St. Joseph College of Teacher Education for Women

Ernakulam

CRITERION II

2.4.5 Adequate skills are developed in students for effective use of ICT for teaching learning process

(Sample evidence showing the tasks carried out for each of the selected response)

Submitted to

National Assessment and Accreditation Council (NAAC)

3rd Cycle of Assessment

2.4.5

Sample evidence showing the tasks carried out for each of the selected response

Sl .No.	Item	Samples	Page No.
1	Preparation of lesson plans	Digital Lesson Plan using Canva Template Created by Students	1-4
		Digital Lesson Plan using Google Slides Created by Students	5-13
2	Developing assessment tools for both online and offline learning	Digital Self-Assessment Tools Created by Students	14-36
3	Effective use of social media/learning apps/adaptive devices for learning	Sample photo of Social Media, Learning Apps, and Adaptive Devices used for Learning	37-47
4	Identifying and selecting/ developing online learning Resources	Simulated Experiments with PhET Interactive Simulations used for Learning by Students	48-49
		Simulated Classroom Environment Created by Students	50
		Digital Mind Map Created by Students (Online Websites)	51
		Digital Concept Map Created by Students (Online Websites)	52-53
		Digital Learning Resources created by Students	
		Audio Book.	54-81
		Digital Lab Manual	82-106
		Digital Puzzle Book	107-143
		Digital Question Bank	144-170
		Digital Quiz Book	171-198
		Digital Scientists Album	199-227

LESSON PLAN

Monday

Tuesday

Wednesday

Thursday

Friday

ALKALIES

Grade : IX

Subject: Chemistry

Date: dd:mm:yyyy

Topic: Alkalies

Lesson: Acid ,Bases, Salts

I. Content Overview

Alkalies

Content Analysis

Terms: Alkalies

Content Analysis

Concepts:
1. Magnesium hydroxide and Calcium hydroxide are alkalies and they turns red litmus blue.
2. Metallic oxides generally exhibit characteristics of bases.
3. Alkalies increases the concentration of hydroxide (OH) ions in an aqueous solution.

Content Analysis

Facts:
1 Magnesium hydroxide turns red litmus blue.
2. Calcium hydroxide turns red litmus solution blue.
3. Mgo and Cao are metallic oxides.

Definitions:

1. The bases that dissolve in water are called Alkalies.
2. Alkalies defined as Substances which can increases Hydroxide ion

Curricular Objectives

knowledge domain:
The pupil develops knowledge and the understanding of the above-mentioned teams, facts, and Concepts related to the topic of Alkalies'
Specifications: Pupil recalls, recognizes, Explains
2 Process domain:
Pupil gains necessary process skills required to develop knowledge and understanding of the above mentioned terms, facts, Concepts ele related to the topic 'Alkalies'
Specifications: Pupil,
1) Observes the Colour change of litmus paper
i) defines alkalies

3.Creativity domain: Pupil develops creative abilizes and ne related do the topic Alkalies
Specifications
: Pupil,
1) combines ideas and objeds related to the depar in new songs. 1) predicts the difference between bases and alkalies
4 Altitudnal domain: pupil develop Scientific attitude by lemuring the topic Alkalies
specifications: Pupil,
1) develops positive attitude towards life.
develops positive attitude towards Science and Science teadnes expresses feelings in a constructive way.
5. Application domain: Pupil applies knowledge and skills related do the topic Alkalies.
Specifications: Pupil,
Integrats Scientific concepts to real life Situations. integrates the Concept of 'alkalies' to daily life situations

IV. Learning Strategies
Experimentation, Demonstration, ICT integration. Subjective Realities
Preconception: Alkalies turns red litmus blue. Mis Conception: All bases are alkalies.
VI. Learning Aids:Apparatus Beaker, Test tube
Chemicals: Calcium oxide, red litmus Solution
VII. Precautions and First Aid
Be Careful while handling glass wares.

Improvised Aids : PPt, Videos

VIII. CLASSROOM TRANSACTIONS

Process/Activity

Sensitization (3 minutes)
Pupil are asked to recall about the Common Characteristics of alkalies and List them in Science diary.
No of Sessions: 3
No of groups: 5
Session-1 (10 minutes)
Activity 1
Pupil observes a video of an experiment. A neatly rubbed and cleaned magnesium ribbon is burned. The ashes are collected in a watch glass and few drops of water is added. It's nature is found out using litmus paper.

Questions

Ideas gained Students gained the facts and
Pupil tries to answer the following questions. Concepts related Questions
1.what was the Colour of ash formed ?
2. What was the nature of the ash mixed with water?
3. Write down the chemical equation by completing it. Mgo + H_2O= ?
Answers
I white powder
2. Basic nature
3. Mg (OH)

Activity 2

Take Some water in a beaker, add some quick lime (Calcium oxide) and stir it Take Someclear Solution in a test tube from the beaker and add a drop of red litmus solution.

From the observation pupil answers the following questions.
1.what was the Colour change?
2. The colour change shown which nature of the Substance formed?

3. what is the Substance formed when Cao reacts with water? Complete the chemical reaction to find it. Cao +H_2O?
4 Are Mgo and Cao metallic oxides of non- Metallic Oxides 9
5 Metallic oxides generally exhibit characteristics of---
6. The bases that dissolve in water

Answers
red changes to blue
2. Basic nature
3. Cao + H_2O CaCOH),
4 Metallic oxides
5. Bases
6 Alkalies

LESSON PLAN

Consolidation of Ideas:

Metallic oxides generally exhibit characteristics of bases. The bases that dissolve in water are called alkalies.

Application: (3 minutes)

Pupil listed out common characteristics of alkalies.
They are!
Turns red litmus blue
Bitter taste
Soapy to touch.
*Is Alkalies and bases are the Same?
No. All bases are not alkalies. Water soluble bases ane Called alkalies.
eg: NaOH, KOH

1X Follow Up Activity (2 minutes)

Written Assignment: Differentiate bases and alkalies Also findout examples of each.
Activity Assignment:Create homemade Alkaline Solution

ST. JOSEPH COLLEGE OF TEACHER EDUCATION FOR WOMEN ERNAKULAM COCHIN-35

ALICE JOSEPH

Digitally signed by ALICE JOSEPH
Date: 2024.02.02 20:48:02 +05'30'

Lesson: Magnets Types and General Properties

July 18, 2022

Audience

- 8 Std
- Physics
- 42 students

Sensitization , Previous Knowledge Checking

5 mins

Grouping. Intro Activity

5 mins

Session 1

Activity 1

10 mins

Session 2

Activity 1

Activity 2

20 mins

Conclusion, Higher order Questions & Assignment

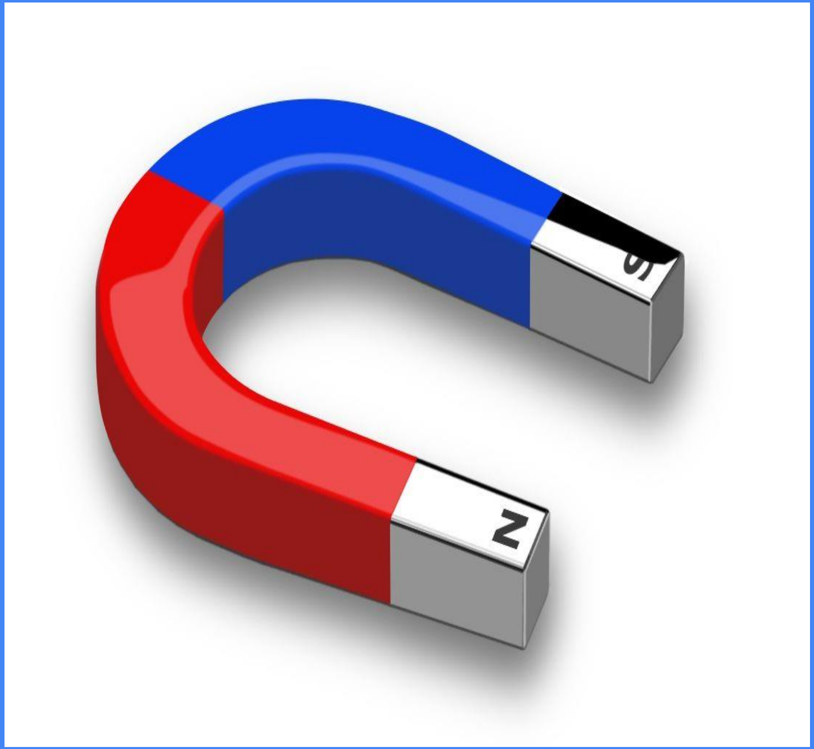
5 mins

Objective

To understand and apply various types of Magnets and Properties of Magnet for required Situations

Magnet

An object which is capable of producing magnetic field and attracting unlike poles and repelling like poles.



