CBSE Class 10 Science

Revision Notes

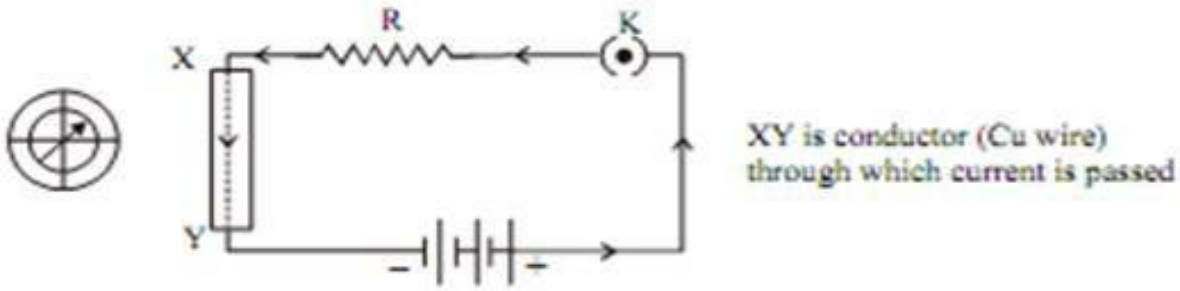
CHAPTER – 13

MAGNETIC EFFECTS OF ELECTRIC CURRENT

In this chapter, we will study the effects of electric current : Moving charges or electric current generates a magnetic field.

1. **Hans Christian Oersted (1777-1851)**
Oersted showed that electricity and magnetism are related to each other.His research later used in radio, television etc.
The unit of magnetic field strength is named Oersted in his honour.

2. **Oersted Experiment**



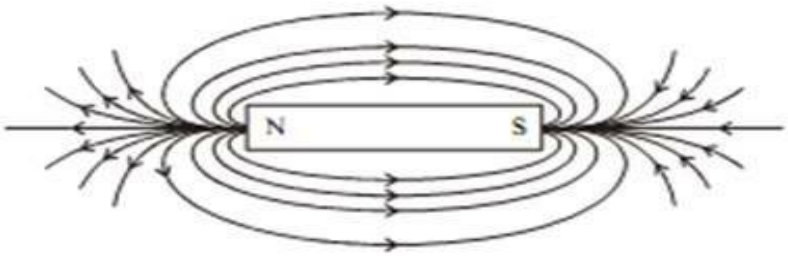
On passing the current through the copper wire XY in the circuit, the compass needle which is placed near the conductor gets deflected. If we reverse the direction of current, the compass needle deflect in reverse direction. If we stop the flow of current, the needle comes at rest.
Hence, it can be concluded that electricity and magnetism are linked to each other. It shows that whenever the current will flow through the conductor,then a magnetic field will develop.

3. **Magnetic Field** : It is the region surrounding a magnet, in which force of magnet can be detected. It is a vector quantity, having both direction& magnitude.

4. **Compass Needle** : It is a small bar magnet, whose north end is pointing towards north pole and south end is pointing towards south pole of earth.

5. **Magnetic Field Lines** : The tangent to the magnetic field line at a point gives the direction

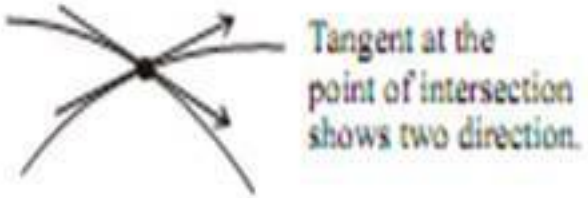
of magnetic field at that point.



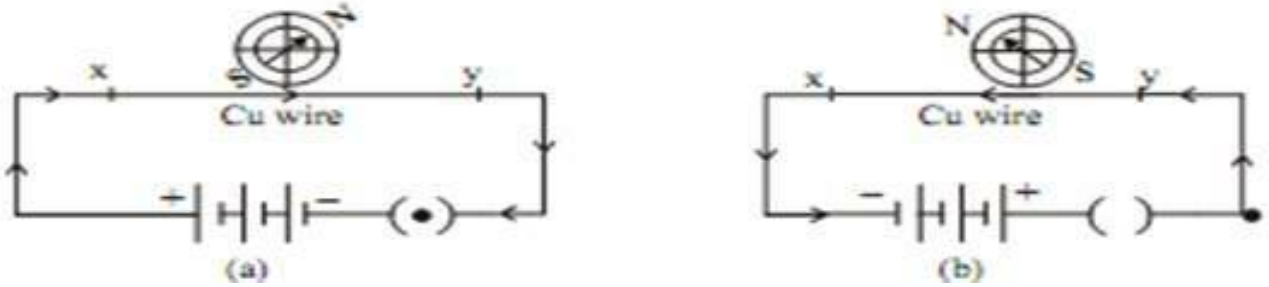
Hence, magnetic field line is a path along which a hypothetical free north pole tend to move towards south pole.

6. **Characteristics of Magnetic field lines** :

(a) The direction of magnetic field lines outside the magnet is always from north pole to south pole of bar magnet and are indicated by an arrow.Inside the magnet, the direction of field lines is from its south pole to north pole. Thus magnetic field lines are closed curves.
(b) The strength of magnetic field is expressed by the closeness of magnetic field lines. Closer the lines, more will be the strength and farther the lines, less will be the magnetic field strength.
(c) No two field lines will intersect each other.If they intersects, then at point of intersection the compass needle will show two directions of magnetic field which is not possible.



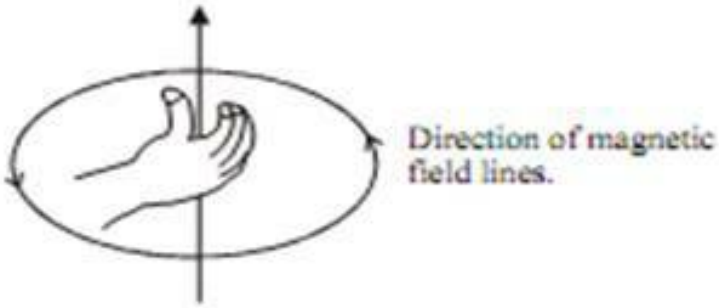
7. **Magnetic field due to Current Carrying Conductor**



The above electric circuit in which a copper wire is placed parallel to a compass needle, shows the deflection in needle gets reversed, when the direction of current reversed. Hence electricity and magnetism are related to each other.

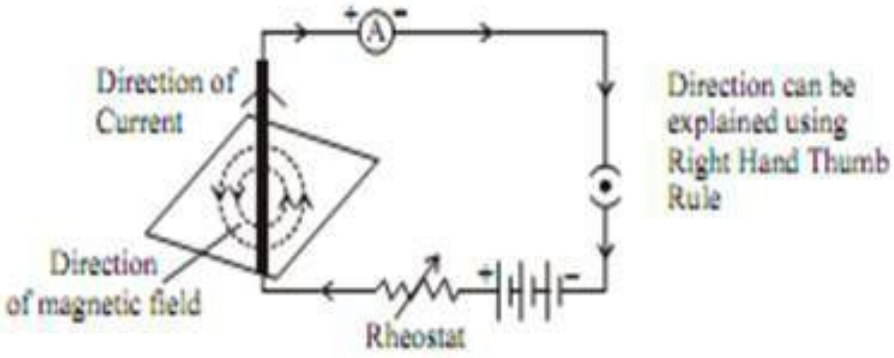
8. **Right Hand Thumb Rule**

It is a convenient way of finding the direction of magnetic field associated with current carrying conductor. Hold the straight wire carrying current in your right hand such that thumb points towards the direction of current, then your folded fingers around the conductor will show the direction of magnetic field.



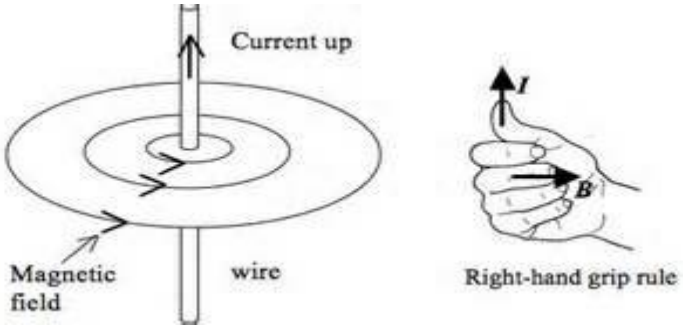
This rule also called Maxwell's corkscrew rule.

9. **Magnetic Field due to Current through a Straight Conductor**

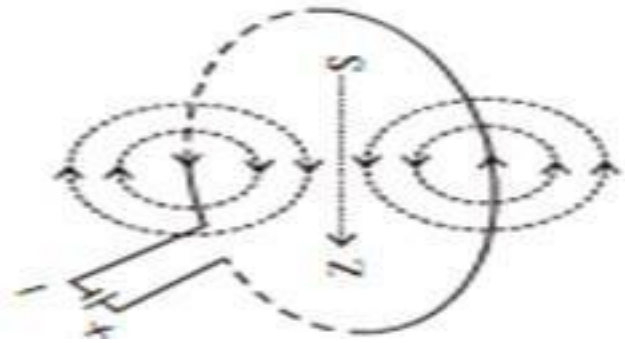


Let a current carrying conductor be suspended vertically and the electric current is flowing from south to north. In this case, the direction of magnetic field will be anticlockwise. If the current is flowing from north to south, the direction of magnetic field will be clockwise.

A current carrying straight conductor has magnetic field in the form of concentric circles; around it. Magnetic field of current carrying straight conductor can be shown by magnetic field lines.



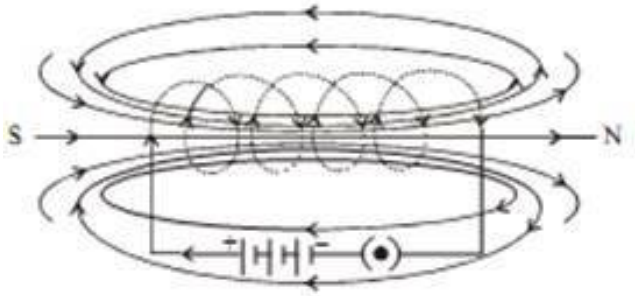
10. **Magnetic Field due to Current through a circular Loop**



Every point on the wire carrying current give rise to the magnetic field,appearing as a straight line at the centre of loop. By applying Right hand Thumb rule, we can find the direction of magnetic field at every section of the wire.

11. **Solenoid :**A Coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder is called solenoid.

12. Magnetic field due to a current in a solenoid :



- Using R.H. Thumb Rule, we can draw the pattern of magnetic field lines around a current carrying 'Solenoid'.
- One end of the solenoid behaves as a magnetic north pole,while the other end behave as the South Pole.
- The filed lines inside the solenoid are in form of parallel straight lines, that implies that magnetic field inside the solenoid is same at all points i.e. Field is uniform.

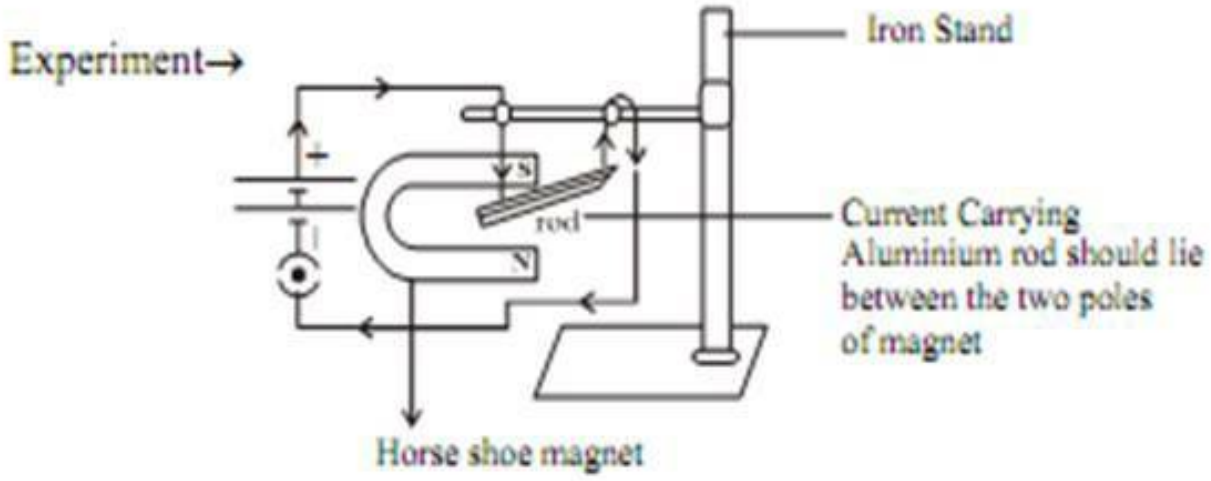
The strength of the magnetic field produced depends upon
(a) the number of turns
(b) Strength of current in the solenoid used in making solenoid.

13. **Electromagnet** : Strong magnetic field inside the solenoid can be used to magnetise a magnetic material for example soft iron, when it is placed inside the coil. The magnet so formed is called electromagnet.It is a temporary magnet.

Properties of Magnetic Field:

- The magnitude; of magnetic field increases with increase in electric current and decreases with decrease in electric current.
- The magnitude of magnetic field; produced by electric current; decreases with increase in distance and vice-versa. The size of concentric circles of magnetic field lines increases with distance from the conductor, which shows that magnetic field decreases with distance.
- Magnetic field lines are always parallel to each other.
- No two field lines cross each other.

14. **Force on a current carrying conductor in a magnetic field.**
Andre Marie Ampere (1775–1836) suggested that the magnet also exert an equal and opposite force on the current carrying conductor.

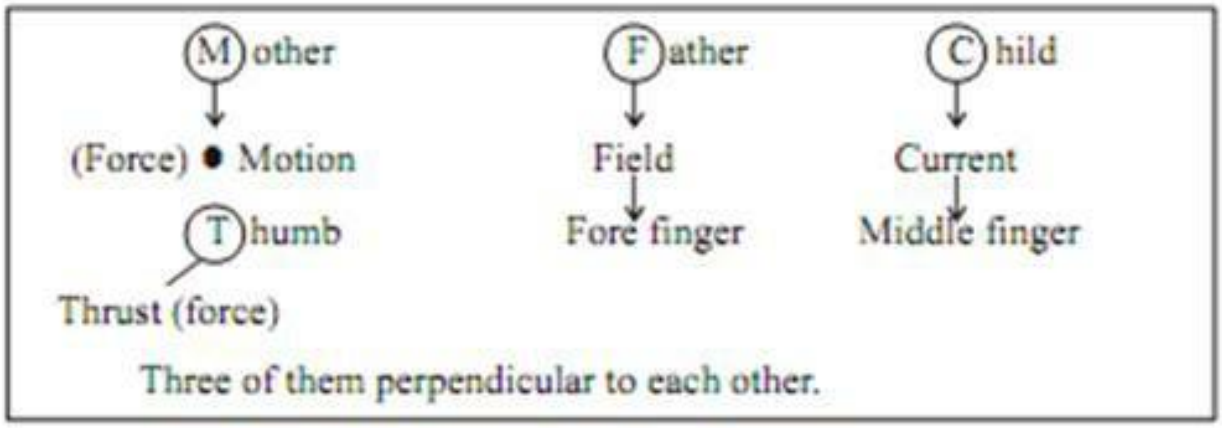


We will observe that the rod will displace i.e. the rod will experience a force, when it is placed in magnetic field, in a perpendicular direction to its length.

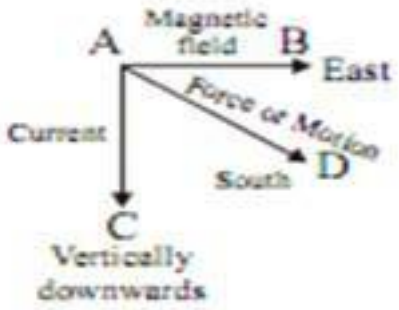
- The direction of the exerted force will be reversed if the direction of current through the conductor is reversed.
- If we change the direction of field by inter changing the two poles of the magnet, again the direction of exert force will change.
- Therefore the direction of exerted force depends on

(a) direction of current
(b) direction of magnetic field lines.

15. **Left Hand fleming Rule**



OR



- According to this rule, stretch **thumb**, **forefinger**, and **middle finge r**of your **left hand** such that they are mutually **perpendicular** to each other.

If fore finger represent direction of magnetic field & middle finger represent direction of current,then thumb will point in the direction of motion or force acting on the conductor.

– ELECTRIC MOTOR :

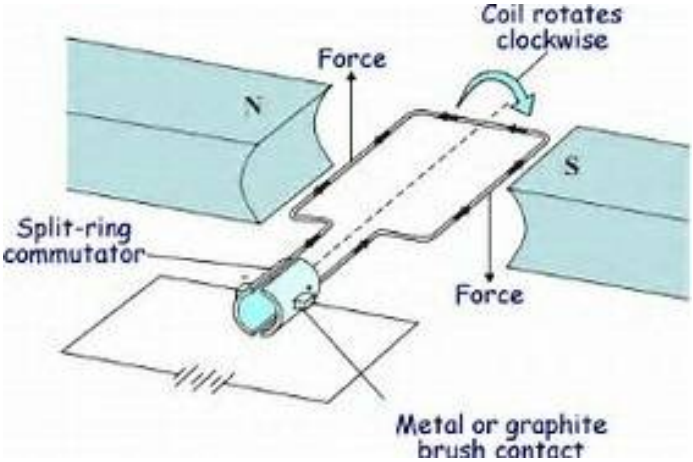
Electrical energy is converted into mechanical energy by using an electric motor. Electric motor works on the basis of rule suggested by Marie Ampere and Fleming's Left Hand Rule.

In an electric motor, a rectangular coil is suspended between the two poles of a magnetic field. The electric supply to the coil is connected with a commutator. Commutator is a device which reverses the direction of flow of electric current through a circuit.

When electric current is supplied to the coil of electric motor, it gets deflected because of magnetic field. As it reaches the half way, the split ring which acts as commutator reverses the direction of flow of electric current. Reversal of direction of current reverses the

direction of forces acting on the coil. The change in direction of force pushes the coil; and it moves another half turn. Thus, the coil completes one rotation around the axle. Continuation of this process keeps the motor in rotation.

In commercial motor, electromagnet; instead of permanent magnet; and armature is used. Armature is a soft iron core with large number of conducting wire turns over it. Large number of turns of conducting wire enhances the magnetic field produced by armature.



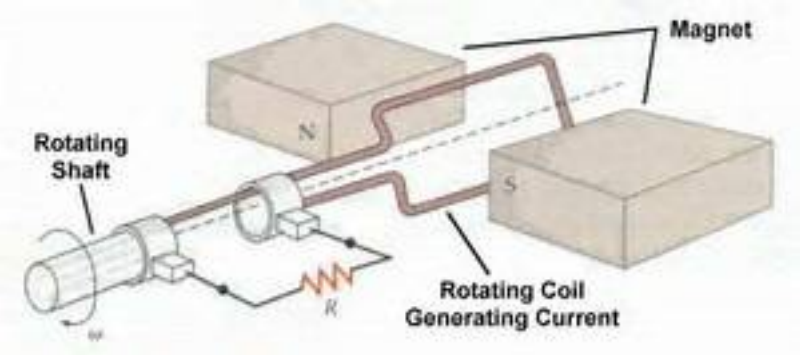
16. **Michael Faraday** : Gave the law of **Electro magnetic Induction :** When a conductor is set to move inside a magnetic field or a magnetic field is set to be changing around a conductor, electric current is induced in the conductor.

17. **Galvanometer** : It is an instrument that can detect the presence of a current in a circuit. If pointer is at zero (the centre of scale) then there will be no flow of current.
If the pointer deflect on either side right or left, this will show the direction of current. Represented by

ELECTRIC GENERATOR :

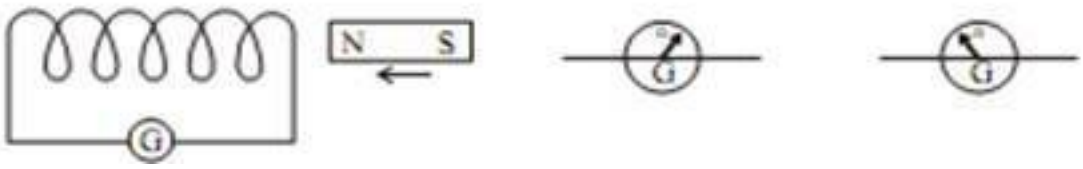
The structure of electric generator is similar to that of an electric motor. In case of an electric generator a rectangular armature is placed within the magnetic field of a permanent magnet. The armature is attached to wire and is positioned in way that it can move around an axle. When the armature moves within the magnetic field an electric current is induced. The direction of induced current changes, when the armature crosses the halfway mark of its

rotation. Thus, the direction of current changes once in every rotation. Due to this, the electric generator usually produces alternate current, i.e. AC. To convert an AC generator into a DC generator, a split ring commutator is used. This helps in producing direct current.



18. **Electro Magnetic Induction**: Can be explained by two experiments

(a) First Experiment $\rightarrow$ "**Self Induction**"



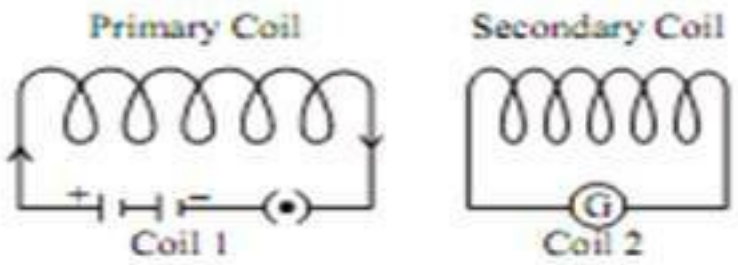
In this experiment, when the north pole of bar magnet is brought closer to the coil or away from the coil, we see momentary deflection in the needle of galvanometer on either side of null point. First right and then left.

Similarly, if we keep the magnet stationary and coil is made to move towards or away from the north pole of magnet. Again we will observe deflection in the needle of galvanometer.

If both bar magnet and coil are kept stationary, there will be no deflection in galvanometer. This experiment can also be done with the south pole of magnet, we will observe the deflection in galvanometer, but it would be in opposite direction to the previous case.

$\Rightarrow$ It concludes that motion of magnet with respect to coil or vice-versa, changes the magnetic field. Due to this change in magnetic field lines, potential difference is induced in the same coil, which set up an induced current in the circuit.

(b) **Second Experiment : Mutual Induction**



In this experiment plug in the key that connects coil with battery and observe the deflection in galvanometer. Now plug out the key that disconnect the coil-1 from battery and observe the deflection in galvanometer, which will be in reverse direction.

Hence, we conclude that potential difference is induced in secondary coil (coil-2), whenever there is a change in current, in primary coil(coil-1) (by on and off of key).

This is because, whenever there is change in current in primary coil

↓

Magnetic field associated with it also changes

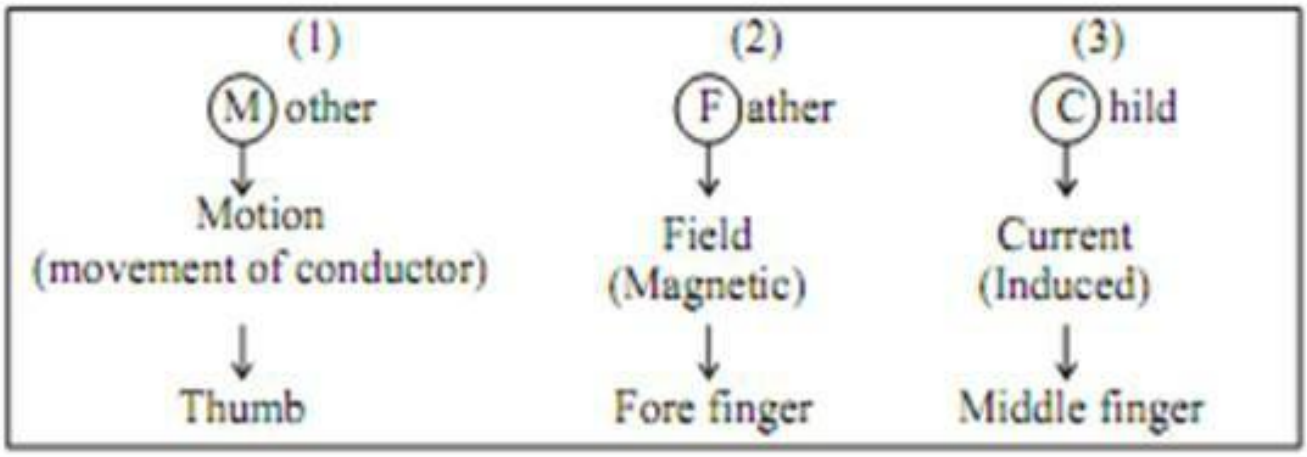
↓

Now, magnetic field lines around the secondary coil (coil-2) will change and induces the electric current in it (observed by the deflection of needle of Galvanometer in secondary circuit)

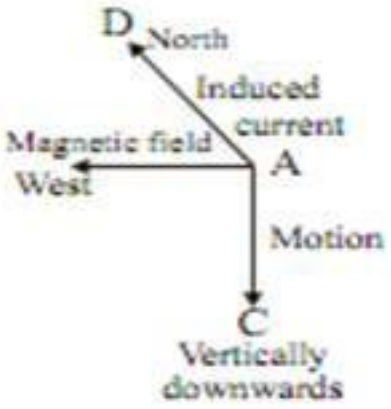
This process, by which changing of strength of current in primary coil, induces a current in secondary coil is called Electromagnetic Induction"

The induced current is found to be highest when the direction of motion of coil is at right angles to the magnetic field.

19. **Fleming's Right Hand Rule**



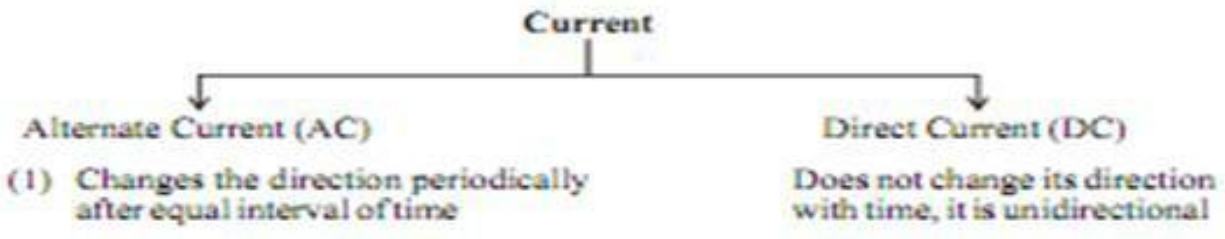
OR

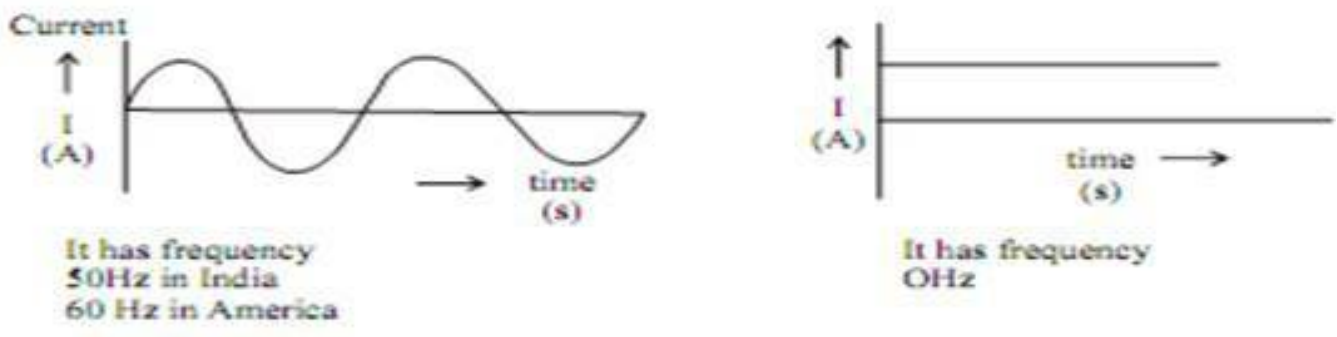


Rule can be defined as :

Stretch, thumb, forefinger, and middle finger of right hand, so that they are perpendicular to each other. The forefinger indicates direction of magnetic field, thumb shows the direction of motion of conductor, then the middle finger will shows the direction of induced current.

Electrical generator is based on the principle of electromagnetic induction. It convert mechanical energy into electrical energy.





21. **Advantages of Alternate Current (AC) over Direct Current (DC)**

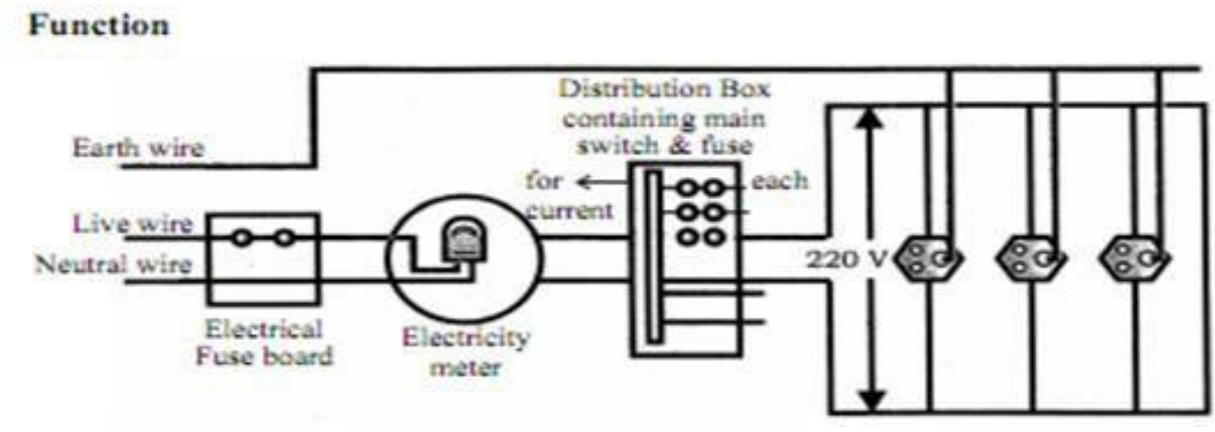
Electric power can be transmitted to longer distances without much loss of energy. Therefore cost of transmission is low.

In India the frequency of AC is 50Hz. It means after every 1/100 second it changes its direction.

22. **Domestic Electric Circuits :**

In our homes, the electric power supplied is of potential difference V = 220V and frequency 50Hz.

It consist of three wires :–
(1) Wire with red insulation cover – LIVE WIRE (POSITIVE) Live wire is at high potential of 220V
(2) Wire with black insulation cover – NEUTRAL WIRE(NEGATIVE) Neutral wire is at zero potential Therefore, the potential difference between the two is 220V.
(3) Wire with Green insulation cover – EARTH WIRE
It is connected to a copper plate deep in the earth near house.
The metallic body of the appliances is connected with the earth wire as a safety measure.

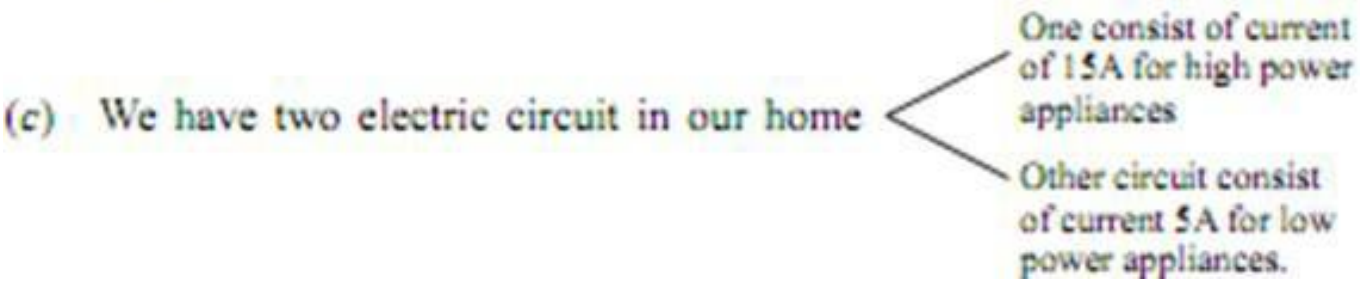


Earth wire provide a low resistance to the current hence any leakage of current to the metallic body of the appliances, keep its potential equal to that of earth. That means zero potential and the user is saved from severe electric shock.

Point to be noted in Domestic Circuit

(a) Each appliance has a separate switch of ON/OFF

(b) In order to provide equal potential difference to each appliance, they should be connected parallel to each other. So that they can be operated at any time.



24. **Short Circuiting** : Due to fault in the appliances or damage in the insulation of two wires, the circuit will offer zero or negligible resistance to the flow of current. Due to low resistance, large amount of current will flow.

According to Joule's law of heating effect , heat is produced in live wire and produces spark, damaging the device and wiring.

25. **Overloading** : Overloading can be caused by (1) Connecting too many appliances to a single socket or (2) accidental rise in supply voltage if the total current drawn by the appliances at a particular time exceeds the bearing capacity of that wire, it will get heated up. This is known as overloading. Fuse a safety device can prevent the circuit from overloading and short circuiting.

What you have learnt

- A compass needle is a small magnet. Its one end, which points towards north, is called a north pole, and the other end, which points towards south, is called a south pole.
- A magnetic field exists in the region surrounding a magnet, in which the force of the magnet can be detected.
- Field lines are used to represent a magnetic field. A field line is the path along which a hypothetical free north pole would tend to move. The direction of the magnetic field at a point is given by the direction that a north pole placed at that point would take.

Field lines are shown closer together where the magnetic field is greater.

- A metallic wire carrying an electric current has associated with it a magnetic field.The field lines about the wire consist of a series of concentric circles whose direction is given by the right-hand rule.
- The pattern of the magnetic field around a conductor due to an electric current flowing through it depends on the shape of the conductor. The magnetic field of a solenoid carrying a current is similar to that of a bar magnet.
- An electromagnet consists of a core of soft iron wrapped around with a coil of insulated copper wire.
- A current-carrying conductor when placed in a magnetic field experiences a force.If the direction of the field and that of the current are mutually perpendicular to each other, then the force acting on the conductor will be perpendicular to both and will be given by Fleming's left-hand rule. This is the basis of an electric motor.An electric motor is a device that converts electric energy into mechanical energy.
- The phenomenon of electromagnetic induction is the production of induced current in a coil placed in a region where the magnetic field changes with time. The magnetic field may change due to a relative motion between the coil and a magnet placed near to the coil. If the coil is placed near to a current-carrying conductor, the magnetic field may change either due to a change in the current through the conductor or due to the relative motion between the coil and conductor. The direction of the induced current is given by the Fleming's right-hand rule.
- A generator converts mechanical energy into electrical energy. It works on the basis of electromagnetic induction.
- In our houses we receive AC electric power of 220 V with a frequency of 50 Hz. One of the wires in this supply is with red insulation, called live wire. The other one is of black insulation, which is a neutral wire. The potential difference between the two is 220 V.

