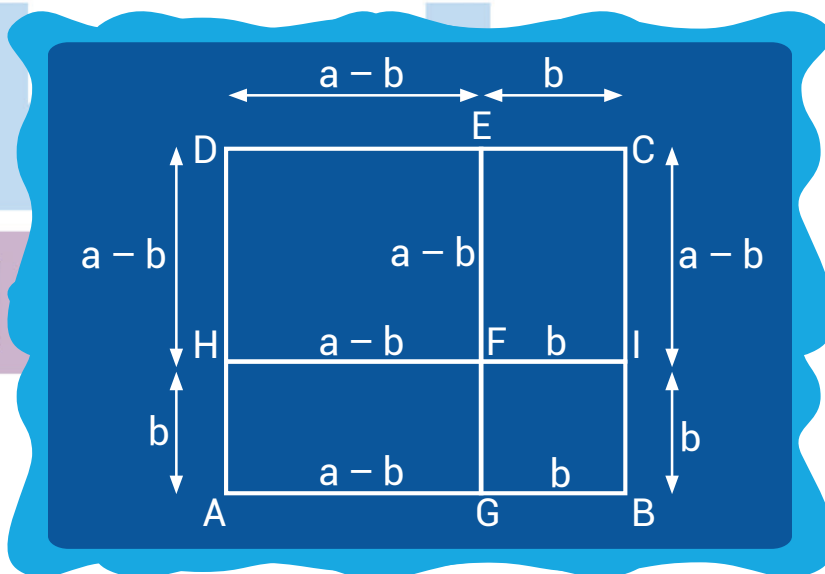
➡ Cut each side of this square taking 'b' units. Such that EC = b units so DE = a - b units.

Area of EDHF =  $(a - b)^2$

Area of ECIF =  $(a - b)b$

Area of AGFH =  $(a - b)b$

Area of BGFI =  $b^2$



➡ Area of EDHF = Area of ABCD - Area of ECIF - Area of AGFH - Area of BGFI

So,  $(a - b)^2$

=  $a^2 - (a - b)b - (a - b)b - b^2$

=  $a^2 - ab + b^2 - ab + b^2 - b^2$

=  $a^2 - 2ab + b^2$

## Puzzle

### MISSING NUMBER

Many missing numbers can be obtained using the pattern in given figure. Some common pattern are :

1. It could be sum of two numbers divided by a constant
2. It could be average of numbers
3. It could be the difference of product of two diagonally opposite number.
4. It could be the difference of sum of adjacent numbers
5. The difference of numbers could be prime number or difference of numbers could be square of prime numbers.



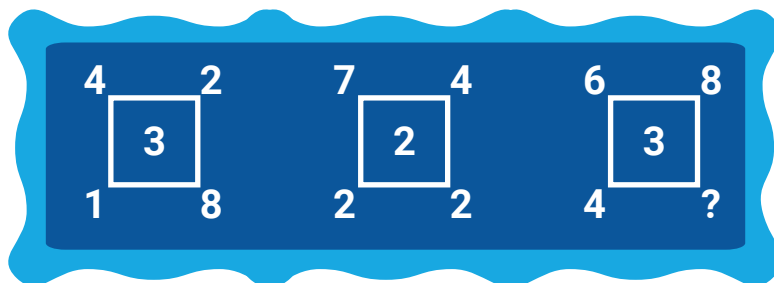
**Question-1** Find missing number.

2	3	6
6	5	?
7	9	5
26	42	48

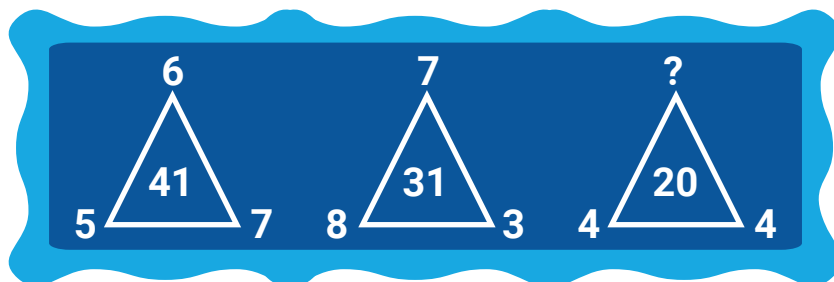
### Question-2

5	7	6
4	4	4
8	2	?

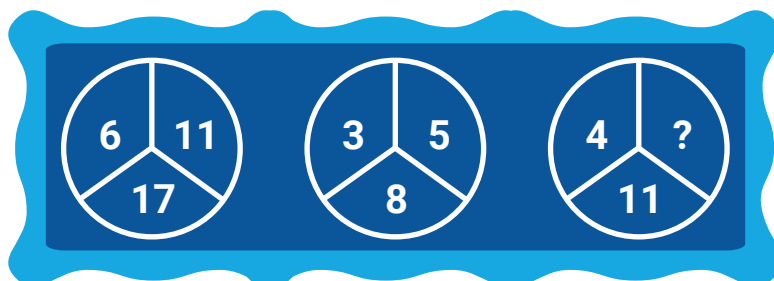
### Question-3



### Question-4



### Question-5





## Puzzle (Answer)

### Solution-1

In the given diagram consider column-I. add the number of 2<sup>nd</sup> and 3<sup>rd</sup> row and multiply the sum with row-I. Element, we will get 26.

like  $(6 + 7) \times 2 = 26$

$$(5 + 9) \times 3 = 42$$

$$(5 + x) 6 = 48$$

$$5 + x = \frac{48}{6} = 8$$

$$x = 8 - 5$$

$$x = 3$$

### Solution-2

In this question take average of the numbers of first and second column to get the number in third column.