Properties of Magnet

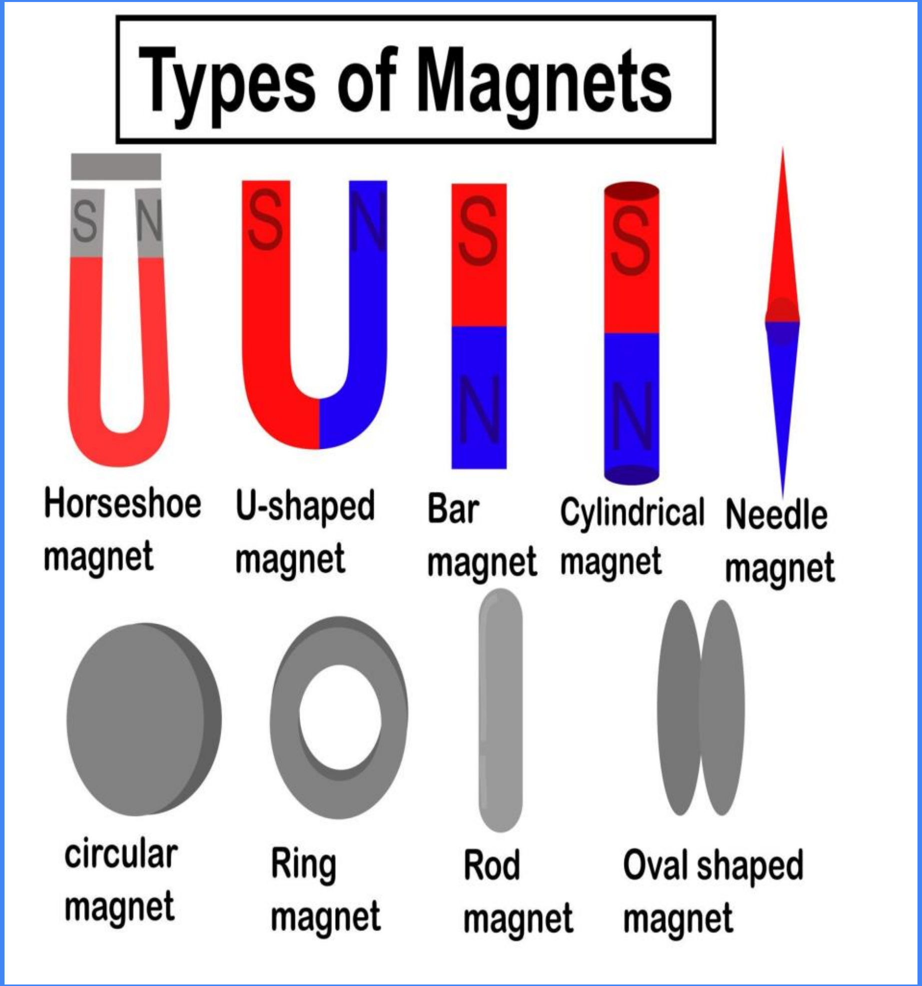
The following are the basic properties of a magnet:

- When a magnet is dipped in iron filings, we can observe that the iron filings cling to the end of the magnet as the attraction is maximum at the ends of the magnet. These ends are known as poles of the magnets.
- Magnetic poles always exist in pairs.
- Whenever a magnet is suspended freely in mid-air, it always points towards the north-south direction. Pole pointing towards geographic north is known as the North Pole, and the pole pointing towards geographic south is known as the South Pole.
- Like poles repel while unlike poles attract.
- The magnetic force between the two magnets is greater when the distance between these magnets is lesser.

Types of Magnets

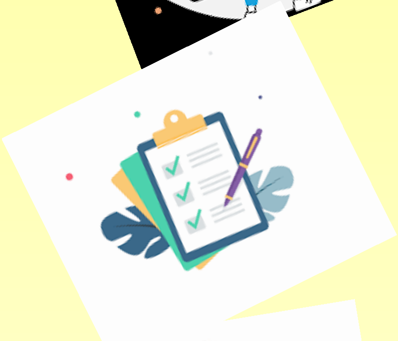
- Permanent Magnets.
- Temporary Magnets.
- Electromagnets
- Neodymium Magnets.
- Samarium Cobalt (SmCo)
- Alnico
- Ceramic or Ferrite.

Based on Shapes



Homework

Identify various types of Magnets in your home and list out its applications




SELF
ASSESSMENT


SELF
ASSESSMENT

E-TOOL


Self-Assessment
Checklist


Made with
Animaker

CHEMISTRY
IX

CHAPTER 2
IS MATTER AROUND US PURE?

1 .STUDENT SELF ASSESSMENT CHECKLIST

Name: School:

To help me become a better learner i need to think about the major topics that I covered while studying the chapter.

Hint:Put a✔

Content	Knows very well	Fairly knows	Don't know
Do I know about the topic mixture?			
Do I know about what solution is?			
And about suspension?			

1. STUDENT SELF ASSESSMENT RUBRICS

TOPIC	UNSATISFCTORY	NEED DEVELOPMENT	SATISFACTORY	EXCELLENT
Types of mixtures	I can neither explain nor found any examples about the types of mixtures	I can understand about the types of mixtures.but I can neither understand nor found out any examples.	I can explain but I cannot found more examples based on it	I can explain and found out examples based on the types of mixtures
Properties of solution	I can neither understand nor found out that it is a homogenious mixture cannot be separated by the process of filtration.	I can understand that it is a homogenious mixture but I neither understand nor found out that it cannot be separated by the process of filtration.	I can understand that it is a homogenious mixture but I cannot found out more separation processes.	I can understand that solution is a homogenious mixture&cannot be see with the naked eyes. And it cannot be separated by the process of filtration.
Properties of suspension	I can neither understand nor found out that it is a heterogenious mixture& can be separated by the process of filtration	I can understand that it is a heterogenious mixture but I neither understand nor found out that it can be separated by the process of filtration	I can understand that it is a heterogenious mixture but I cannot found out more separation processes	I can understand that solution is a heterogenious mixture&can be see with the naked eyes. And it can be separated by the process of filtration.

1. STUDENT SELF ASSESSMENT RATING SCALE

TRY TO RATE YOURSELF USING RATING SCALE.

	1	2	3	4	5
Knowledge about mixtures & its properties.					
Knowledge about solution & its properties.					
Knowledge about suspension & its properties.					

1- very satisfied
2- satisfied
3-neutral
4- dissatisfied
5- very dissatisfied

2 STUDENT SELF ASSESSMENT CHECKLIST

Name: School:

To help me become a better learner i need to think about the major topics that I covered while studying the chapter.

Hint:Put a ✓

Content	Knows very well	Fairly knows	Don't know
Do I know about the topic colloids?			
Do I know about techniques of separations?			
And about their applications ?			

2 STUDENT SELF ASSESSMENT RUBRICS

TOPIC	UNSATISFCTORY	NEED DEVELOPMENT	SATISFACTORY	EXCELLENT
Properties of colloids	I can neither understand that it is a heterogenious mixture& nor found out that it cannot be separated by the process of filtration.	I can understand that it is a heterogenious mixture but I neither found out that it cannot be separated by the process of filtration.	I can understand that it is a heterogenious mixture but I cannot found out more separation processes	I can understand that solution is a heterogenious mixture and it cannot be separated by the process of filtration but the process of centrifugation can be used to separate colloidal particles
Seperating the components of a mixture	I can neither understand nor found out that heterogenious mixtures can be separated by physical methods like handpicking, sieving and also by centrifugation method.	I can understand that heterogenious mixtures can be separated by physical methods like handpicking, sieving but I neither found out the process of centrifugation method	I can understand that heterogenious mixtures can be separated by physical methods like handpicking, sieving but I cannot found out more separation processes.	I can understand that heterogenious mixtures can be separated by physical methods like handpicking, sieving and also by centrifugation method.
Applications	I didn't know any applications	I know that the salt can be purified from salt water but I neither found out any other applications.	I know that salt can be purified from salt water but I cannot found out more application	I know about the purification of salt from sea water and the separation of crystals of alum from impure samples

2. STUDENT SELF ASSESSMENT RATING SCALE

TRY TO RATE YOURSELF USING RATING SCALE.

	1	2	3	4	5
Knowledge about colloids & its properties.					
Knowledge about separating the component of mixtures					
About applications					

1- very satisfied
2- satisfied
3-neutral
4- dissatisfied
5- very dissatisfied

3 .STUDENT SELF ASSESSMENT CHECKLIST

Name: School:

To help me become a better learner i need to think about the major topics that I covered while studying the chapter.