The third is the earth wire that has green insulation and this is connected to a metallic body deep inside earth. It is used as a safety measure to ensure that any leakage of current to a metallic body does not give any severe shock to a user.

- Fuse is the most important safety device, used for protecting the circuits due to short-circuiting or overloading of the circuits.

Class - 10

Hindi

ASSIGNMENT-4

Date-26/06/2020

LESSON- MATA KA ANCHAL

BY- MADHURI SRIVASTAVA

LINK- https://www.youtube.com/watch?v=Obc5XajhV9s&feature=youtu.be

1056CH01

1

माता का आँचल

शिवपूजन सहाय

जहाँ लड़कों का संग, तहाँ बाजे मृदंग[1]
जहाँ बुड्ढों का संग, तहाँ खरचे का तंग

हमारे पिता तड़के[2] उठकर, निबट-नहाकर पूजा करने बैठ जाते थे। हम बचपन से ही उनके अंग लग गए थे। माता से केवल दूध पीने तक का नाता था। इसलिए पिता के साथ ही हम भी बाहर की बैठक में ही सोया करते। वह अपने साथ ही हमें भी उठाते और साथ ही नहला-धुलाकर पूजा पर बिठा लेते। हम भभूत का तिलक लगा देने के लिए उनको दिक करने लगते थे। कुछ हँसकर, कुछ झुँझलाकर और कुछ डाँटकर वह हमारे चौड़े लिलार[3] में त्रिपुंड[4] कर देते थे। हमारे लिलार में भभूत खूब खुलती थी। सिर में लंबी-लंबी जटाएँ थीं। भभूत रमाने से हम खासे 'बम-भोला' बन जाते थे।

पिता जी हमें बड़े प्यार से 'भोलानाथ' कहकर पुकारा करते। पर असल में हमारा नाम था 'तारकेश्वरनाथ'। हम भी उनको 'बाबू जी' कहकर पुकारा करते और माता को 'मइयाँ'।

जब बाबू जी रामायण का पाठ करते तब हम उनकी बगल में बैठे-बैठे आइने में अपना मुँह निहारा करते थे। जब वह हमारी ओर देखते तब हम कुछ लजाकर और मुसकराकर आइना नीचे रख देते थे। वह भी मुसकरा पड़ते थे।

पूजा-पाठ कर चुकने के बाद वह राम-राम लिखने लगते। अपनी एक 'रामनामा बही' पर हजार राम-नाम लिखकर वह उसे पाठ करने की पोथी के साथ बाँधकर रख देते। फिर

1. एक तरह का वाद्य यंत्र 2. प्रभात, सवेरा 3. ललाट 4. एक प्रकार का तिलक जिसमें ललाट पर तीन आड़ी या अर्धचंद्राकार रेखाएँ बनाई जाती हैं

पाँच सौ बार कागज के छोटे-छोटे टुकड़ों पर राम-नाम लिखकर आटे की गोलियों में लपेटते और उन गोलियों को लेकर गंगा जी की ओर चल पड़ते थे।

उस समय भी हम उनके कंधे पर विराजमान रहते थे। जब वह गंगा में एक-एक आटे की गोलियाँ फेंककर मछलियों को खिलाने लगते तब भी हम उनके कंधे पर ही बैठे-बैठे हँसा करते थे। जब वह मछलियों को चारा देकर घर की ओर लौटने लगते तब बीच रास्ते में झुके हुए पेड़ों की डालों पर हमें बिठाकर झूला झुलाते थे।

कभी-कभी बाबू जी हमसे कुश्ती भी लड़ते। वह शिथिल होकर हमारे बल को बढ़ावा देते और हम उनको पछाड़ देते थे। वह उत्तान[5] पड़ जाते और हम उनकी छाती पर चढ़ जाते थे। जब हम उनकी लंबी-लंबी मूँछें उखाड़ने लगते तब वह हँसते-हँसते हमारे हाथों को मूँछों से छुड़ाकर उन्हें चूम लेते थे। फिर जब हमसे खट्टा और मीठा चुम्मा माँगते तब हम बारी-बारी कर अपना बायाँ और दाहिना गाल उनके मुँह की ओर फेर देते थे। बाएँ का खट्टा चुम्मा लेकर जब वह दाहिने का मीठा चुम्मा लेने लगते तब अपनी दाढ़ी या मूँछ हमारे कोमल गालों पर गड़ा देते थे। हम झुँझलाकर फिर उनकी मूँछें नोचने लग जाते थे। इस पर वह बनावटी रोना रोने लगते और हम अलग खड़े-खड़े खिल-खिलाकर हँसने लग जाते थे।

उनके साथ हँसते-हँसते जब हम घर आते तब उनके साथ ही हम भी चौके पर खाने बैठते थे। वह हमें अपने ही हाथ से, फूल के एक कटोरे में गोरस और भात सानकर[6] खिलाते थे। जब हम खाकर अफर[7] जाते तब मइयाँ थोड़ा और खिलाने के लिए हठ करती थीं। वह बाबू जी से कहने लगती—आप तो चार-चार दाने के कौर बच्चे के मुँह में देते जाते हैं; इससे वह थोड़ा खाने पर भी समझ लेता है कि हम बहुत खा गए; आप खिलाने का ढंग नहीं जानते—बच्चे को भर-मुँह कौर खिलाना चाहिए।

जब खाएगा बड़े-बड़े कौर, तब पाएगा दुनिया में ठौर[8]।

—देखिए, मैं खिलाती हूँ। मरदुए क्या जाने कि बच्चों को कैसे खिलाना चाहिए, और महतारी[9] के हाथ से खाने पर बच्चों का पेट भी भरता है।

यह कह वह थाली में दही-भात सानती और अलग-अलग तोता, मैना, कबूतर, हंस, मोर आदि के बनावटी नाम से कौर बनाकर यह कहते हुए खिलाती जाती कि जल्दी खा लो, नहीं तो उड़ जाएँगे; पर हम उन्हें इतनी जल्दी उड़ा जाते थे कि उड़ने का मौका ही नहीं मिलता था।

5. पीठ के बल लेटना 6. मिलाना, लपेटना, गूँधना 7. भर पेट से अधिक खा लेना
8. स्थान, अवसर 9. माता

जब हम सब बनावटी चिड़ियों को चट कर जाते थे तब बाबू जी कहने लगते–अच्छा, अब तुम 'राजा' हो, जाओ खेलो।

बस, हम उठकर उछलने-कूदने लगते थे। फिर रस्सी में बँधा हुआ काठ का घोड़ा लेकर नंग-धड़ंग बाहर गली में निकल जाते थे।

जब कभी मइयाँ हमें अचानक पकड़ पाती तब हमारे लाख छटपटाने पर भी एक चुल्लू कड़वा तेल[10] हमारे सिर पर डाल ही देती थी। हम रोने लगते और बाबू जी उस पर बिगड़ खड़े होते; पर वह हमारे सिर में तेल चोथकर[11] हमें उबटकर ही छोड़ती थी। फिर हमारी नाभी और लिलार में काजल की बिंदी लगाकर चोटी गूँथती और उसमें फूलदार लट्टू बाँधकर रंगीन कुरता-टोपी पहना देती थी। हम खासे 'कन्हैया' बनकर बाबू जी की गोद में सिसकते-सिसकते बाहर आते थे।

बाहर आते ही हमारी बाट जोहनेवाला बालकों का एक झुंड मिल जाता था। हम उन खेल के साथियों को देखते ही, सिसकना भूलकर, बाबू जी की गोद से उतर पड़ते और अपने हमजोलियों के दल में मिलकर तमाशे करने लग जाते थे।

तमाशे भी ऐसे-वैसे नहीं, तरह-तरह के नाटक। चबूतरे का एक कोना ही नाटक-घर बनता था। बाबू जी जिस छोटी चौकी पर बैठकर नहाते थे, वही रंगमंच बनती। उसी पर सरकंडे के खंभों पर कागज का चँदोआ[12] तानकर, मिठाइयों की दुकान लगाई जाती। उसमें चिलम के खोंचे पर कपड़े के थालों में ढेले के लड्डू, पत्तों की पूरी-कचौरियाँ, गीली मिट्टी की जलेबियाँ, फूटे घड़े के टुकड़ों के बताशे आदि मिठाइयाँ सजाई जातीं। ठीकरों के बटखरे और जस्ते के छोटे-छोटे टुकड़ों के पैसे बनते। हमीं लोग खरीदार और हमीं लोग दुकानदार। बाबू जी भी दो-चार गोरखपुरिए पैसे खरीद लेते थे।

थोड़ी देर में मिठाई की दुकान बढ़ाकर हम लोग घरौंदा बनाते थे। धूल की मेड़ दीवार बनती और तिनकों का छप्पर। दातून के खंभे, दियासलाई की पेटियों के किवाड़, घड़े के मुँहड़े की चूल्हा-चक्की, दौए की कड़ाही और बाबू जी की पूजा वाली आचमनी कलछी बनती थी। पानी के घी, धूल के पिसान और बालू की चीनी से हम लोग ज्योनार[13] तैयार करते थे। हमीं लोग ज्योनार करते और हमीं लोगों की ज्योनार बैठती थी। जब पंगत बैठ जाती थी तब बाबू जी भी धीरे-से आकर, पाँत के अंत में, जीमने[14] के लिए बैठ जाते थे। उनको बैठते देखते ही हम लोग हँसकर और घरौंदा बिगाड़कर भाग चलते थे। वह भी हँसते-हँसते लोट-पोट हो जाते और कहने लगते–फिर कब भोज होगा भोलानाथ?

10. सरसों का तेल 11. सराबोर कर देना 12. छोटा शामियाना 13. भोज, दावत
14. भोजन करना

कभी-कभी हम लोग बरात का भी जुलूस निकालते थे। कनस्तर का तंबूरा बजता, अमोले[15] को घिसकर शहनाई बजायी जाती, टूटी चूहेदानी की पालकी बनती, हम समधी बनकर बकरे पर चढ़ लेते और चबूतरे के एक कोने से चलकर बरात दूसरे कोने में जाकर दरवाजे लगती थी। वहाँ काठ की पटरियों से घिरे, गोबर से लिपे, आम और केले की टहनियों से सजाए हुए छोटे आँगन में कुलिहए का कलसा रखा रहता था। वहाँ पहुँचकर बरात फिर लौट आती थी। लौटने के समय, खटोली पर लाल ओहार[16] डालकर, उसमें दुलहिन को चढ़ा लिया जाता था। लौट आने पर बाबू जी ज्यों ही ओहार उघारकर दुलहिन का मुख निरखने लगते, त्यों ही हम लोग हँसकर भाग जाते।

थोड़ी देर बाद फिर लड़कों की मंडली जुट जाती थी। इकट्ठा होते ही राय जमती कि खेती की जाए। बस, चबूतरे के छोर पर घिरनी गड़ जाती और उसके नीचे की गली कुआँ बन जाती थी। मूँज की बटी हुई पतली रस्सी में एक चुक्कड़ बाँध गराड़ी पर चढ़ाकर लटका दिया जाता और दो लड़के बैल बनकर 'मोट' खींचने लग जाते। चबूतरा खेत बनता, कंकड़ बीज और ठेंगा हल-जुआठा। बड़ी मेहनत से खेत जोते-बोए और पटाए जाते। फसल तैयार होते देर न लगती और हम हाथोहाथ फसल काट लेते थे। काटते समय गाते थे–

ऊँच नीच में बई किचारी, जो उपजी सो भई हमारी।

फसल को एक जगह रखकर उसे पैरों से रौंद डालते थे। कसोरे[17] का सूप बनाकर ओसाते और मिट्टी की दीए के तराजू पर तौलकर राशि तैयार कर देते थे। इसी बीच बाबू जी आकर पूछ बैठते थे–इस साल की खेती कैसी रही भोलानाथ?

बस, फिर क्या, हम लोग ज्यों-का-त्यों खेत-खलिहान छोड़कर हँसते हुए भाग जाते थे। कैसी मौज की खेती थी।

ऐसे-ऐसे नाटक हम लोग बराबर खेला करते थे। बटोही भी कुछ देर ठिठककर हम लोगों के तमाशे देख लेते थे।

जब कभी हम लोग रदरी के मेले में जाने वाले आदमियों का झुंड देख पाते तब कूद-कूदकर चिल्लाने लगते थे–

चलो भाइयो रदरी, सतू पिसान की मोटरी।

अगर किसी दूल्हे के आगे-आगे जाती हुई ओहारदार पालकी देख पाते, तब खूब जोर से चिल्लाने लगते थे–

15. आम का उगता हुआ पौधा 16. परदे के लिए डाला हुआ कपड़ा
17. मिट्टी का बना छिछला कटोरा

रहरी[18] में रहरी पुरान रहरी, डोला के कनिया हमार मेहरी।

इसी पर एक बार बूढ़े वर ने हम लोगों को बहुत दूर तक खदेड़कर ढेलों से मारा था। उस खसूट-खब्बीस की सूरत आज तक हमें याद है। न जाने किस ससुर ने वैसा जमाई ढूँढ़ निकाला था। वैसा घोड़ मुँहा आदमी हमने कभी नहीं देखा।

आम की फसल में कभी-कभी खूब आँधी आती है। आँधी के कुछ दूर निकल जाने पर हम लोग बाग की ओर दौड़ पड़ते थे। वहाँ चुन-चुनकर घुले-घुले 'गोपी' आम चाबते थे।

एक दिन की बात है, आँधी आई और पट पड़ गयी। आकाश काले बादलों से ढक गया। मेघ गरजने लगे। बिजली कौंधने और ठंडी हवा सनसनाने लगी। पेड़ झूमने और जमीन चूमने लगे। हम लोग चिल्ला उठे–

एक पइसा की लाई, बाजार में छितराई, बरखा उधरे बिलाई।

लेकिन बरखा न रुकी; और भी मूसलाधार पानी होने लगा। हम लोग पेड़ों की जड़ से धड़ से सट गए, जैसे कुत्ते के कान में अँठई[19] चिपक जाती है। मगर बरखा जमी नहीं, थम गई।

बरखा बंद होते ही बाग में बहुत-से बिच्छू नजर आए। हम लोग डरकर भाग चले। हम लोगों में बैजू बड़ा ढीठ था। संयोग की बात, बीच में मूसन तिवारी मिल गए। बेचारे बूढ़े आदमी को सूझता कम था। बैजू उनको चिढ़ाकर बोला–

बुढ़वा बेईमान माँगे करैला का चोखा।

हम लोगों ने भी, बैजू के सुर-में-सुर मिलाकर यही चिल्लाना शुरू किया। मूसन तिवारी ने बेतहाशा खदेड़ा। हम लोग तो बस अपने-अपने घर की ओर आँधी हो चले।

जब हम लोग न मिल सके तब तिवारी जी सीधे पाठशाला में चले गए। वहाँ से हमको और बैजू को पकड़ लाने के लिए चार लड़के 'गिरफ्तारी वारंट' लेकर छूटे। इधर ज्यों ही हम लोग घर पहुँचे, त्यों ही गुरु जी के सिपाही हम लोगों पर टूट पड़े। बैजू तो नौ-दो ग्यारह हो गया; हम पकड़े गए। फिर तो गुरु जी ने हमारी खूब खबर ली।

बाबू जी ने यह हाल सुना। वह दौड़े हुए पाठशाला में आए। गोद में उठाकर हमें पुचकारने और फुसलाने लगे। पर हम दुलारने से चुप होनेवाले लड़के नहीं थे। रोते-रोते उनका कंधा आँसुओं से तर कर दिया। वह गुरु जी को चिरौरी[20] करके हमें घर ले चले। रास्ते में फिर हमारे साथी लड़कों का झुंड मिला। वे जोर से नाचते और गाते थे–

18. अरहर 19. कुत्ते के शरीर में चिपके रहने वाले छोटे कीड़े, किलनी
20. दीनतापूर्वक की जाने वाली प्रार्थना, विनती

माई पकाई गरर-गरर पूआ, हम खाइब पूआ, ना खेलब जुआ।

फिर क्या था, हमारा रोना-धोना भूल गया। हम हठ करके बाबू जी की गोद से उतर पड़े और लड़कों की मंडली में मिलकर लगे वही तान-सुर अलापने। तब तक सब लड़के सामनेवाले मकई के खेत में दौड़ पड़े। उसमें चिड़ियों का झुंड चर रहा था। वे दौड़-दौड़कर उन्हें पकड़ने लगे, पर एक भी हाथ न आई। हम खेत से अलग ही खड़े होकर गा रहे थे–

राम जी की चिरई, राम जी का खेत, खा लो चिरई, भर-भर पेट।

हमसे कुछ दूर बाबू जी और हमारे गाँव के कई आदमी खड़े होकर तमाशा देख रहे थे और यही कहकर हँसते थे कि 'चिड़िया की जान जाए, लड़कों का खिलौना'। सचमुच 'लड़के और बंदर पराई पीर नहीं समझते।'

एक टीले पर जाकर हम लोग चूहों के बिल से पानी उलीचने लगे।

नीचे से ऊपर पानी फेंकना था। हम सब थक गए। तब तक गणेश जी के चूहे की रक्षा के लिए शिव जी का साँप निकल आया। रोते-चिल्लाते हम लोग बेतहाशा भाग चले। कोई औंधा गिरा, कोई अंटाचित। किसी का सिर फूटा, किसी के दाँत टूटे। सभी गिरते-पड़ते भागे। हमारी सारी देह लहूलुहान हो गई। पैरों के तलवे काँटों से छलनी हो गए।

हम एक सुर से दौड़े हुए आए और घर में घुस गए। उस समय बाबू जी बैठक के ओसारे[21] में बैठकर हुक्का गुड़गुड़ा रहे थे। उन्होंने हमें बहुत पुकारा पर उनकी अनसुनी करके हम दौड़ते हुए मइयाँ के पास ही चले गए। जाकर उसी की गोद में शरण ली।

'मइयाँ' चावल अमनिया[22] कर रही थी। हम उसी के आँचल में छिप गए। हमें डर से काँपते देखकर वह ज़ोर से रो पड़ी और सब काम छोड़ बैठी। अधीर होकर हमारे भय का कारण पूछने लगी। कभी हमें अंग भरकर दबाती और कभी हमारे अंगों को अपने आँचल से पोंछकर हमें चूम लेती। बड़े संकट में पड़ गई।

झटपट हल्दी पीसकर हमारे घावों पर थोपी गई। घर में कुहराम मच गया। हम केवल धीमे सुर से "सीं...स...सीं" कहते हुए मइयाँ के आँचल में लुके चले जाते थे। सारा शरीर थर-थर काँप रहा था। रोंगटे खड़े हो गए थे। हम आँखें खोलना चाहते थे; पर वे खुलती न थीं। हमारे काँपते हुए ओंठों को मइयाँ बार-बार निहारकर रोती और बड़े लाड़ से हमें गले लगा लेती थी।

इसी समय बाबू जी दौड़े आए। आकर झट हमें मइयाँ की गोद से अपनी गोद में लेने लगे। पर हमने मइयाँ के आँचल की—प्रेम और शांति के चँदोवे की—छाया न छोड़ी...।

प्रश्न-अभ्यास

1. प्रस्तुत पाठ के आधार पर यह कहा जा सकता है कि अप्पे का अपने पिता से अधिक जुड़ाव था, फिर भी बिपदा के समय वह पिता के पास न जाकर माँ की शरण लेता है। आपकी समझ से इसकी क्या वजह हो सकती है?
2. आपके विचार से भोलानाथ अपने साथियों को देखकर सिसकना क्यों भूल जाता है?
3. आपने देखा होगा कि भोलानाथ और उसके साथी जब-तब खेलते-खाते समय किसी न किसी प्रकार की तुकबंदी करते हैं। आपको यदि अपने खेलों आदि से जुड़ी तुकबंदी याद हो तो लिखिए।
4. भोलानाथ और उसके साथियों के खेल और खेलने की सामग्री आपके खेल और खेलने की सामग्री से किस प्रकार भिन्न है?
5. पाठ में आए ऐसे प्रसंगों का वर्णन कीजिए जो आपके दिल को छू गए हों?
6. इस उपन्यास अंश में तीस के दशक की ग्राम्य संस्कृति का चित्रण है। आज की ग्रामीण संस्कृति में आपको किस तरह के परिवर्तन दिखाई देते हैं।
7. पाठ पढ़ते-पढ़ते आपको भी अपने माता-पिता का लाड़-प्यार याद आ रहा होगा। अपनी इन भावनाओं को डायरी में अंकित कीजिए।

21. बैठकखाना 22. साफ़, शुद्ध

8. यहाँ माता-पिता का बच्चे के प्रति जो वात्सल्य व्यक्त हुआ है उसे अपने शब्दों में लिखिए।
9. **माता का आँचल** शीर्षक की उपयुक्तता बताते हुए कोई अन्य शीर्षक सुझाइए।
10. बच्चे माता-पिता के प्रति अपने प्रेम को कैसे अभिव्यक्त करते हैं?
11. इस पाठ में बच्चों की जो दुनिया रची गई है वह आपके बचपन की दुनिया से किस तरह भिन्न है?
12. फणीश्वरनाथ रेणु और नागार्जुन की आंचलिक रचनाओं को पढ़िए।

CBSE Class–10 Hindi

NCERT Solutions

Kritika Chapter - 1

Mata ka Aanchal

1. प्रस्तुत पाठ के आधार पर यह कहा जा सकता है कि बच्चे का अपने पिता से अधिक जुड़ाव था, फिर भी विपदा के समय वह पिता के पास न जाकर माँ की शरण लेता है। आपकी समझ से इसकी क्या वजह हो सकती है ?

उत्तर:- बच्चे को हृदयस्पर्शी स्नेह की पहचान होती है। बच्चे को विपदा के समय अत्याधिक ममता और स्नेह की आवश्यकता थी। भोलानाथ का अपने पिता से अपार स्नेह था पर जब उस पर विपदा आई तो उसे जो शांति व प्रेम की छाया अपनी माँ की गोद में जाकर मिली, वह शायद उसे पिता से प्राप्त नहीं हो पाती। माँ के आँचल में बच्चा स्वयं को सुरक्षित महसूस करता है ।

2. आपके विचार से भोलानाथ अपने साथियों को देखकर सिसकना क्यों भूल जाता है ?

उत्तर:- भोलानाथ भी बच्चों की स्वाभाविक आदत के अनुसार अपनी उम्र के बच्चों के साथ खेलने में रुचि लेता है। उसे अपनी मित्र मंडली के साथ तरह-तरह की क्रीड़ा करना अच्छा लगता है। वे उसके हर खेल व हुड़दंग के साथी हैं। अपने मित्रों को मजा करते देख वह स्वयं को रोक नहीं पाता। इसलिए रोना भूलकर वह दुबारा अपनी मित्र मंडली में खेल का मजा उठाने लगता है। उसी मनोवस्था में वह सिसकना भी भूल जाता है।

3. आपने देखा होगा कि भोलानाथ और उसके साथी जब-तब खेलते-खाते समय किसी न किसी प्रकार की तुकबंदी करते हैं । आपको यदि अपने खेलों आदि से जुड़ी तुकबंदी याद हो तो लिखिए ।

उत्तर:- मुझे भी अपने बचपन के कुछ खेल और एक - आध तुकबन्दियाँ याद हैं :-

१ अटकन - बटकन दही चटाके,
बनफूल बंगाले।

२ अक्कड़ - बक्कड़ बम्बे बो,
अस्सी नब्बे पूरे सौ।

4. भोलानाथ और उसके साथियों के खेल और खेलने की सामग्री आपके खेल और खेलने की सामग्री से किस प्रकार भिन्न है ?

उत्तर:- भोलानाथ व उसके साथी खेल के लिए आँगन व खेतों पर पड़ी चीजों को ही अपने खेल का आधार बनाते हैं। उनके लिए मिट्टी के बर्तन, पत्थर, पेड़ों की पत्तियाँ, गीली मिट्टी, घर के समान आदि वस्तुएँ होती थीं जिनसे वे खेलते व खुश होते। आज जमाना बदल चुका है। आज माता-पिता अपने बच्चों का बहुत ध्यान रखते हैं। ये बच्चों को बेफिक्र अनुमति नहीं देते। हमारे खेलने के लिए आज क्रिकेट का सामान, भिन्न-भिन्न तरह के वीडियो गेम व कम्प्यूटर गेम आदि बहुत सी चीजें हैं, जो इनकी तुलना में बहुत अलग हैं। भोलानाथ जैसे बच्चों की वस्तुएँ सुलभता से व बिना मूल्य खर्च किए ही प्राप्त हो जाती हैं परन्तु आज खेल सामग्री स्वनिर्मित न होकर बाजार से खरीदनी पड़ती है। आज के युग में खेलने की समय-सीमा भी तय कर ली जाती है। अतः आज खेल में स्वच्छंदता नहीं होती है।

5. पाठ में आए ऐसे प्रसंगों का वर्णन कीजिए जो आपके दिल को छू गए हों।

उत्तर:- पाठ में ऐसे कई प्रसंग आए हैं जिन्होंने मेरे दिल को छू लिया -

(१) रामायण पाठ कर रहे अपने पिता के पास बैठे हुए भोलानाथ का आईने में अपनेआप को देखकर खुश होना और जब उसके पिताजी उसे देखते हैं तो लजाकर उसका आईना रख देने की अदा बड़ी प्यारी लगती है।

(२) बच्चे का अपने पिता के साथ कुश्ती लड़ना, शिथिल होकर बच्चे के बल को बढ़ावा देना और पछाड़ खा कर गिर जाना। बच्चे का अपने पिता की मूंछ खींचना और पिता का इसमें प्रसन्न होना आदि बड़े ही आनन्दमयी प्रसंग हैं।

(३) बच्चों द्वारा बारात का स्वांग रचते हुए समधी का बकरे पर सवार होना, दुल्हन को लिवा लाना व पिता द्वारा दुल्हन का घूँघट उठाने पर सब बच्चों का भाग जाना। बच्चों के खेल में एक ओर जहाँ समाज के प्रति उनका रुझान झलकता है तो दूसरी ओर उनकी नाटकीयता, स्वांग व उनका बचपना।

(४) कहानी के अन्त में भोलानाथ का माँ के आँचल में छिपना, सिसकना, माँ की चिंता, हल्दी लगाना और बाबू जी के बुलाने पर भी माँ की गोद न छोड़ना - एक मर्मस्पर्शी दृश्य उपस्थित करता है; अनायास माँ की याद दिला देता है।

---

6. इस उपन्यास अंश में तीस के दशक की ग्राम्य संस्कृति का चित्रण है। आज की ग्रामीण संस्कृति में आपको किस तरह के परिवर्तन दिखाई देते हैं ?

उत्तर:- १. गाँवों में हरे भरे खेतों के बीच वृक्षों के झुरमुट और ठंडी छाँव से घिरा कच्ची मिट्टी एवं छान का घर हुआ करता था। आज ज्यादातर गाँवों में पक्के मकान ही देखने मिलते हैं।

२. पहले गाँवों में भरे पूरे परिवार होते थे। आज एकल संस्कृति ने जन्म लिया है।

३. अब गाँवों में भी विज्ञान का प्रभाव बढ़ता जा रहा है; जैसे - लालटेन के स्थान पर बिजली, बैल के स्थान पर ट्रैक्टर का प्रयोग, घरेलू खाद के स्थान पर बाजार में उपलब्ध कृत्रिम खाद का प्रयोग तथा विदेशी दवाइयों का प्रयोग किया जा रहा है।

४. पहले की तुलना में अब किसानों (खेतिहर मजदूरों) की संख्या घट रही है।

५. पहले गाँव में लोग बहुत ही सीधा-सादा जीवन व्यतीत करते थे। आज बनावटीपन देखने मिलता है।

---

7. पाठ पढ़ते-पढ़ते आपको भी अपने माता-पिता का लाड़-प्यार याद आ रहा होगा। अपनी इन भावनाओं को डायरी में अंकित कीजिए।

उत्तर:- मुझे भी मेरे बचपन की एक घटना याद आ रही है जो नीचे वर्णित है -

मैं आँगन में खेल रहा था। कुछ बच्चे पत्थर फेंक कर पेड़ पर फँसी पतंग निकालने का प्रयास कर रहे थे।

अचानक एक पत्थर मेरी आँख पर लगा। मैं जोरों से रोने लगा। मुझे पीड़ा से रोता हुआ देखकर माँ भी रोने लगी फिर माँ और पिता जी मुझे डॉक्टर के पास ले गए। डॉक्टर ने जब कहा डरने की बात नहीं है तब दोनों की जान में जान आई।

---

8. यहाँ माता-पिता का बच्चे के प्रति जो वात्सल्य व्यक्त हुआ है, उसे अपने शब्दों में लिखिए।

उत्तर:- 'माता का अँचल' में माता-पिता के वात्सल्य का बहुत सरस और मनमोहक वर्णन हुआ है। इसमें लेखक ने अपने शैशव काल

का वर्णन किया है।

भोलानाथ के पिता के दिन का आरम्भ ही भोलानाथ के साथ शुरू होता है। उसे नहलाकर पूजा पाठ कराना, उसको अपने साथ घुमाने ले जाना, उसके साथ खेलना व उसकी बालसुलभ क्रीड़ा से प्रसन्न होना आदि उनके स्नेह व प्रेम को व्यक्त करता है।

भोलानाथ की माता वात्सल्य व ममत्व से भरी हुई है। भोलानाथ को भोजन कराने के लिए उनका भिन्न-भिन्न तरह से स्वांग रचना - एक स्नेही माता की ओर संकेत करता है। जो अपने पुत्र के भोजन को लेकर चिन्तित है। दूसरी ओर उसको लहूलुहान व भय से काँपता देखकर माँ स्वयं भी रोने व चिल्लाने लगती है। अपने पुत्र की ऐसी दशा देखकर माँ का हृदय भी दुखी हो जाता है। माँ का ममतालु मन इतना भावुक है कि वह बच्चे को डर के मारे काँपता देखकर रोने लगती है। उसकी ममता पाठक को बहुत प्रभावित करती है।

9. 'माता का अँचल' शीर्षक की उपयुक्तता बताते हुए कोई अन्य शीर्षक सुझाइए।

उत्तर:- लेखक ने इस कहानी के आरम्भ में दिखाया है कि भोलानाथ का ज्यादा से ज्यादा समय पिता के साथ बीतता है। कहानी का शीर्षक पहले तो पाठक को कुछ अटपटा-सा लगता है पर जैसे-जैसे कहानी आगे बढ़ती है बात समझ में आने लगती है। इस कहानी में माँ के आँचल की सार्थकता को समझाने का प्रयास किया गया है। भोलानाथ को माता व पिता दोनों से बहुत प्रेम मिला है। उसका दिन पिता की छत्रछाया में ही शुरू होता है। पिता उसकी हर क्रीड़ा में सदैव साथ रहते हैं, विपदा होने पर उसकी रक्षा करते हैं। परन्तु जब वह साँप से डरकर माता की गोद में आता है और माता की जो प्रतिक्रिया होती है, वैसी प्रतिक्रिया या उतनी तड़प एक पिता में नहीं हो सकती। माता उसके भय से भयभीत है, उसके दुःख से दुखी है, उसके आँसू से खिन्न है। वह अपने पुत्र की पीड़ा को देखकर अपनी सुधबुध खो देती है। वह बस इसी प्रयास में है कि वह अपने पुत्र की पीड़ा को समाप्त कर सके। माँ का यही प्रयास उसके बच्चे को आत्मीय सुख व प्रेम का अनुभव कराता है। उसके बाद तो बात शीशे की तरह साफ हो जाती है कि पाठ का शीर्षक 'माता का अँचल' क्यों उचित है ? पूरे पाठ में माँ की ममता ही प्रधान दिखती है, इसलिए कहा जा सकता है कि पाठ का शीर्षक सर्वथा उचित है। इसका अन्य शीर्षक हो सकता है - 'माँ की ममता'।

10. बच्चे माता-पिता के प्रति अपने प्रेम को कैसे अभिव्यक्त करते हैं ?

उत्तर:- बच्चे माता-पिता के प्रति अपने प्रेम की अभिव्यक्ति कई तरह से करते हैं -

१. माता-पिता के साथ विभिन्न प्रकार की बातें करके अपना प्यार व्यक्त करते हैं।

२. माता-पिता को कहानी सुनाने, कहीं घुमाने ले जाने की या अपने साथ खेलने को कहकर।

३. माता-पिता के साथ नाना-प्रकार के खेल खेलकर।

४. माता-पिता की गोद में बैठकर या पीठ पर सवार होकर।

५. वे अपने माता-पिता से रो-धोकर या जिद करके कुछ माँगते हैं और मिल जाने पर उनको विभिन्न तरह से प्यार करते हैं।

६. माता-पिता के साथ रहकर उनसे अपना प्यार व्यक्त करते हैं।

11. इस पाठ में बच्चों की जो दुनिया रची गई है l वह आपके बचपन की दुनिया से किस तरह भिन्न है?