$$(5 + 7) \div 2 = 6$$

$$(4 + 4) \div 2 = 4$$

$$(8 + 2) \div 2 = 5$$

hence, answer is **5**

### Solution-3

Here in each rectangular figure add the top 2 digits in each figure and multiply the centre value of the figure, so result is written in the bottom.

$$(4 + 2) \times 3 = 18$$

$$(7 + 4) \times 2 = 22$$

$$(6 + 8) \times 3 = 42$$

hence, answer is **2**

### Solution-4

Here in each triangle, the number in the centre of each triangle equals the product of bottom two digits plus the top digit.

hence, answer is  $4 \times 4 + 4 = 20$

Answer is **4**

### Solution-5

**Two Tricks :**

**Tricks I :**

Sum of upper two numbers is equal to lower number

$$6 + 11 = 17, 3 + 5 = 8, 4 + 7 = 11$$

**Tricks II :**

$$(6 \times 2) - 1 = 11 \text{ and } (6 \times 3) - 1 = 17$$

$$(3 \times 2) - 1 = 5 \text{ and } (3 \times 3) - 1 = 8$$

$$(4 \times 2) - 1 = 7 \text{ and } (4 \times 3) - 1 = 11$$

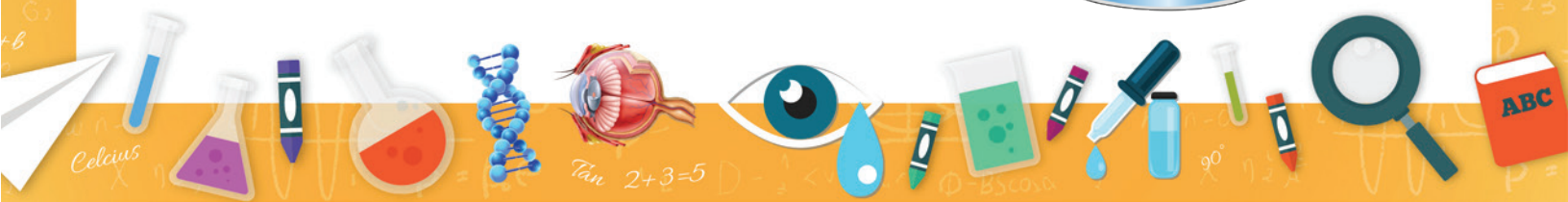
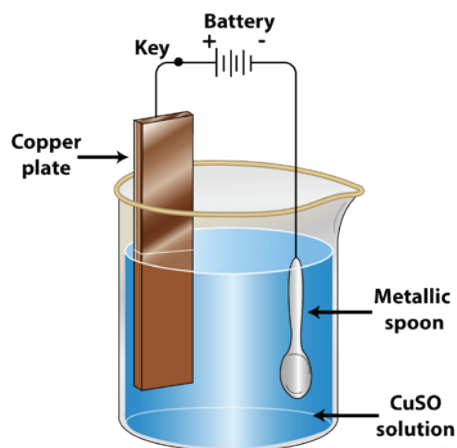
hence, answer is **7**

# Chemical Effects of Electric Current



## History of Electroplating

1. Modern electrochemistry was invented by Italian chemist Luigi Valentino Brugnatelli in 1805.
2. Luigi Valentino Brugnatelli's inventions were suppressed by the French Academy of sciences and did not become used in general industry for the following thirty years.
3. By 1839, scientists in Britain and Russia had independently devised metal deposition processes similar to Brugnatelli's for the copper electroplating of printing press plates.
4. John Wright of England discovered that potassium cyanide was suitable electrolyte for gold and silver electroplating.
5. Wright's associates, George Elkington and Henry Elkington were awarded the first patents for electroplating in 1840. They founded the electroplating industry in Birmingham from where it spread around the world.







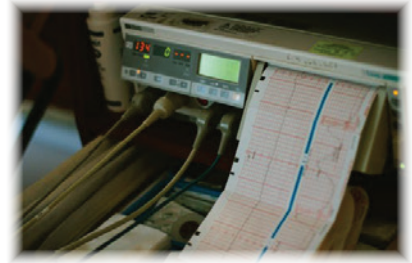
## Interesting Facts

The brain and the heart function by means of tiny electric currents.



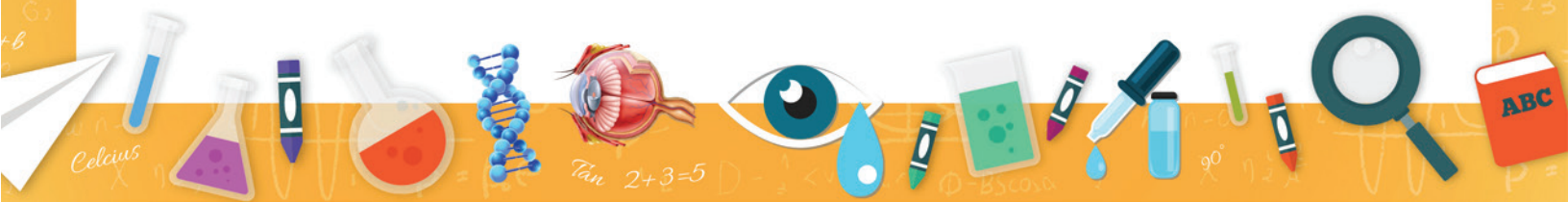
### Fact-1

Graphical recording of electrical activity of the heart, as detected by electrodes placed on the skin is called electrocardiograph (ECG). This is used to diagnose heart diseases.