Hint:Put a✓

Content	Knows very well	Fairly knows	Don't know
Do I know about the topic Physical and chemical changes			
Do I know about what element is?			
And about what compound is?			

3. STUDENT SELF ASSESSMENT RUBRICS

TOPIC	UNSATISFCTORY	NEED DEVELOPMENT	SATISFACTORY	EXCELLENT
Physical and chemical changes	I can neither explain nor found any examples about the physical and chemical changes	I can understand about the physical and chemical changes ,but I can neither understand nor found out any examples.	I can explain but I cannot found more examples based on it	I can explain and found out examples based on the physical and chemical changes
Elements	I can neither understand nor found out that element is a form of matter and cannot found out any examples.	I can understand that element is a form of matter, but I can neither understand nor found out any examples.	I can understand that element is a form of matter but cannot found that, it cannot be broken down by chemical reaction	I can understand that element is a form of matter that cannot be broken down by chemical reaction.
Compounds	I can neither understand nor explain that that the compound is composed of two or more elements &chemically combined with one another in a fixed proportion.	I can understand that compound is composed of two or more elements but I can neither found out that it is chemically combined with one another in a fixed proportion	I can understand that compound is composed of two or more elements but cannot found that it is chemically combined with one another in a fixed proportion.	I can understand that compound is composed of two or more elements and chemically combined with one another in a fixed proportion.

3 STUDENT SELF ASSESSMENT RATING SCALE

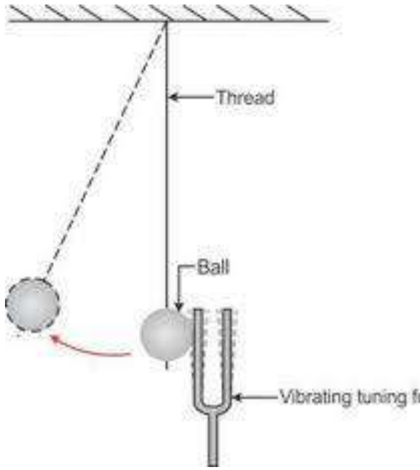
TRY TO RATE YOURSELF USING RATING SCALE.

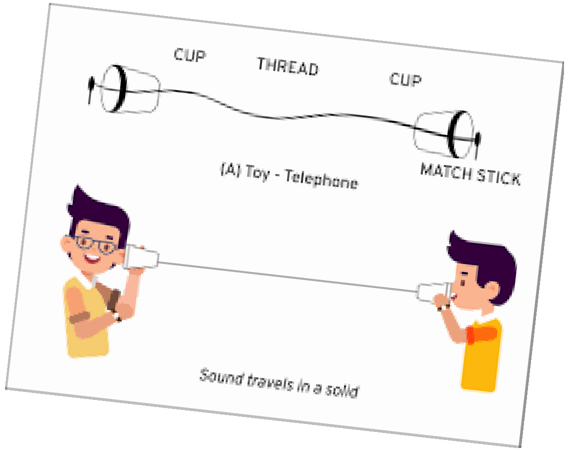
	1	2	3	4	5
Knowledge about physical and chemical change					
Knowledge about Elements					
Knowledge about compounds					

1- very satisfied
2- satisfied
3-neutral
4- dissatisfied
5- very dissatisfied

PHYSICS
IX

CHAPTER 12
SOUND





1.STUDENT SELF ASSESSMENT CHECKLIST

Name: School:

To help me become a better learner i need to think about the major topics that I covered while studying the chapter.

Hint:Put a✔

Content	Knows very well	Fairly knows	Don't know
Do I know about sound?			
Do I know about production of sound?			
And about propagation of sound?			

1. STUDENT SELF ASSESSMENT RUBRICS

TOPIC	UNSATISFCTORY	NEED DEVELOPMENT	SATISFACTORY	EXCELLENT
sound	I can neither explain nor understand about sound.	I can understand about sound,it is a vibration that propagates through a medium but I neither cannot found out the types of sounds	I can understand about sound,it isa vibration that propagates through a medium but I cannot found out the types of sound.	I can explain about sound and its types& understand that sound is vibration that propagates through a medium
Production of sound	I can neither understand that sound production solely dependent on the waves nor how it collides with other particles.	I can understand that sound production solely dependent on the waves.but i neither cannot found that it depends on the collision with other particles and cannot find out much more examples	I can understand that sound production solely dependent on the waves.but cannot found that it depends on the collision with other particles.	I can understand that sound production solely dependent on the waves and how it collides with other particles and found out examples too.
Propagation of sound	I can neither understand that sound is propagated by the to and fro motion of particles nor found out the particle in contact with the vibrating object is first displaced from its equilibrium position.	I can understand that sound is propagated by the to and fro motion of particles of the medium.but I neither cannot found out that the particle in contact with the vibrating object is first displaced from its equilibrium position.	I can understand that sound is propagated by the to and fro motion of particles of the medium.but cannot found out that the particle in contact with the vibrating object is first displaced from its equilibrium position.	I can understand that sound is propagated by the to and fro motion of particles of the medium and found out that the particle in contact with the vibrating object is first displaced from its equilibrium position

1 STUDENT SELF ASSESSMENT RATING SCALE

TRY TO RATE YOURSELF USING RATING SCALE.

	1	2	3	4	5
Knowledge about sound.					
Knowledge about production of sound					
Knowledge about propagatio n of sound					

1- very satisfied
2- satisfied
3-neutral
4- dissatisfied
5- very dissatisfied

2.STUDENT SELF ASSESSMENT CHECKLIST

Name: School:

To help me become a better learner i need to think about the major topics that I covered while studying the chapter.

Hint:Put a✓

Content	Knows very well	Fairly knows	Don't know
Do I know that sound needs a medium to travel?			
Do I know the characteristics of sound wave?			
Do I know that sound wave is a longitudinal wave?			

2. STUDENT SELF ASSESSMENT RUBRICS

TOPIC	UNSATISFCTORY	NEED DEVELOPMENT	SATISFACTORY	EXCELLENT
Sound needs a medium to travel	I can neither understand nor get an idea that the sounds needs a medium to travel.	I can understand that sound is a mechanical wave and needs only medium like air,but I can neither understand nor found out that it travels through medium like water, steel etc.	I can understand that sound is a mechanical wave and needs only medium like air,but cannot found out that it travels through medium like water, steel etc.	I can understand that sound is a mechanical wave and needs a medium like air , water, steel etc
Characteristics of sound waves	I can neither understand nor found out that the frequency, amplitude and speed are the characteristics of sound wave.	I can understand that the characteristics of sound wave are only amplitude and speed , but I can neither understand nor cannot found that it depends on the frequency	I can understand that the characteristics of sound wave are only amplitude and speed , but cannot found that it depends on the frequency.	I can understand that the characteristics of sound wave are frequency, amplitude and speed.
Sound waves are longitudinal waves	I can neither understand that longitudinal waves are waves in which the vibration of the medium is parallel to the direction the wave travels nor found out that the displacement of the medium is in the same direction of the wave propagation.	I can understand that longitudinal waves are waves in which the vibration of the medium is parallel to the direction the wave travels but can neither understand nor found out that the displacement of the medium is in the same direction of the wave propagation	I can understand that longitudinal waves are waves in which the vibration of the medium is parallel to the direction the wave travels but cannot found out that the displacement of the medium is in the same direction of the wave propagation	I can understand that longitudinal waves are waves in which the vibration of the medium is parallel to the direction the wave travels and displacement of the medium is in the same direction of the wave propagation.

2. STUDENT SELF ASSESSMENT RATING SCALE

TRY TO RATE YOURSELF USING RATING SCALE.

	1	2	3	4	5
Knowledge about that sound needs a medium to travel					
Knowledge about characteristics of sound wave					
Knowlegde about longitudinal wave					

1- very satisfied
2- satisfied
3-neutral
4- dissatisfied
5- very dissatisfied

3 .STUDENT SELF ASSESSMENT CHECKLIST

Name: School:

To help me become a better learner i need to think about the major topics that I covered while studying the chapter.

Hint:Put a✓

Content	Knows very well	Fairly knows	Don't know
Do I know about the reflection of sound?			
Do I know about echo?			
And about the range of hearing?			