उत्तर:- प्रस्तुत पाठ में बच्चों की जो दुनिया रची गई है l उसकी पृष्ठभूमि पूर्णतया ग्रामीण जीवन पर आधारित है। प्रस्तुत कहानी तीस के दशक की है। तत्कालीन समय में बच्चों के पास खेलने-कूदने का अधिक समय हुआ करता था। उनपर पढ़ाई करने का दबाव अब

जितना नहीं था। ये अलग बात है कि उस समय उनके पास खेलने के अधिक साधन नहीं थे। वे लोग अपने खेल प्रकृति से ही प्राप्त करते थे और उसी प्रकृति के साथ खेलते थे। उनके लिए मिट्टी, खेत, पानी, पेड़, मिट्टी के बर्तन आदि साधन थे। आज तीन वर्ष की उम्र होते ही बच्चों को नर्सरी में भर्ती करा दिया जाता है। आज के बच्चे विडियो गेम, टी.वी., कम्प्यूटर, शतरंज आदि खेलने में लगे रहते हैं या फिर क्रिकेट, फुटबॉल, हॉकी, बेडमिण्टन या कार्टून आदि में ही अपना समय बीता देते हैं।

12. फणीश्वरनाथ रेणु और नागार्जुन की आँचलिक रचनाओं को पढ़िए।

उत्तर:- १ फणीश्वरनाथ रेणु का उपन्यास 'मैला आँचल' पठनीय है।

२ नागार्जुन का उपन्यास 'बलचनमा' आँचलिक है।

……END……

Assignment 4 Time Table			
Subject- Hindi course A(002)			
Chapter- Mata Ka Anchal (Kritika-bhag -2)			
Date/ Day	Chapter with topic and video link (link should be visited a day before the class begins.)	Questions to be done on your own	Questions of difficulty level
29-06-2020/ Monday	Mata Ka Aanchal Kritika bhag 2		
1-7-2020/ Wednesday	https://youtu.be/Obc5XajhV9s	question no 3,6,	question 1and 2
30-6-2020/ Tuesday	Bholanath aur uske pita ji	question no 6,8	question no 5 ,7,9
2-7-2020 Thursday	https://youtu.be/Obc5XajhV9s		
6-7-2020 Monday	Bholanath aur uski mata ji	question no 4 and10	khel khel me ki jane wali tukbandion k arth
8-7-2020 Wednesday	https://youtu.be/Obc5XajhV9s		indoor games aur mahnge khilauno ke beech khota bachpan
7-7-2020Tuesday	sheershak ki sarthakata aur aaj ke bachpan par vichar vimarsh		bachche ke jeevan me mata ka sthan?
9-7-2020 Thursday	https://youtu.be/Obc5XajhV9s		

Assignment 4 Time Table			
Subject- Hindi course A(002)			
Chapter- Mata Ka Anchal (Kritika-bhag -2)			
Date/ Day	Chapter with topic and video link (link should be visited a day before the class begins.)	Questions to be done on your own	Questions of difficulty level
29-06-2020/ Monday	Mata Ka Aanchal Kritika bhag 2		
1-7-2020/ Wednesday	https://youtu.be/Obc5XajhV9s	question no 3,6,	question 1and 2
30-6-2020/ Tuesday	Bholanath aur uske pita ji	question no 6,8	question no 5 ,7,9
2-7-2020 Thursday	https://youtu.be/Obc5XajhV9s		
6-7-2020 Monday	Bholanath aur uski mata ji	question no 4 and10	khel khel me ki jane wali tukbandion k arth
8-7-2020 Wednesday	https://youtu.be/Obc5XajhV9s		indoor games aur mahnge khilauno ke beech khota bachpan
7-7-2020Tuesday	sheershak ki sarthakata aur aaj ke bachpan par vichar vimarsh		bachche ke jeevan me mata ka sthan?
9-7-2020 Thursday	https://youtu.be/Obc5XajhV9s		

Assignment 4 Time Table

Subject- Biology

Chapter-1 Life Processess - Excretion

Date/ Day	Chapter with topic and video link (link	Questions to be done on your own	Questions of difficulty level
3 July Friday	Chapter 1 : life Processess - Excretion	1. what is the importance of excretion?	1. explain the mechanism of excretion in Amoeba.
	1. Excretion in lower organisms like Amoeba	2. How the excretion occur in plant?	
	2. plant excretion		
	https://youtu.be/gxPiIBpDqKo		
4 July Saturday	Chapter 1 : life Processess - Excretion		
	1. Different types of excretory products.	1. Give an example of amnotelic organism.	1. Draw a well labelled diagram of human excretory system.
	2. Introduction about human excretory system.	2. Name an organism which excrete urea.	
	https://youtu.be/gxPiIBpDqKo		
10 July Friday	Chapter 1 : life Processess - Excretion		
	1. Structure of nephrone	1.name the functional unit of kidney	1. why the position nof both the kidneys are different?
	https://youtu.be/gxPiIBpDqKo		
11 July Saturday	Chapter 1 : life Processess - Excretion		
	1. mechanism of urine formation	1.what is GFR?	1. how the urine is formed?
	https://youtu.be/gxPiIBpDqKo	2. why the inner lining of bowman's capsule is perforated?	

Assignment 4 Time Table

Subject- Civics

Chapter- FEDERALISM

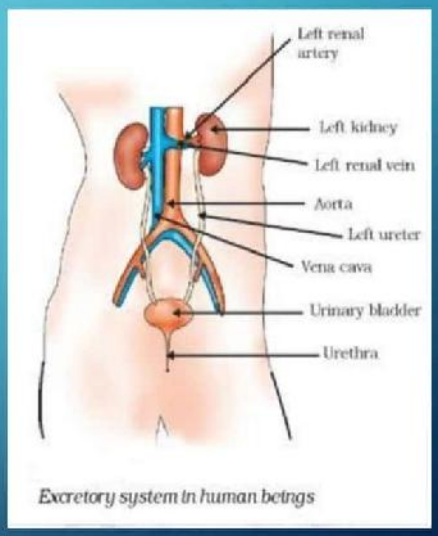
Date/ Day	Chapter with topic and video link (link should	Questions to be done on your own	Questions of difficulty level
1st July Wednesday	features of Federalism	exercise questions question no 4	
	https://m.youtube.com/watch?v=WqkBTXV1GAI&t=20s		
2nd July Thursday	what makes India a federal country	exercise questions 6,7,8,9	How can you say that India is a federal country?
3rd July Friday	distribution of legislative power between centre and state		
4th July Saturday	practice of Federalism	question 3 practice of Federalism	
	https://m.youtube.com/watch?v=-wHMYYj_NiQ		
8th July Wednesday	language policy centre state relationship		
9th July Thursday	Decentralisation in India		
10th july Friday	local self government		
11th July Saturday	limitations of local self government		How Federalism is practiced in India

WHAT IS EXCRETION ?

THE BIOLOGICAL PROCESS INVOLVED

IN THE REMOVAL OF HARMFUL WASTES

FROM THE BODY IS CALLED EXCRETION



Excretory system in human beings

EXCRETION IN HUMAN BEINGS

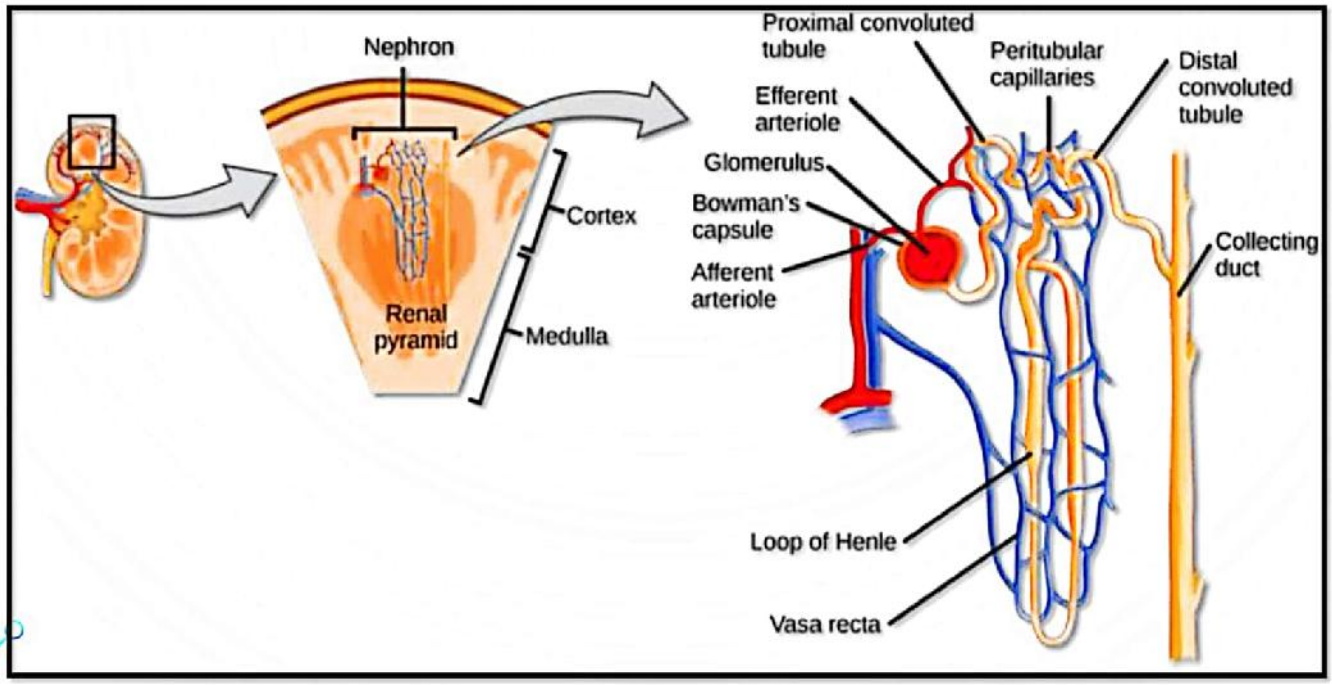
- The excretory system of human beings includes a pair of kidneys, a pair of ureters, a urinary bladder and a urethra.
- Urine produced in the kidneys passes through the ureters into the urinary bladder where it is stored until it is released through the urethra. Urine is made to filter out nitrogenous waste such as urea or uric acid from the blood.
- Capillary cluster in the kidney is associated with the cup shaped end of a tube that collects the filtered urine.Each kidney has large numbers of these filtration units called nephrons.

EXCRETION IN HUMAN BEINGS contd…

- Some substances in the initial filtrate such as glucose, amino acids, salts and a major amount of water are re-absorbed

- The Urine forming in each kidney eventually enters a long tube ,the ureter, which connects the kidneys with the urinary bladder .Urine is stored in the urinary bladder until the pressure of the expanded bladder leads to the urge to pass it out through the urethra.

Structure of a Nephron



EXCRETION IN PLANTS

- Plants get rid of excess water by transpiration .Many plant waste products are stored in cellular vacuoles .
- Waste products may be stored in leaves that fall off.Other waste products are stored as resins and gums in old xylem
- Plants also excrete some waste substances into the soil around them.

** For providing clarity and better understanding some of the content has been taken from Internet*

Class 10
Biology
Subject teacher: Ms.Shivani Tandon
Assignment 4

Assignment questions

a) Describe the structure and functioning of nephrons.

b) How is the amount of urine produced regulated?

c) What are the method used by plants to get rid of excretory products?

d) What is osmoregulation?

e) State two vital functions of the human kidney. Name the procedure used in the working of artificial kidney.

Class 10

Subject-Chemistry

Assignment 4

Lesson-Acids,Bases and Salts

By-Nivedita Sinha

Session - 2020-2021

https://diksha.gov.in/play/content/do_31299112878048870412 26?referrer=utm_source%3Ddiksha_mobile%26utm_content%3Ddo_31279645524573388812025 7%26utm_campaign%3Dshare_content

👆link for class X Chemistry tutorial.

Instructions for the students:

1. Download the diksha app from the play store.
2. Open the app and login as student.
3. Select the medium in which you want to study.
4. Now select the class 10
5. Select the subject.. Science
6. Open the second chapter in chemistry Acid Bases and salts.
7. Go through the explanation content in the video.
8. Try to solve exercises question answers mcqs etc

CHAPTER 2

Acids, Bases and Salts

You have learnt in your previous classes that the sour and bitter tastes of food are due to acids and bases, respectively, present in them.

If someone in the family is suffering from a problem of acidity after overeating, which of the following would you suggest as a remedy– lemon juice, vinegar or baking soda solution?

- Which property did you think of while choosing the remedy? Surely you must have used your knowledge about the ability of acids and bases to nullify each other's effect.
- Recall how we tested sour and bitter substances without tasting them.

You already know that acids are sour in taste and change the colour of blue litmus to red, whereas, bases are bitter and change the colour of the red litmus to blue. Litmus is a natural indicator, turmeric is another such indicator. Have you noticed that a stain of curry on a white cloth becomes reddish-brown when soap, which is basic in nature, is scrubbed on it? It turns yellow again when the cloth is washed with plenty of water. You can also use synthetic indicators such as methyl orange and phenolphthalein to test for acids and bases.

In this Chapter, we will study the reactions of acids and bases, how acids and bases cancel out each other's effects and many more interesting things that we use and see in our day-to-day life.

Do You Know?

Litmus solution is a purple dye, which is extracted from lichen, a plant belonging to the division Thallophyta, and is commonly used as an indicator. When the litmus solution is neither acidic nor basic, its colour is purple. There are many other natural materials like red cabbage leaves, turmeric, coloured petals of some flowers such as *Hydrangea*, *Petunia* and *Geranium*, which indicate the presence of acid or base in a solution. These are called acid-base indicators or sometimes simply indicators.

QUESTION

1. You have been provided with three test tubes. One of them contains distilled water and the other two contain an acidic solution and a basic solution, respectively. If you are given only red litmus paper, how will you identify the contents of each test tube?

2.1 UNDERSTANDING THE CHEMICAL PROPERTIES OF ACIDS AND BASES

2.1.1 Acids and Bases in the Laboratory

Activity 2.1

- Collect the following solutions from the science laboratory– hydrochloric acid (HCl), sulphuric acid (H_2SO_4), nitric acid (HNO_3), acetic acid (CH_3COOH), sodium hydroxide (NaOH), calcium hydroxide [$Ca(OH)_2$], potassium hydroxide (KOH), magnesium hydroxide [$Mg(OH)_2$], and ammonium hydroxide (NH_4OH).
- Put a drop of each of the above solutions on a watch glass one by one and test with a drop of the indicators shown in Table 2.1.
- What change in colour did you observe with red litmus, blue litmus, phenolphthalein and methyl orange solutions for each of the solutions taken?
- Tabulate your observations in Table 2.1.

Table 2.1

Sample solution	Red litmus solution	Blue litmus solution	Phenolph-thalein solution	Methyl orange solution

These indicators tell us whether a substance is acidic or basic by change in colour. There are some substances whose odour changes in acidic or basic media. These are called olfactory indicators. Let us try out some of these indicators.

Activity 2.2

- Take some finely chopped onions in a plastic bag along with some strips of clean cloth. Tie up the bag tightly and leave overnight in the fridge. The cloth strips can now be used to test for acids and bases.
- Take two of these cloth strips and check their odour.
- Keep them on a clean surface and put a few drops of dilute HCl solution on one strip and a few drops of dilute NaOH solution on the other.

- Rinse both cloth strips with water and again check their odour.
- Note your observations.
- Now take some dilute vanilla essence and clove oil and check their odour.
- Take some dilute HCl solution in one test tube and dilute NaOH solution in another. Add a few drops of dilute vanilla essence to both test tubes and shake well. Check the odour once again and record changes in odour, if any.
- Similarly, test the change in the odour of clove oil with dilute HCl and dilute NaOH solutions and record your observations.

Which of these – vanilla, onion and clove, can be used as olfactory indicators on the basis of your observations?

Let us do some more activities to understand the chemical properties of acids and bases.

2.1.2 How do Acids and Bases React with Metals?

Activity 2.3

CAUTION: This activity needs the teacher's assistance.

- Set the apparatus as shown in Fig. 2.1.
- Take about 5 mL of dilute sulphuric acid in a test tube and add a few pieces of zinc granules to it.
- What do you observe on the surface of zinc granules?
- Pass the gas being evolved through the soap solution.
- Why are bubbles formed in the soap solution?
- Take a burning candle near a gas filled bubble.
- What do you observe?
- Repeat this Activity with some more acids like HCl, HNO_3 and CH_3COOH.
- Are the observations in all the cases the same or different?

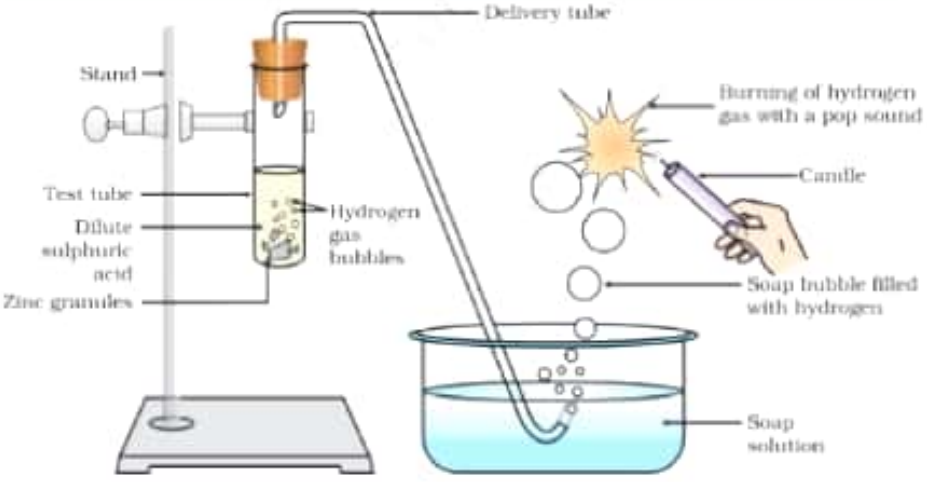


Figure 2.1 Reaction of zinc granules with dilute sulphuric acid and testing hydrogen

Note that the metal in the above reactions displaces hydrogen atoms from the acids as hydrogen gas and forms a compound called a salt. Thus, the reaction of a metal with an acid can be summarised as –

Acid + Metal → Salt + Hydrogen gas

Can you now write the equations for the reactions you have observed?

Activity 2.4

- Place a few pieces of granulated zinc metal in a test tube.
- Add 2 mL of sodium hydroxide solution and warm the contents of the test tube.
- Repeat the rest of the steps as in Activity 2.3 and record your observations.

The reaction that takes place can be written as follows.

$2NaOH(aq) + Zn(s) \rightarrow Na_2ZnO_2(s) + H_2(g)$

(Sodium zincate)

You find again that hydrogen is formed in the reaction. However, such reactions are not possible with all metals.

2.1.3 How do Metal Carbonates and Metal Hydrogencarbonates React with Acids?

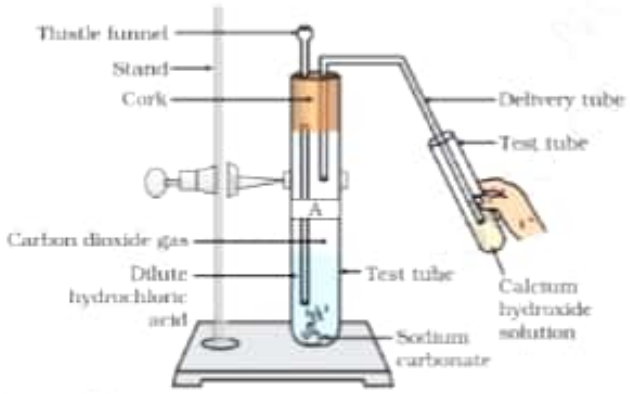


Figure 2.2
Passing carbon dioxide gas through calcium hydroxide solution

Activity 2.5

- Take two test tubes, label them as A and B.
- Take about 0.5 g of sodium carbonate (Na_2CO_3) in test tube A and about 0.5 g of sodium hydrogencarbonate ($NaHCO_3$) in test tube B.
- Add about 2 mL of dilute HCl to both the test tubes.
- What do you observe?
- Pass the gas produced in each case through lime water (calcium hydroxide solution) as shown in Fig. 2.2 and record your observations.

The reactions occurring in the above Activity are written as –

Test tube A: $Na_2CO_3(s) + 2\,HCl(aq) \rightarrow 2NaCl(aq) + H_2O(l) + CO_2(g)$

Test tube B: $NaHCO_3(s) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l) + CO_2(g)$

On passing the carbon dioxide gas evolved through lime water,

$Ca(OH)_2(aq) + CO_2(g) \rightarrow CaCO_3(s) + H_2O(l)$

(Lime water) (White precipitate)

On passing excess carbon dioxide the following reaction takes place:

$$CaCO_3(s) + H_2O(l) + CO_2(g) \rightarrow Ca(HCO_3)_2(aq)$$

(Soluble in water)

Limestone, chalk and marble are different forms of calcium carbonate. All metal carbonates and hydrogencarbonates react with acids to give a corresponding salt, carbon dioxide and water.

Thus, the reaction can be summarised as

Metal carbonate/Metal hydrogencarbonate + Acid → Salt + Carbon dioxide + Water

2.1.4 How do Acids and Bases React with each other?

Activity 2.6

- Take about 2 mL of dilute NaOH solution in a test tube and add two drops of phenolphthalein solution.
- What is the colour of the solution?
- Add dilute HCl solution to the above solution drop by drop.
- Is there any colour change for the reaction mixture?
- Why did the colour of phenolphthalein change after the addition of an acid?
- Now add a few drops of NaOH to the above mixture.
- Does the pink colour of phenolphthalein reappear?
- Why do you think this has happened?

In the above Activity, we have observed that the effect of a base is nullified by an acid and vice-versa. The reaction taking place is written as –

$$NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l)$$

The reaction between an acid and a base to give a salt and water is known as a neutralisation reaction. In general, a neutralisation reaction can be written as –

Base + Acid → Salt + Water

2.1.5 Reaction of Metallic Oxides with Acids

Activity 2.7

- Take a small amount of copper oxide in a beaker and add dilute hydrochloric acid slowly while stirring.
- Note the colour of the solution. What has happened to the copper oxide?

You will notice that the colour of the solution becomes blue-green and the copper oxide dissolves. The blue-green colour of the solution is due to the formation of copper(II) chloride in the reaction. The general reaction between a metal oxide and an acid can be written as –

Metal oxide + Acid → Salt + Water

Now write and balance the equation for the above reaction. Since metallic oxides react with acids to give salts and water, similar to the reaction of a base with an acid, metallic oxides are said to be basic oxides.

2.1.6 Reaction of a Non-metallic Oxide with Base

You saw the reaction between carbon dioxide and calcium hydroxide (lime water) in Activity 2.5. Calcium hydroxide, which is a base, reacts with carbon dioxide to produce a salt and water. Since this is similar to the reaction between a base and an acid, we can conclude that non-metallic oxides are acidic in nature.

Q U E S T I O N S

1. Why should curd and sour substances not be kept in brass and copper vessels?
2. Which gas is usually liberated when an acid reacts with a metal? Illustrate with an example. How will you test for the presence of this gas?
3. Metal compound A reacts with dilute hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle. Write a balanced chemical equation for the reaction if one of the compounds formed is calcium chloride.

2.2 WHAT DO ALL ACIDS AND ALL BASES HAVE IN COMMON?

In Section 2.1 we have seen that all acids have similar chemical properties. What leads to this similarity in properties? We saw in Activity 2.3 that all acids generate hydrogen gas on reacting with metals, so hydrogen seems to be common to all acids. Let us perform an Activity to investigate whether all compounds containing hydrogen are acidic.

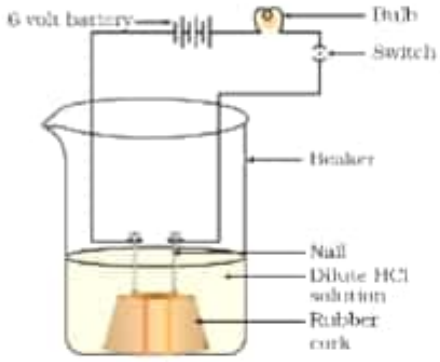


Figure 2.3
Acid solution in water conducts electricity

Activity 2.8

- Take solutions of glucose, alcohol, hydrochloric acid, sulphuric acid, etc.
- Fix two nails on a cork, and place the cork in a 100 mL beaker.
- Connect the nails to the two terminals of a 6 volt battery through a bulb and a switch, as shown in Fig. 2.3.
- Now pour some dilute HCl in the beaker and switch on the current.
- Repeat with dilute sulphuric acid.
- What do you observe?
- Repeat the experiment separately with glucose and alcohol solutions. What do you observe now?
- Does the bulb glow in all cases?

The bulb will start glowing in the case of acids, as shown in Fig. 2.3. But you will observe that glucose and alcohol solutions do not conduct electricity. Glowing of the bulb indicates that there is a flow of electric current through the solution. The electric current is carried through the acidic solution by ions.

Acids contain H^+ ion as cation and anion such as Cl^- in HCl, NO_3^- in HNO_3, SO_4^{2-} in H_2SO_4, CH_3COO^- in CH_3COOH. Since the cation present in acids is H^+, this suggests that acids produce hydrogen ions, H (aq), in solution, which are responsible for their acidic properties.

Repeat the same Activity using alkalis such as sodium hydroxide, calcium hydroxide, etc. What can you conclude from the results of this Activity?

2.2.1 What Happens to an Acid or a Base in a Water Solution?

Do acids produce ions only in aqueous solution? Let us test this.

Activity 2.9

- Take about 1g solid NaCl in a clean and dry test tube and set up the apparatus as shown in Fig. 2.4.
- Add some concentrated sulphuric acid to the test tube.
- What do you observe? Is there a gas coming out of the delivery tube?
- Test the gas evolved successively with dry and wet blue litmus paper.
- In which case does the litmus paper change colour?
- On the basis of the above Activity, what do you infer about the acidic character of:
  (i) dry HCl gas
  (ii) HCl solution?

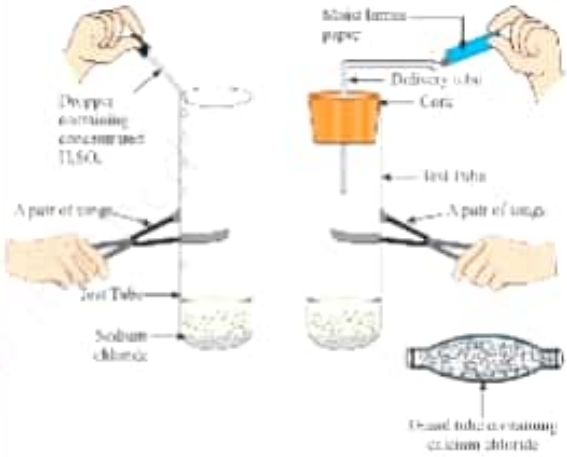


Figure 2.4 Preparation of HCl gas

Note to teachers: If the climate is very humid, you will have to pass the gas produced through a guard tube (drying tube) containing calcium chloride to dry the gas.

This experiment suggests that hydrogen ions in HCl are produced in the presence of water. The separation of H^+ ion from HCl molecules cannot occur in the absence of water.

$$HCl + H_2O \rightarrow H_3O^+ + Cl^-$$

Hydrogen ions cannot exist alone, but they exist after combining with water molecules. Thus hydrogen ions must always be shown as $H^+(aq)$ or hydronium ion (H_3O^+).

$$H^+ + H_2O \rightarrow H_3O^+$$

We have seen that acids give H_3O^+ or $H^+(aq)$ ion in water. Let us see what happens when a base is dissolved in water.

$$NaOH(s) \xrightarrow{H_2O} Na^+(aq) + OH^-(aq)$$

$$KOH(s) \xrightarrow{H_2O} K^+(aq) + OH^-(aq)$$

$$Mg(OH)_2(s) \xrightarrow{H_2O} Mg^{2+}(aq) + 2OH^-(aq)$$

Bases generate hydroxide (OH^-) ions in water. Bases which are soluble in water are called alkalis.

Do You Know?

All bases do not dissolve in water. An alkali is a base that dissolves in water. They are soapy to touch, bitter and corrosive. Never taste or touch them as they may cause harm. Which of the bases in the Table 2.1 are alkalis?

Now as we have identified that all acids generate $H^+(aq)$ and all bases generate $OH^-(aq)$, we can view the neutralisation reaction as follows –

$$Acid + Base \rightarrow Salt + Water$$

$$H\boxed{X + M}OH \rightarrow MX + HOH$$

$$H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$$

Let us see what is involved when water is mixed with an acid or a base.

Figure 2.5
Warning sign displayed on containers containing concentrated acids and bases

Activity 2.10

- Take 10 mL water in a beaker.
- Add a few drops of concentrated H_2SO_4 to it and swirl the beaker slowly.
- Touch the base of the beaker.
- Is there a change in temperature?
- Is this an exothermic or endothermic process?
- Repeat the above Activity with sodium hydroxide pellets and record your observations.

The process of dissolving an acid or a base in water is a highly exothermic one. Care must be taken while mixing concentrated nitric acid or sulphuric acid with water. The acid must always be added slowly to water with constant stirring. If water is added to a concentrated acid, the heat generated may cause the mixture to splash out and cause burns. The glass container may also break due to excessive local heating. Look out for the warning sign (shown in Fig. 2.5) on the can of concentrated sulphuric acid and on the bottle of sodium hydroxide pellets.

Mixing an acid or base with water results in decrease in the concentration of ions (H_3O^+/OH^-) per unit volume. Such a process is called dilution and the acid or the base is said to be diluted.

QUESTIONS

1. Why do HCl, HNO_3, etc., show acidic characters in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character?
2. Why does an aqueous solution of an acid conduct electricity?
3. Why does dry HCl gas not change the colour of the dry litmus paper?
4. While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?
5. How is the concentration of hydronium ions (H_3O^+) affected when a solution of an acid is diluted?
6. How is the concentration of hydroxide ions (OH^-) affected when excess base is dissolved in a solution of sodium hydroxide?

2.3 HOW STRONG ARE ACID OR BASE SOLUTIONS?

We know how acid-base indicators can be used to distinguish between an acid and a base. We have also learnt in the previous section about dilution and decrease in concentration of H^+ or OH^- ions in solutions. Can we quantitatively find the amount of these ions present in a solution? Can we judge how strong a given acid or base is?

We can do this by making use of a universal indicator, which is a mixture of several indicators. The universal indicator shows different colours at different concentrations of hydrogen ions in a solution.

A scale for measuring hydrogen ion concentration in a solution, called pH scale has been developed. The p in pH stands for '*potenz*' in German, meaning power. On the pH scale we can measure pH generally from 0 (very acidic) to 14 (very alkaline). pH should be thought of simply as a number which indicates the acidic or basic nature of a solution. Higher the hydronium ion concentration, lower is the pH value.

The pH of a neutral solution is 7. Values less than 7 on the pH scale represent an acidic solution. As the pH value increases from 7 to 14, it represents an increase in OH^- ion concentration in the solution, that is, increase in the strength of alkali (Fig. 2.6). Generally paper impregnated with the universal indicator is used for measuring pH.

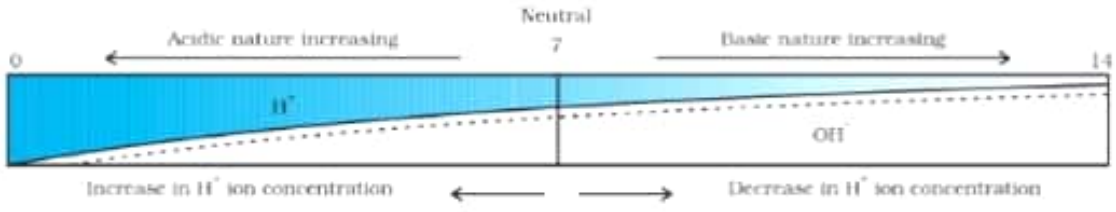


Figure 2.6 *Variation of* pH *with the change in concentration of* $H^+(aq)$ *and* $OH^-(aq)$ *ions*

Activity 2.11

- Test the pH values of solutions given in Table 2.2.
- Record your observations.
- What is the nature of each substance on the basis of your observations?

Table 2.2

S. No.	Solution	Colour of pH paper	Approx-imate pH value	Nature of substance
1	Saliva (before meal)			
2	Saliva (after meal)			
3	Lemon juice			
4	Colourless aerated drink			
5	Carrot juice			
6	Coffee			
7	Tomato juice			
8	Tap water			
9	1M NaOH			
10	1M HCl			

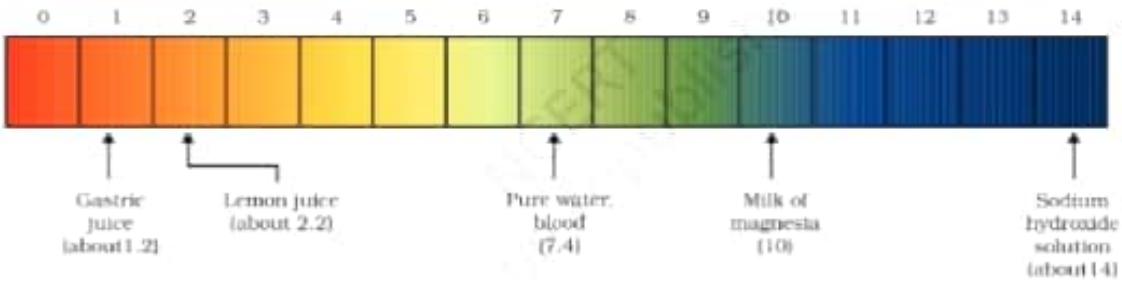


Figure 2.7 *pH of some common substances shown on a pH paper (colours are only a rough guide)*

The strength of acids and bases depends on the number of H^+ ions and OH^- ions produced, respectively. If we take hydrochloric acid and acetic acid of the same concentration, say one molar, then these produce different amounts of hydrogen ions. Acids that give rise to more H^+ ions are said to be strong acids, and acids that give less H^+ ions are said to be weak acids. Can you now say what weak and strong bases are?

2.3.1 Importance of pH in Everyday Life

Are plants and animals pH sensitive?

Our body works within the pH range of 7.0 to 7.8. Living organisms can survive only in a narrow range of pH change. When pH of rain water is less than 5.6, it is called acid rain. When acid rain flows into the rivers, it lowers the pH of the river water. The survival of aquatic life in such rivers becomes difficult.

Do You Know?

Acids in other planets

The atmosphere of venus is made up of thick white and yellowish clouds of sulphuric acid. Do you think life can exist on this planet?

What is the pH of the soil in your backyard?

Plants require a specific pH range for their healthy growth. To find out the pH required for the healthy growth of a plant, you can collect the soil from various places and check the pH in the manner described below in Activity 2.12. Also, you can note down which plants are growing in the region from which you have collected the soil.

Activity 2.12

- Put about 2 g soil in a test tube and add 5 mL water to it.
- Shake the contents of the test tube.
- Filter the contents and collect the filtrate in a test tube.
- Check the pH of this filtrate with the help of universal indicator paper.
- What can you conclude about the ideal soil pH for the growth of plants in your region?

pH in our digestive system

It is very interesting to note that our stomach produces hydrochloric acid. It helps in the digestion of food without harming the stomach. During indigestion the stomach produces too much acid and this causes pain and irritation. To get rid of this pain, people use bases called antacids. One such remedy must have been suggested by you at the beginning of this Chapter. These antacids neutralise the excess acid. Magnesium hydroxide (Milk of magnesia), a mild base, is often used for this purpose.

pH change as the cause of tooth decay

Tooth decay starts when the pH of the mouth is lower than 5.5. Tooth enamel, made up of calcium hydroxyapatite (a crystalline form of calcium phosphate) is the hardest substance in the body. It does not dissolve in water, but is corroded when the pH in the mouth is below 5.5. Bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating. The best way to prevent this is to clean the mouth after eating food. Using toothpastes, which are generally basic, for cleaning the teeth can neutralise the excess acid and prevent tooth decay.

Self defence by animals and plants through chemical warfare

Have you ever been stung by a honey-bee? Bee-sting leaves an acid which causes pain and irritation. Use of a mild base like baking soda on the stung area gives relief. Stinging hair of nettle leaves inject methanoic acid causing burning pain.

Do You Know?

Nature provides neutralisation options

Nettle is a herbaceous plant which grows in the wild. Its leaves have stinging hair, which cause painful stings when touched accidentally. This is due to the methanoic acid secreted by them. A traditional remedy is rubbing the area with the leaf of the dock plant, which often grows beside the nettle in the wild. Can you guess the nature of the dock plant? So next time you know what to look out for if you accidentally touch a nettle plant while trekking. Are you aware of any other effective traditional remedies for such stings?

Table 2.3 Some naturally occurring acids

Natural source	Acid	Natural source	Acid
Vinegar	Acetic acid	Sour milk (Curd)	Lactic acid
Orange	Citric acid	Lemon	Citric acid
Tamarind	Tartaric acid	Ant sting	Methanoic acid
Tomato	Oxalic acid	Nettle sting	Methanoic acid

QUESTIONS

1. You have two solutions, A and B. The pH of solution A is 6 and pH of solution B is 8. Which solution has more hydrogen ion concentration? Which of this is acidic and which one is basic?
2. What effect does the concentration of $H^+(aq)$ ions have on the nature of the solution?
3. Do basic solutions also have $H^+(aq)$ ions? If yes, then why are these basic?
4. Under what soil condition do you think a farmer would treat the soil of his fields with quick lime (calcium oxide) or slaked lime (calcium hydroxide) or chalk (calcium carbonate)?