### Fact-2

Graphical recording of the electrical activity of the brain as detected by the electrodes placed on the scalp is called electroencephalography (EEG). This is helpful to diagnose brain disorders, particularly epilepsy.



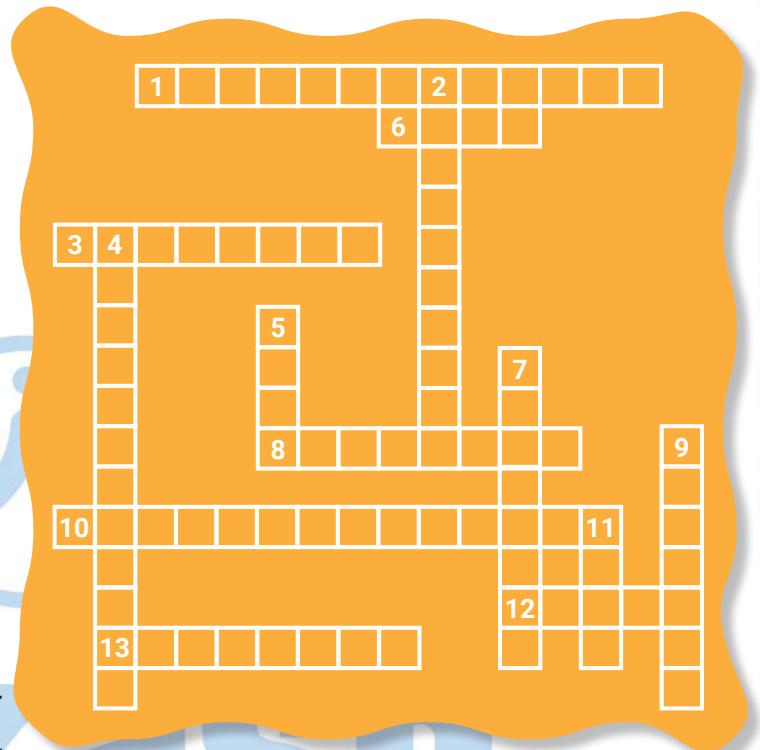
# Crossword

## ACROSS

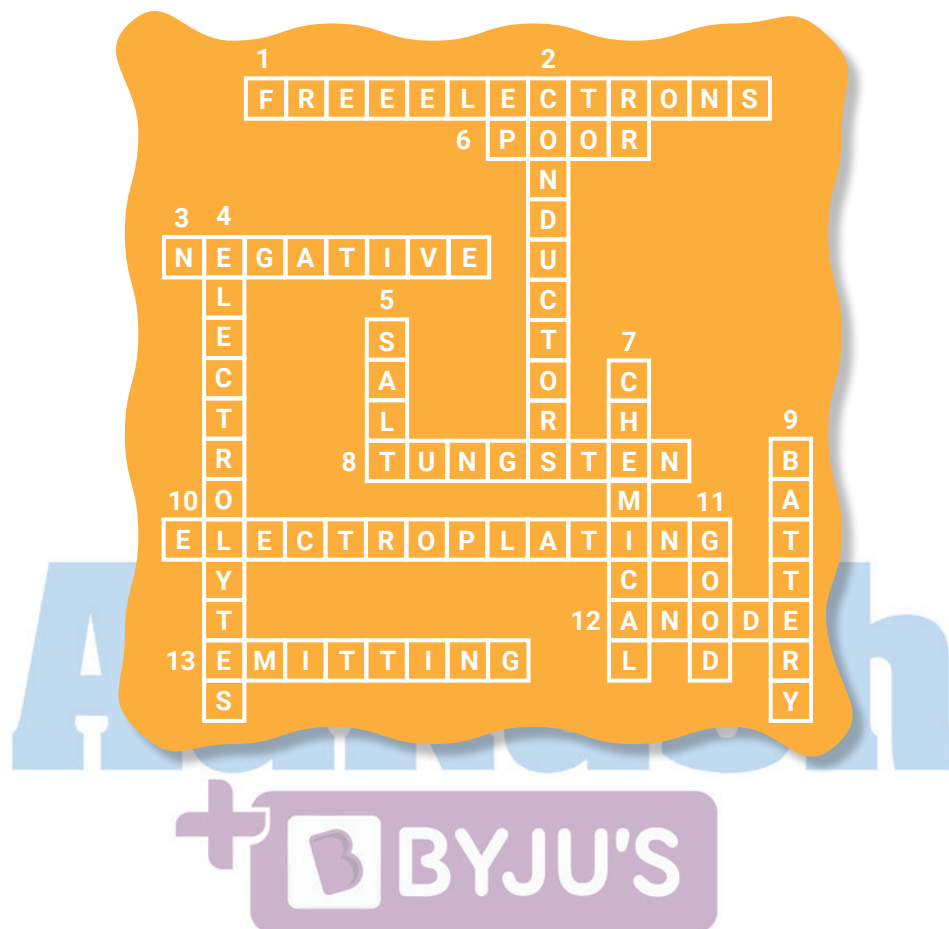
1. In metals, \_\_\_\_ are responsible for the conduction of electricity. [4, 9]
3. Anions carry \_\_\_\_ charge. [8]
6. Kerosene is a \_\_\_\_ conductor of electricity. [4]
8. The filament of a bulb is made of \_\_\_\_\_. [8]
10. The process of depositing a layer of a desired metal on another metal by means of electricity is called \_\_\_\_\_. [14]
12. \_\_\_\_ is the rod connected to the positive terminal of the battery. [5]
13. LED means light \_\_\_\_ diode. [8]