3. STUDENT SELF ASSESSMENT RUBRICS

TOPIC	UNSATISFCTORY	NEED DEVELOPMENT	SATISFACTORY	EXCELLENT
Reflection of sound	I can neither explain nor understand about the reflection of sound.	I can explain and understand about the reflection of sound and it follows the same laws of reflection but I neither cannot found out nor understand the obstacles needed for the reflection of sound waves.	I can explain and understand about the reflection of sound and it follows the same laws of reflection, but I cannot found out the obstacles which is needed for the reflection of sound waves	I can explain and understand about the reflection of sound and it follows the same laws of reflection, an obstacle of large size which may be polished or rough is needed for the reflection of sound waves
Echo	I can neither understand that echoes are sounds caused by the reflection of sound waves from a surface back to the listener and nor found out any examples.	I can understand that echoes are sounds caused by the reflection of sound waves from a surface back to the listener but I neither understand nor found out any examples.	I can understand that echoes are sounds caused by the reflection of sound waves from a surface back to the listener and but cannot found out much more examples	I can understand that echoes are sounds caused by the reflection of sound waves from a surface back to the listener and got examples too.
Range of hearing	I can neither know the audible range of hearing for human beings, children under the age of five and nor some animals like rhinoceroses , whales elephant and some insects like moth	I can understand the audible range of hearing for human beings, children under the age of five but I can neither know or understand the the audible range of some animals like rhinoceroses , whales elephant and some insects like moth	I can understand the audible range of hearing for human beings, children under the age of five but I cannot get the audible range of some animals like rhinoceroses , whales elephant and some insects like moth.	I can understand the audible range of hearing for human beings, children under the age of five and some animals like rhinoceroses , whales elephant and some insects like moth.

3. STUDENT SELF ASSESSMENT RATING SCALE

TRY TO RATE YOURSELF USING RATING SCALE.

	1	2	3	4	5
Knowledge about reflection of sound					
Knowledge about echo					
Knowledge about the range of hearing					

1- very satisfied
2- satisfied
3-neutral
4- dissatisfied
5- very dissatisfied

Students, I hope the self assessment e- tool is useful for your learning.

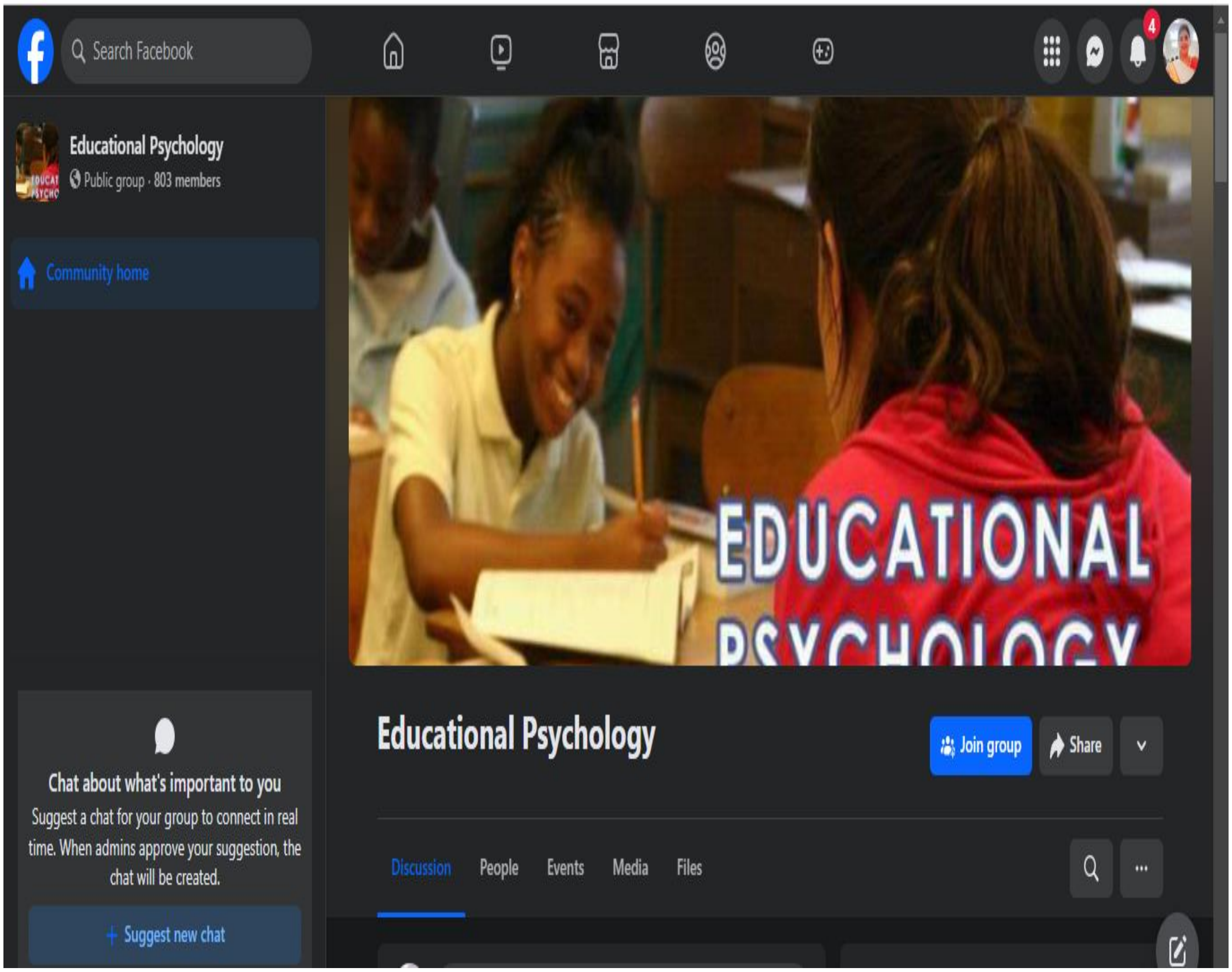
THANK YOU.

ALICE JOSEPH

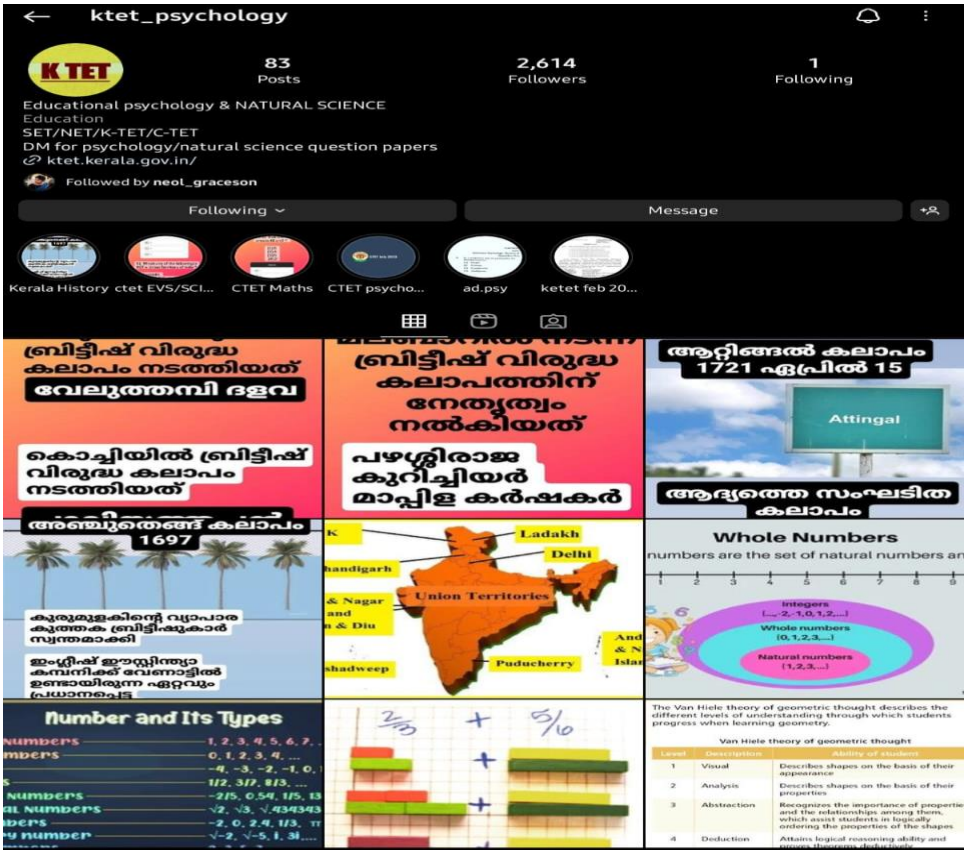
Sl.No	Document	Sample Type All Screen shorts
1	1) Social Media: a) Facebook b) Instagram c) Youtube d) Telegram	Facebook-Psychology only Instagram-Psychology only Youtube- Philosophy, Psychology, Technology Telegram- Philosophy, Psychology, Technology
	Learning Apps: 1. Educational Philosophy 2. Educational Psychology 3. Optional Subjects	1. Educational Philosophy 2. Educational Psychology 3. epathshala diksha kerala.board.textbooks
3	Adaptive Devices: 1) Jamboard 2) Audio Textbook	1.Jamboard-google 2.Audio Textbook -NCERT