2.4 MORE ABOUT SALTS

In the previous sections we have seen the formation of salts during various reactions. Let us understand more about their preparation, properties and uses.

2.4.1 Family of Salts

Activity 2.13

- Write the chemical formulae of the salts given below.
  Potassium sulphate, sodium sulphate, calcium sulphate, magnesium sulphate, copper sulphate, sodium chloride, sodium nitrate, sodium carbonate and ammonium chloride.

- Identify the acids and bases from which the above salts may be obtained.
- Salts having the same positive or negative radicals are said to belong to a family. For example, NaCl and Na_2SO_4 belong to the family of sodium salts. Similarly, NaCl and KCl belong to the family of chloride salts. How many families can you identify among the salts given in this Activity?

2.4.2 pH of Salts

Activity 2.14

- Collect the following salt samples – sodium chloride, potassium nitrate, aluminium chloride, zinc sulphate, copper sulphate, sodium acetate, sodium carbonate and sodium hydrogencarbonate (some other salts available can also be taken).
- Check their solubility in water (use distilled water only).
- Check the action of these solutions on litmus and find the pH using a pH paper.
- Which of the salts are acidic, basic or neutral?
- Identify the acid or base used to form the salt.
- Report your observations in Table 2.4.

Salts of a strong acid and a strong base are neutral with pH value of 7. On the other hand, salts of a strong acid and weak base are acidic with pH value less than 7 and those of a strong base and weak acid are basic in nature, with pH value more than 7.

Table 2.4

Salt	pH	Acid used	Base used

2.4.3 Chemicals from Common Salt

By now you have learnt that the salt formed by the combination of hydrochloric acid and sodium hydroxide solution is called sodium chloride. This is the salt that you use in food. You must have observed in the above Activity that it is a neutral salt.

Seawater contains many salts dissolved in it. Sodium chloride is separated from these salts. Deposits of solid salt are also found in several parts of the world. These large crystals are often brown due to impurities. This is called rock salt. Beds of rock salt were formed when seas of bygone ages dried up. Rock salt is mined like coal.

You must have heard about Mahatma Gandhi's *Dandi March*. Did you know that sodium chloride was such an important symbol in our struggle for freedom?

Common salt — A raw material for chemicals

The common salt thus obtained is an important raw material for various materials of daily use, such as sodium hydroxide, baking soda, washing soda, bleaching powder and many more. Let us see how one substance is used for making all these different substances.

Sodium hydroxide

When electricity is passed through an aqueous solution of sodium chloride (called brine), it decomposes to form sodium hydroxide. The process is called the chlor-alkali process because of the products formed–chlor for chlorine and alkali for sodium hydroxide.

$$2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$$

Chlorine gas is given off at the anode, and hydrogen gas at the cathode. Sodium hydroxide solution is formed near the cathode. The three products produced in this process are all useful. Figure 2.8 shows the different uses of these products.

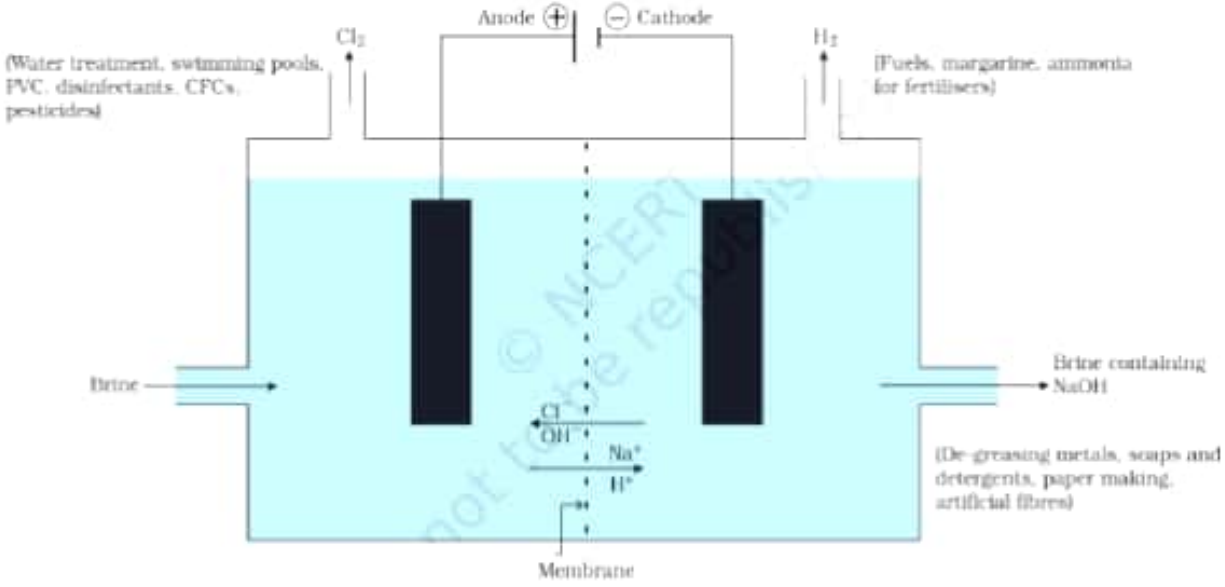


Figure 2.8 *Important products from the chlor-alkali process*

Bleaching powder

You have already come to know that chlorine is produced during the electrolysis of aqueous sodium chloride (brine). This chlorine gas is used for the manufacture of bleaching powder. Bleaching powder is produced by the action of chlorine on dry slaked lime [$Ca(OH)_2$]. Bleaching powder is represented as $CaOCl_2$, though the actual composition is quite complex.

$$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$$

Bleaching powder is used –

(i) for bleaching cotton and linen in the textile industry, for bleaching wood pulp in paper factories and for bleaching washed clothes in laundry;

(ii) as an oxidising agent in many chemical industries; and

(iii) to make drinking water free from germs.

Baking soda

The baking soda is commonly used in the kitchen for making tasty crispy pakoras, etc. Sometimes it is added for faster cooking. The chemical name of the compound is sodium hydrogencarbonate ($NaHCO_3$). It is produced using sodium chloride as one of the raw materials.

$$NaCl + H_2O + CO_2 + NH_3 \rightarrow \underset{\text{(Ammonium chloride)}}{NH_4Cl} + \underset{\text{(Sodium hydrogencarbonate)}}{NaHCO_3}$$

Did you check the pH of sodium hydrogencarbonate in Activity 2.14? Can you correlate why it can be used to neutralise an acid? It is a mild non-corrosive basic salt. The following reaction takes place when it is heated during cooking –

$$\underset{\text{(Sodium hydrogencarbonate)}}{2NaHCO_3} \xrightarrow{\text{Heat}} \underset{\text{(Sodium carbonate)}}{Na_2CO_3} + H_2O + CO_2$$

Sodium hydrogencarbonate has got various uses in the household.

Uses of Baking soda

(i) For making baking powder, which is a mixture of baking soda (sodium hydrogencarbonate) and a mild edible acid such as tartaric acid. When baking powder is heated or mixed in water, the following reaction takes place –

$$NaHCO_3 + H^+ \rightarrow CO_2 + H_2O + \text{Sodium salt of acid}$$
(From any acid)

Carbon dioxide produced during the reaction can cause bread or cake to rise making them soft and spongy.

(ii) Sodium hydrogencarbonate is also an ingredient in antacids. Being alkaline, it neutralises excess acid in the stomach and provides relief.

(iii) It is also used in soda-acid fire extinguishers.

Washing soda

Another chemical that can be obtained from sodium chloride is $Na_2CO_3.10H_2O$ (washing soda). You have seen above that sodium carbonate can be obtained by heating baking soda; recrystallisation of sodium carbonate gives washing soda. It is also a basic salt.

$$\underset{\text{(Sodium carbonate)}}{Na_2CO_3} + 10H_2O \rightarrow Na_2CO_3.10H_2O$$

What does $10H_2O$ signify? Does it make Na_2CO_3 wet? We will address this question in the next section.

Sodium carbonate and sodium hydrogencarbonate are useful chemicals for many industrial processes as well.

Uses of washing soda

(i) Sodium carbonate (washing soda) is used in glass, soap and paper industries.
(ii) It is used in the manufacture of sodium compounds such as borax.
(iii) Sodium carbonate can be used as a cleaning agent for domestic purposes.
(iv) It is used for removing permanent hardness of water.

2.4.4 Are the Crystals of Salts really Dry?

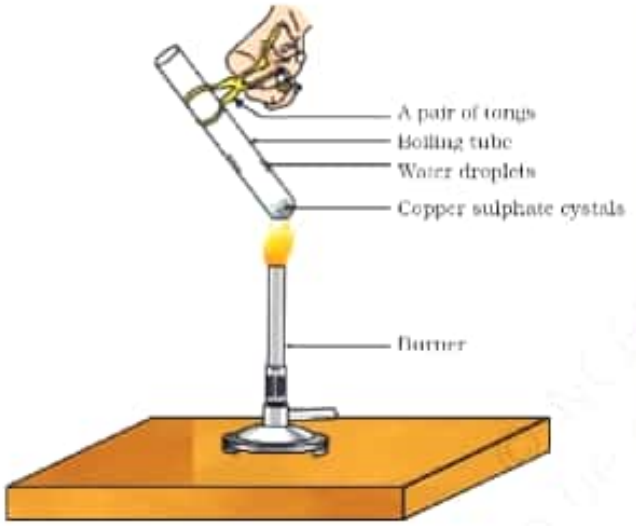


Figure 2.9
Removing water of crystallisation

Activity 2.15

- Heat a few crystals of copper sulphate in a dry boiling tube.
- What is the colour of the copper sulphate after heating?
- Do you notice water droplets in the boiling tube? Where have these come from?
- Add 2-3 drops of water on the sample of copper sulphate obtained after heating.
- What do you observe? Is the blue colour of copper sulphate restored?

Copper sulphate crystals which seem to be dry contain water of crystallisation. When we heat the crystals, this water is removed and the salt turns white.

If you moisten the crystals again with water, you will find that blue colour of the crystals reappears.

Water of crystallisation is the fixed number of water molecules present in one formula unit of a salt. Five water molecules are present in one formula unit of copper sulphate. Chemical formula for hydrated copper sulphate is $Cu\,SO_4.5H_2O$. Now you would be able to answer the question whether the molecule of $Na_2CO_3.10H_2O$ is wet.

One other salt, which possesses water of crystallisation is gypsum. It has two water molecules as water of cyrstallisation. It has the chemical formula $CaSO_4.2H_2O$. Let us look into the use of this salt.

Plaster of Paris

On heating gypsum at 373 K, it loses water molecules and becomes calcium sulphate hemihydrate ($CaSO_4.\frac{1}{2}H_2O$). This is called Plaster of

Paris, the substance which doctors use as plaster for supporting fractured bones in the right position. Plaster of Paris is a white powder and on mixing with water, it changes to gypsum once again giving a hard solid mass.

$$\underset{\text{(Plaster of Paris)}}{CaSO_4 \cdot \frac{1}{2} H_2O} + 1\frac{1}{2} H_2O \rightarrow \underset{\text{(Gypsum)}}{CaSO_4 \cdot 2H_2O}$$

Note that only half a water molecule is shown to be attached as water of crystallisation. How can you get half a water molecule? It is written in this form because two formula units of $CaSO_4$ share one molecule of water. Plaster of Paris is used for making toys, materials for decoration and for making surfaces smooth. Try to find out why is calcium sulphate hemihydrate called 'Plaster of Paris' ?

QUESTIONS

1. What is the common name of the compound $CaOCl_2$?
2. Name the substance which on treatment with chlorine yields bleaching powder.
3. Name the sodium compound which is used for softening hard water.
4. What will happen if a solution of sodium hydrocarbonate is heated? Give the equation of the reaction involved.
5. Write an equation to show the reaction between Plaster of Paris and water.

What you have learnt

- Acid-base indicators are dyes or mixtures of dyes which are used to indicate the presence of acids and bases.
- Acidic nature of a substance is due to the formation of $H^+(aq)$ ions in solution. Formation of $OH^-(aq)$ ions in solution is responsible for the basic nature of a substance.
- When an acid reacts with a metal, hydrogen gas is evolved and a corresponding salt is formed.
- When a base reacts with a metal, along with the evolution of hydrogen gas a salt is formed which has a negative ion composed of the metal and oxygen.
- When an acid reacts with a metal carbonate or metal hydrogencarbonate, it gives the corresponding salt, carbon dioxide gas and water.
- Acidic and basic solutions in water conduct electricity because they produce hydrogen and hydroxide ions respectively.

EXERCISES

1. A solution turns red litmus blue, its pH is likely to be
   (a) 1 (b) 4 (c) 5 (d) 10
2. A solution reacts with crushed egg-shells to give a gas that turns lime-water milky. The solution contains
   (a) NaCl (b) HCl (c) LiCl (d) KCl
3. 10 mL of a solution of NaOH is found to be completely neutralised by 8 mL of a given solution of HCl. If we take 20 mL of the same solution of NaOH, the amount HCl solution (the same solution as before) required to neutralise it will be
   (a) 4 mL (b) 8 mL (c) 12 mL (d) 16 mL
4. Which one of the following types of medicines is used for treating indigestion?
   (a) Antibiotic
   (b) Analgesic
   (c) Antacid
   (d) Antiseptic
5. Write word equations and then balanced equations for the reaction taking place when –
   (a) dilute sulphuric acid reacts with zinc granules.
   (b) dilute hydrochloric acid reacts with magnesium ribbon.
   (c) dilute sulphuric acid reacts with aluminium powder.
   (d) dilute hydrochloric acid reacts with iron filings.
6. Compounds such as alcohols and glucose also contain hydrogen but are not categorised as acids. Describe an Activity to prove it.
7. Why does distilled water not conduct electricity, whereas rain water does?

8. Why do acids not show acidic behaviour in the absence of water?
9. Five solutions A,B,C,D and E when tested with universal indicator showed pH as 4,1,11,7 and 9, respectively. Which solution is
   (a) neutral?
   (b) strongly alkaline?
   (c) strongly acidic?
   (d) weakly acidic?
   (e) weakly alkaline?

   Arrange the pH in increasing order of hydrogen-ion concentration.
10. Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A, while acetic acid (CH_3COOH) is added to test tube B. Amount and concentration taken for both the acids are same. In which test tube will the fizzing occur more vigorously and why?
11. Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd? Explain your answer.
12. A milkman adds a very small amount of baking soda to fresh milk.
   (a) Why does he shift the pH of the fresh milk from 6 to slightly alkaline?
   (b) Why does this milk take a long time to set as curd?
13. Plaster of Paris should be stored in a moisture-proof container. Explain why?
14. What is a neutralisation reaction? Give two examples.
15. Give two important uses of washing soda and baking soda.

(II) **Preparing a soda-acid fire extinguisher**

The reaction of acids with metal hydrogencarbonates is used in the fire extinguishers which produce carbon dioxide.

- Take 20 mL of sodium hydrogencarbonate ($NaHCO_3$) solution in a wash-bottle.
- Suspend an ignition tube containing dilute sulphuric acid in the wash-bottle (Fig. 2.10).
- Close the mouth of the wash-bottle.
- Tilt the wash-bottle so that the acid from the ignition tube mixes with the sodium hydrogencarbonate solution below.
- You will notice discharge coming out of the nozzle.
- Direct this discharge on a burning candle. What happens?

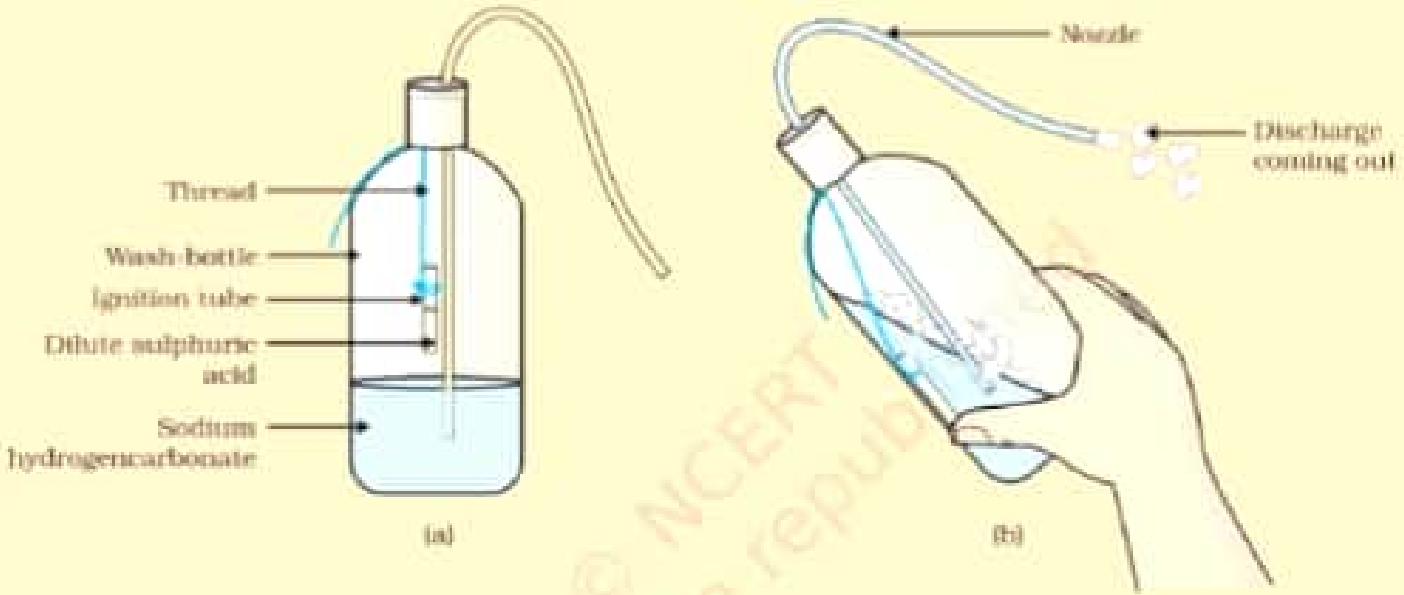


Figure 2.10 *(a) Ignition tube containing dilute sulphuric acid suspended in a wash-bottle containing sodium hydrogencarbonate, (b) Discharge coming out of the nozzle*

Class 10

Subject-Chemistry

Assignment 4

Lesson-Acids,Bases and Salts

By-Nivedita Sinha

Session - 2020-2021

https://diksha.gov.in/play/content/do_31299112878048870412 26?referrer=utm_source%3Ddiksha_mobile%26utm_content%3Ddo_31279645524573388812025 7%26utm_campaign%3Dshare_content

👆link for class X Chemistry tutorial.

Instructions for the students:

1. Download the diksha app from the play store.
2. Open the app and login as student.
3. Select the medium in which you want to study.
4. Now select the class 10
5. Select the subject.. Science
6. Open the second chapter in chemistry Acid Bases and salts.
7. Go through the explanation content in the video.
8. Try to solve exercises question answers mcqs etc

CHAPTER 2

Acids, Bases and Salts

You have learnt in your previous classes that the sour and bitter tastes of food are due to acids and bases, respectively, present in them.

If someone in the family is suffering from a problem of acidity after overeating, which of the following would you suggest as a remedy– lemon juice, vinegar or baking soda solution?

- Which property did you think of while choosing the remedy? Surely you must have used your knowledge about the ability of acids and bases to nullify each other's effect.
- Recall how we tested sour and bitter substances without tasting them.

You already know that acids are sour in taste and change the colour of blue litmus to red, whereas, bases are bitter and change the colour of the red litmus to blue. Litmus is a natural indicator, turmeric is another such indicator. Have you noticed that a stain of curry on a white cloth becomes reddish-brown when soap, which is basic in nature, is scrubbed on it? It turns yellow again when the cloth is washed with plenty of water. You can also use synthetic indicators such as methyl orange and phenolphthalein to test for acids and bases.

In this Chapter, we will study the reactions of acids and bases, how acids and bases cancel out each other's effects and many more interesting things that we use and see in our day-to-day life.

Do You Know?

Litmus solution is a purple dye, which is extracted from lichen, a plant belonging to the division Thallophyta, and is commonly used as an indicator. When the litmus solution is neither acidic nor basic, its colour is purple. There are many other natural materials like red cabbage leaves, turmeric, coloured petals of some flowers such as *Hydrangea*, *Petunia* and *Geranium*, which indicate the presence of acid or base in a solution. These are called acid-base indicators or sometimes simply indicators.

QUESTION

1. You have been provided with three test tubes. One of them contains distilled water and the other two contain an acidic solution and a basic solution, respectively. If you are given only red litmus paper, how will you identify the contents of each test tube?

2.1 UNDERSTANDING THE CHEMICAL PROPERTIES OF ACIDS AND BASES

2.1.1 Acids and Bases in the Laboratory

Activity 2.1

- Collect the following solutions from the science laboratory– hydrochloric acid (HCl), sulphuric acid (H_2SO_4), nitric acid (HNO_3), acetic acid (CH_3COOH), sodium hydroxide (NaOH), calcium hydroxide [$Ca(OH)_2$], potassium hydroxide (KOH), magnesium hydroxide [$Mg(OH)_2$], and ammonium hydroxide (NH_4OH).
- Put a drop of each of the above solutions on a watch glass one by one and test with a drop of the indicators shown in Table 2.1.
- What change in colour did you observe with red litmus, blue litmus, phenolphthalein and methyl orange solutions for each of the solutions taken?
- Tabulate your observations in Table 2.1.

Table 2.1

Sample solution	Red litmus solution	Blue litmus solution	Phenolph-thalein solution	Methyl orange solution

These indicators tell us whether a substance is acidic or basic by change in colour. There are some substances whose odour changes in acidic or basic media. These are called olfactory indicators. Let us try out some of these indicators.

Activity 2.2

- Take some finely chopped onions in a plastic bag along with some strips of clean cloth. Tie up the bag tightly and leave overnight in the fridge. The cloth strips can now be used to test for acids and bases.
- Take two of these cloth strips and check their odour.
- Keep them on a clean surface and put a few drops of dilute HCl solution on one strip and a few drops of dilute NaOH solution on the other.

- Rinse both cloth strips with water and again check their odour.
- Note your observations.
- Now take some dilute vanilla essence and clove oil and check their odour.
- Take some dilute HCl solution in one test tube and dilute NaOH solution in another. Add a few drops of dilute vanilla essence to both test tubes and shake well. Check the odour once again and record changes in odour, if any.
- Similarly, test the change in the odour of clove oil with dilute HCl and dilute NaOH solutions and record your observations.

Which of these – vanilla, onion and clove, can be used as olfactory indicators on the basis of your observations?

Let us do some more activities to understand the chemical properties of acids and bases.

2.1.2 How do Acids and Bases React with Metals?

Activity 2.3

CAUTION: This activity needs the teacher's assistance.

- Set the apparatus as shown in Fig. 2.1.
- Take about 5 mL of dilute sulphuric acid in a test tube and add a few pieces of zinc granules to it.
- What do you observe on the surface of zinc granules?
- Pass the gas being evolved through the soap solution.
- Why are bubbles formed in the soap solution?
- Take a burning candle near a gas filled bubble.
- What do you observe?
- Repeat this Activity with some more acids like HCl, HNO_3 and CH_3COOH.
- Are the observations in all the cases the same or different?

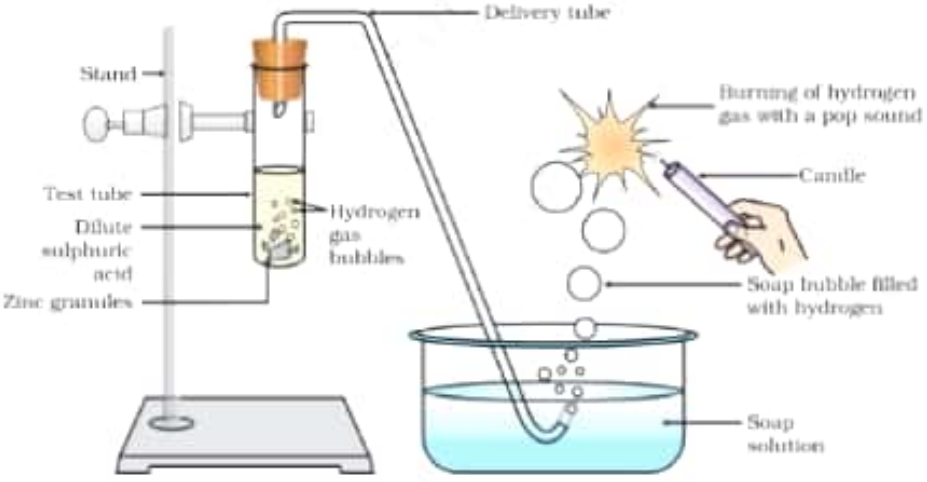


Figure 2.1 Reaction of zinc granules with dilute sulphuric acid and testing hydrogen

Note that the metal in the above reactions displaces hydrogen atoms from the acids as hydrogen gas and forms a compound called a salt. Thus, the reaction of a metal with an acid can be summarised as –

Acid + Metal → Salt + Hydrogen gas

Can you now write the equations for the reactions you have observed?

Activity 2.4

- Place a few pieces of granulated zinc metal in a test tube.
- Add 2 mL of sodium hydroxide solution and warm the contents of the test tube.
- Repeat the rest of the steps as in Activity 2.3 and record your observations.

The reaction that takes place can be written as follows.

$2NaOH(aq) + Zn(s) \rightarrow Na_2ZnO_2(s) + H_2(g)$

(Sodium zincate)

You find again that hydrogen is formed in the reaction. However, such reactions are not possible with all metals.

2.1.3 How do Metal Carbonates and Metal Hydrogencarbonates React with Acids?

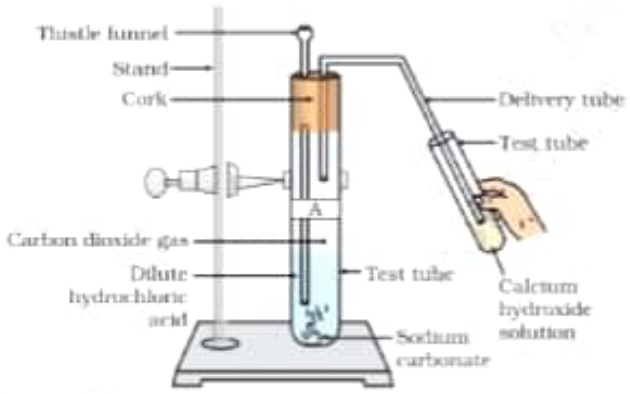


Figure 2.2
Passing carbon dioxide gas through calcium hydroxide solution

Activity 2.5

- Take two test tubes, label them as A and B.
- Take about 0.5 g of sodium carbonate (Na_2CO_3) in test tube A and about 0.5 g of sodium hydrogencarbonate ($NaHCO_3$) in test tube B.
- Add about 2 mL of dilute HCl to both the test tubes.
- What do you observe?
- Pass the gas produced in each case through lime water (calcium hydroxide solution) as shown in Fig. 2.2 and record your observations.

The reactions occurring in the above Activity are written as –

Test tube A: $Na_2CO_3(s) + 2\,HCl(aq) \rightarrow 2NaCl(aq) + H_2O(l) + CO_2(g)$

Test tube B: $NaHCO_3(s) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l) + CO_2(g)$

On passing the carbon dioxide gas evolved through lime water,

$Ca(OH)_2(aq) + CO_2(g) \rightarrow CaCO_3(s) + H_2O(l)$

(Lime water) (White precipitate)

On passing excess carbon dioxide the following reaction takes place:

$$CaCO_3(s) + H_2O(l) + CO_2(g) \rightarrow Ca(HCO_3)_2(aq)$$

(Soluble in water)

Limestone, chalk and marble are different forms of calcium carbonate. All metal carbonates and hydrogencarbonates react with acids to give a corresponding salt, carbon dioxide and water.

Thus, the reaction can be summarised as

Metal carbonate/Metal hydrogencarbonate + Acid → Salt + Carbon dioxide + Water

2.1.4 How do Acids and Bases React with each other?

Activity 2.6

- Take about 2 mL of dilute NaOH solution in a test tube and add two drops of phenolphthalein solution.
- What is the colour of the solution?
- Add dilute HCl solution to the above solution drop by drop.
- Is there any colour change for the reaction mixture?
- Why did the colour of phenolphthalein change after the addition of an acid?
- Now add a few drops of NaOH to the above mixture.
- Does the pink colour of phenolphthalein reappear?
- Why do you think this has happened?

In the above Activity, we have observed that the effect of a base is nullified by an acid and vice-versa. The reaction taking place is written as –

$$NaOH(aq) + HCl(aq) \rightarrow NaCl(aq) + H_2O(l)$$

The reaction between an acid and a base to give a salt and water is known as a neutralisation reaction. In general, a neutralisation reaction can be written as –

Base + Acid → Salt + Water

2.1.5 Reaction of Metallic Oxides with Acids

Activity 2.7

- Take a small amount of copper oxide in a beaker and add dilute hydrochloric acid slowly while stirring.
- Note the colour of the solution. What has happened to the copper oxide?

You will notice that the colour of the solution becomes blue-green and the copper oxide dissolves. The blue-green colour of the solution is due to the formation of copper(II) chloride in the reaction. The general reaction between a metal oxide and an acid can be written as –

Metal oxide + Acid → Salt + Water

Now write and balance the equation for the above reaction. Since metallic oxides react with acids to give salts and water, similar to the reaction of a base with an acid, metallic oxides are said to be basic oxides.

2.1.6 Reaction of a Non-metallic Oxide with Base

You saw the reaction between carbon dioxide and calcium hydroxide (lime water) in Activity 2.5. Calcium hydroxide, which is a base, reacts with carbon dioxide to produce a salt and water. Since this is similar to the reaction between a base and an acid, we can conclude that non-metallic oxides are acidic in nature.

Q U E S T I O N S

1. Why should curd and sour substances not be kept in brass and copper vessels?
2. Which gas is usually liberated when an acid reacts with a metal? Illustrate with an example. How will you test for the presence of this gas?
3. Metal compound A reacts with dilute hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle. Write a balanced chemical equation for the reaction if one of the compounds formed is calcium chloride.

2.2 WHAT DO ALL ACIDS AND ALL BASES HAVE IN COMMON?

In Section 2.1 we have seen that all acids have similar chemical properties. What leads to this similarity in properties? We saw in Activity 2.3 that all acids generate hydrogen gas on reacting with metals, so hydrogen seems to be common to all acids. Let us perform an Activity to investigate whether all compounds containing hydrogen are acidic.

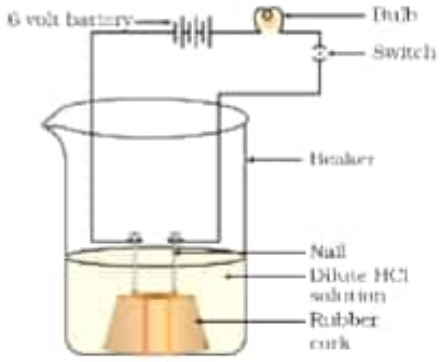


Figure 2.3
Acid solution in water conducts electricity

Activity 2.8

- Take solutions of glucose, alcohol, hydrochloric acid, sulphuric acid, etc.
- Fix two nails on a cork, and place the cork in a 100 mL beaker.
- Connect the nails to the two terminals of a 6 volt battery through a bulb and a switch, as shown in Fig. 2.3.
- Now pour some dilute HCl in the beaker and switch on the current.
- Repeat with dilute sulphuric acid.
- What do you observe?
- Repeat the experiment separately with glucose and alcohol solutions. What do you observe now?
- Does the bulb glow in all cases?

The bulb will start glowing in the case of acids, as shown in Fig. 2.3. But you will observe that glucose and alcohol solutions do not conduct electricity. Glowing of the bulb indicates that there is a flow of electric current through the solution. The electric current is carried through the acidic solution by ions.

Acids contain H^+ ion as cation and anion such as Cl^- in HCl, NO_3^- in HNO_3, SO_4^{2-} in H_2SO_4, CH_3COO^- in CH_3COOH. Since the cation present in acids is H^+, this suggests that acids produce hydrogen ions, H (aq), in solution, which are responsible for their acidic properties.

Repeat the same Activity using alkalis such as sodium hydroxide, calcium hydroxide, etc. What can you conclude from the results of this Activity?

2.2.1 What Happens to an Acid or a Base in a Water Solution?

Do acids produce ions only in aqueous solution? Let us test this.

Activity 2.9

- Take about 1g solid NaCl in a clean and dry test tube and set up the apparatus as shown in Fig. 2.4.
- Add some concentrated sulphuric acid to the test tube.
- What do you observe? Is there a gas coming out of the delivery tube?
- Test the gas evolved successively with dry and wet blue litmus paper.
- In which case does the litmus paper change colour?
- On the basis of the above Activity, what do you infer about the acidic character of:
  (i) dry HCl gas
  (ii) HCl solution?

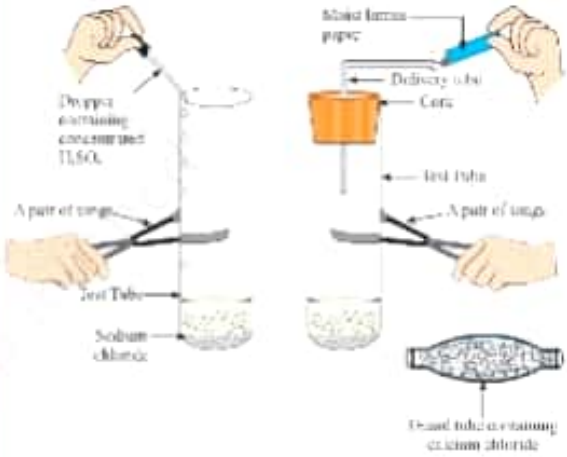


Figure 2.4 Preparation of HCl gas

Note to teachers: If the climate is very humid, you will have to pass the gas produced through a guard tube (drying tube) containing calcium chloride to dry the gas.

This experiment suggests that hydrogen ions in HCl are produced in the presence of water. The separation of H^+ ion from HCl molecules cannot occur in the absence of water.

$$HCl + H_2O \rightarrow H_3O^+ + Cl^-$$

Hydrogen ions cannot exist alone, but they exist after combining with water molecules. Thus hydrogen ions must always be shown as $H^+(aq)$ or hydronium ion (H_3O^+).

$$H^+ + H_2O \rightarrow H_3O^+$$

We have seen that acids give H_3O^+ or $H^+(aq)$ ion in water. Let us see what happens when a base is dissolved in water.

$$NaOH(s) \xrightarrow{H_2O} Na^+(aq) + OH^-(aq)$$

$$KOH(s) \xrightarrow{H_2O} K^+(aq) + OH^-(aq)$$

$$Mg(OH)_2(s) \xrightarrow{H_2O} Mg^{2+}(aq) + 2OH^-(aq)$$

Bases generate hydroxide (OH^-) ions in water. Bases which are soluble in water are called alkalis.

Do You Know?

All bases do not dissolve in water. An alkali is a base that dissolves in water. They are soapy to touch, bitter and corrosive. Never taste or touch them as they may cause harm. Which of the bases in the Table 2.1 are alkalis?