## DOWN

2. Metals are good \_\_\_\_ of electricity. [10]
4. Liquids that conduct electricity are called \_\_\_\_\_. [12]
5. Pure water can be made conducting by adding \_\_\_\_ to it. [4]
7. The passage of electric current through a solution causes \_\_\_\_ effect. [8]
9. A bulb in a circuit does not glow if the \_\_\_\_ is discharged. [7]
11. Graphite is a \_\_\_\_ conductor of electricity. [4]



## Answer (Crossword)





# Coal and Petroleum



## Advantages and Disadvantages of Coal



### Advantages of Coal

1. Coal is a reliable energy source. You may use it wherever and whenever it is required. It suffers less from seasonal fluctuations.
2. Coal is the largest source of energy for the generation of electricity worldwide. Even the products obtained by its processing have amazing uses.
3. It is easy to burn coal and it produces high energy upon combustion.
4. Coal is an affordable energy source because of its stable price as compared to other fuels.



## Disadvantages of coal

1. Coal produces large amount of carbon dioxide on burning which leads to global warming and climate change.
2. The burning of coal is not environmental friendly because it produces harmful byproducts and gaseous emissions such as sulphur dioxide, carbon dioxide and nitrogen oxide that causes pollution in the environment including acid rain.
3. Coal is a non-renewable energy source. Coal is depleting fastly because we consume too much of it.
4. Coal mining ruins the environment and puts the lives of people specially the coal miners in danger.







## Quiz on Coal and Petroleum

1.

Which of the following is used in the extraction of metals?

- |                 |               |
|-----------------|---------------|
| (a) Coke        | (b) Petroleum |
| (c) Natural Gas | (d) Coal      |

2.

Which of the following products of destructive distillation of coal is used in making perfumes?

- |              |                       |
|--------------|-----------------------|
| (a) Coke     | (b) Coal tar          |
| (c) Coal gas | (D) Ammoniacal Liquor |

3.

Naphthalene balls used to repel insects and moths are obtained from?

- |                 |               |
|-----------------|---------------|
| (a) Coke        | (b) Petroleum |
| (c) Natural gas | (d) Coal tar  |

4.

Kerosene is used in

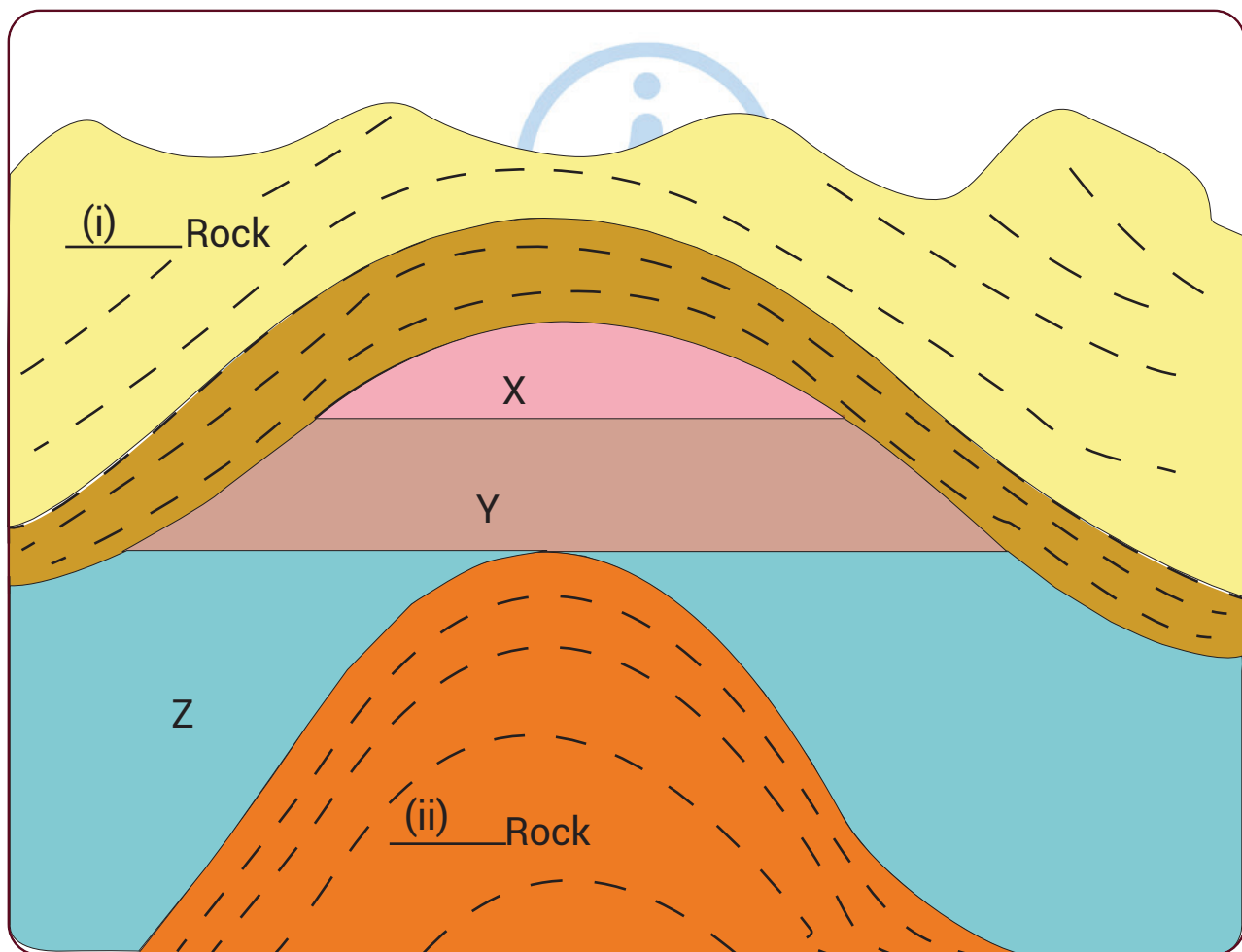
- |                 |                    |
|-----------------|--------------------|
| (a) Ointments   | (b) Road surfacing |
| (c) Jet engines | (d) Dry-cleaning   |



## Puzzle

Q.