Samples

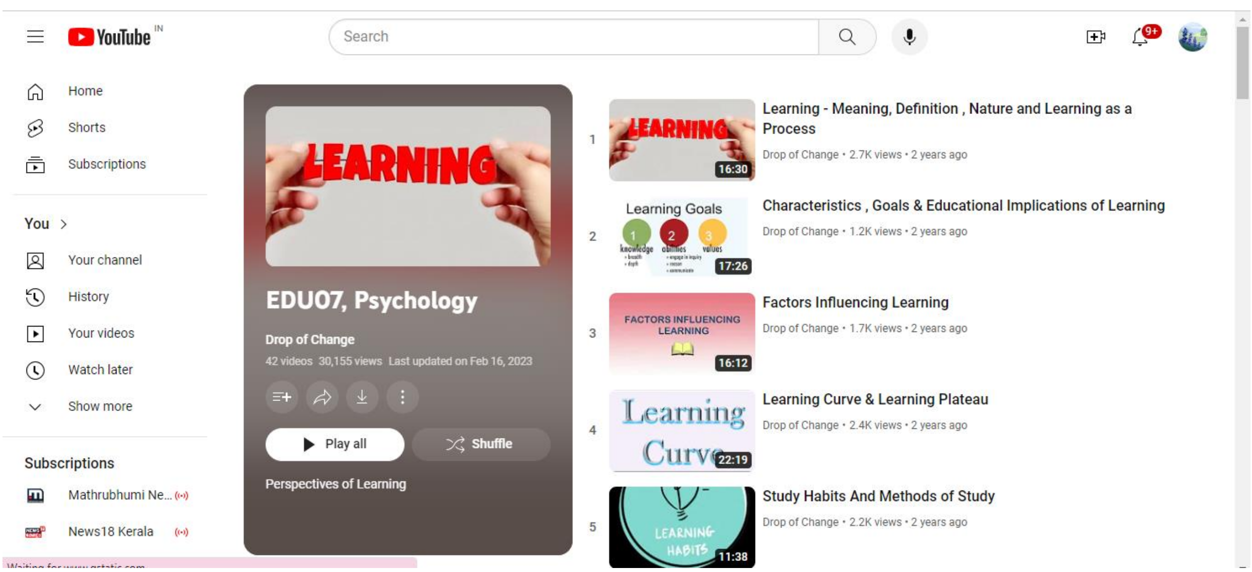
Facebook

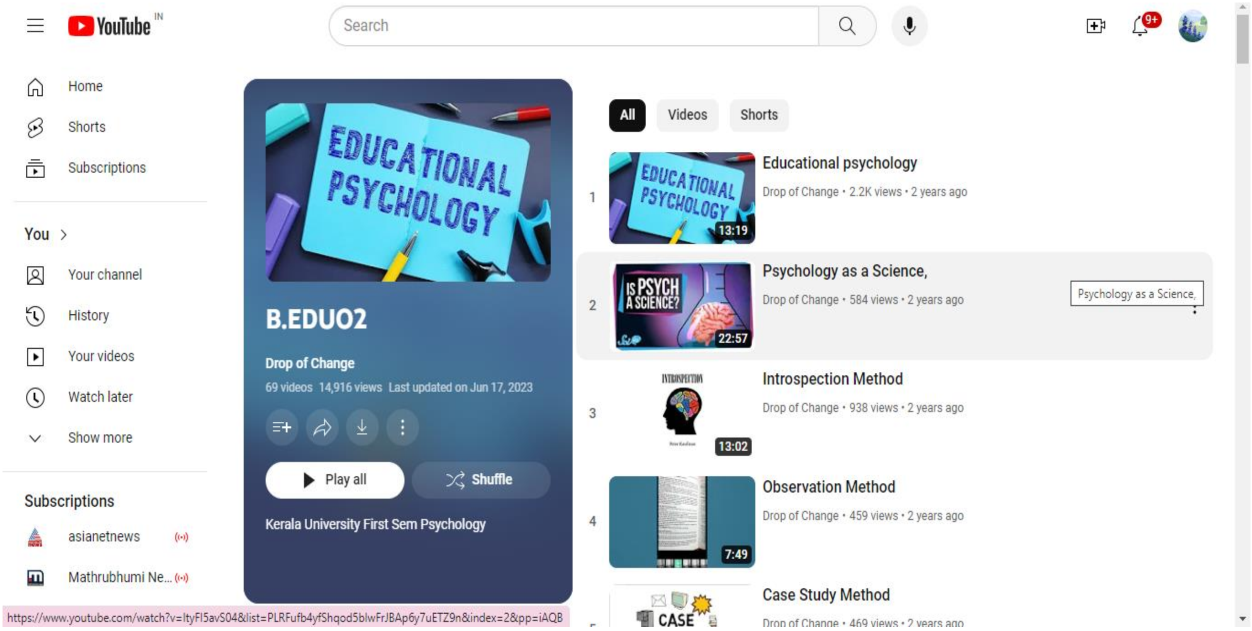


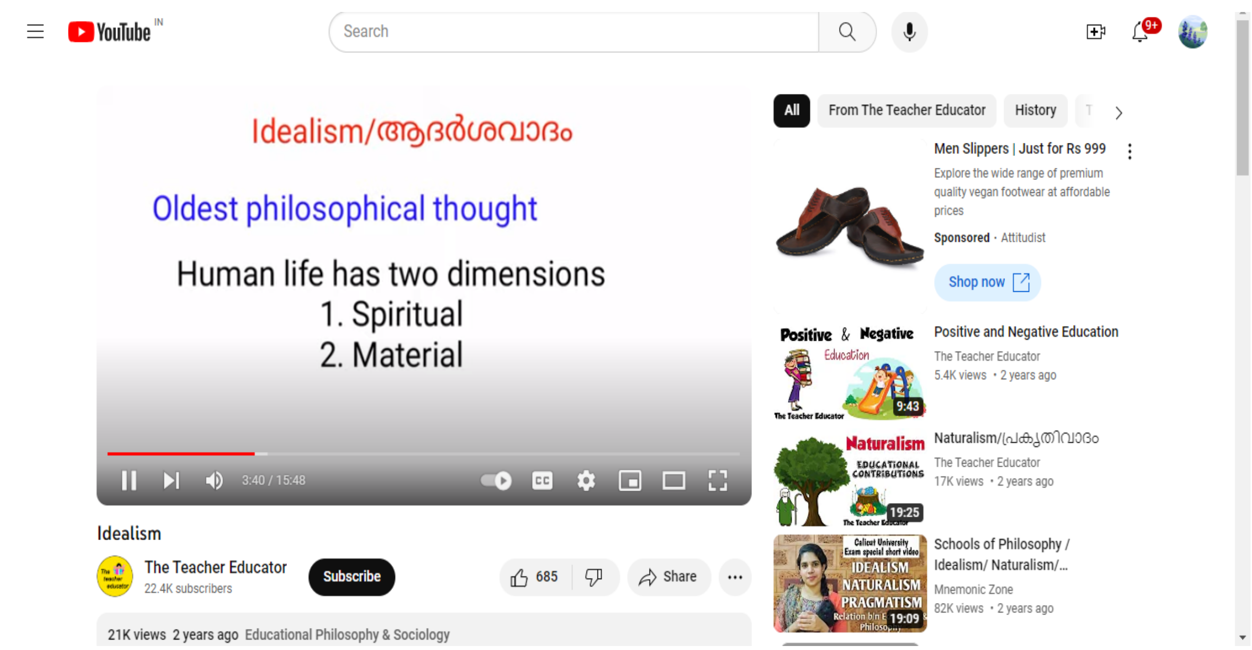
Instagram

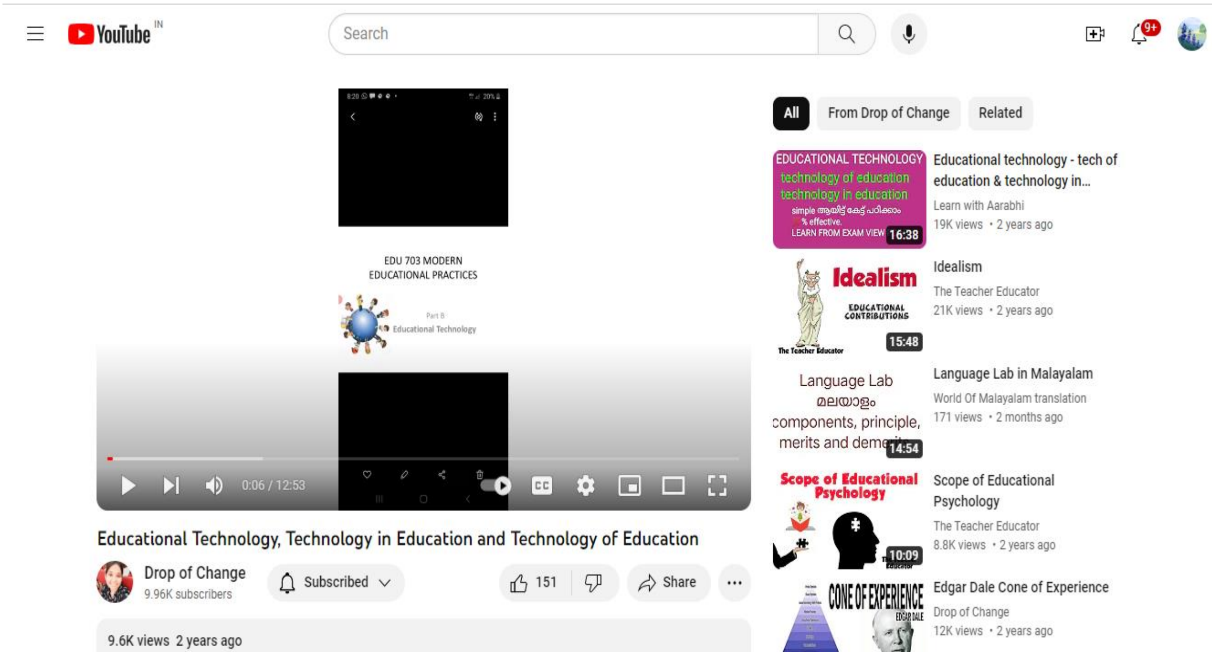


YouTube

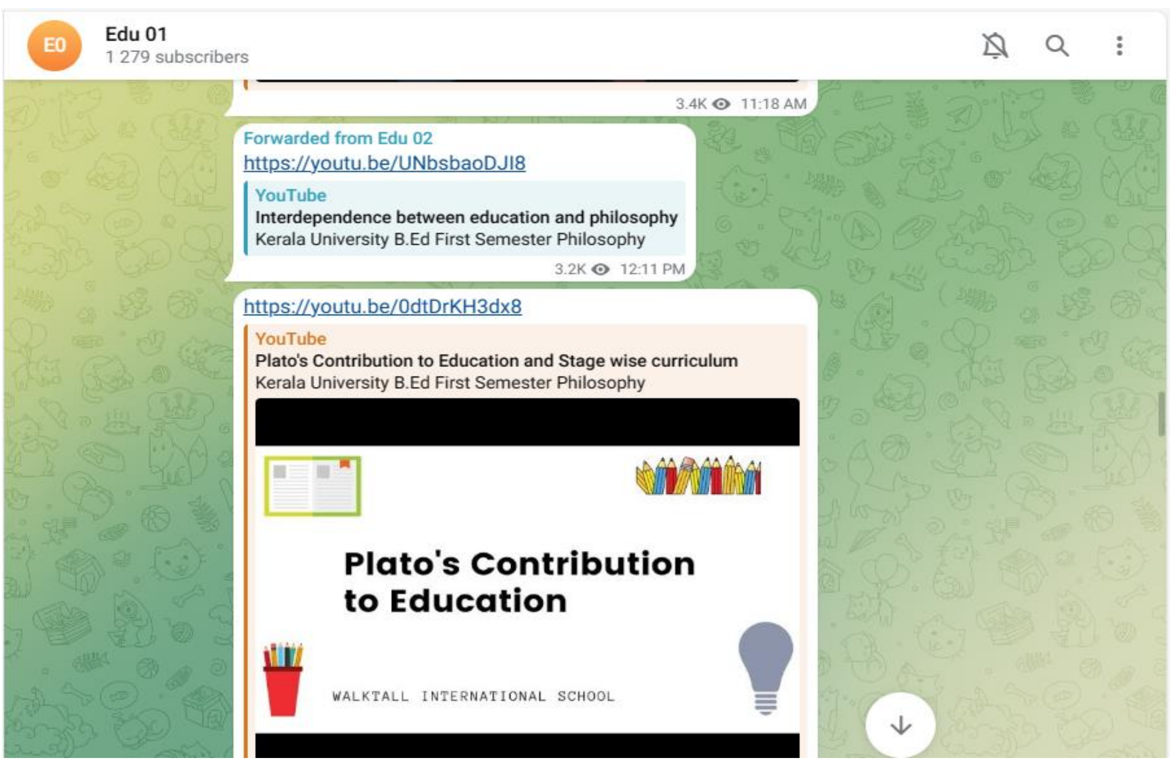


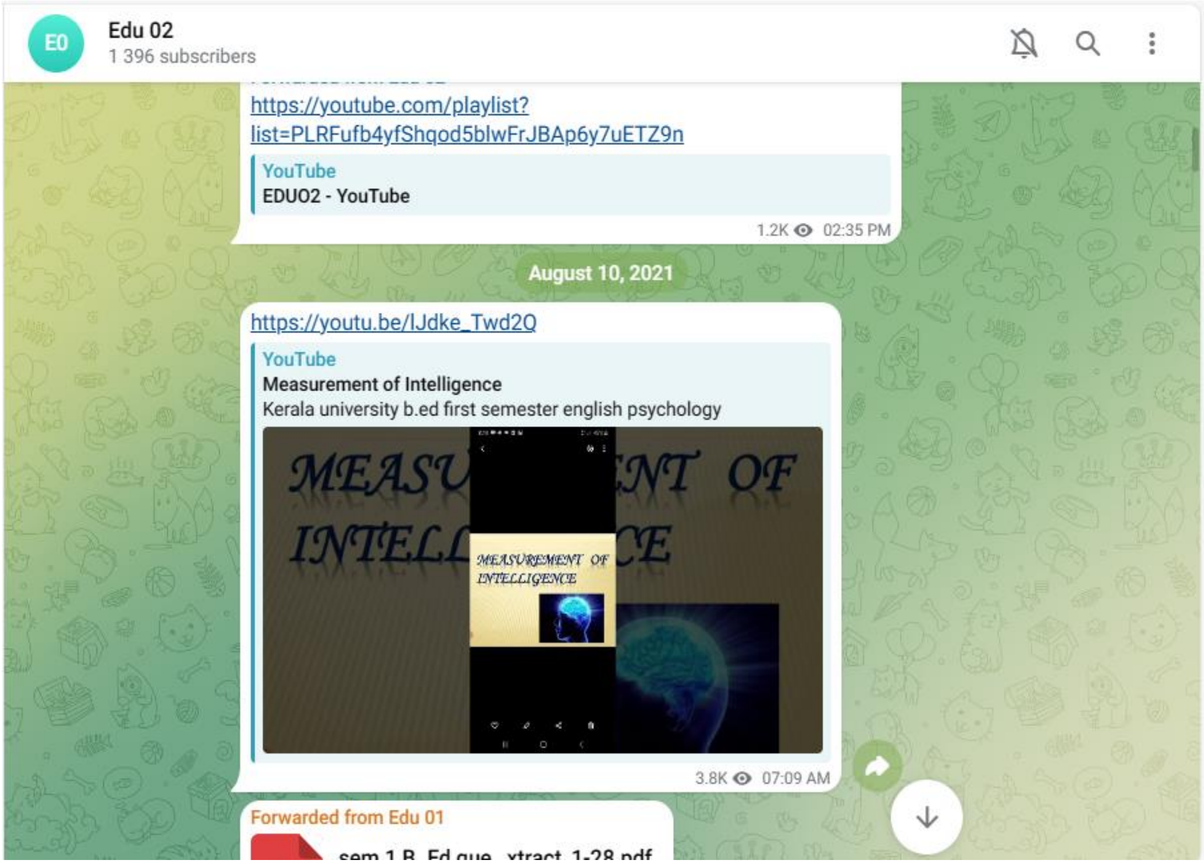

YouTube
Search
Home
Shorts
Subscriptions
You
Your channel
History
Your videos
Watch later
Show more
Subscriptions
asianetnews
Mathrubhumi Ne...
EDUCATIONAL PSYCHOLOGY
B.EDU02
Drop of Change
69 videos 14,916 views Last updated on Jun 17, 2023
Play all
Shuffle
Kerala University First Sem Psychology
All
Videos
Shorts
Educational psychology
Drop of Change • 2.2K views • 2 years ago
13:19
Psychology as a Science,
Drop of Change • 584 views • 2 years ago
22:57
Introspection Method
Drop of Change • 938 views • 2 years ago
13:02
Observation Method
Drop of Change • 459 views • 2 years ago
7:49
Case Study Method
https://www.youtube.com/watch?v=ltyFl5avS04&list=PLRFufb4yfShqod5blwFrJBAp6y7uETZ9n&index=2&pp=iAQB