Now as we have identified that all acids generate $H^+(aq)$ and all bases generate $OH^-(aq)$, we can view the neutralisation reaction as follows –

$$Acid + Base \rightarrow Salt + Water$$

$$H\boxed{X + M}OH \rightarrow MX + HOH$$

$$H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$$

Let us see what is involved when water is mixed with an acid or a base.

Figure 2.5
Warning sign displayed on containers containing concentrated acids and bases

Activity 2.10

- Take 10 mL water in a beaker.
- Add a few drops of concentrated H_2SO_4 to it and swirl the beaker slowly.
- Touch the base of the beaker.
- Is there a change in temperature?
- Is this an exothermic or endothermic process?
- Repeat the above Activity with sodium hydroxide pellets and record your observations.

The process of dissolving an acid or a base in water is a highly exothermic one. Care must be taken while mixing concentrated nitric acid or sulphuric acid with water. The acid must always be added slowly to water with constant stirring. If water is added to a concentrated acid, the heat generated may cause the mixture to splash out and cause burns. The glass container may also break due to excessive local heating. Look out for the warning sign (shown in Fig. 2.5) on the can of concentrated sulphuric acid and on the bottle of sodium hydroxide pellets.

Mixing an acid or base with water results in decrease in the concentration of ions (H_3O^+/OH^-) per unit volume. Such a process is called dilution and the acid or the base is said to be diluted.

QUESTIONS

1. Why do HCl, HNO_3, etc., show acidic characters in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character?
2. Why does an aqueous solution of an acid conduct electricity?
3. Why does dry HCl gas not change the colour of the dry litmus paper?
4. While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?
5. How is the concentration of hydronium ions (H_3O^+) affected when a solution of an acid is diluted?
6. How is the concentration of hydroxide ions (OH^-) affected when excess base is dissolved in a solution of sodium hydroxide?

2.3 HOW STRONG ARE ACID OR BASE SOLUTIONS?

We know how acid-base indicators can be used to distinguish between an acid and a base. We have also learnt in the previous section about dilution and decrease in concentration of H^+ or OH^- ions in solutions. Can we quantitatively find the amount of these ions present in a solution? Can we judge how strong a given acid or base is?

We can do this by making use of a universal indicator, which is a mixture of several indicators. The universal indicator shows different colours at different concentrations of hydrogen ions in a solution.

A scale for measuring hydrogen ion concentration in a solution, called pH scale has been developed. The p in pH stands for '*potenz*' in German, meaning power. On the pH scale we can measure pH generally from 0 (very acidic) to 14 (very alkaline). pH should be thought of simply as a number which indicates the acidic or basic nature of a solution. Higher the hydronium ion concentration, lower is the pH value.

The pH of a neutral solution is 7. Values less than 7 on the pH scale represent an acidic solution. As the pH value increases from 7 to 14, it represents an increase in OH^- ion concentration in the solution, that is, increase in the strength of alkali (Fig. 2.6). Generally paper impregnated with the universal indicator is used for measuring pH.

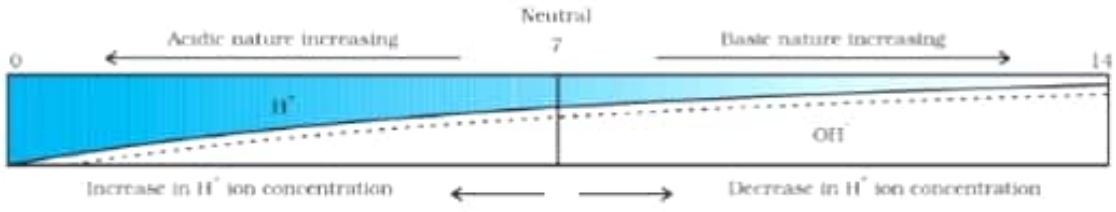


Figure 2.6 *Variation of* pH *with the change in concentration of* $H^+(aq)$ *and* $OH^-(aq)$ *ions*

Activity 2.11

- Test the pH values of solutions given in Table 2.2.
- Record your observations.
- What is the nature of each substance on the basis of your observations?

Table 2.2

S. No.	Solution	Colour of pH paper	Approx-imate pH value	Nature of substance
1	Saliva (before meal)			
2	Saliva (after meal)			
3	Lemon juice			
4	Colourless aerated drink			
5	Carrot juice			
6	Coffee			
7	Tomato juice			
8	Tap water			
9	1M NaOH			
10	1M HCl			

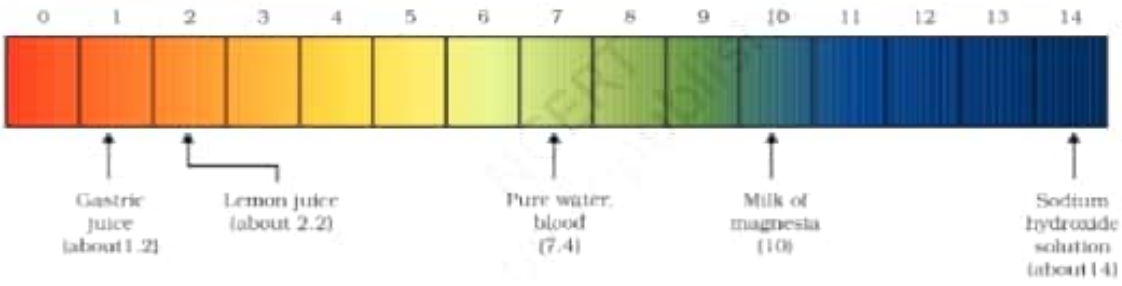


Figure 2.7 *pH of some common substances shown on a pH paper (colours are only a rough guide)*

The strength of acids and bases depends on the number of H^+ ions and OH^- ions produced, respectively. If we take hydrochloric acid and acetic acid of the same concentration, say one molar, then these produce different amounts of hydrogen ions. Acids that give rise to more H^+ ions are said to be strong acids, and acids that give less H^+ ions are said to be weak acids. Can you now say what weak and strong bases are?

2.3.1 Importance of pH in Everyday Life

Are plants and animals pH sensitive?

Our body works within the pH range of 7.0 to 7.8. Living organisms can survive only in a narrow range of pH change. When pH of rain water is less than 5.6, it is called acid rain. When acid rain flows into the rivers, it lowers the pH of the river water. The survival of aquatic life in such rivers becomes difficult.

Do You Know?

Acids in other planets

The atmosphere of venus is made up of thick white and yellowish clouds of sulphuric acid. Do you think life can exist on this planet?

What is the pH of the soil in your backyard?

Plants require a specific pH range for their healthy growth. To find out the pH required for the healthy growth of a plant, you can collect the soil from various places and check the pH in the manner described below in Activity 2.12. Also, you can note down which plants are growing in the region from which you have collected the soil.

Activity 2.12

- Put about 2 g soil in a test tube and add 5 mL water to it.
- Shake the contents of the test tube.
- Filter the contents and collect the filtrate in a test tube.
- Check the pH of this filtrate with the help of universal indicator paper.
- What can you conclude about the ideal soil pH for the growth of plants in your region?

pH in our digestive system

It is very interesting to note that our stomach produces hydrochloric acid. It helps in the digestion of food without harming the stomach. During indigestion the stomach produces too much acid and this causes pain and irritation. To get rid of this pain, people use bases called antacids. One such remedy must have been suggested by you at the beginning of this Chapter. These antacids neutralise the excess acid. Magnesium hydroxide (Milk of magnesia), a mild base, is often used for this purpose.

pH change as the cause of tooth decay

Tooth decay starts when the pH of the mouth is lower than 5.5. Tooth enamel, made up of calcium hydroxyapatite (a crystalline form of calcium phosphate) is the hardest substance in the body. It does not dissolve in water, but is corroded when the pH in the mouth is below 5.5. Bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating. The best way to prevent this is to clean the mouth after eating food. Using toothpastes, which are generally basic, for cleaning the teeth can neutralise the excess acid and prevent tooth decay.

Self defence by animals and plants through chemical warfare

Have you ever been stung by a honey-bee? Bee-sting leaves an acid which causes pain and irritation. Use of a mild base like baking soda on the stung area gives relief. Stinging hair of nettle leaves inject methanoic acid causing burning pain.

Do You Know?

Nature provides neutralisation options

Nettle is a herbaceous plant which grows in the wild. Its leaves have stinging hair, which cause painful stings when touched accidentally. This is due to the methanoic acid secreted by them. A traditional remedy is rubbing the area with the leaf of the dock plant, which often grows beside the nettle in the wild. Can you guess the nature of the dock plant? So next time you know what to look out for if you accidentally touch a nettle plant while trekking. Are you aware of any other effective traditional remedies for such stings?

Table 2.3 Some naturally occurring acids

Natural source	Acid	Natural source	Acid
Vinegar	Acetic acid	Sour milk (Curd)	Lactic acid
Orange	Citric acid	Lemon	Citric acid
Tamarind	Tartaric acid	Ant sting	Methanoic acid
Tomato	Oxalic acid	Nettle sting	Methanoic acid

QUESTIONS

1. You have two solutions, A and B. The pH of solution A is 6 and pH of solution B is 8. Which solution has more hydrogen ion concentration? Which of this is acidic and which one is basic?
2. What effect does the concentration of $H^+(aq)$ ions have on the nature of the solution?
3. Do basic solutions also have $H^+(aq)$ ions? If yes, then why are these basic?
4. Under what soil condition do you think a farmer would treat the soil of his fields with quick lime (calcium oxide) or slaked lime (calcium hydroxide) or chalk (calcium carbonate)?

2.4 MORE ABOUT SALTS

In the previous sections we have seen the formation of salts during various reactions. Let us understand more about their preparation, properties and uses.

2.4.1 Family of Salts

Activity 2.13

- Write the chemical formulae of the salts given below.
  Potassium sulphate, sodium sulphate, calcium sulphate, magnesium sulphate, copper sulphate, sodium chloride, sodium nitrate, sodium carbonate and ammonium chloride.

- Identify the acids and bases from which the above salts may be obtained.
- Salts having the same positive or negative radicals are said to belong to a family. For example, NaCl and Na_2SO_4 belong to the family of sodium salts. Similarly, NaCl and KCl belong to the family of chloride salts. How many families can you identify among the salts given in this Activity?

2.4.2 pH of Salts

Activity 2.14

- Collect the following salt samples – sodium chloride, potassium nitrate, aluminium chloride, zinc sulphate, copper sulphate, sodium acetate, sodium carbonate and sodium hydrogencarbonate (some other salts available can also be taken).
- Check their solubility in water (use distilled water only).
- Check the action of these solutions on litmus and find the pH using a pH paper.
- Which of the salts are acidic, basic or neutral?
- Identify the acid or base used to form the salt.
- Report your observations in Table 2.4.

Salts of a strong acid and a strong base are neutral with pH value of 7. On the other hand, salts of a strong acid and weak base are acidic with pH value less than 7 and those of a strong base and weak acid are basic in nature, with pH value more than 7.

Table 2.4

Salt	pH	Acid used	Base used

2.4.3 Chemicals from Common Salt

By now you have learnt that the salt formed by the combination of hydrochloric acid and sodium hydroxide solution is called sodium chloride. This is the salt that you use in food. You must have observed in the above Activity that it is a neutral salt.

Seawater contains many salts dissolved in it. Sodium chloride is separated from these salts. Deposits of solid salt are also found in several parts of the world. These large crystals are often brown due to impurities. This is called rock salt. Beds of rock salt were formed when seas of bygone ages dried up. Rock salt is mined like coal.

You must have heard about Mahatma Gandhi's *Dandi March*. Did you know that sodium chloride was such an important symbol in our struggle for freedom?

Common salt — A raw material for chemicals

The common salt thus obtained is an important raw material for various materials of daily use, such as sodium hydroxide, baking soda, washing soda, bleaching powder and many more. Let us see how one substance is used for making all these different substances.

Sodium hydroxide

When electricity is passed through an aqueous solution of sodium chloride (called brine), it decomposes to form sodium hydroxide. The process is called the chlor-alkali process because of the products formed–chlor for chlorine and alkali for sodium hydroxide.

$$2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$$

Chlorine gas is given off at the anode, and hydrogen gas at the cathode. Sodium hydroxide solution is formed near the cathode. The three products produced in this process are all useful. Figure 2.8 shows the different uses of these products.

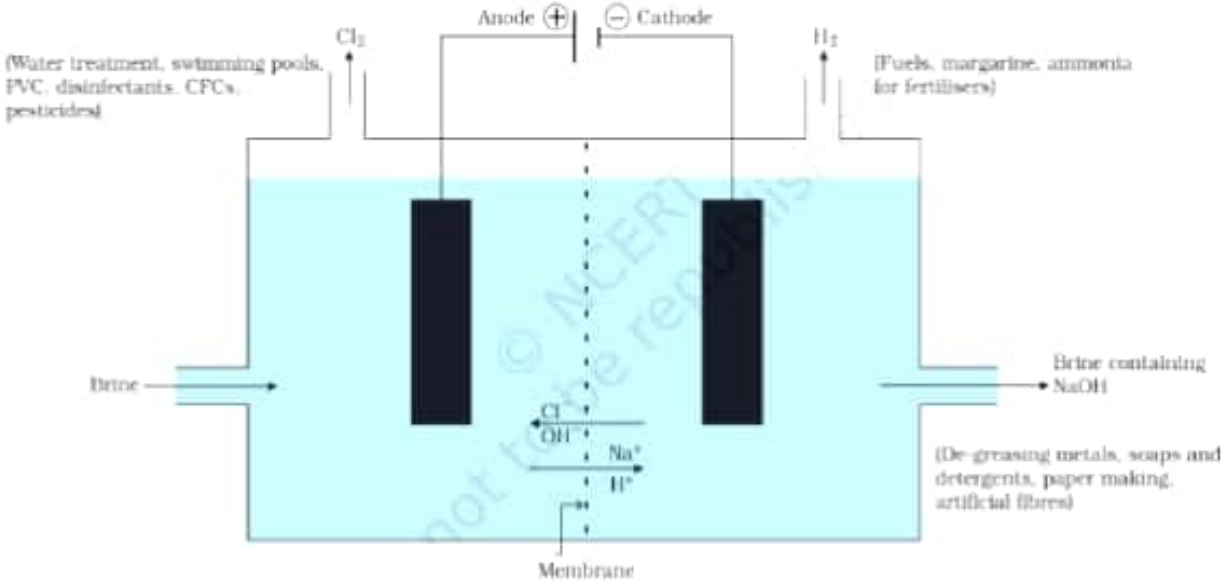


Figure 2.8 *Important products from the chlor-alkali process*

Bleaching powder

You have already come to know that chlorine is produced during the electrolysis of aqueous sodium chloride (brine). This chlorine gas is used for the manufacture of bleaching powder. Bleaching powder is produced by the action of chlorine on dry slaked lime [$Ca(OH)_2$]. Bleaching powder is represented as $CaOCl_2$, though the actual composition is quite complex.

$$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$$

Bleaching powder is used –

(i) for bleaching cotton and linen in the textile industry, for bleaching wood pulp in paper factories and for bleaching washed clothes in laundry;

(ii) as an oxidising agent in many chemical industries; and

(iii) to make drinking water free from germs.

Baking soda

The baking soda is commonly used in the kitchen for making tasty crispy pakoras, etc. Sometimes it is added for faster cooking. The chemical name of the compound is sodium hydrogencarbonate ($NaHCO_3$). It is produced using sodium chloride as one of the raw materials.

$$NaCl + H_2O + CO_2 + NH_3 \rightarrow \underset{\text{(Ammonium chloride)}}{NH_4Cl} + \underset{\text{(Sodium hydrogencarbonate)}}{NaHCO_3}$$

Did you check the pH of sodium hydrogencarbonate in Activity 2.14? Can you correlate why it can be used to neutralise an acid? It is a mild non-corrosive basic salt. The following reaction takes place when it is heated during cooking –

$$\underset{\text{(Sodium hydrogencarbonate)}}{2NaHCO_3} \xrightarrow{\text{Heat}} \underset{\text{(Sodium carbonate)}}{Na_2CO_3} + H_2O + CO_2$$

Sodium hydrogencarbonate has got various uses in the household.

Uses of Baking soda

(i) For making baking powder, which is a mixture of baking soda (sodium hydrogencarbonate) and a mild edible acid such as tartaric acid. When baking powder is heated or mixed in water, the following reaction takes place –

$$NaHCO_3 + H^+ \rightarrow CO_2 + H_2O + \text{Sodium salt of acid}$$
(From any acid)

Carbon dioxide produced during the reaction can cause bread or cake to rise making them soft and spongy.

(ii) Sodium hydrogencarbonate is also an ingredient in antacids. Being alkaline, it neutralises excess acid in the stomach and provides relief.

(iii) It is also used in soda-acid fire extinguishers.

Washing soda

Another chemical that can be obtained from sodium chloride is $Na_2CO_3.10H_2O$ (washing soda). You have seen above that sodium carbonate can be obtained by heating baking soda; recrystallisation of sodium carbonate gives washing soda. It is also a basic salt.

$$\underset{\text{(Sodium carbonate)}}{Na_2CO_3} + 10H_2O \rightarrow Na_2CO_3.10H_2O$$

What does $10H_2O$ signify? Does it make Na_2CO_3 wet? We will address this question in the next section.

Sodium carbonate and sodium hydrogencarbonate are useful chemicals for many industrial processes as well.

Uses of washing soda

(i) Sodium carbonate (washing soda) is used in glass, soap and paper industries.
(ii) It is used in the manufacture of sodium compounds such as borax.
(iii) Sodium carbonate can be used as a cleaning agent for domestic purposes.
(iv) It is used for removing permanent hardness of water.

2.4.4 Are the Crystals of Salts really Dry?

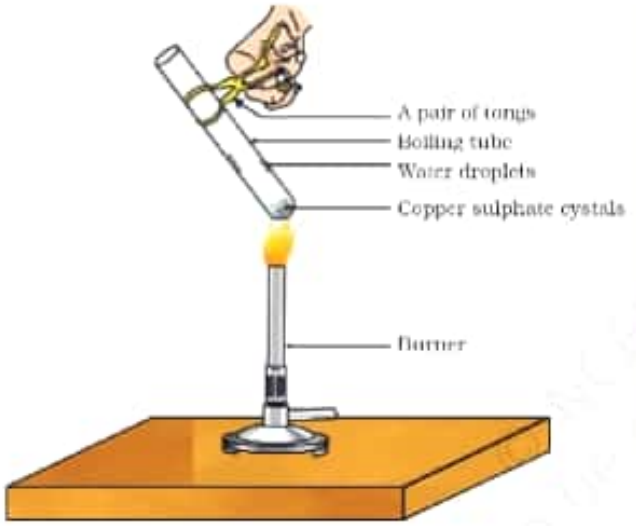


Figure 2.9
Removing water of crystallisation

Activity 2.15

- Heat a few crystals of copper sulphate in a dry boiling tube.
- What is the colour of the copper sulphate after heating?
- Do you notice water droplets in the boiling tube? Where have these come from?
- Add 2-3 drops of water on the sample of copper sulphate obtained after heating.
- What do you observe? Is the blue colour of copper sulphate restored?

Copper sulphate crystals which seem to be dry contain water of crystallisation. When we heat the crystals, this water is removed and the salt turns white.

If you moisten the crystals again with water, you will find that blue colour of the crystals reappears.

Water of crystallisation is the fixed number of water molecules present in one formula unit of a salt. Five water molecules are present in one formula unit of copper sulphate. Chemical formula for hydrated copper sulphate is $Cu\,SO_4.5H_2O$. Now you would be able to answer the question whether the molecule of $Na_2CO_3.10H_2O$ is wet.

One other salt, which possesses water of crystallisation is gypsum. It has two water molecules as water of cyrstallisation. It has the chemical formula $CaSO_4.2H_2O$. Let us look into the use of this salt.

Plaster of Paris

On heating gypsum at 373 K, it loses water molecules and becomes calcium sulphate hemihydrate ($CaSO_4.\frac{1}{2}H_2O$). This is called Plaster of

Paris, the substance which doctors use as plaster for supporting fractured bones in the right position. Plaster of Paris is a white powder and on mixing with water, it changes to gypsum once again giving a hard solid mass.

$$\underset{\text{(Plaster of Paris)}}{CaSO_4 \cdot \frac{1}{2} H_2O} + 1\frac{1}{2} H_2O \rightarrow \underset{\text{(Gypsum)}}{CaSO_4 \cdot 2H_2O}$$

Note that only half a water molecule is shown to be attached as water of crystallisation. How can you get half a water molecule? It is written in this form because two formula units of $CaSO_4$ share one molecule of water. Plaster of Paris is used for making toys, materials for decoration and for making surfaces smooth. Try to find out why is calcium sulphate hemihydrate called 'Plaster of Paris' ?

QUESTIONS

1. What is the common name of the compound $CaOCl_2$?
2. Name the substance which on treatment with chlorine yields bleaching powder.
3. Name the sodium compound which is used for softening hard water.
4. What will happen if a solution of sodium hydrocarbonate is heated? Give the equation of the reaction involved.
5. Write an equation to show the reaction between Plaster of Paris and water.

What you have learnt

- Acid-base indicators are dyes or mixtures of dyes which are used to indicate the presence of acids and bases.
- Acidic nature of a substance is due to the formation of $H^+(aq)$ ions in solution. Formation of $OH^-(aq)$ ions in solution is responsible for the basic nature of a substance.
- When an acid reacts with a metal, hydrogen gas is evolved and a corresponding salt is formed.
- When a base reacts with a metal, along with the evolution of hydrogen gas a salt is formed which has a negative ion composed of the metal and oxygen.
- When an acid reacts with a metal carbonate or metal hydrogencarbonate, it gives the corresponding salt, carbon dioxide gas and water.
- Acidic and basic solutions in water conduct electricity because they produce hydrogen and hydroxide ions respectively.

EXERCISES

1. A solution turns red litmus blue, its pH is likely to be
   (a) 1 (b) 4 (c) 5 (d) 10
2. A solution reacts with crushed egg-shells to give a gas that turns lime-water milky. The solution contains
   (a) NaCl (b) HCl (c) LiCl (d) KCl
3. 10 mL of a solution of NaOH is found to be completely neutralised by 8 mL of a given solution of HCl. If we take 20 mL of the same solution of NaOH, the amount HCl solution (the same solution as before) required to neutralise it will be
   (a) 4 mL (b) 8 mL (c) 12 mL (d) 16 mL
4. Which one of the following types of medicines is used for treating indigestion?
   (a) Antibiotic
   (b) Analgesic
   (c) Antacid
   (d) Antiseptic
5. Write word equations and then balanced equations for the reaction taking place when –
   (a) dilute sulphuric acid reacts with zinc granules.
   (b) dilute hydrochloric acid reacts with magnesium ribbon.
   (c) dilute sulphuric acid reacts with aluminium powder.
   (d) dilute hydrochloric acid reacts with iron filings.
6. Compounds such as alcohols and glucose also contain hydrogen but are not categorised as acids. Describe an Activity to prove it.
7. Why does distilled water not conduct electricity, whereas rain water does?

8. Why do acids not show acidic behaviour in the absence of water?
9. Five solutions A,B,C,D and E when tested with universal indicator showed pH as 4,1,11,7 and 9, respectively. Which solution is
   (a) neutral?
   (b) strongly alkaline?
   (c) strongly acidic?
   (d) weakly acidic?
   (e) weakly alkaline?

   Arrange the pH in increasing order of hydrogen-ion concentration.
10. Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A, while acetic acid (CH_3COOH) is added to test tube B. Amount and concentration taken for both the acids are same. In which test tube will the fizzing occur more vigorously and why?
11. Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd? Explain your answer.
12. A milkman adds a very small amount of baking soda to fresh milk.
   (a) Why does he shift the pH of the fresh milk from 6 to slightly alkaline?
   (b) Why does this milk take a long time to set as curd?
13. Plaster of Paris should be stored in a moisture-proof container. Explain why?
14. What is a neutralisation reaction? Give two examples.
15. Give two important uses of washing soda and baking soda.

(II) **Preparing a soda-acid fire extinguisher**

The reaction of acids with metal hydrogencarbonates is used in the fire extinguishers which produce carbon dioxide.

- Take 20 mL of sodium hydrogencarbonate ($NaHCO_3$) solution in a wash-bottle.
- Suspend an ignition tube containing dilute sulphuric acid in the wash-bottle (Fig. 2.10).
- Close the mouth of the wash-bottle.
- Tilt the wash-bottle so that the acid from the ignition tube mixes with the sodium hydrogencarbonate solution below.
- You will notice discharge coming out of the nozzle.
- Direct this discharge on a burning candle. What happens?

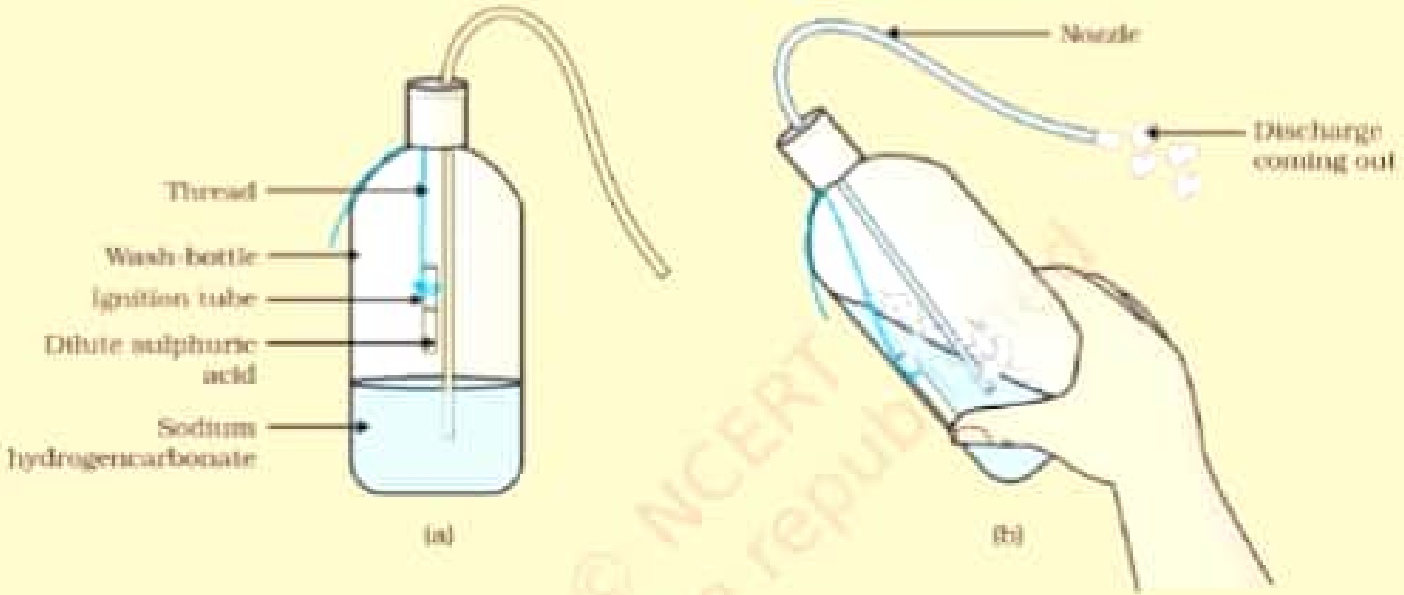


Figure 2.10 *(a) Ignition tube containing dilute sulphuric acid suspended in a wash-bottle containing sodium hydrogencarbonate, (b) Discharge coming out of the nozzle*

Jagat Taran Golden Jubilee School

Sub: Information Technology (402)

Class: 10

Assignment 4

Chapter 6: Digital Documentation (Advanced)

1) To access the video click the following link:

https://youtu.be/D1YY3RGh7qs

https://youtu.be/PMPdgNoa858

2) Go through the Pdf and attempt the following questions.
   Do all the questions in your note book.
   1) What is a fill format mode?
   2) How do you drag and drop a selection to create a style?
   3) What are the ways in which an entered image can be cropped?
   4) How can you link the image file to the document instead of embedding it?
   5) How can you position images within

6 Digital Documentation (Advanced)

LEARNING OBJECTIVES

After studying this chapter, students will be able to:

- Apply styles in the document.
- Insert and use images in document.
- Create and use template.
- Create table of contents.

INTRODUCTION

Word processing is probably the most used application of the Office suite by any vendor. It has multiple uses at a large number of places. It has use in offices, schools and other educational institutes, homes and any kind of organisation. Forms, circulars, worksheets, question papers, assignment submissions, etc. are documents that start their "life" as a word processing file. We have covered detailed discussion on many aspects of the word processor, Writer in the previous grade. In this grade, we take up a different set of things about Writer. Let us first recapitulate the basic concepts of writer.

STARTING LIBREOFFICE WRITER

To start Writer, click on the **Start → All Programs → LibreOffice 6.2 → LibreOffice Writer**.

The following window appears on the screen.

FIG. 6.1: LIBREOFFICE WRITER WINDOW

The two insert modes of Writer are **INSERT** and **OVERWRITE**. In the INSERT mode, the text gets typed from left to right and the insertion pointer gets pushed rightward with key presses for characters.

The OVERWRITE mode types over any existing text if typing is continued.

COMPONENTS OF LIBREOFFICE WRITER

Given below is the labeled interface of Writer.

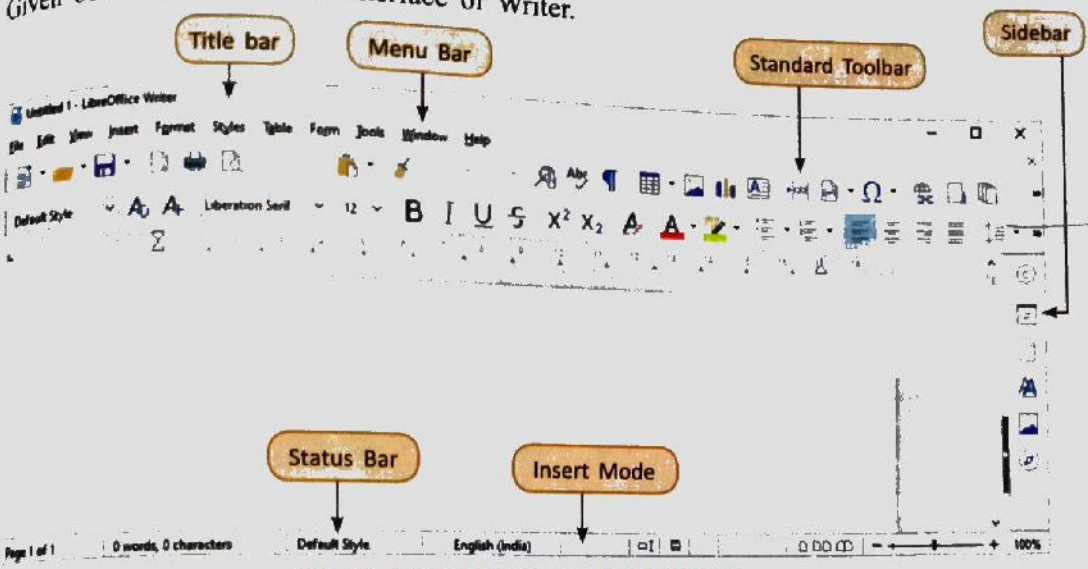


FIG. 6.2: LABELLED DIAGRAM OF WRITER

Title Bar

The title bar is located at the top of the interface. It contains the file name, name of application and window management buttons on the right.When the document is not yet named, the document name will appear as Untitled X, where X is a number. Untitled documents are numbered in the order that they are created.

Menu Bar

The Menu Bar is located just below the Title Bar in Windows and Linux and at the top of the screen in MacOS. When you select one of the menus, a drop-down shows up that includes:

Commands that directly cause an action like Close or Save from the File tab

Commands that open dialogs. In that case the command is followed by an ellipsis, like (...).

Commands that open further submenus. In this case there is a right-pointing arrow to the right of the command. Moving the cursor onto one of these items causes its submenu to open.

Sidebar

The sidebar normally opens on the right side of the Writer interface. If required, you may open up the sidebar with **View** menu > **Sidebar**. The Sidebar also has a hide/show icon. When the sidebar is closed, it can be opened using hide/show icon.

Toolbars

LibreOffice has two types of toolbar locations: docked (fixed in place) or floating. Docked toolbars can be moved to different locations(for example: top, bottom or side of the workspace) or made to float.

Status Bar

The status bar is located at the bottom of the workspace. It provides information about the document and convenient ways to quickly change some document features. It can be hidden by deselecting it in the View menu.

FIG. 6.3: STATUS BAR

Using the Navigator

Writer provides ways to move quickly through a document and find specific items by using many features of the Navigator, the Navigation toolbar and related icons.

In the default installation of Writer, the Navigator is part of the sidebar. It lists all the headings, tables, text frames, graphics, bookmarks, and other objects contained in a document.

EDIT THE DOCUMENT

To undo the most recent change in a document, press **Ctrl + Z**, or choose **Edit > Undo** on the menu bar, or click on the Undo icon on the Standard toolbar.

After changes have been undone, Redo becomes active. To redo a change, select **Edit > Redo**, or press **Ctrl + Y** or click on the Redo icon on the standard toolbar.

Selecting a Vertical Block of Text

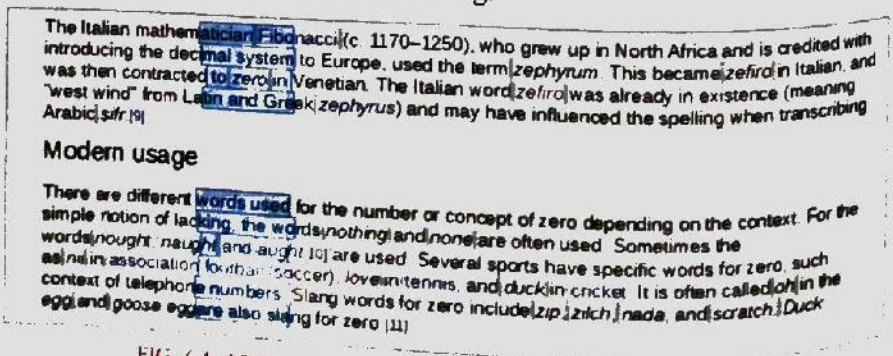
In order to select a vertical block of text, follow these steps:

- Either press Alt + Shift + F8 keys.,

  OR

- Select **Edit > Selection Mode > Block Area**.

Doing either of the above two will allow you to select a vertical block of text. After the selection the text looks like the following.


The Italian mathematician Fibonacci (c. 1170–1250), who grew up in North Africa and is credited with introducing the decimal system to Europe, used the term *zephyrum*. This became *zefiro* in Italian, and was then contracted to *zero* in Venetian. The Italian word *zefiro* was already in existence (meaning "west wind" from Latin and Greek *zephyrus*) and may have influenced the spelling when transcribing Arabic *sifr*.[9]

Modern usage

There are different words used for the number or concept of zero depending on the context. For the simple notion of lacking, the words *nothing* and *none* are often used. Sometimes the words *nought*, *naught* and *aught*,[10] are used. Several sports have specific words for zero, such as *nil* in association football (soccer), *love* in tennis, and *duck* in cricket. It is often called *oh* in the context of telephone numbers. Slang words for zero include *zip*, *zilch*, *nada*, and *scratch*. *Duck egg* and *goose egg* are also slang for zero.[11]

FIG. 6.4: AFTER SELECTION OF VERTICAL BLOCK OF TEXT

To display the Find & Replace dialog box, use the keyboard shortcut **Ctrl + H**, or choose **Edit > Find & Replace** from the Menu bar, or click on the **Find & Replace** button on the Find toolbar.