This picture is clipped from coal and petroleum which is showing the petroleum and natural gas deposits. Have a clear look and give the answers of below mentioned questions



1. Tell the name of Rock (i) and (ii).
2. Which method is used for separating the components of "Y".
3. "Z" is called Universal solvent. What is "Z"?
4. "X" is stored under high pressure as \_\_\_\_\_.





## Answer (Quiz on Coal and Petroleum)

1. (a) Coke

2. (b) Coal tar

3. (d) Coal tar

4. (c) Jet engines

## Answer (Puzzle)

1. (i) Impervious rock and (ii) Reservoir rock

2. Fractional distillation

3. Water

4. CNG



# Reproduction in Animals



## Riddle



I like to hop around  
I'm a tadpole when I'm young  
I am green and I croak  
And catch flies with my long tongue

Ans



## Legend of Silkworm

BYJU'S



In China, there is a legend that the silkworm's silk was first discovered by the wife of the Yellow Emperor, Leizu around the year 2696 BC. According to the book written in the 13th century, she was drinking tea under a tree when a cocoon fell into her tea. She picked it out and as it started to wrap around her finger, she slowly felt something warm. When the silk ran out, she saw a small cocoon. In an instant, she realized that this cocoon was the source of the silk. She taught this to the people and it became common. There are many more legends about the silkworm.