YouTube
Search
Idealism/ആദർശവാദം
Oldest philosophical thought
Human life has two dimensions
1. Spiritual
2. Material
3:40 / 15:48
Idealism
The Teacher Educator
22.4K subscribers
Subscribe
685
Share
21K views 2 years ago Educational Philosophy & Sociology
All
From The Teacher Educator
History
Men Slippers | Just for Rs 999
Explore the wide range of premium quality vegan footwear at affordable prices
Sponsored · Attitudist
Shop now
Positive and Negative Education
The Teacher Educator
5.4K views • 2 years ago
9:43
Naturalism/പ്രകൃതിവാദം
The Teacher Educator
17K views • 2 years ago
19:25
Schools of Philosophy / Idealism/ Naturalism/...
Mnemonic Zone
82K views • 2 years ago
19:09


YouTube IN
Search
EDU 703 MODERN EDUCATIONAL PRACTICES
Educational Technology
0:06 / 12:53
Educational Technology, Technology in Education and Technology of Education
Drop of Change
9.96K subscribers
Subscribed
151
Share
9.6K views 2 years ago
All
From Drop of Change
Related
Educational technology - tech of education & technology in...
Learn with Aarabhi
19K views • 2 years ago
Idealism
The Teacher Educator
21K views • 2 years ago
Language Lab in Malayalam
World Of Malayalam translation
171 views • 2 months ago
Scope of Educational Psychology
The Teacher Educator
8.8K views • 2 years ago
Edgar Dale Cone of Experience
Drop of Change
12K views • 2 years ago

Telegram


Edu 01
1 279 subscribers
3.4K 11:18 AM
Forwarded from Edu 02
https://youtu.be/UNbsbaoDJI8
YouTube
Interdependence between education and philosophy
Kerala University B.Ed First Semester Philosophy
3.2K 12:11 PM
https://youtu.be/0dtDrKH3dx8
YouTube
Plato's Contribution to Education and Stage wise curriculum
Kerala University B.Ed First Semester Philosophy
Plato's Contribution to Education
WALKTALL INTERNATIONAL SCHOOL


Edu 02
1 396 subscribers
https://youtube.com/playlist?list=PLRFufb4yfShqod5blwFrJBAp6y7uETZ9n
YouTube
EDUO2 - YouTube
1.2K 02:35 PM
August 10, 2021
https://youtu.be/lJdke_Twd2Q
YouTube
Measurement of Intelligence
Kerala university b.ed first semester english psychology
MEASUREMENT OF INTELLIGENCE
3.8K 07:09 AM
Forwarded from Edu 01


Edu 03
1 130 subscribers
2.6K 09:00 AM
https://youtu.be/95_U1EG9WEU
YouTube
Computer Managed Instruction
Kerala University First Sem Technology Unit III
CMI
2.6K 10:05 AM
https://youtu.be/1ITLU-5D43o
YouTube
Flipped Classroom
Kerala University B.Ed First Sem Technology

Learning Apps

Attention deficit hyperactivity disorder

Montessori education

Dyslexia

Bloom's taxonomy

Research & Education Association

Adolescence

Flow

Socratic method

Pedagogy

Learning

Critical thinking

Intelligence

Mnemonic

Factor analysis

Problem solving

Educational technology

Creativity

Metacognition

Halo effect

Constructivism

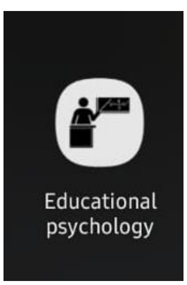
Psychometrics

Learning theory

Test

Self-concept

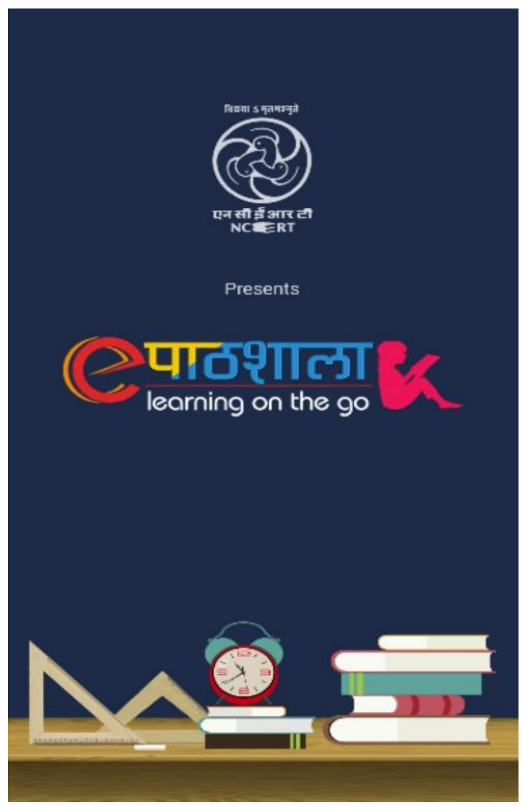
Latchkey kid

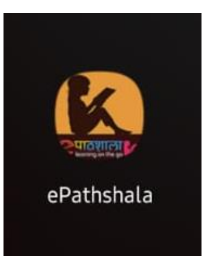



Welcome to DIKSHA!

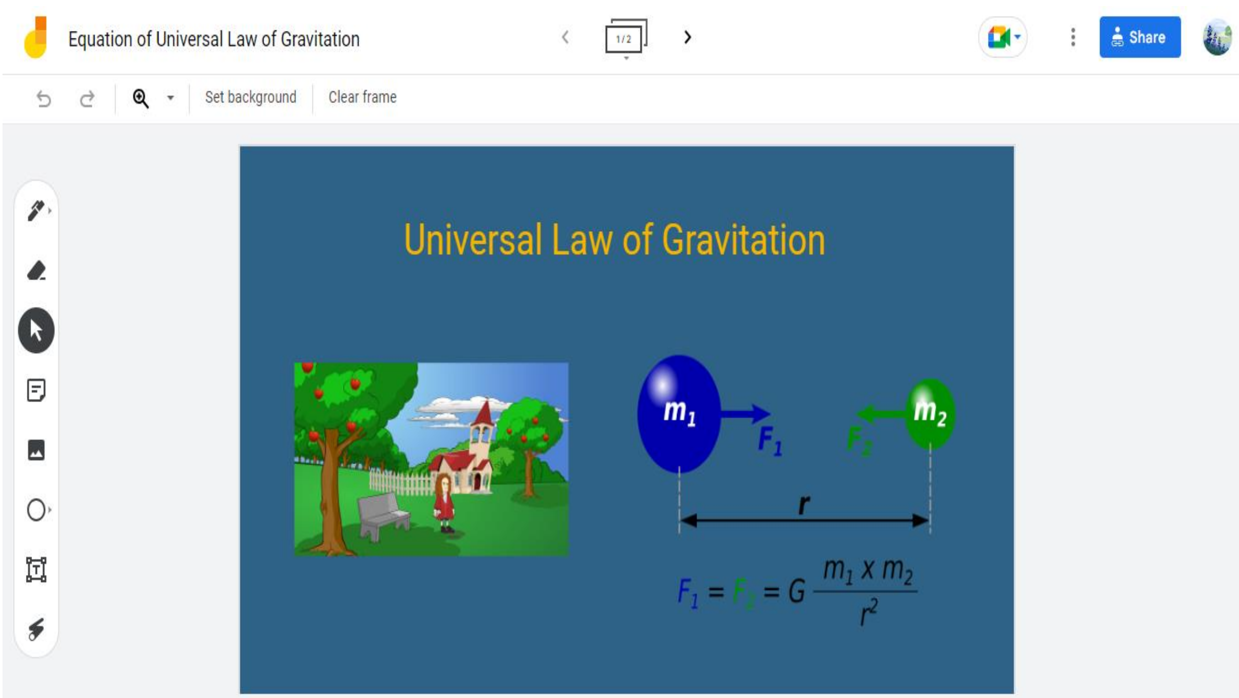

DIKSHA


ePathshala
STUDENTS
TEACHERS
PARENTS
EDUCATORS


NCERT
Presents
पाठशाला
learning on the go

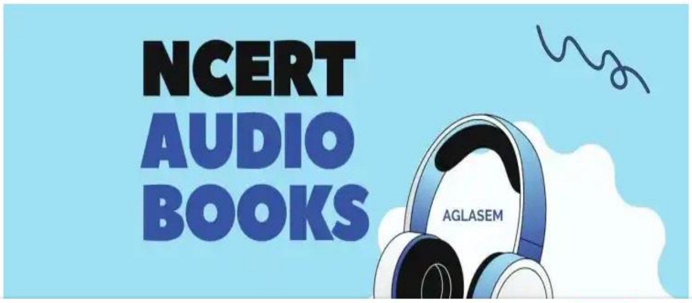

ePathshala


Kerala Board Textbooks, SCERT
Mukesh Kaushik
Contains ads
4.4★
8.21K reviews
100K+
Downloads
3+
Rated for 3+
Install on more devices
Share
Add to wishlist
This app is available for your device
You can share this with your family. Learn more about Family Library
1st - 12th
kerala
board
TEXT BOOKS