Checking Spelling and Grammar

Writer provides a spelling checker, which checks to see if each word in the document is in the installed dictionary. Also provided is a grammar checker, which can be used separately or in combination with the spelling checker.

Automatic spell-checking checks each word as it is typed and displays a wavy red line under any unrecognised words.

Creating Headers and Footers

Headers are portions of a document that appear at the top of every page, footer appears at the bottom of a page. They typically include a page number and sometimes document information such as title.

Paragraph Alignment

In order to align paragraphs, you may use the Formatting toolbar. Paragraph alignment options is a part of the Formatting toolbar. So, just select the paragraph to be aligned and press the button from the toolbar. Follow these steps:

1. Choose the paragraph to be aligned.
2. Choose the kind of alignment required.

The highlighted paragraph gets aligned accordingly.

Non-printing Characters

In order to view the non-printing characters as part of the document, follow one of these steps.

Choose **View > Formatting Marks**.

OR

Press **Ctrl + F10.**

OR

Click on **Toggle Formatting Marks** from the Standard toolbar.

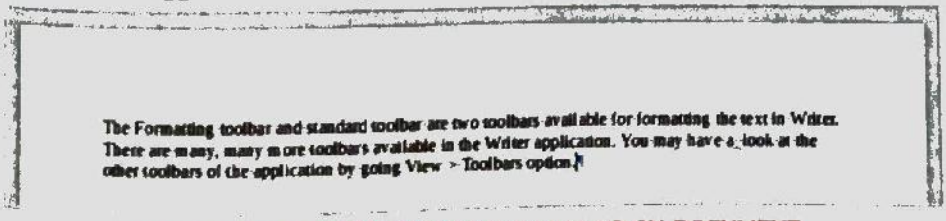


FIG. 6.5: FORMATTING MARKS SHOWING UP ON DOCUMENT

Changing Text Case

To quickly change the case of text, select it, choose **Format > Text** from the menu bar, and then choose one of the following:

UPPERCASE, where all letters are capitalised.

Lowercase, where all letters are made of lower case

- **Cycle case**, where the text cycles among different change case options like: UPPER CASE, lower case and Capitalize Every Word.
- **Sentence case**, where the first letter of the sentence is in Capitals as also are the proper nouns.
- **Capitalize Every Word**, where every word starts with a capital letter.
- **tOGGLE cASE**, reverses the case of each letter in the selection.

In order to change case of text, you must first select the text. After that click on **Format > Text** and select the required change case option. The case of the selected text will be changed.

If you do not select the text beforehand, only the word that the insertion pointer is on will be changed in case.

the formating toolbar and standard toolbar are two toolbars available for formatting the text in writer. there are many, many more toolbars available in the writer application, you may have a look at the other toolbars of the application by going 'view' > toolbars option."

FIG. 6.6: ON CHANGING THE CASE OF THE SELECTED TEXT

Inserting a Table

To insert a new table using the **Insert Table** dialog, where you can specify the properties for the table, position the cursor where you want the table to appear, then use any of the following methods to open the dialog box:

- Choose **Table > Insert Table** from the Menu bar.
- Press **Ctrl + F12**.
- On the Standard toolbar, click on the **Insert Table** icon and select **More Options** at the bottom of the drop-down graphic.

In the General section of the Insert Table dialog box, in the name box you can enter a different name from the Writer-generated default for the table.

Deleting Rows and Columns

To quickly delete one or more rows or columns, place the cursor in the row or column you want to delete and do one of the following:

- Click on the Rows or Columns icons on the Table toolbar.
- Right-click and choose **Delete > Rows** or **Delete > Columns**.

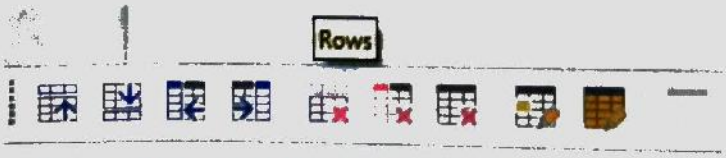


FIG. 6.8: OPTIONS TO DELETE ROW FROM TABLE TOOLBAR

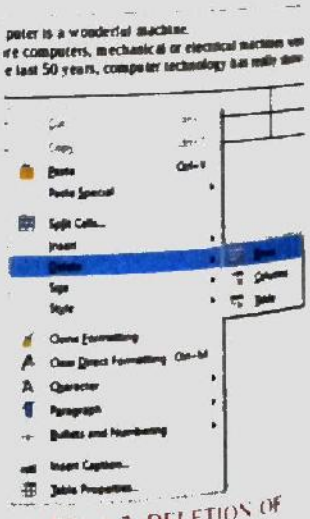


FIG. 6.7: DELETION OF ROWS/COLUMNS

Deleting a Table

To delete a table, do either of the following:

- Click anywhere in the table and choose **Table > Delete > Table** from the Menu bar.
- Select from the end of the paragraph before the table to the start of the paragraph after the table, and then press the **Delete** key or the **Backspace** key

Copying a Table

To copy a table from one part of the document and paste it into another part:

1. Click anywhere in the table.
2. From the Menu bar choose **Table > Select > Table.**
3. Press **Ctrl+C** or click on the **Copy** icon on the **Standard** toolbar.
4. Move the cursor to the target position and click to fix the insertion point.
5. Press **Ctrl+V** or click on the **Paste** icon in the **Standard** toolbar.

Moving a Table

To move a table from one part of a document to another part:

1. Click anywhere in the table.
2. From the Menu bar, choose **Table > Select > Table.**
3. Press **Ctrl+X** or click on the **Cut** icon in the Standard toolbar. (This step removes the contents of the cells but leaves the empty cells, which must be removed in step 6.)
4. Move the cursor to the target position and click to fix the insertion point.
5. Press **Ctrl+V** or click on the **Paste** icon in the Standard toolbar. (This pastes the cells and their contents and formatting.)
6. Return to the original table, click somewhere in it and then choose **Table > Delete > Table** from the Menu bar.

SESSION 1 APPLY STYLES IN THE DOCUMENT

Styles in a word processor is a combination of font effects, colors and background such that it can be saved and applied whenever needed into the Writer document. Apart from the styles, you may create and save yourself, there are many inbuilt styles available in Writer. There are multiple ways to access the styles that are available. Follow these steps.

Click on **Styles** from the sidebar.

OR

Click on **Styles** menu from menu bar of Writer. A large set of styles and options are available.

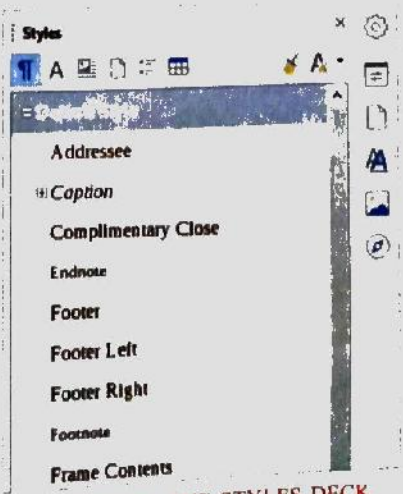


FIG. 6.9 (A): THE STYLES DECK FROM SIDEBAR

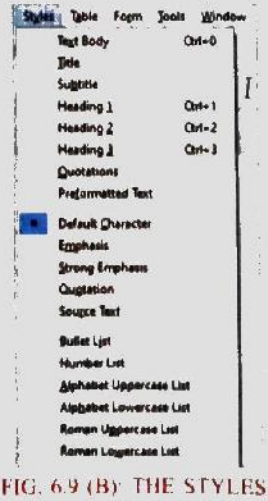


FIG. 6.9 (B): THE STYLES MENU OF WRITER

Styles help improve consistency in the document. They also make major formatting changes easy. For example, you may want to change the indentation level of all paragraphs different or make the font in all headers (or footers) of a specific type. LibreOffice has six style categories.

- Paragraph Styles
- Frame Styles
- Character Styles
- List Styles
- Page Styles
- Table Styles

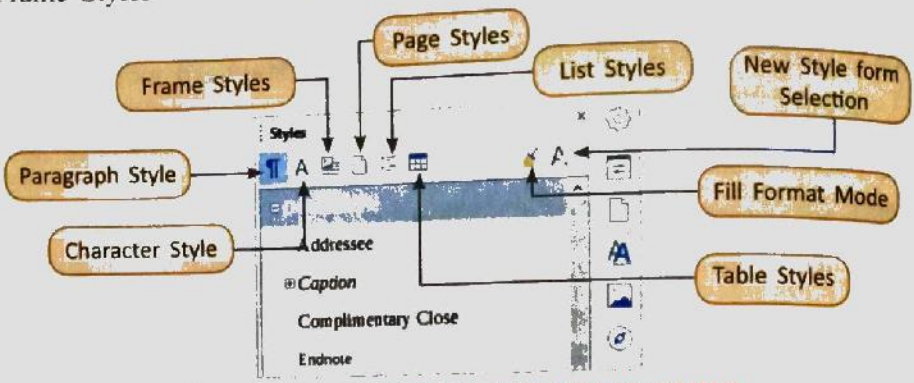


FIG. 6.10: DIFFERENT STYLES AVAILABLE IN WRITER

Paragraphs are the building blocks of a document. So, paragraph styles are the most used styles in Writer.

Using Fill Format Mode

You can use Fill Format mode to apply a style to many areas quickly without having to go back to the Styles deck and double-click each time. This method is useful for formatting scattered paragraphs, words or other items with the same style, and it may be easier to use than making multiple selections first and then applying a style to all of them. Follow these steps to apply fill format mode:

1. Open the **Styles deck** (Fig. 6.9(A)) and select a style.
2. Click on the **Fill Format Mode** icon(shown in Fig. 6.10).
3. To apply a paragraph, page, or frame style, hover the mouse over the paragraph, page, or frame and click. To apply a character style, hold down the mouse button while selecting the characters. Clicking on a word applies the character style to that word.
4. Repeat step 3 until you have made all the changes for that style.
5. To quit **Fill Format mode**, click on the icon again or press the **Esc** key.

When this mode is active, a right-click anywhere in the document undoes the last **Fill Format** action. Be careful not to accidentally right-click and undo actions you want to keep.

Using Keyboard Shortcuts

Some keyboard shortcuts for applying styles are predefined. For example, **Ctrl + 0** applies the Text body style, **Ctrl + 1** applies the Heading 1 style, and **Ctrl + 2** applies the Heading 2 style.

Creating and Updating New Style from Selection

Styles are part of the document properties, therefore new styles you create or formatting changes you make to an existing style are available only within the document they belong to. Styles always stay with a document.

New Style from Selection

Use New Style to create a new style from the formatting of an item in the current document. For example, you can change the formatting of a paragraph until it appears as you like, and then you can turn the formatting into a new style. This procedure can save time because you do not have to remember all the formatting settings you want, as is necessary when creating a new style with the Style dialog box. In addition, you can immediately see how the item will look when formatted with the style you are creating.

Follow these steps to create a new style from a selection:

1. Change the formatting of the object (paragraph, frame, and so on) to your liking.
2. From the icons at the top of the window, choose the category of style to create (paragraph, style and so on).
3. In the document, select the item to save as a style.
4. Go back to the **Styles deck** and click on the **New Style** from **Selection** icon(See Fig. 6.10),then select New Style (See Fig. 6.11) from the menu. The **Create Style** dialog opens.
5. Type a name for the new style. The list shows the names of existing custom styles of the selected type, if any. Click on **OK** to save the new style.

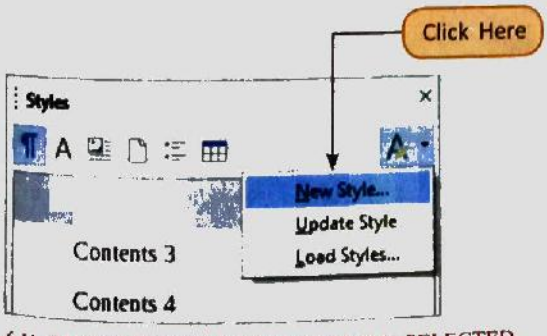


FIG. 6.11: THE NEW STYLE OPTION BEING SELECTED

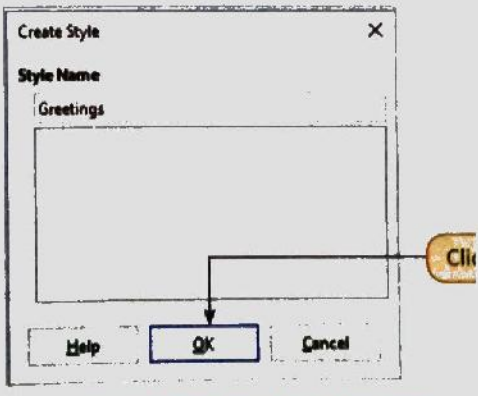


FIG. 6.12: THE CREATE STYLE DIALOG BOX

Update Style (From a Selection)

Let's use paragraph styles as an example.

1. Create a new paragraph (or select an existing paragraph) and edit all the properties you want to alter in the style (such as indentation, font properties, alignment, and others).

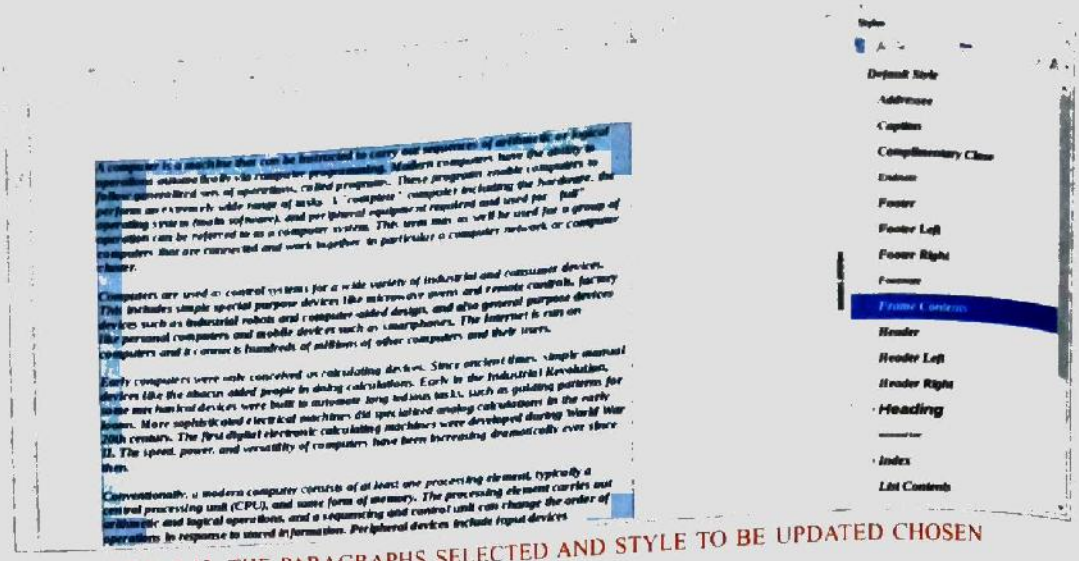


FIG. 6.13: THE PARAGRAPHS SELECTED AND STYLE TO BE UPDATED CHOSEN

2. Select the paragraph by clicking anywhere in the paragraph.
3. In the **Styles** deck, select the style you want to update (single-click, not double-click) and then click on the **New Style from Selection** icon and select **Update Style** (See Fig. 6.14).

   The procedure to update another category of style (character, page or frame styles) is the same: select the item in question, modify it, select the style you want to update, and choose Update Style.

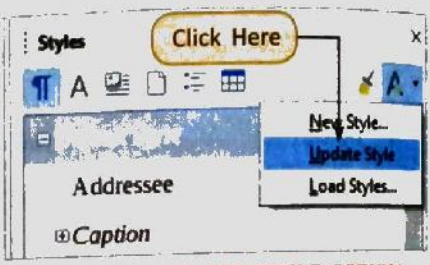


FIG. 6.14: UPDATE STYLE OPTION FROM NEW STYLE FROM SELECTION

Load Styles (from a Template or Document)

The last option under the New Style from Selection icon is used to copy styles into the current document by loading them from a template or another document. Using this method, you can copy all styles, or groups of styles, at one time.

The steps to use Load Styles are as follows:

1. Open the document to copy styles into.
2. In the **Styles deck**, click on the **New Style** from **Selection** icon and then on **Load Styles** (see Fig. 6.14)
3. In the **Load Styles** dialog (Fig. 6.15), find and select the template or document to copy styles from.

   Click on the **From File** button if the styles you want are contained in a text document rather than a template. In this case, a standard file selection dialog opens up, where you can select the desired document.

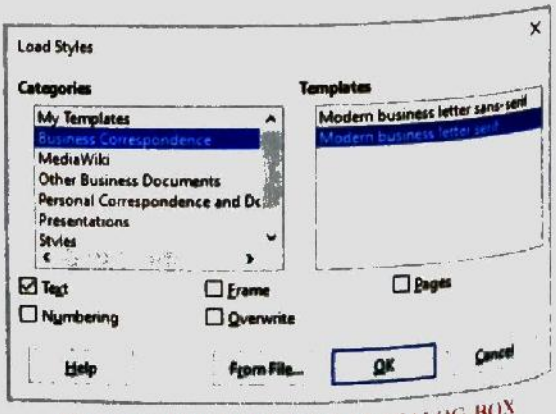


FIG. 6.15: THE LOAD STYLES DIALOG BOX

4. Select the options for the types of styles to be copied: Text (Paragraph and Character styles), Frame, Pages, Numbering (List styles). If you select Overwrite, the styles being copied will replace any styles of the same names in the target document.
5. Click on **OK** to copy the styles.

Drag-and-drop a Selection to Create a Style

Another way to create a new style is to drag-and-drop a text selection into the Styles deck.

1. Open the **Styles** deck.
2. Select the style category you are going to create (for example a character style) using one of the icons near the top of the deck.
3. Select the object on which you want to base the style and drag it to the **Styles deck**. The cursor changes to indicate whether the operation is possible.

You cannot use the drag-and-drop method to create a new page style or table style.

FIG. 6.16: TO COPY STYLE FROM DOCUMENT

FIG. 6.17: THE CREATE STYLE DIALOG BOX

4. In the **Create Style** dialog, type a name for the new style and click on **OK** to save the style.

Applying Styles

It is possible to assign keyboard shortcuts for the styles. By selecting the text and hitting the keys will paint the style on the text.

1. Open the **Tools** > **Customize** option from an Openwriter document. The **Customize** dialog box appears.
2. Choose whether to have the shortcut key assignment available to all the components of LibreOffice or only in Writer.
3. Select the desired shortcut key in the Shortcut Keys list at the top of the page.
4. Select the required function from the **Category** and **Function** lists.

FIG. 6.18: TOOLS > CUSTOMIZE OPTION

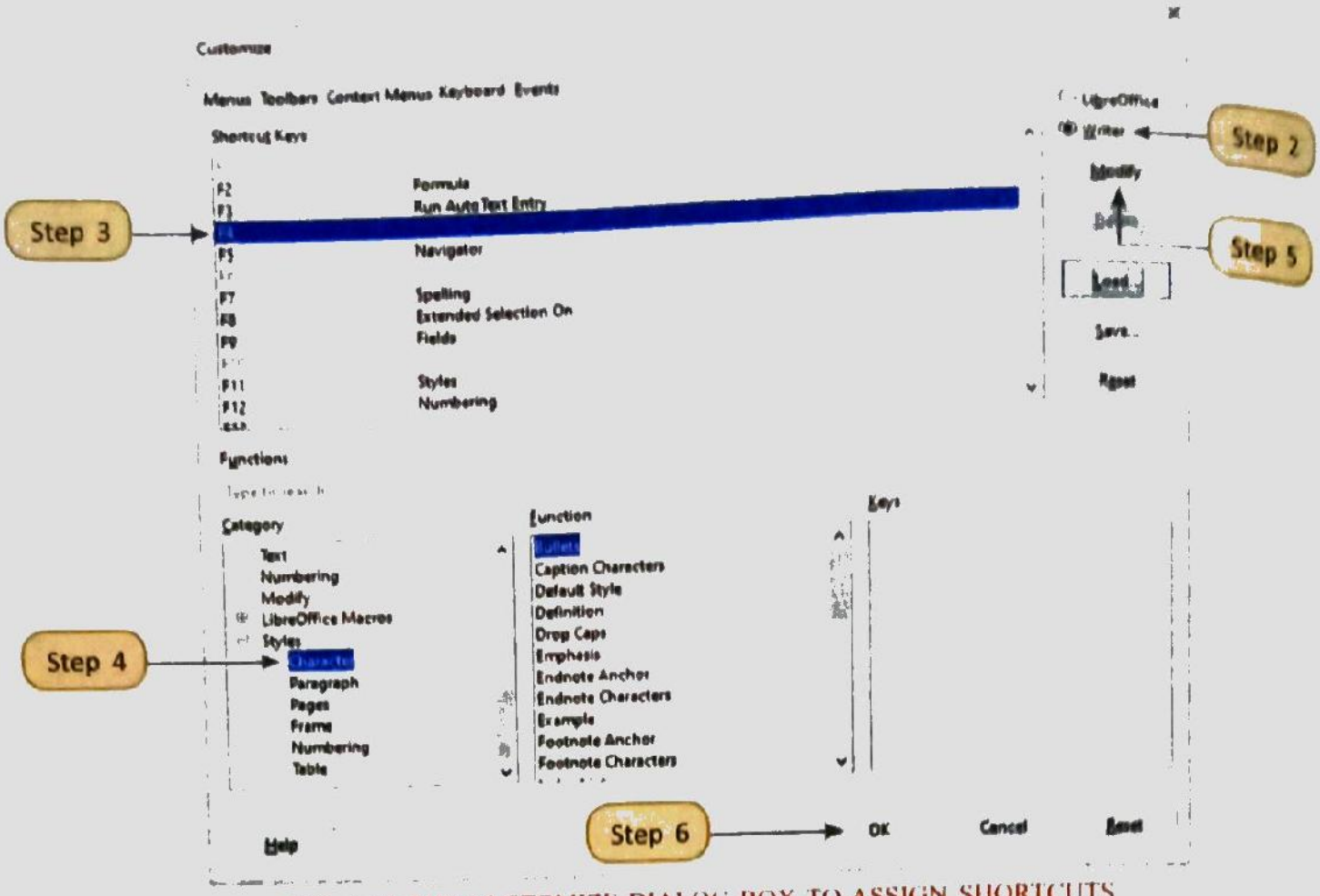


FIG. 6.19: THE CUSTOMIZE DIALOG BOX TO ASSIGN SHORTCUTS

5. Click the **Modify** button. The selection now appears in the Keys list on the lower right.
6. Click on **OK** to accept the change.

   Repeat as required.

SUMMARY

- Styles in a word processor is a combination of font effects, colors and background such that it can be saved and applied whenever needed into the Writer document.
- You can use Fill Format mode to apply a style to many areas quickly without having to go back to the Styles deck and double-click each time.
- Use New Style to create a new style from the formatting of an item in the current document.
- Another way to create a new style is to drag-and-drop a text selection into the Styles deck.

SESSION 2 INSERT AND USE IMAGES IN A DOCUMENT

Images can be added to a document in several ways: by inserting an image file stored on your computer, directly from a graphics program or a scanner, by dragging them from the clip art internal gallery, or by copying and pasting from a source being viewed on your computer.

Inserting an Image File

When the image is stored in a file stored on the computer, you can insert it into a LibreOffice document using any one of the following methods.

Drag and Drop

1. Open a file browser window and locate the image you want to insert.
2. Drag the image into the Writer document and drop it where you want it to appear. A faint vertical line marks where the image will be dropped.

This method embeds (saves a copy of) the image file in the Writer document. To link the file instead of embedding it, hold down the **Ctrl + Shift** keys while dragging the image.

Insert Image dialog box

1. Click in the LibreOffice where you want the image to appear.
2. Choose **Insert > Image** from the menu bar.
3. On the **Insert Image** dialog box, navigate to the file to be inserted, and select it.

   At the bottom of the dialog (Fig. 6.21) are one or two options. Select **Preview** (not available on all installations) to view a thumbnail of the selected image on the right (as shown in the example).

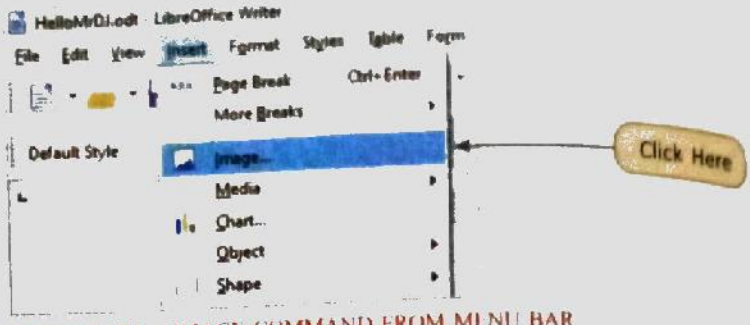


FIG. 6.20: THE INSERT - IMAGE COMMAND FROM MENU BAR

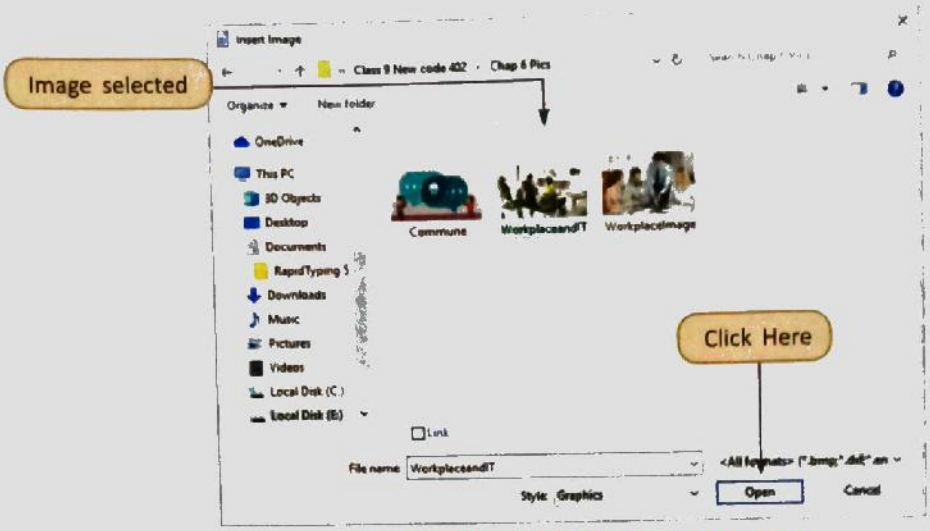


FIG. 6.21: THE INSERT IMAGE DIALOG BOX

4. Click on **Open** option.

Copy and Paste

Using the clipboard, you can copy images into a LibreOffice document from another LibreOffice document and from other programs. To do this:

1. Open both the source document and the target document.
2. In the source document, select the image to be copied.
3. Press **Ctrl+C** (or right-click and select **Copy** from the context menu) to copy the image to the clipboard.

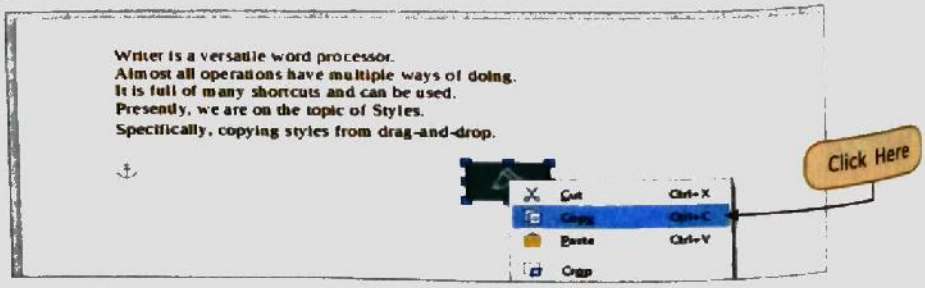


FIG. 6.22: THE COPYING OF PICTURE FROM SOURCE DOCUMENT

4. Switch to the target document.
5. Click to place the cursor where the image is to be inserted.

6. Press **Ctrl+V** (or right-click and select **Paste** from the context menu) to insert the image.

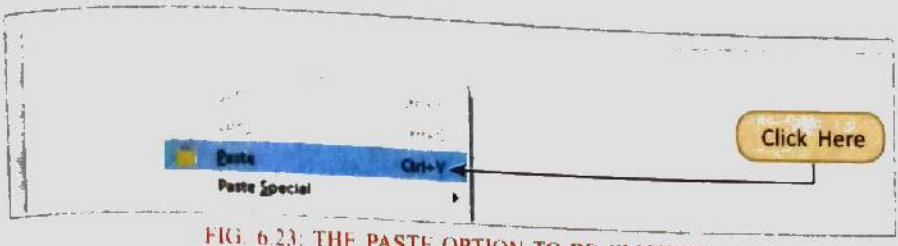


FIG. 6.23: THE PASTE OPTION TO BE CLICKED

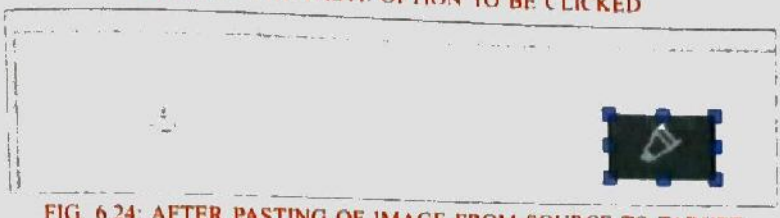


FIG. 6.24: AFTER PASTING OF IMAGE FROM SOURCE TO TARGET

Modifying an Image

When you insert a new image, you may need to modify it to suit the document. This section describes the use of the Image toolbar for resizing, cropping, and rotating an image.

Writer provides many tools for working with images. These tools are sufficient for most people's everyday requirements. However, for professional results it is generally better to use an image manipulation program such as GIMP to modify images (for example, to crop, resize, rotate, and change color values) and then insert the result into Writer.

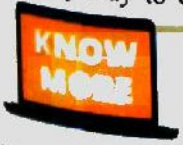
Using the Image Toolbar

When you insert an image or select one already present in the document, the Image toolbar appears. You can set it to always be present **(View > Toolbars > Image)** and choose whether to float or dock it.

FIG. 6.25: THE IMAGE TOOLBAR

Cropping Images

When you are only interested in a section of the image for the purpose of your document, you may wish to crop (cut off) parts of it. Writer provides two ways to crop an image: the **Crop** tool and the **Crop page** of the Image dialog. The Crop tool provides a quick and easy way to crop an image; but for more control, use the **Image** dialog.



If you crop an image in Writer, the image itself is not changed. Writer hides, not cuts off, part of the image.

Using the Crop tool

To use the Crop tool, right-click on the image and select **Crop** from the context menu. Cropping handles appear at the corners and mid-points of the sides of the

image (see Fig. 6.27). Drag a handle to cut off part of the image. Click outside the image to turn off cropping mode.

FIG. 6.26 THE CROP OPTION FROM CONTEXT MENU

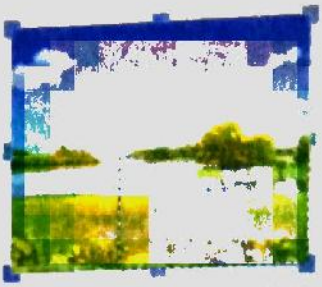


FIG. 6.27 THE IMAGE BEING CROPPED

FIG. 6.28 THE IMAGE AFTER BEING CROPPED

Using the Crop Page of the Image Dialog

To use the Image dialog, right-click on the image and select **Properties** from the context menu, then select the **Crop page** of the **Image** dialog.

The units of measurement shown on the Crop page are those set in **Tools** > **Options** > **LibreOffice Writer** > **General**.

FIG. 6.29: THE PROPERTIES OPTION BEING CLICKED FROM CONTEXT MENU

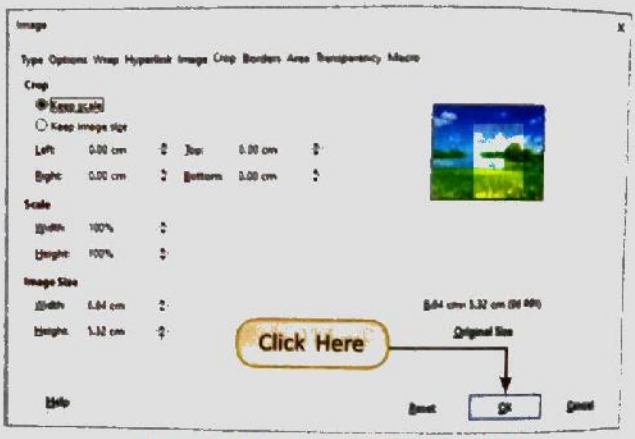


FIG. 6.30: THE IMAGE DIALOG WITH CROP PAGE OPEN

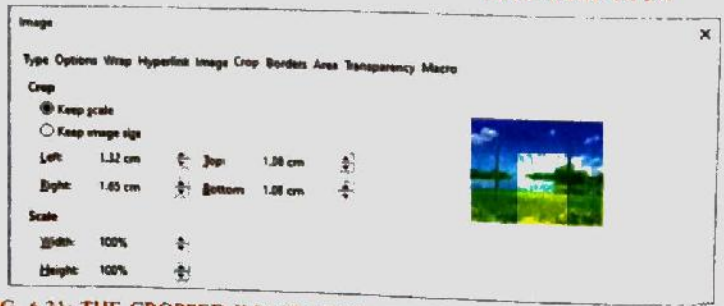


FIG. 6.31: THE CROPPED IMAGE VISIBLE AFTER CHOICE OF LEFT, RIGHT, TOP AND BOTTOM MARGINS

Resizing an Image

To perfectly fit the image into your document, you may have to resize it. There are a number of options available in Writer to do this.

The **Drawing** toolbar may appear at the bottom or left side of the workspace. You can move it to another location and dock it, or float it and move it to a convenient place on the screen.

To use a drawing tool:

1. Click in the document where you want the drawing to be anchored. You can change the anchor later, if necessary.
2. Select the tool from the **Drawing** toolbar (Fig. 6.35). The mouse pointer changes to a drawing-functions pointer and the normal **Formatting** toolbar changes to the **Drawing Object Properties** toolbar (Fig. 6.36).

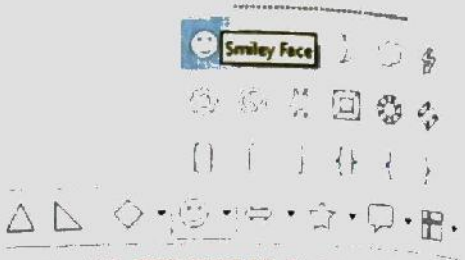


FIG. 6.35: THE SMILEY FACE CHOSEN AS DRAWING OBJECT FROM DRAWING TOOLBAR

3. Move the cross-hair pointer to the place in the document where you want the image to appear and then click-and-drag to create the drawing object. Release the mouse button. The selected drawing function remains active, so that you can draw another object of the same type.
4. To cancel the selected drawing function, press the **Esc** key or click on the Select icon (the arrow) on the **Drawing** toolbar.
5. You can now change the properties (fill color, line type and weight, anchoring, and others) of the drawing object using either the Drawing **Object Properties** toolbar (Fig. 6.36) or the choices and dialog reached by right-clicking on the drawing object.