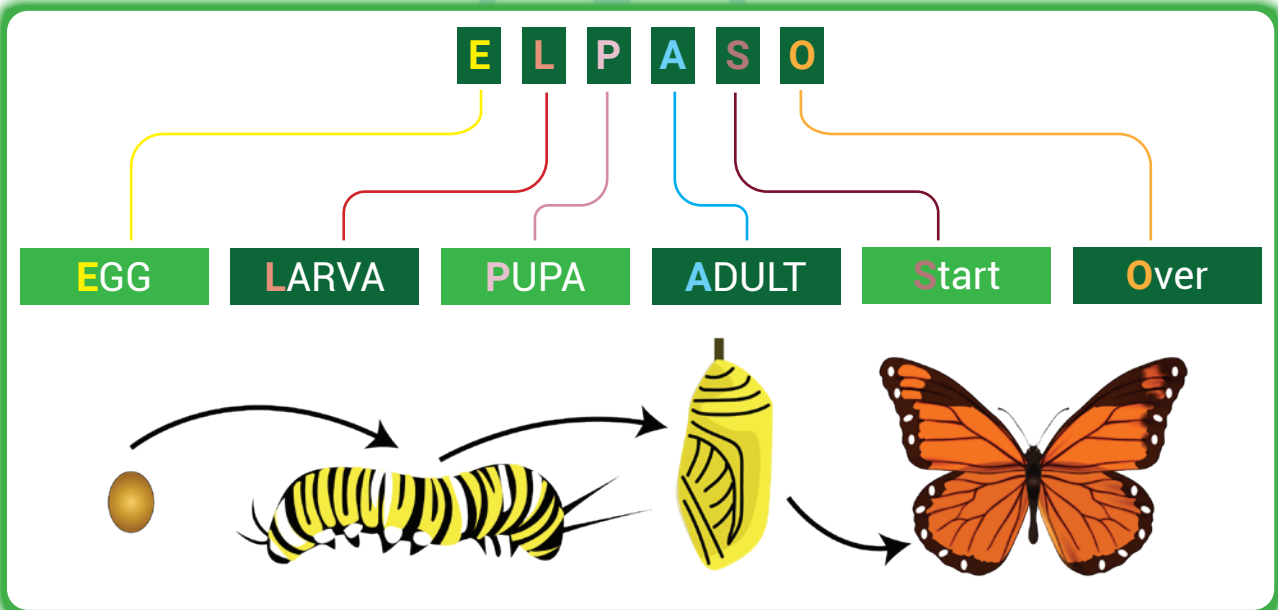




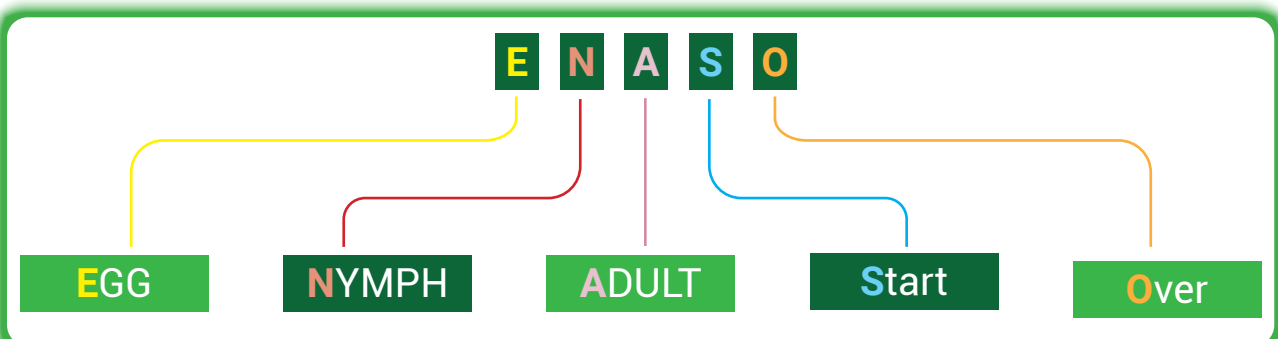
## Mnemonics

### Metamorphosis is of Two Types

1. Complete – In this, stages are egg, larva, pupa, adult  
Mnemonic for complete metamorphosis - E.L.P.A.S.O



2. Incomplete- In this, stages are egg, nymph, adult  
Mnemonic for incomplete metamorphosis- E.N.A.S.O



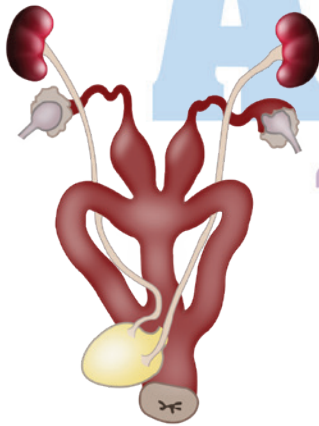


## Interesting Facts



Banana slugs mate using penises on their heads

Elephants are pregnant for two years



Kangaroos have three vagina and two uterus

Male seahorses give birth to young ones

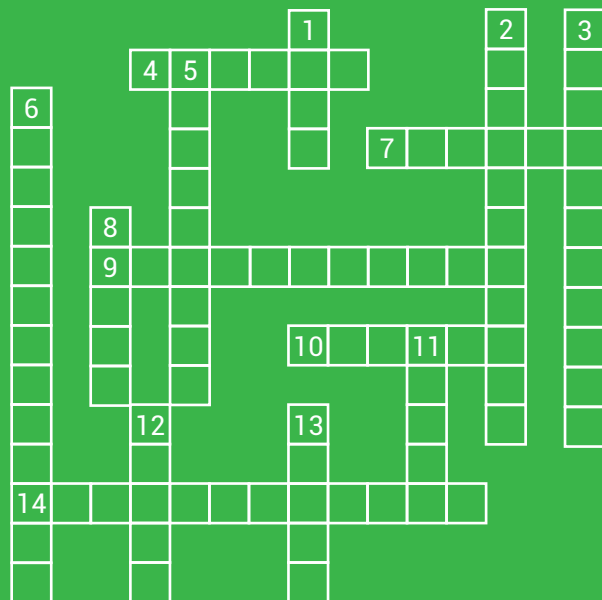




# Crossword

## Across

4. The stage of embryo in which all the body parts can be identified is called \_\_\_\_\_. [6]
7. Another term for fertilized egg. [6]
9. The act of expelling the fully grown young one from the mother's uterus is known as \_\_\_\_\_. [11]
10. Sperms are produced in these male reproductive organs. [6]
14. The process of embedding of embryo in the wall of uterus is \_\_\_\_\_. [12]

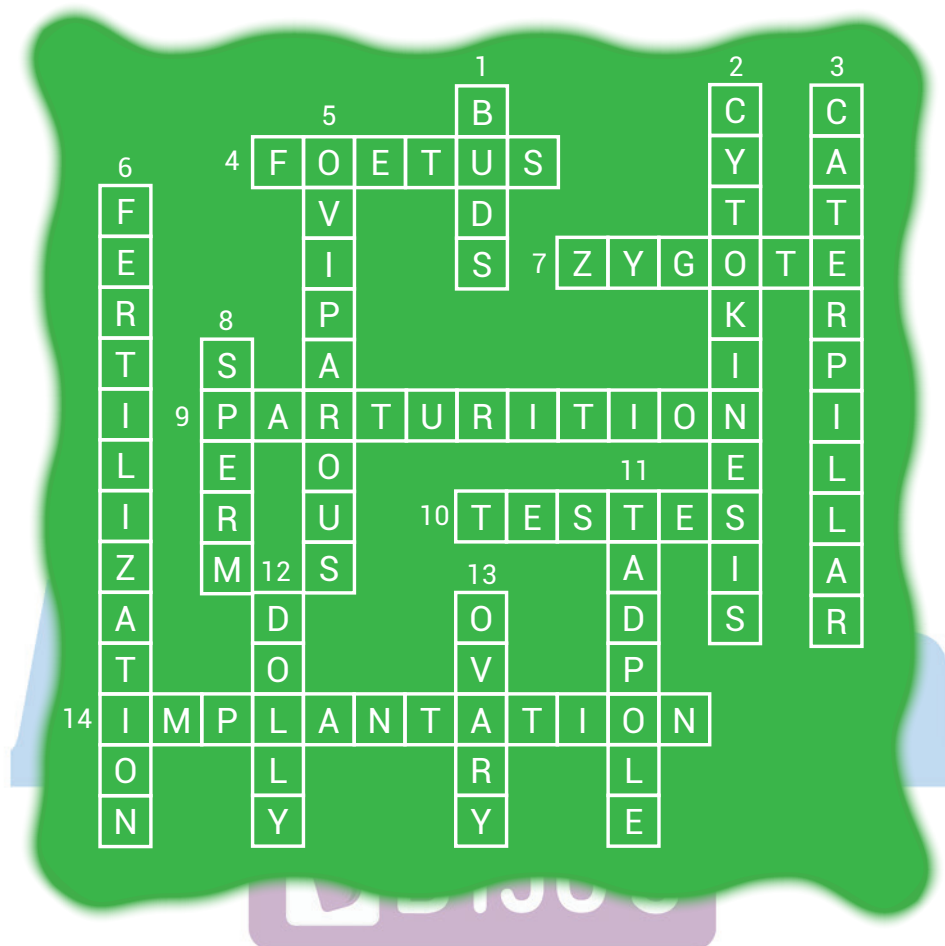


## Down

1. The term used for bulges observed on the side of the body of *Hydra*. [4]
2. Division of cytoplasm is known as \_\_\_\_\_. [11]
3. The larval stage of silkworm is \_\_\_\_\_. [11]
5. These animals lay eggs. [9]
6. The process of the fusion of gametes. [13]
8. The name of motile gamete of human being . [5]
11. The larval stage of frog is \_\_\_\_\_. [7]
12. Name of the first cloned mammal is [5]
13. Eggs are produced in this female reproductive organ. [5]