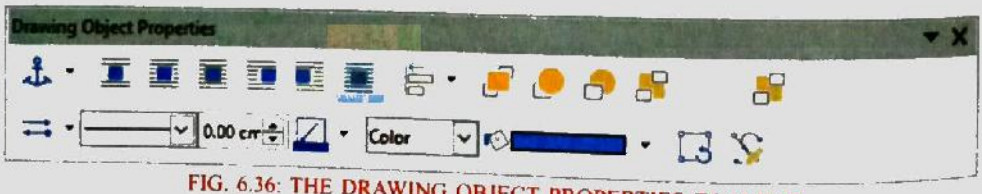


FIG. 6.36: THE DRAWING OBJECT PROPERTIES TOOLBAR

Setting or changing properties for drawing objects

To set the properties for a drawing object before you draw it:

1. On the **Drawing** toolbar (Fig. 6.35), click the Select tool.
2. On the **Drawing Object Properties** toolbar (Fig. 6.36), click on the icon for each property and select the value you want for that property.

The default you set applies to the current document and session. It is not retained when you close the document or close Writer, and it does not apply to any other document you open. The defaults apply to all the drawing objects except text objects.

To change the properties for an existing drawing object, select the object, then continue as described above.

Resizing a Drawing Object

An object is resized in a similar way to an image. Select the object, click one of the eight handles around it and drag it to its new size. The object will be scaled up or down.

When you grab the corner handle of an object and drag it, LibreOffice will resize proportionately. If you also press the Shift key, the resizing will not keep object proportions. Conversely, if you grab one of the edges, LibreOffice will scale unproportionally in the direction perpendicular to the edge; if you also press the Shift key, LibreOffice will scale proportionately. The method is the same as given in Fig. 6.33 and 6.34.

Grouping Drawing Objects

Grouping drawing objects makes it easier to handle several objects as a single entity, while preserving their relative sizes and positions. When objects are grouped, any editing operations carried out on that group are applied to all members of the group. If you click on one member of the group, the whole group is selected.

To group drawing objects, follow the given steps:

1. Select one object, then hold down the Shift key and select the others you want to include in the group. The bounding box expands to include all the selected objects.
2. With the objects selected, hover the mouse pointer over one of the objects and choose **Format** > **Group** > **Group** from the Menu bar or right-click and choose **Group** from the context menu.

You cannot include an embedded or linked image in a group with drawing objects.

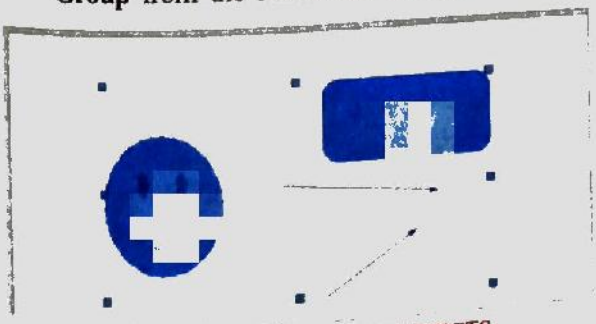


FIG. 6.37: THE DRAWING OBJECTS AFTER BEING SELECTED

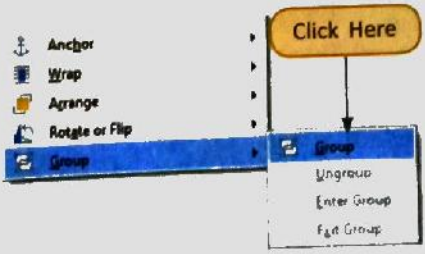


FIG. 6.38: THE FORMAT > GROUP > GROUP OPTION

You can edit an individual member of a group without ungrouping or breaking the group. Select the group and go to **Format** > **Group** > **Enter Group** on the Menu bar. Next, click on the object to be edited. When you have finished editing an individual member of a group, go to **Format** > **Group** > **Exit Group** on the Menu bar.

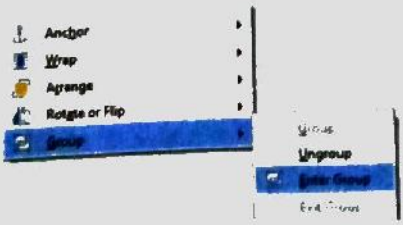


FIG. 6.39: THE FORMAT > GROUP > ENTER GROUP OPTION

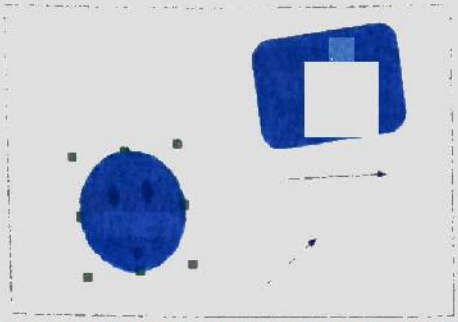


FIG. 6.40: EDITING OF INDIVIDUAL OBJECT AFTER FORMAT > GROUP > ENTER GROUP

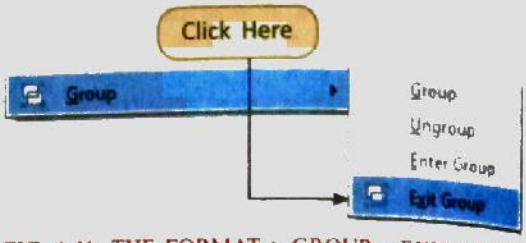


FIG. 6.41: THE FORMAT > GROUP > EXIT GROUP OPTION TO END INDIVIDUAL EDITING

To ungroup or break apart a group of objects, select the group then go to **Format** > **Group** > **Ungroup** on the Menu bar. See Fig. 6.39.

Positioning Images Within Text

When you add an image to a text document, you need to choose how to position it with respect to the text and other images. The positioning of images is often rather time-consuming and may be very frustrating for both inexperienced and experienced users. As Writer is a word processor rather than a desktop publishing program, there are some limitations to the flexibility in positioning images and it takes time to get things exactly as you would like them.

Positioning of an image is controlled by four settings:

- Arrangement refers to the placement of an image on an imaginary vertical axis. Arrangement controls how images are stacked upon each other or relative to the text.
- Alignment refers to the vertical or horizontal placement of an image in relation to the chosen anchor point.
- Anchoring refers to the reference point for the images. This point could be the page, or frame where the object is, a paragraph, or even a character. An image always has an anchor point.
- Text wrapping refers to the relation of images to the surrounding text, which may wrap around the graphic on one or both sides, be overprinted behind or in front of the graphic, or treat the graphic as a separate paragraph or character.

The settings can be accessed in a number of ways, depending on the nature of the images:

- From the Format menu, where you can find Anchor, Wrap, and Arrange (both for images and drawing objects).
- From the context menu displayed when you right-click the graphic; this menu also includes Alignment.
- For images, from the **Type** and **Wrap** pages of the **Image** dialog box. Note, that you cannot control the arrangement using the dialog. To open the Image dialog, click the image to select it and then choose **Format** > **Image** > **Properties** or right-click the image and choose Properties on the context menu.
- For drawing objects, from the **Position** and **Size** page of the **Position and Size** dialog. To open the dialog, right-click the drawing object and choose **Position and Size** on the context menu.

- For an embedded object (such as a Calc spreadsheet or Draw document), from the OLEObject toolbar. Below are some examples based on this section, related to text and image positioning. The picture gets fixed as if it is a character that is part of the words in the page.

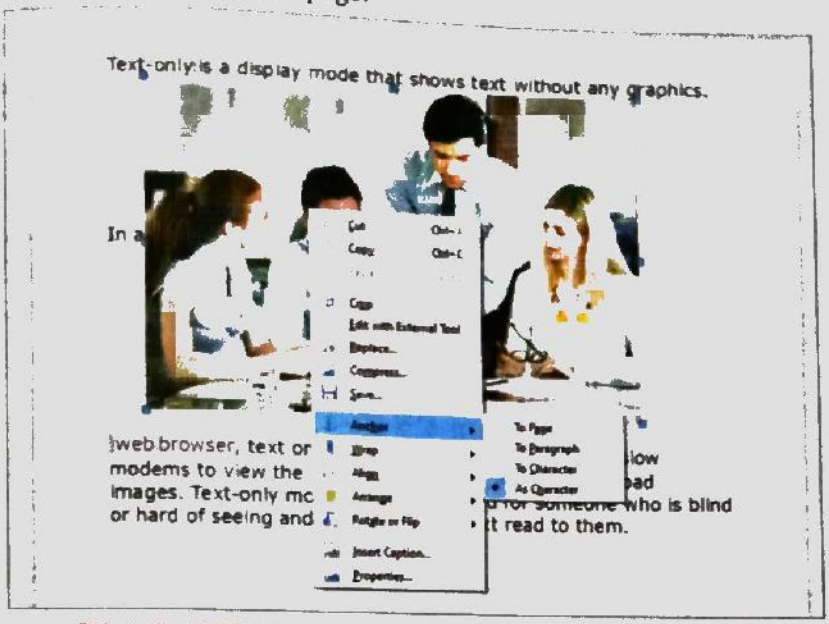


FIG. 6.42: AFTER THE PICTURE IS ANCHORED AS A CHARACTER

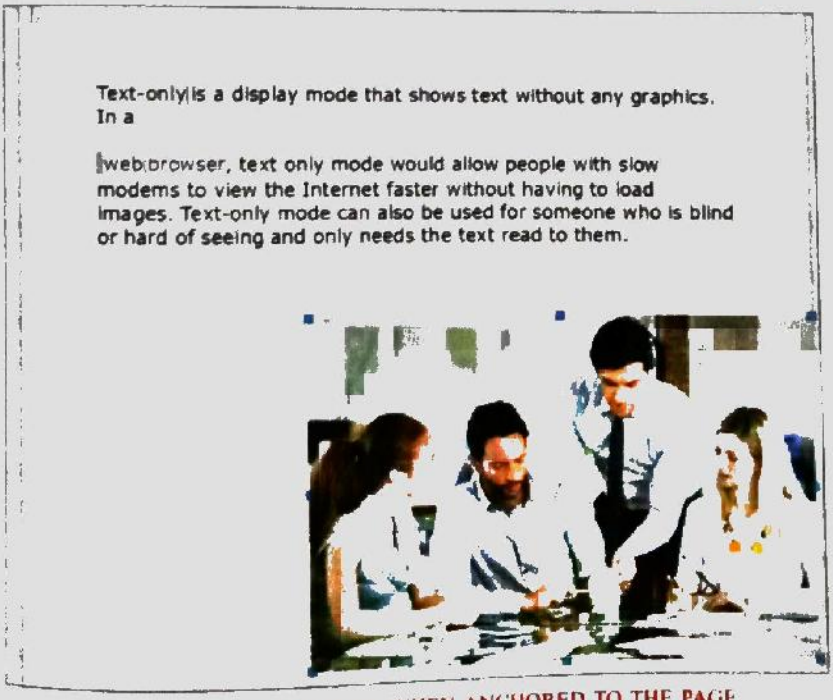


FIG. 6.43: THE PICTURE WHEN ANCHORED TO THE PAGE

You can move around the image on the page but cannot shift from the page. Now, the next set of pictures are to check for wrapping of image around text. Below is the image in the text, before setting any wrapping. There is no text wrapping around the picture in above.

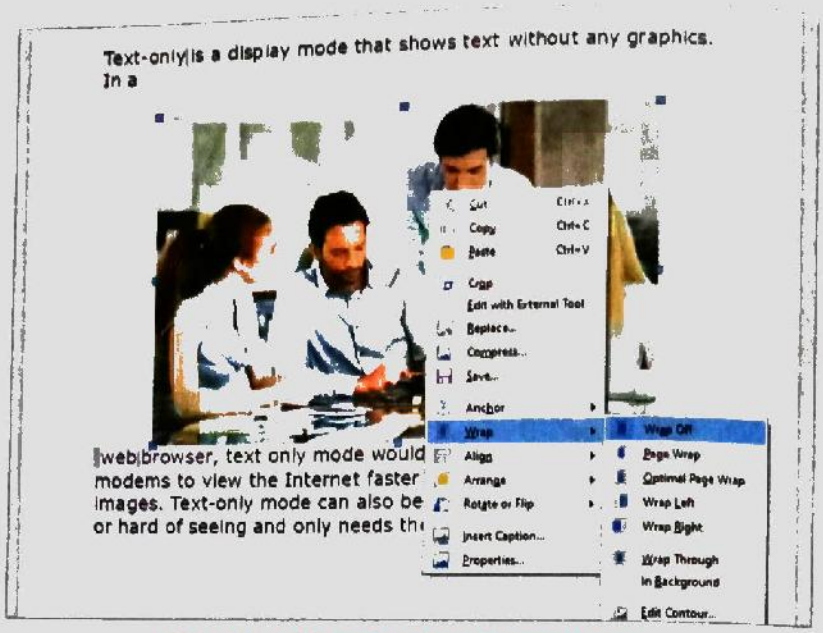


FIG. 6.44: WHEN THE WRAP IS SET TO OFF

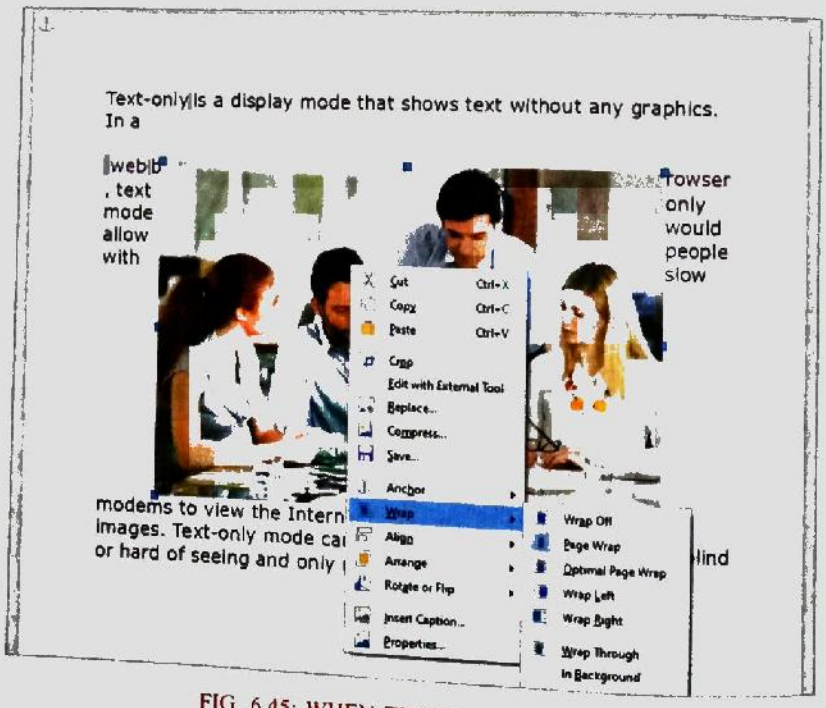


FIG. 6.45: WHEN THE PAGE WRAP IS SET

MARY

ges can be added to a document in several ways: by inserting an image file stored on your puter, directly from a graphics program or a scanner, by dragging them from the clip art internal ery, or by copying and pasting from a source being viewed on your computer.

g the clipboard, you can copy images into a LibreOffice document from another LibreOffice ument and from other programs.

n you insert an image or select one already present in the document, the Image toolbar appears. erfectly fit the image into your document, you may have to resize it.

Assignment 4 Time Table			
Subject-Economics			
Chapter- 2 Sectors of the Indian Economy			
Date/ Day	Chapter with topic and video link (link should be visited a day before the class begins.)	Questions to be done on your own	Questions of difficulty level
29-06-2020 Mon	CH 2 Sectors of Indian Economy	Q 1 of Assignment 4 pdf file	NIL
	Topic - Sectors of Economic activities	Ex page 35 and 36 of Text book	
	https://www.youtube.com/watch?v=Z68BaODYI5c&feature=youtu.be		
30-06-2020 Tues	CH 2 Sectors of Indian Economy	NIL	NIL
	Topic - Sectors of Economic activities		
01-07-2020 Wed	CH 2 Sectors of Indian Economy	……	…….
	Topic - Sectors of Economic activities		
02-07-2020 Thur	Topic- Comparing the three sectors	Q NO 2	……
		given in pdf assignment 4	
03 ang 04-07-2020	Topic- Comparing the three sectors	…….	…….
Fri and Sat			
06-07-2020 Mon	Topic- Primary, Secondary and Tertiary seectors in India	Q no. 3 and 4 in the Assignment 4 PDF	
07 -07-2020 Tue	Topic- Primary, Secondary and Tertiary sectors in India	……	……
08-07-2020 Wed	Division of sectors as Organised and Unorganised	Q5 given in Assignment pdf file	
09-07-2020 Thurs	Division of sectors as Organised and Unorganised	Q NO. 14 page no. 37 of Text book	……
10-07-2020 Fri	Sectors in terms of Ownership: Public and Private Sectors	Q. No. 5 of Assignment pdf	……
	https://www.youtube.com/watch?v=ja4CCPPDrmU&feature=youtu.be	Q 15,16,17,18 OF Text book page no.37	
11-07-2020 Sat	Sectors in terms of Ownership: Public and Private Sectors		

Assignment 4 Time Table			
Subject- ENGLISH			
Chapter- THE MIDNIGHT VISITOR			
Date/ Day	Chapter with topic and video link (link should be	Questions to be done on your own	Questions of difficulty level
06/07/2020 Mon.	THE MIDNIGHT VISITOR (10 - A)	Footprints Without Feet (NCERT)Think About It Ques.2	Footprints Without Feet (NCERT)Think About It Ques. 1 & 3
	https://youtu.be/V6ocIRhs0yQ	Footprints Without Feet (NCERT)Talk About It Ques.2	Footprints Without Feet (NCERT)Talk About It Ques. 1
07/07/2020 Tues.	THE MIDNIGHT VISITOR (10 - A)	Footprints Without Feet (NCERT)Think About It Ques.2	Footprints Without Feet (NCERT)Think About It Ques. 1 & 3
	https://youtu.be/V6ocIRhs0yQ	Footprints Without Feet (NCERT)Talk About It Ques.2	Footprints Without Feet (NCERT)Talk About It Ques. 1
10/07/2020 Fri.	THE MIDNIGHT VISITOR (10 - E)	Footprints Without Feet (NCERT)Think About It Ques.2	Footprints Without Feet (NCERT)Think About It Ques. 1 & 3
	https://youtu.be/V6ocIRhs0yQ	Footprints Without Feet (NCERT)Talk About It Ques.2	Footprints Without Feet (NCERT)Talk About It Ques. 1
11/07/2020 Sat.	THE MIDNIGHT VISITOR (10 - E)	Footprints Without Feet (NCERT)Think About It Ques.2	Footprints Without Feet (NCERT)Think About It Ques. 1 & 3
	https://youtu.be/V6ocIRhs0yQ	Footprints Without Feet (NCERT)Talk About It Ques.2	Footprints Without Feet (NCERT)Talk About It Ques. 1

Assignment 4 Time Table

Subject- ENGLISH

Chapter- TWO STORIES OF FLYING

Date/ Day	Chapter with topic and video link (link should be	Questions to be done on your own	Questions of difficulty level
29/06/2020 Mon.	HIS FIRST FLIGHT (10 - A)	FIRST FLIGHT (NCERT) Thinking About The Text Ques 1 2 & 4	FIRST FLIGHT (NCERT) Thinking About The Text Ques. 3 & 5
	https://youtu.be/mPBjvsWfw6o		
30/06/2020 Tues.	THE BLACK AEROPLANE	FIRST FLIGHT (NCERT) Thinking About The Text Ques. 1 & 4	FIRST FLIGHT (NCERT) Thinking About The Text Ques. 2 3 & 5
	https://youtu.be/mPBjvsWfw6o		
03/07 2020 Fri.	HIS FIRST FLIGHT (10 - E)	FIRST FLIGHT (NCERT) Thinking About The Text Ques 1 2 & 4	FIRST FLIGHT (NCERT) Thinking About The Text Ques. 3 & 5
	https://youtu.be/mPBjvsWfw6o		
04/07/2020 Sat.	THE BLACK AEROPLANE	FIRST FLIGHT (NCERT) Thinking About The Text Ques. 1 & 4	FIRST FLIGHT (NCERT) Thinking About The Text Ques. 2 3 & 5
	https://youtu.be/mPBjvsWfw6o		

The midnight visitor class 10

Class 10 English chapter The midnight visitor summ...

https://youtu.be/V6ocIRhs0yQ

Answer the questions in very short in ur class work copy: Q1. Who was Fowler and why did he want to meet Ausable? Q2. Who was Ausable?

Q3. Why had Max come to Ausable's flat?

Q4. What did Max do when there was a knock at the door? Q5. Who was actually knocking at the door?

II. Write the ques.& ans given below in your c w copy:

Click on the above YouTube link & listen to the explanation of the story: Two Stories About Flying

Open Diksha App
Select English class 10
Select First Flight & Two Stories About Flying
Select Very Short Answer....Do Que. No: 1 ,2 & 3
Select Short Answer...Do Que.No: 2 & 3
Select Long Answer.....Do Que No: 1 & 2
Select MCQ....Do all the Ques

Assignment 4 Time Table

Subject-Geography

Chapter- Forest and Wildlife Resources

Date/ Day	Chapter with topic and video link (link should be visited a day before the class begins.)	Questions to be done on your own	Questions of difficulty level
29-06-2020 Mon	Flora and Fauna in India	Q. No. 3, 4 and 6 given in PDF file of	Q3 How far were the colonial forest
	https://www.youtube.com/watch?v=U-kQhjz37qU&feature=youtu.be	Assignment	policies resposible for deplation of forest
			resources in India
30-06-2020 Tues	Flora and Fauna in India	Q. No. 3, 4 and 6 given in PDF file of	
		Assignment	
01-07-2020 Wed	Flora and Fauna in India	……	……
02-07-2020 Thur	Conservation of Forest and Wildlife in India	Q NO. 1,2 AND 5	Q5 Write briefly about the different
	https://www.youtube.com/watch?v=KnzX_uBPOcI&feature=youtu.be	given in pdf og assignment 4	types of forests in India.
03 AND 04-07-2020	Conservation of Forest and Wildlife in India	…….	…….
Fri and Sat			
06-07-2020 Mon	Types and Distribution of Forest and Wildlife	Q no. 5 in the Assignment 4 PDF	
	https://www.youtube.com/watch?v=KnzX_uBPOcI&feature=youtu.be		
07 AND 08-07-2020	Types and Distribution of Forest and Wildlife	……	……
Tue and Wed			
09-07-2020 Thurs	Community and Conservation	Q NO. 6 in theAssignment 4 pdf.	……
	https://www.youtube.com/watch?v=KnzX_uBPOcI&feature=youtu.be		
10-07-2020 Fri	Community and Conservation	Q. No. 5(i) and (ii) page no. 22 of	Q. no. 5(ii)
		text book	
11-07-2020 Sat	Community and Conservation		

Jagat taran golden jubilee school

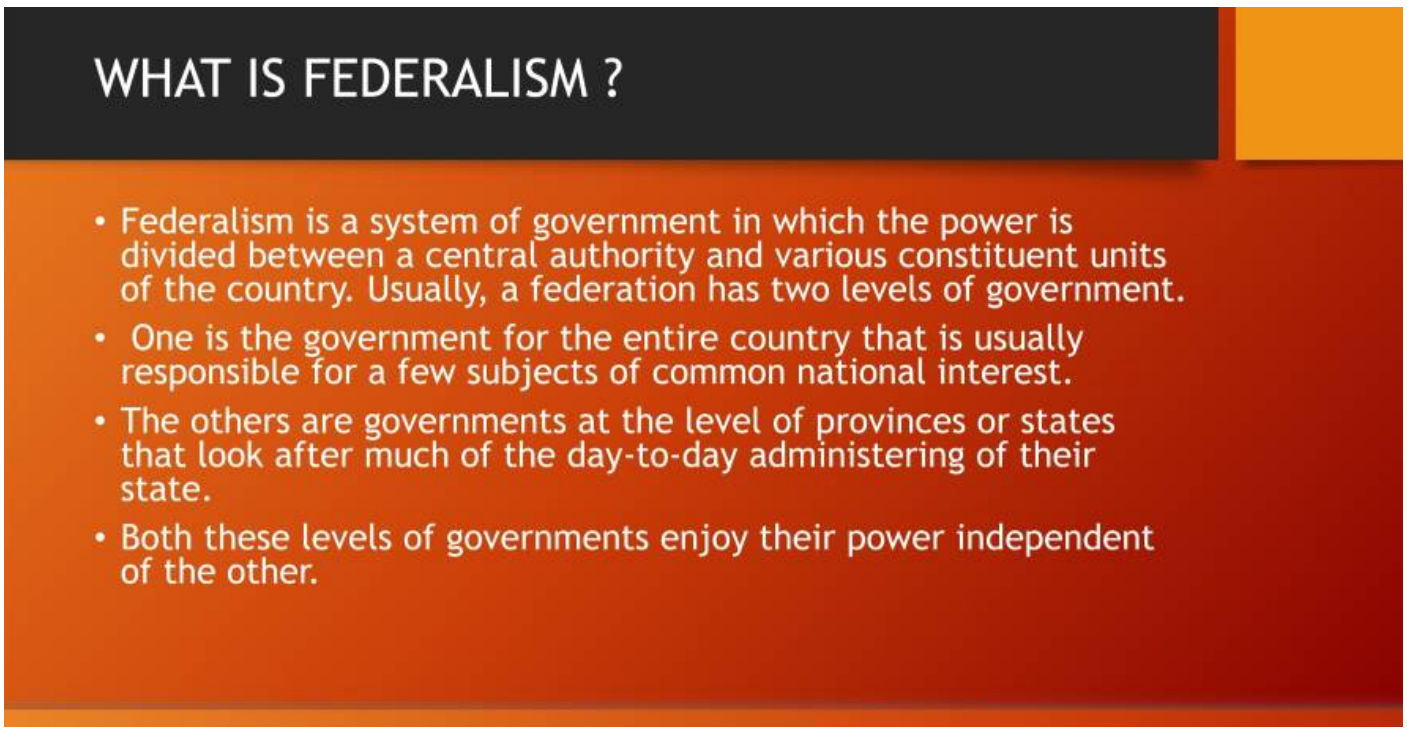
Class 10th session- 2020-21
HISTORY/CIVICS Assignment 4
Chapter 2 FEDERALISM

G https://diksha.gov.in/play/content/do_31279572104...

Get DIKSHA app from:

DIKSHA - Platform for School Education - Apps...
The DIKSHA platform offers teachers, students and p...
https://play.google.com/store/apps/details?id=in.go...

Main Content



FEDERAL V/S UNITARY GOVERNMENT

FEDERAL GOVERNMENT

- There are usually two or in some countries, more than two levels of government who execute their authority independent of each other.
- In a federal system, the central government cannot order the state government to do something.
- State government has powers of its own for which it is not answerable to the central government.
- Both these governments are separately answerable to the people.

UNITARY GOVERNMENT

- Under the unitary system, either there is only one level of government or the sub-units are subordinate to the central government.
- The central government can pass on orders to the provincial or the local government.

FEATURES OF FEDERALISM

1. There are two or more levels (or tiers) of government.

2. Different tiers of government govern the same citizens, but each tier has its own JURISDICTION in specific matters of legislation, taxation and administration.

3. The jurisdictions of the respective levels or tiers of government are specified in the constitution. So the existence and authority of each tier of government is constitutionally guaranteed.

4. The fundamental provisions of the constitution cannot be unilaterally changed by one level of government. Such changes require the consent of both the levels of government.

5. Courts have the power to interpret the constitution and the powers of different levels of government. The highest court acts as an umpire if disputes arise between different levels of government in the exercise of their respective powers.

6. Sources of revenue for each level of government are clearly specified to ensure its financial autonomy.

7. The federal system thus has dual objectives: to safeguard and promote unity of the country, while at the same time accommodate regional diversity. Therefore, two aspects are crucial for the institutions and practice of federalism. Governments at different levels should agree to some rules of power-sharing. They should also trust that each would abide by its part of the agreement. An ideal federal system has both aspects : mutual trust and agreement to live together.

The exact balance of power between the central and the state government varies from one federation to another. This balance depends mainly on the historical context in which the federation was formed.

TYPES OF FEDERALISM

COMING TOGETHER

- The first route involves independent States coming together on their own to form a bigger unit, so that by pooling sovereignty and retaining identity they can increase their security.
- This type of 'coming together' federations include the USA, Switzerland and Australia.
- In this first category of federations, all the constituent States usually have equal power and are strong vis-à-vis the federal government.

HOLDING TOGETHER

- The second route is where a large country decides to divide its power between the constituent States and the national government.
- India, Spain and Belgium are examples of this kind of 'holding together' federations.
- In this second category, the central government tends to be more powerful vis-à-vis the States.
- Very often different constituent units of the federation have unequal powers. Some units are granted special powers.

WHAT MAKES INDIA A FEDERAL COUNTRY ?

- India had emerged as an independent nation after a painful and bloody partition. Soon after Independence, several princely states became a part of the country. The Constitution declared India as a Union of States. Although it did not use the word federation, the Indian Union is based on the principles of federalism.
- The Constitution originally provided for a two-tier system of government, the Union Government or what we call the Central Government, representingthe Union of India and the State governments.
- Later, a third tier of federalism was added in the form of Panchayats and Municipalities. As in any federation, these different tiers enjoy separate jurisdiction. The Constitution clearly provided a threefold distribution of legislative powers between the Union Government and the State Governments.
- Thus, it contains three lists:

THE THREE LISTS OF SUBJECTS

UNION LIST

Includes subjects of national importance such as defence of the country, foreign affairs, banking, communications and currency.

They are included in this list because we need a uniform policy on these matters throughout the country.

The Union Government alone can make laws relating to the subjects mentioned in the Union List.

STATE LIST

Contains subjects of State and local importance such as police, trade, commerce, agriculture and irrigation.

The State Government alone can make laws relating to the subjects mentioned in the State List.

CONCURRENT LIST

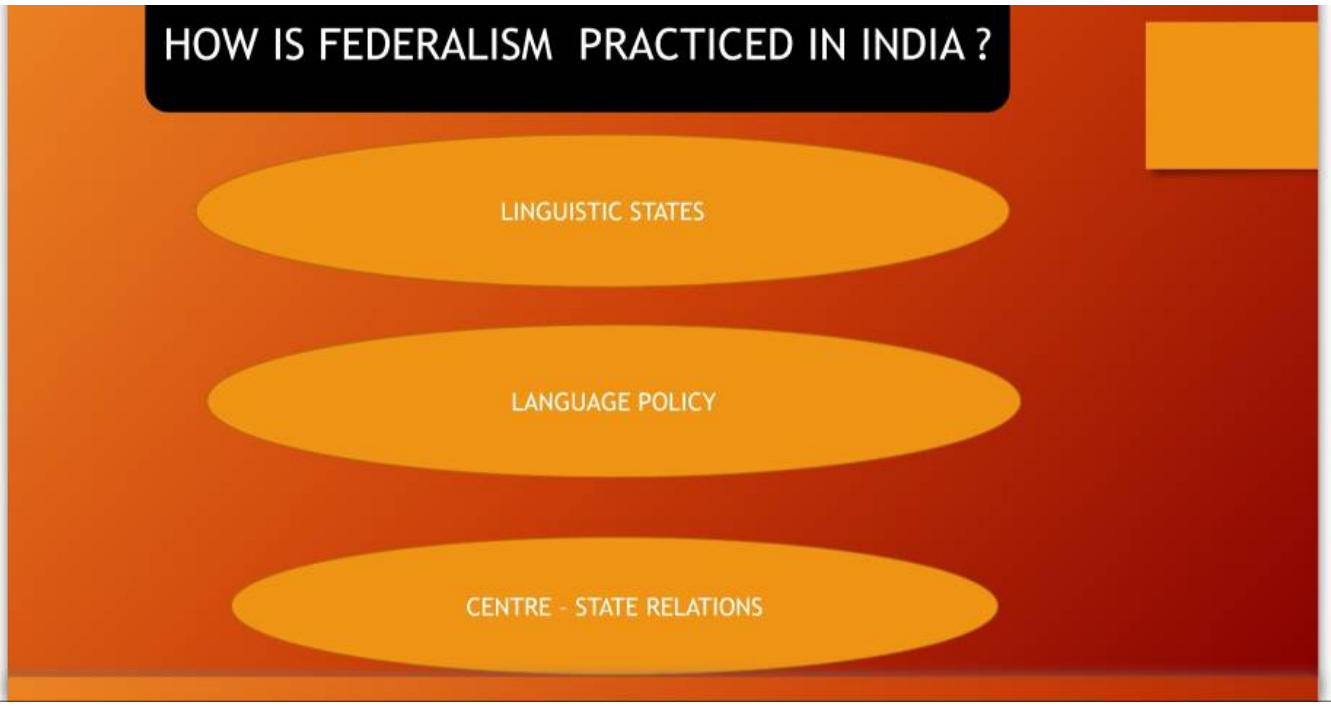
Includes subjects of common interest to both the Union Government as well as the State Governments, such as education, forest, trade unions, marriage, adoption and succession.

Both the Union as well as the State Governments can make laws on the subjects mentioned in this list.

If their laws conflict with each other, the law made by the Union Government will prevail.

What about subjects that do not fall in any of the three lists?

Subjects like computer software that came up after the constitution was made? According to our constitution, the Union Government has the power to legislate on these 'residuary' subjects.



IMPORTANT QUESTIONS

1. What is Federalism? Explain its certain features.
2. Distinguish between the Unitary and the federal system of the government by giving example.
3. What are the duel objectives of Federalism?
4. Discuss the coming together and holding together of federations.
5. Explain the threefold distribution of legislative powers between the centre and state.
6. What makes India a federal country ?

@@@@@@@@@@

HISTORY ASSIGNMENT

NATIONALISM IN INDIA

MAIN CONTENT

See India And The Contemporary World II on DIKSHA at

G https://diksha.gov.in/play/content/do_31279573820...

Get DIKSHA app from:

DIKSHA - Platform for School Education - Apps...
The DIKSHA platform offers teachers, students and p...
https://play.google.com/store/apps/details?id=in.go...

History
CHAPTER – 3 Nationalism in India

The growth of modern nationalism is intimately connected to anti-colonial movement.

The congress under the leadership of Mahatma Gandhi tried to forge groups together within one movement. However, the unity did not emerge without conflict.

First World War, Khilafat and Non-Cooperation

1. National Movement was spreading in New areas in 1919 and incorporating new social groups and developing new modes of struggle.
2. Mahatma Gandhi came to India and The Idea of Satyagraha emphasised the power of truth and the need to search for truth.
3. He advocated that physical force was not necessary to fight the oppressor.
4. In 1916, He travelled to Champaran in Bihar to inspire the peasants to struggle against the oppressive plantation system.

The Idea of Satyagraha

1. Mahatma Gandhi returned to India in January, 1915. His heroic fight for the Indians in South Africa was well-known. His novel method of mass agitation known as Satyagraha had yielded good results.
2. The idea of Satyagraha emphasized the power of truth and the need to search for truth.
3. In 1916, Gandhi travelled to Champaran in Bihar to inspire the peasants to struggle against the oppressive plantation system.
4. In 1917,crops field in Kheda district of Gujrat, but the government refused to remit land revenue and insisted on its full collection.
5. In 1918, Mahatma Gandhi intervened in a dispute between workers and mill owners of Ahmedabad. He advised to workers to go on strike and to demand a 35% increase in wages.
6. Satyagraha brought Gandhiji into close touch with the workers in the urban areas.

The Rawlatt act

1. When the Rawlatt act 1919, was passed hurriedly through the Imperial Legislative Council inspire of unanimous opposition of the Indian members, Gandhiji's patience comes to an end.
2. Gandhi wanted non-violent civil disobedience against such unjust laws, which would start with a hartal on 6th April.
3. 6th April 1919 was observed as Satyagraha Day when people all over the country observed fast and hartal.
4. 1919, the country witnessed a remarkable political awakening in India.
5. Local leaders were picked up from Amritsar and Mahatma Gandhi was barred from entering Delhi.
6. On 10th April, the police in Amritsar fired upon a peaceful procession, provoking widespread attacks on banks.

Jallianwalla Bagh Massacre

1. A large crowd gathered in the enclosed ground of Jalliawalla Bagh.
2. People came to protest against government's repressive measure while some came to attend the annual Baisakhi fair.
3. General Dyer entered the area. Blocked the exit points and opened fire on the crowd, killing hundreds.
4. The government responded with brutal repression seeking to humiliate and terrorise people.
5. Satyagrahis were forced to rub their noses on the ground, crawl on the streets and do Salaam (salute) to all Sahibs.

Khilafat movement

1. Rowlatt Satyagraha had been a widespread movement, it was still limited mostly to cities and towns.
2. Mahatma Gandhi now felt the need to launch a more broad based movement in India.
3. But he was certain that no such movement could be organized without bringing the Hindus and Muslims closer together.
4. The First World War had ended with the defeat of Ottoman Turkey. There were rumors that a harsh peace treaty was going to be imposed on the Ottoman Emperor, who was the spiritual head (Khalifa) of the Islamic world.
5. The Muslims of India decided to force Britain to change her Turkish policy.
6. A Khalifa Committee was formed under the leadership of Maulana Azad, Ajmal Khan and Hasrat Mohani.
7. A young generation of Muslim leaders like the brothers Muhammad Ali and Shaukat Ali began discussing with Mahatma Gandhi about the possibility of a united mass action on the issue.

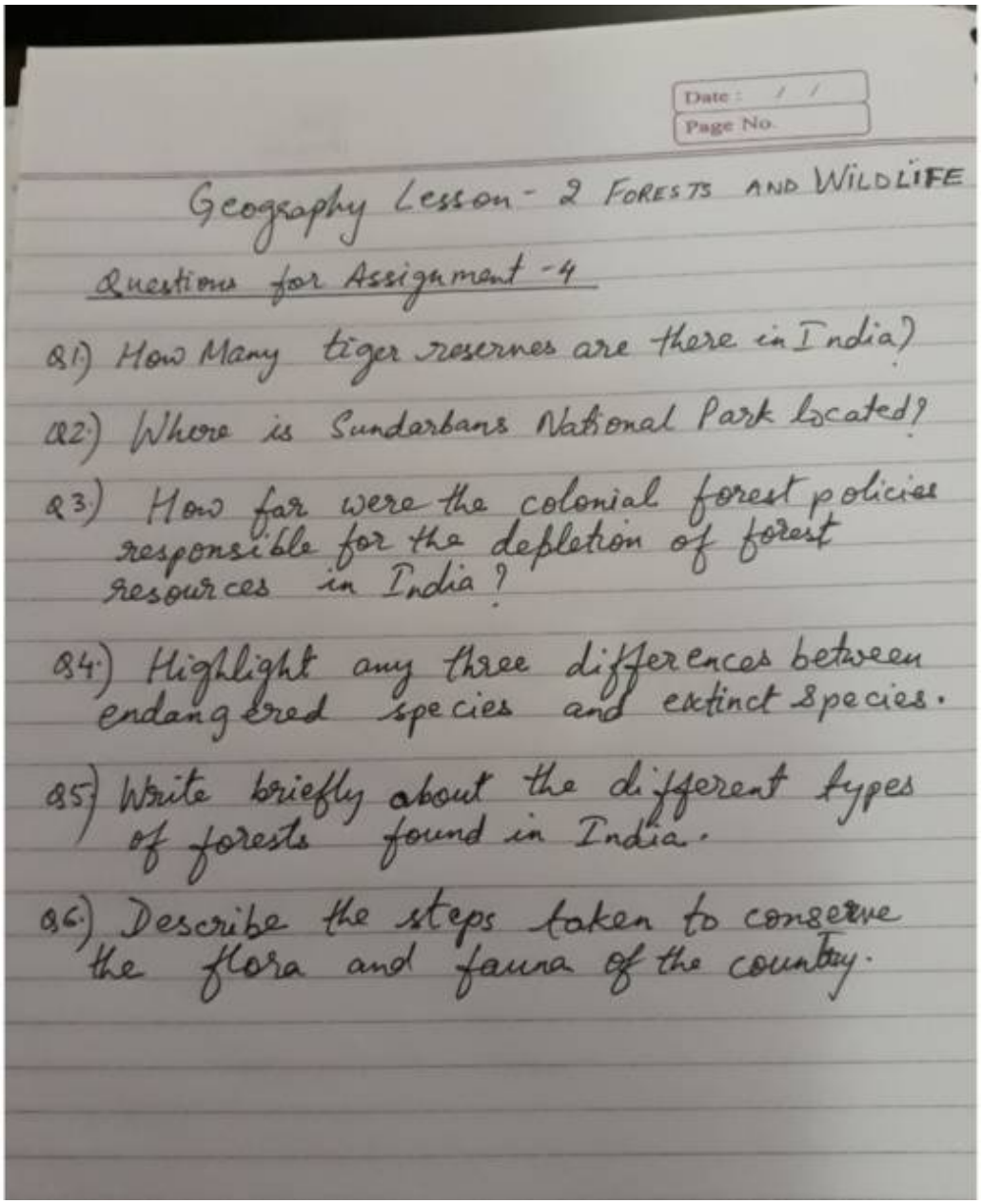
IMPORTANT QUESTIONS

1.What was the impact of first world war over India?
2. What is the idea of satyagraha?
3. Discuss the three main satyagraha movements led by Mahatma Gandhi.
4. What was Rawlatt act? Why did mahatma Gandhi launch a civil disobedience campaign against it?
5. When where and by whom the khilafat committee was formed?

###############

GEOGRAPHY
Chapter 2

Forest and Wildlife Resources - Chapter 2 Geo...
Key notes and summary of Class 10 NCERT Chapter ...
https://youtu.be/KnzX_uBPOcI



Date : / /
Page No.

Geography Lesson - 2 FORESTS AND WILDLIFE

Questions for Assignment -4

Q1) How Many tiger reserves are there in India?

Q2) Where is Sunderbans National Park located?

Q3) How far were the colonial forest policies responsible for the depletion of forest resources in India?

Q4) Highlight any three differences between endangered species and extinct species.

Q5) Write briefly about the different types of forests found in India.

Q6) Describe the steps taken to conserve the flora and fauna of the country.

##############

ECONOMICS

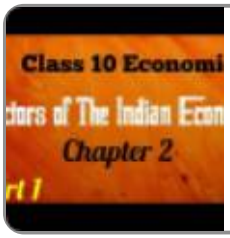
Chapter 2 - Sectors of Indian Economy
Main content

Sector of Economic Activities

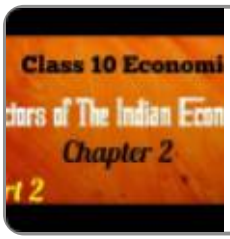
- **Primary Sector :** When we produce a good by exploiting natural resources. It is an activity of the primary sector also known as agriculture and related sector.
- **Secondary Sector :** Natural products are changed into others forms through ways of manufacturing. Also known as Industrial sector.
- **Tertiary Sector :** These activities , by themselves, do not produce a good but they are an aid or a support for the production process. Also known as service sector

What is GDP?

Gross Domestic Production: the total value of final goods and services produced in each sector during a particular year provides the total production of the sector for that year.



Sectors of The Indian Economy Part 1| Class 1...
Sectors of The Indian Economy Part 1| Class 10 Eco...
https://youtu.be/Z68BaODYl5c



Sectors of The Indian Economy Part 2| Class 1...
Sectors of The Indian Economy Part 2| Class 10 Eco...
https://youtu.be/ja4CCPPDrmU

IMPORTANT QUESTIONS

1. Explain the different sectors of Indian economy by giving examples.
2. How are the primary secondary and the tertiary sectors are interdependent to each others?
3. What is GDP ?
4. Differentiate between the final goods

and the intermediate goods.

5. Give reasons for the rising importance of the Tertiary sector in India.

****

Last modified: 24 Jun 2020

Introduction to Quadratic Equations

Quadratic Polynomial

> A polynomial of the form ax^2+bx+c, where a,b and c are real numbers and $a \neq 0$ is called a quadratic polynomial.

Quadratic Equation

When we equate a quadratic polynomial to a constant, we get a quadratic equation.

Any equation of the form $p(x)=c$, where $p(x)$ is a polynomial of degree 2 and c is a constant, is a quadratic equation.

The standard form of a Quadratic Equation

The standard form of a quadratic equation is $ax^2+bx+c=0$, where a,b and c are real numbers and $a\neq0$.

'a' is the coefficient of x^2. It is called the quadratic coefficient.

'b' is the coefficient of x. It is called the linear coefficient. 'c' is the constant term.

Solving QE by Factorisation

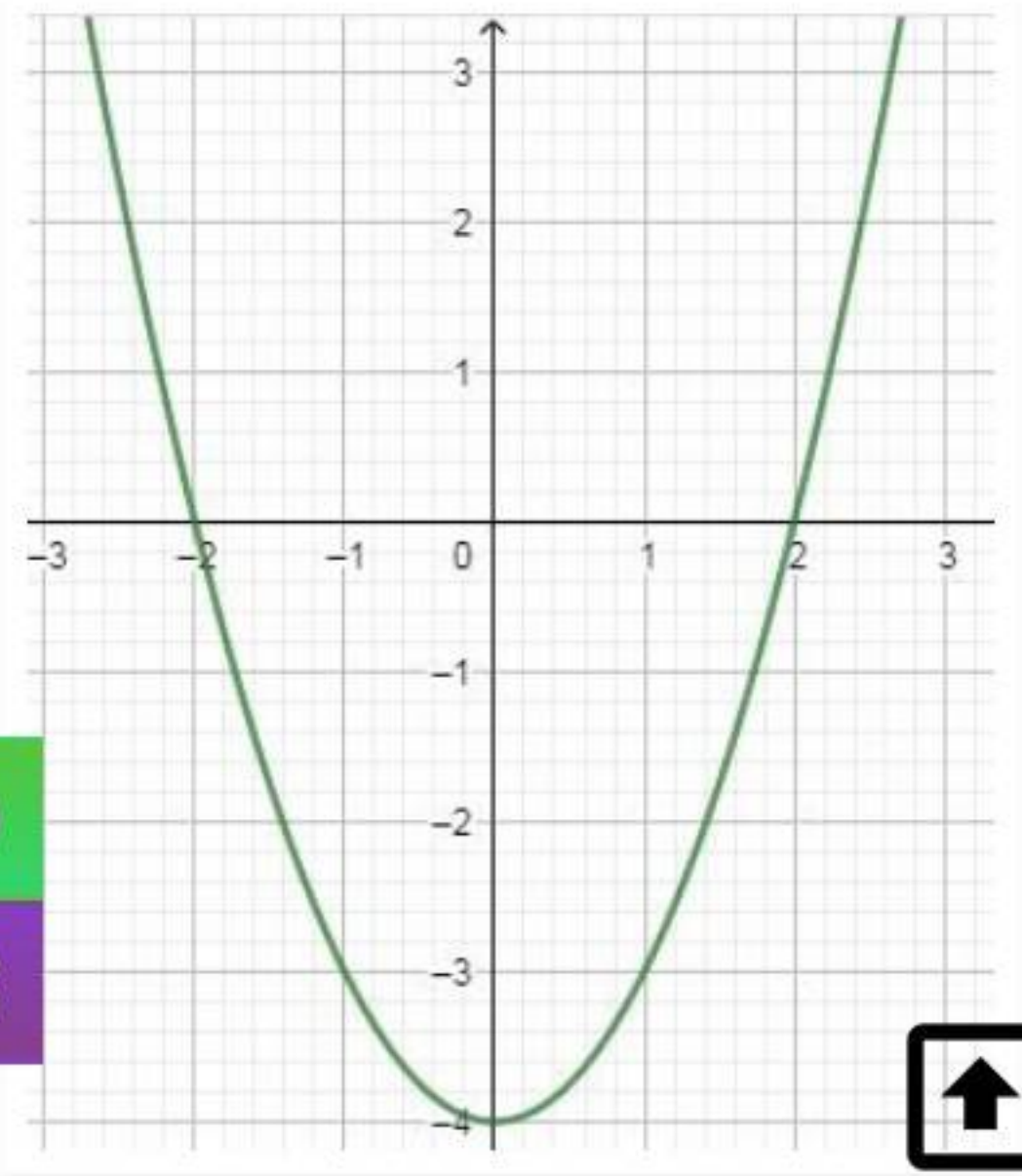
Roots of a Quadratic equation

The values of x for which a quadratic equation is satisfied are called the roots of the quadratic equation.

If α is a root of the quadratic equation $ax^2+bx+c=0$,then, $a\alpha^2+b\alpha+c=0$.

A quadratic equation can have two distinct roots, two equal roots or real roots may not exist.

Graphically, the roots of a quadratic equation are the points where the graph of the quadratic polynomial cuts the x-axis.



Graph of a Quadratic Equation

In the above figure, -2 and 2 are the roots of the quadratic equation $x^2-4=0$

Note:

- If the graph of the quadratic polynomial cuts the x-axis at two distinct points, then it has real and distinct roots.
- If the graph of the quadratic polynomial touches the x-axis, then it has real and equal roots.

- If the graph of the quadratic polynomial does not cut or touch the x-axis then it does not have any real roots.

Solving a Quadratic Equation by Factorization method

Consider a quadratic equation

$2x^2-5x+3=0$

$\Rightarrow 2x^2-2x-3x+3=0$

This step is splitting the middle

erm

We split the middle term by finding two numbers (-2 and -3) such that their sum is equal to the coefficient of x and their product is equal to the product of the coefficient of x^2 and the constant.

$(-2) + (-3) = (-5)$

And $(-2) \times (-3) = 6$

$2x^2-2x-3x+3=0$

$2x(x-1)-3(x-1)=0$

$(x-1)(2x-3)=0$

In this step, we have expressed the quadratic polynomial as a product of its factors.

Thus, $x = 1$ and $x = 3/2$ are the roots of the given quadratic equation.

This method of solving a quadratic equation is called the factorisation method.

Solving QE by Completing the Square

Solving a Quadratic Equation by Completion of squares method

In the method of completing the squares, the quadratic equation is expressed in the form $(x\pm k)^2=p^2$.

Consider the quadratic equation $2x^2-8x=10$

(i) Express the quadratic equation in standard form.

$2x^2-8x-10=0$

(ii) Divide the equation by the coefficient of x^2 to make the coefficient of x^2 equal to 1.

$x^2-4x-5=0$

(iii) Add square of half of the coefficient of x to both sides of the equation to get an expression of the form $x^2\pm2kx+k^2$.

$(x^2-4x+4)-5=0+4$

(iv) Isolate the above expression, $(x\pm k)^2$ on the LHS to obtain an equation of the form $(x\pm k)^2=p^2$

$(x-2)^2=9$

(v) Take the positive and negative square roots.

$x-2=\pm 3$

$=-1$ or $x=5$

Solving QE Using Quadratic Formula

Quadratic Formula

Quadratic Formula is used to directly obtain the roots of a quadratic equation from the standard form of the equation.

For the quadratic equation $ax^2+bx+c=0$,

$x= [-b\pm \sqrt{(b^2-4ac)}]/2a$

By substituting the values of a,b and c, we can directly get the roots of the equation.

Discriminant

For a quadratic equation of the form $ax^2+bx+c=0$, the expression b^2-4ac is called the **discriminant**, (denoted by **D**), of the quadratic equation.

The **discriminant** determines the **nature of roots** of the quadratic equation based on the **coefficients** of the quadratic polynomial.

Formula when D>0

Solve $2x^2-7x+3=0$ using the quadratic formula.

(i) Identify the coefficients of the quadratic polynomial. a = 2,b = -7,c = 3

(ii) Calculate the discriminant, b^2-4ac

$D=(-7)^2-4\times2\times3=25$

D> 0, therefore, the roots are distinct.

ii) Substitute the coefficients
the quadratic formula to find
he roots

(iii) Substitute the coefficients in the quadratic formula to find the roots

$x= [-(-7)\pm \sqrt{((-7)^2-4(2)(3))}]/2(2)$

$x=(7 \pm 5)/4$

$x=3$ and $x= 1/2$ are the roots.

Nature of Roots

Based on the value of the discriminant, $D=b^2-4ac$, the roots of a quadratic equation can be of three types.

Case 1: If **D>0**, the equation has two **distinct real roots**.

Case 2: If **D=0**, the equation has two **equal real roots**.

Case 1: If **D>0**, the equation has two **distinct real roots**.

Case 2: If **D=0**, the equation has two **equal real roots**.

Case 3: If **D<0**, the equation has **no real roots**.

For a quadratic equation of the form $ax^2+bx+c=0$, the expression b^2-4ac is called the **discriminant**, (denoted by **D**), of the quadratic equation.

The **discriminant** determines the **nature of roots** of the quadratic equation based on the **coefficients** of the quadratic polynomial.

Example 2 : Check whether the following are quadratic equations:

(i) $(x-2)^2+1=2x-3$ (ii) $x(x+1)+8=(x+2)(x$

(iii) $x(2x+3)=x^2+1$ (iv) $(x+2)^3=x^3-4$

Solution :

(i) LHS $=(x-2)^2+1=x^2-4x+4+1=x^2-4x+5$

Therefore, $(x-2)^2+1=2x-3$ can be rewritten as

i.e., $$x^2-4x+5=2x-3$$

$$x^2-6x+8=0$$

It is of the form $ax^2+bx+c=0$.

Therefore, the given equation is a quadratic equation.

(ii) Since $x(x + 1) + 8 \equiv x^2 + x + 8$ and $(x + 2)(x - 2) \equiv x^2 - 4$

Therefore, $x^2 + x + 8 \equiv x^2 - 4$

i.e., $x + 12 \equiv 0$

It is not of the form $ax^2 + bx + c \equiv 0$.

Therefore, the given equation is not a quadratic equation.

(iii) Here, $\text{LHS} \equiv x(2x + 3) \equiv 2x^2 + 3x$

So, $x(2x + 3) \equiv x^2 + 1$ can be rewritten as

$2x^2 + 3x \equiv x^2 + 1$

Therefore, we get $x^2 + 3x - 1 = 0$

It is of the form $ax^2 + bx + c = 0$.

So, the given equation is a quadratic equation.

(iv) Here, $\text{LHS} = (x + 2)^3 = x^3 + 6x^2 + 12x + 8$

Therefore, $(x + 2)^3 = x^3 - 4$ can be rewritten as

$x^3 + 6x^2 + 12x + 8 = x^3 - 4$

i.e., $6x^2 + 12x + 12 = 0$ or, $x^2 + 2x + 2 = 0$

It is of the form $ax^2 + bx + c = 0$.

So, the given equation is a quadratic equation.

Example 4 : Find the roots of the quadratic equation $6x^2 - x - 2 = 0$.

Solution : We have

$$\begin{aligned} 6x^2 - x - 2 &= 6x^2 + 3x - 4x - 2 \\ &= 3x\,(2x + 1) - 2\,(2x + 1) \\ &= (3x - 2)(2x + 1) \end{aligned}$$

The roots of $6x^2 - x - 2 = 0$ are the values of x for which $(3x - 2)(2x + 1) = 0$

Therefore, $3x - 2 = 0$ or $2x + 1 = 0$,

i.e., $$x = \frac{2}{3} \quad \text{or} \quad x = -\frac{1}{2}$$

Therefore, the roots of $6x^2 - x - 2 = 0$ are $\frac{2}{3}$ and $-\frac{1}{2}$.

We verify the roots, by checking that $\frac{2}{3}$ and $-\frac{1}{2}$ satisfy $6x^2 - x - 2 = 0$.

Example 5 : Find the roots of the quadratic equation $3x^2 - 2\sqrt{6}x + 2 = 0$.

Solution : $$\begin{aligned} 3x^2 - 2\sqrt{6}x + 2 &= 3x^2 - \sqrt{6}x - \sqrt{6}x + 2 \\ &= \sqrt{3}\,x\left(\sqrt{3}\,x - \sqrt{2}\right) - \sqrt{2}\left(\sqrt{3}\,x - \sqrt{2}\right) \\ &= \left(\sqrt{3}\,x - \sqrt{2}\right)\left(\sqrt{3}\,x - \sqrt{2}\right) \end{aligned}$$

So, the roots of the equation are the values of x for which

$$\left(\sqrt{3}\,x - \sqrt{2}\right)\left(\sqrt{3}\,x - \sqrt{2}\right) = 0$$

Now, $\sqrt{3}x - \sqrt{2} = 0$ for $x = \sqrt{\frac{2}{3}}$.

So, this root is repeated twice, one for each repeated factor $\sqrt{3}x - \sqrt{2}$.

Therefore, the roots of $3x^2 - 2\sqrt{6}x + 2 = 0$ are $\sqrt{\frac{2}{3}}, \sqrt{\frac{2}{3}}$.

Let us consider some examples to

Example 7 : Solve the equation given in Example 3 by the method of completi square.

Solution : The equation $2x^2 - 5x + 3 = 0$ is the same as $x^2 - \frac{5}{2}x + \frac{3}{2} = 0$.

Now, $x^2 - \frac{5}{2}x + \frac{3}{2} = \left(x - \frac{5}{4}\right)^2 - \left(\frac{5}{4}\right)^2 + \frac{3}{2} = \left(x - \frac{5}{4}\right)^2 - \frac{1}{16}$

Therefore, $2x^2 - 5x + 3 = 0$ can be written as $\left(x - \frac{5}{4}\right)^2 - \frac{1}{16} = 0$.

So, the roots of the equation $2x^2 - 5x + 3 = 0$ are exactly the same as those

$\left(x - \frac{5}{4}\right)^2 - \frac{1}{16} = 0$. Now, $\left(x - \frac{5}{4}\right)^2 - \frac{1}{16} = 0$ is the same as $\left(x - \frac{5}{4}\right)^2 = \frac{1}{16}$

Therefore, $x - \frac{5}{4} = \pm\frac{1}{4}$

i.e., $x = \frac{5}{4} \pm \frac{1}{4}$

i.e., $x = \frac{5}{4} + \frac{1}{4}$ or $x = \frac{5}{4} - \frac{1}{4}$

i.e., $x = \frac{3}{2}$ or $x = 1$

and then

This m

Example 8
the square

Solution :

This is th
(

i.e.,

i.e.,

i.e.,

i.e.,

i.e.,

So,

Ther

Veri

Therefore, the solutions of the equations are $x = \frac{3}{2}$ and 1.

Let us **verify** our solutions.

Putting $x = \frac{3}{2}$ in $2x^2 - 5x + 3 = 0$, we get $2\left(\frac{3}{2}\right)^2 - 5\left(\frac{3}{2}\right) + 3 = 0$, which is correct. Similarly, you can verify that $x = 1$ also satisfies the given equation.

In Example 7, we divided the equation $2x^2 - 5x + 3 = 0$ throughout by 2 to get $x^2 - \frac{5}{2}x + \frac{3}{2} = 0$ to make the first term a perfect square and then completed the square. Instead, we can multiply throughout by 2 to make the first term as $4x^2 = (2x)^2$ and then complete the square.

This method is illustrated in the next example.

Example 8 : Find the roots of the equation $5x^2 - 6x - 2 = 0$ by the method of completing the square.

Solution : Multiplying the equation throughout by 5, we get

$$25x^2 - 30x - 10 = 0$$

This is the same as

$$(5x)^2 - 2 \times (5x) \times 3 + 3^2 - 3^2 - 10 = 0$$

i.e., $$(5x - 3)^2 - 9 - 10 = 0$$

i.e., $$(5x - 3)^2 - 19 = 0$$

i.e., $$(5x - 3)^2 = 19$$

i.e., $$5x - 3 = \pm\sqrt{19}$$

i.e., $$5x = 3 \pm \sqrt{19}$$

So, $$x = \frac{3 \pm \sqrt{19}}{5}$$

Therefore, the roots are $\frac{3+\sqrt{19}}{5}$ and $\frac{3-\sqrt{19}}{5}$.

Example 13 : Find the roots of the following quadratic equations, if they exist, using the quadratic formula:

(i) $3x^2 - 5x + 2 = 0$ (ii) $x^2 + 4x + 5 = 0$ (iii) $2x^2 - 2\sqrt{2}\,x + 1 = 0$

Solution :

(i) $3x^2 - 5x + 2 = 0$. Here, $a = 3$, $b = -5$, $c = 2$. So, $b^2 - 4ac = 25 - 24 = 1 > 0$.

Therefore, $x = \dfrac{5 \pm \sqrt{1}}{6} = \dfrac{5 \pm 1}{6}$, i.e., $x = 1$ or $x = \dfrac{2}{3}$

So, the roots are $\dfrac{2}{3}$ and 1.

(ii) $x^2 + 4x + 5 = 0$. Here, $a = 1$, $b = 4$, $c = 5$. So, $b^2 - 4ac = 16 - 20 = -4 < 0$.

Since the square of a real number cannot be negative, therefore $\sqrt{b^2 - 4ac}$ will not have any real value.

So, there are no real roots for the given equation.

(iii) $2x^2 - 2\sqrt{2}\,x + 1 = 0$. Here, $a = 2$, $b = -2\sqrt{2}$, $c = 1$.

So, $b^2 - 4ac = 8 - 8 = 0$

Therefore, $x = \dfrac{2\sqrt{2} \pm \sqrt{0}}{4} = \dfrac{\sqrt{2}}{2} \pm 0$, i.e., $x = \dfrac{1}{\sqrt{2}}$.

So, the roots are $\dfrac{1}{\sqrt{2}}, \dfrac{1}{\sqrt{2}}$.

Example 14 : Find the roots of the following equations:

(i) $x+\frac{1}{x}=3, x \neq 0$ (ii) $\frac{1}{x}-\frac{1}{x-2}=3, x \neq 0,2$

Solution :

(i) $x+\frac{1}{x}=3$. Multiplying throughout by x, we get

$$x^2+1=3x$$

i.e., $x^2-3x+1=0$, which is a quadratic equation.

Here, $a=1, b=-3, c=1$

So, $b^2-4ac=9-4=5>0$

Therefore, $x=\frac{3 \pm \sqrt{5}}{2}$ (Why?)

So, the roots are $\frac{3+\sqrt{5}}{2}$ and $\frac{3-\sqrt{5}}{2}$.

(ii) $\frac{1}{x}-\frac{1}{x-2}=3, x \neq 0, 2$.

As $x \neq 0, 2$, multiplying the equation by $x(x-2)$, we get

$$(x-2)-x=3x(x-2)$$

$$=3x^2-6x$$

So, the given equation reduces to $3x^2-6x+2=0$, which is a quadratic equation.

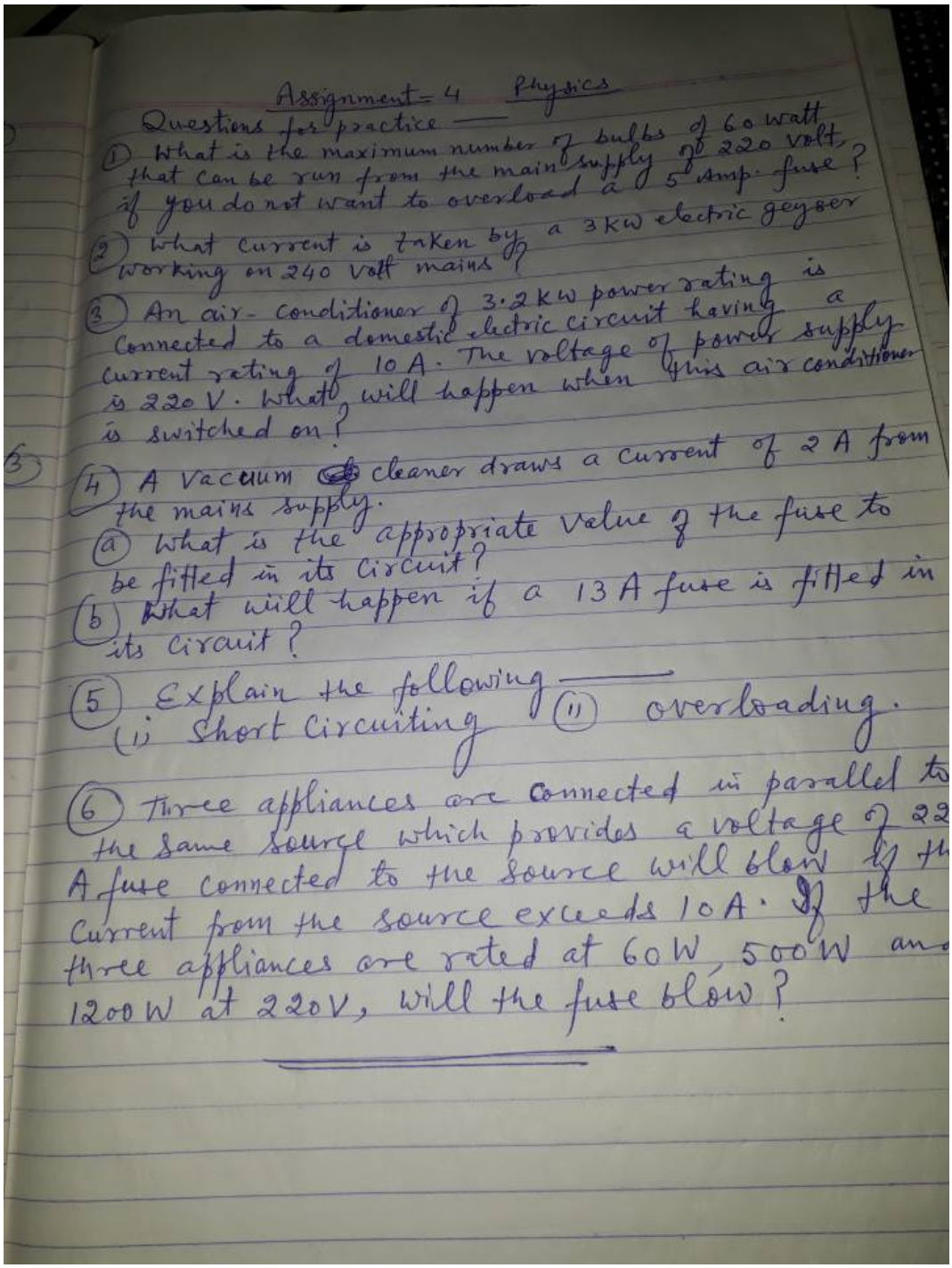
Here, $a=3, b=-6, c=2$. So, $b^2-4ac=36-24=12>0$

Therefore, $x=\frac{6 \pm \sqrt{12}}{6}=\frac{6 \pm 2\sqrt{3}}{6}=\frac{3 \pm \sqrt{3}}{3}$.

So, the roots are $\frac{3+\sqrt{3}}{3}$ and $\frac{3-\sqrt{3}}{3}$.

Assignment 4 Time Table			
Subject- MATHEMATICS			
Chapter- QUADRATIC EQUATION (assignment 4)			
Date/ Day	Chapter with topic and video link (link should be	Questions to be done on your own	Questions of difficulty level
01-07-2020 wed.		exercise 4.1 question number 1 (3,6) , 2(3)	exercise 4.1 question 2(4)
	chapter 4 Quadratic equation	exercise 4.2 question number 4,5	exercise 4.2 question 1(3,4)
	Introduction and standard form of quadratic equation		
	solution of quadratic equation by factorization		
	http://youtu.be/-Zqt1XMJv78		
02-07-2020 thurs	Chapter 4 Quadratic equation	exercise 4.3 question number 1(1,4)	exercise 4.3 question number 1(2)
	solution of quadratic equation graphically roots		
	solving QE by completing the square method		
	http://youtu.be/-Zqt1XMJv78		
08-07-2020 wed	Chapter 4 Quadratic equation	exercise 4.3 question number 4,6,8	exercise 4.3 question number 9,10
	solving QE by using quadratic formula		
	discriminant		
	http://youtu.be/-Zqt1XMJv78		
09-07-2020 thurs	Chapter 4 Quadratic equation	exercise 4.4 question number 2(1) ,4	exercise 4.4 question number 1(2), 5
	nature of roots		
	http://youtu.be/-Zqt1XMJv78		

Image



Assignment = 4 Physics

Questions for practice —

(1) What is the maximum number of bulbs of 60 watt that can be run from the main supply of 220 volt, if you do not want to overload a 5 Amp. fuse?

(2) What current is taken by a 3 KW electric geyser working on 240 volt mains?

(3) An air-conditioner of 3.2 KW power rating is connected to a domestic electric circuit having a current rating of 10 A. The voltage of power supply is 220 V. What will happen when this air conditioner is switched on?

(4) A vacuum cleaner draws a current of 2 A from the mains supply.
(a) What is the appropriate value of the fuse to be fitted in its circuit?
(b) What will happen if a 13 A fuse is fitted in its circuit?

(5) Explain the following —
(i) short circuiting (ii) overloading.

(6) Three appliances are connected in parallel to the same source which provides a voltage of 22
A fuse connected to the source will blow if th
current from the source exceeds 10 A. If the
three appliances are rated at 60 W, 500 W an
1200 W at 220 V, will the fuse blow?

Last modified: 19:43

ASSIGNMENT -4 TIME TABLE(29 June – 11 July, 2020)
CLASS -10 (Physics)

TOPIC : Magnetic Effect and Electric Current **Teacher : P.K. Upadhyay**

DAY/DATE	Chapter with topic and video link	Questions to be done on your own	Questions of difficulty level
29 June (Thursday) To 04 July	Introduction to Magnet, Magnetic Field , Characteristics of magnet, Right hand thumb rule, Properties of magnetic field, Force on current,	**N/A**	**Assignment -04 Q. no. 01 -05**
06 July to 11 july	Left hand thumb Fleming rule, Electric motor, Galvanometer, Electric Generator, Electromagnetic Induction , Short circuit, overloading	**N/A**	**Assignment -04 Q. no. 05 and 06**