## Answers (Crossword)



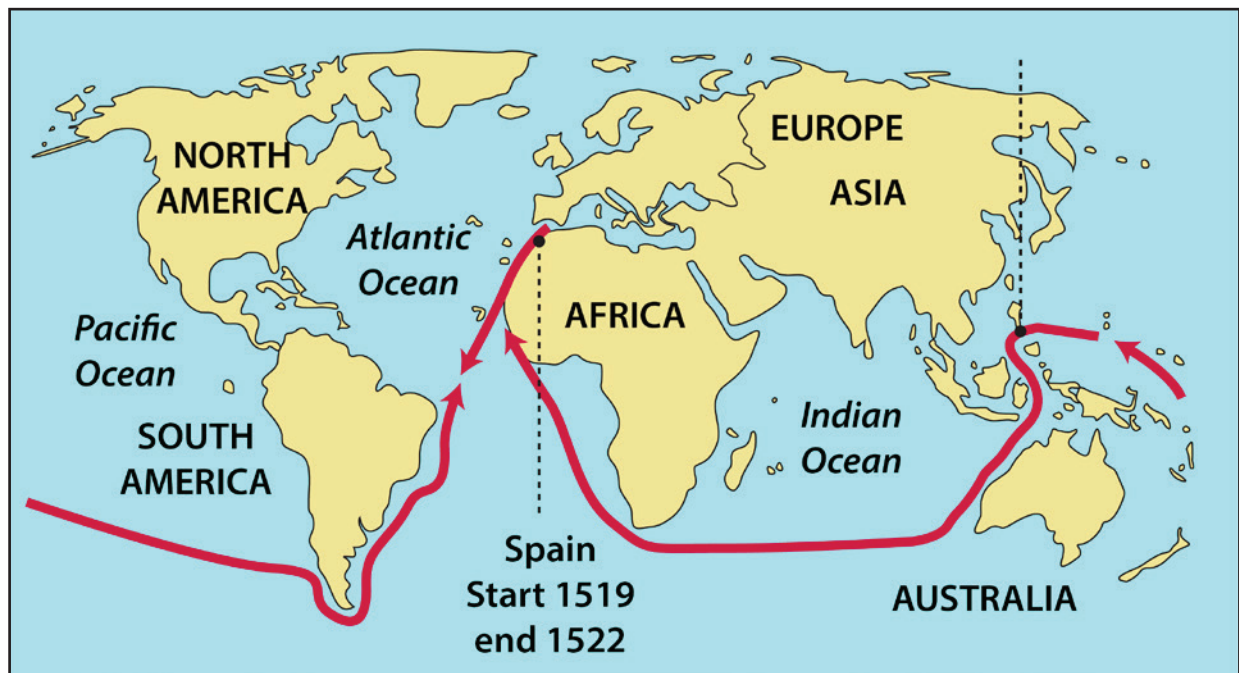
# Famous First in History

## The First Man Made Fire

12 Million Years ago

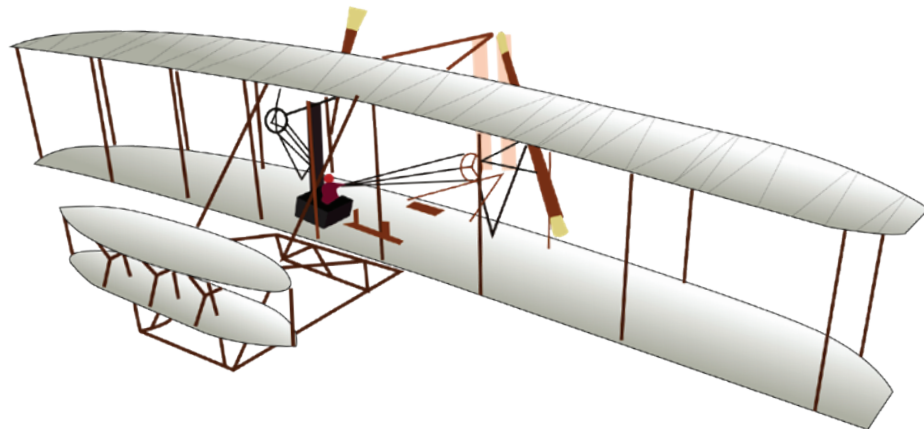


## The First Circumnavigation of the Globe (1522)



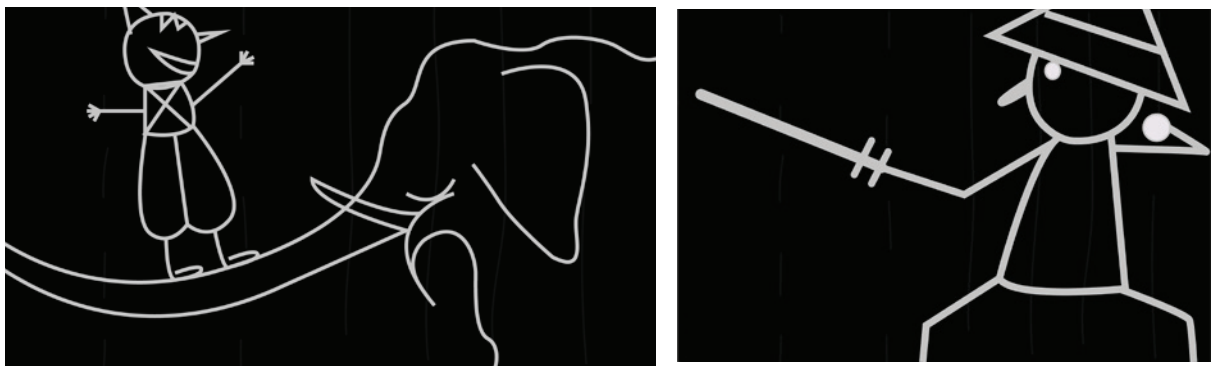
## The First Man Made flight (1903)

The wright brothers, Oliver and wilbur wright, built the first aeroplane.



## The First Animation Film (1908)

French director Emile Cohl made the first cartoon, Fantasmagorie.



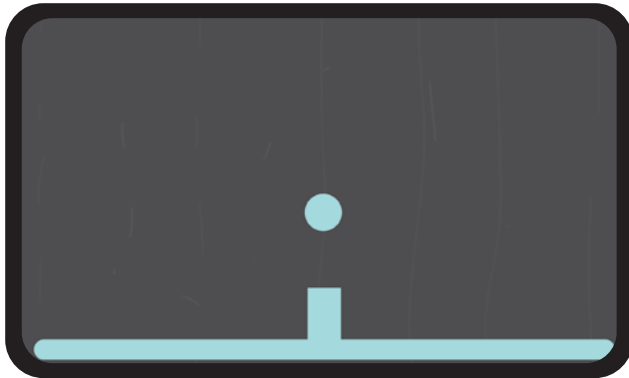
The cartoon had 700 drawings, but was a little more than a minute in length.





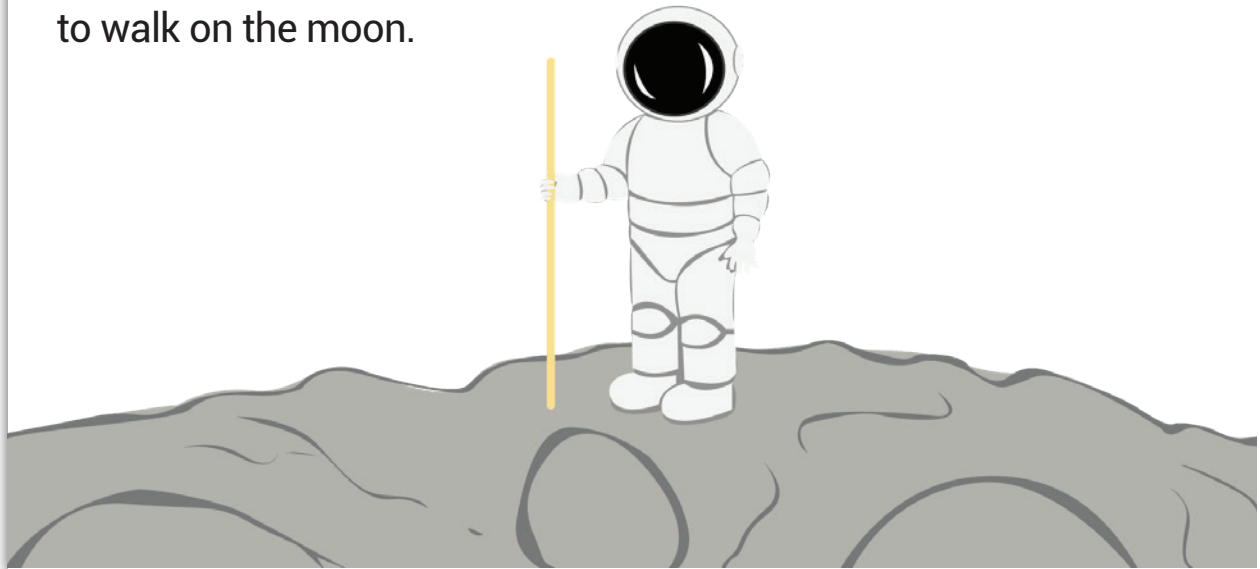
## The First Video Game (1958)

Physicist William Higinbotham invented the first video game.



## The First Step on the Moon (1969)

Neil Armstrong is the first man to walk on the moon.



**BHARAT RATNA, MISSILE MAN OF INDIA & FORMER PRESIDENT**

*Happy Birthday*

**Dr. APJ Abdul Kalam**

*“A nation can accomplish  
all it could ever want with  
the effort of its people”*



Born - 15 Oct 1931  
Died - 27 July 2015

A.P.J. Abdul Kalam, in full Avul Pakir Jainulabdeen Abdul Kalam, (born October 15, 1931, Rameswaram, India - died July 27, 2015, Shillong), Indian scientist and politician who played a leading role in the development of India's missile and nuclear weapons programs. He was president of India from 2002 to 2007.

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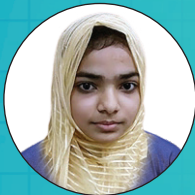
Abhiram A Prabhu



Dhairya Sharan



Myra Mahajan



Sahrish Deshmukh



Aryan Vij



Pari Makkar



Bhumika Kapoor



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————— *Well done! We are Proud of You !!* —————





*Congratulations!*

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