Equation of Universal Law of Gravitation
1/2
Share
Set background
Clear frame
Universal Law of Gravitation
m_1
m_2
F_1
F_2
r
$F_1 = F_2 = G \frac{m_1 \times m_2}{r^2}$

NCERT Audio Books for Class 1 to 12 (MP3 in English and Hindi)

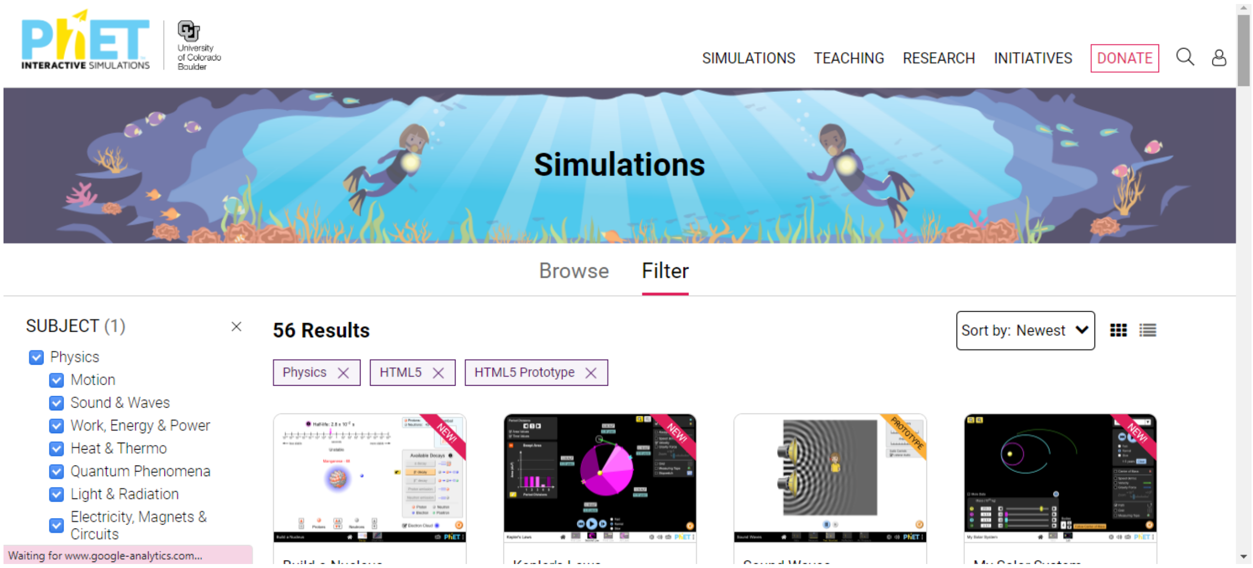
by Anwesha Bose — March 3, 2023 in Study Material

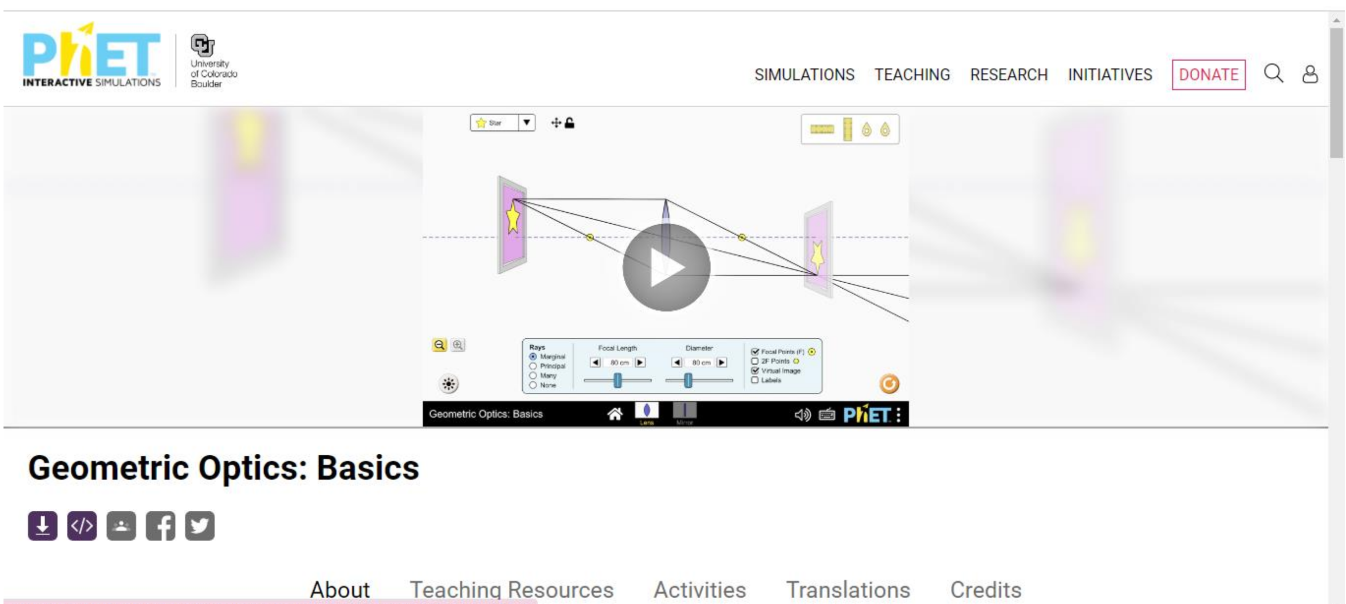


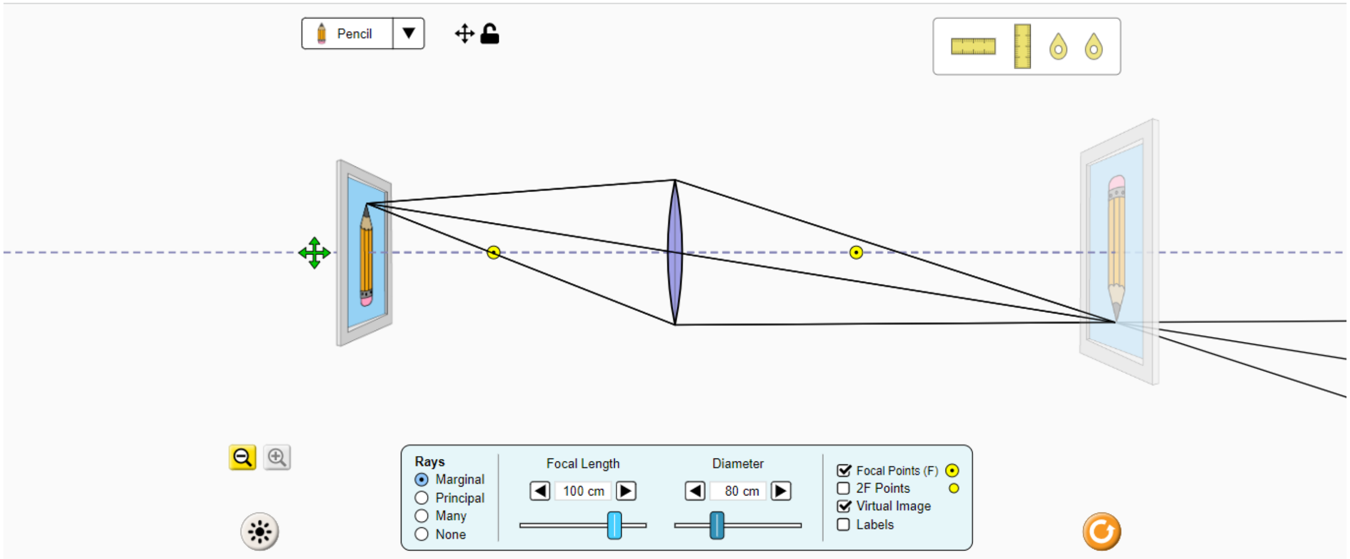
CBSE Board Quick Links

CBSE Date Sheet
CBSE Result
CBSE Syllabus
CBSE Sample Papers
CBSE Question Papers
CBSE Notes
CBSE Practice Papers
Mock Tests

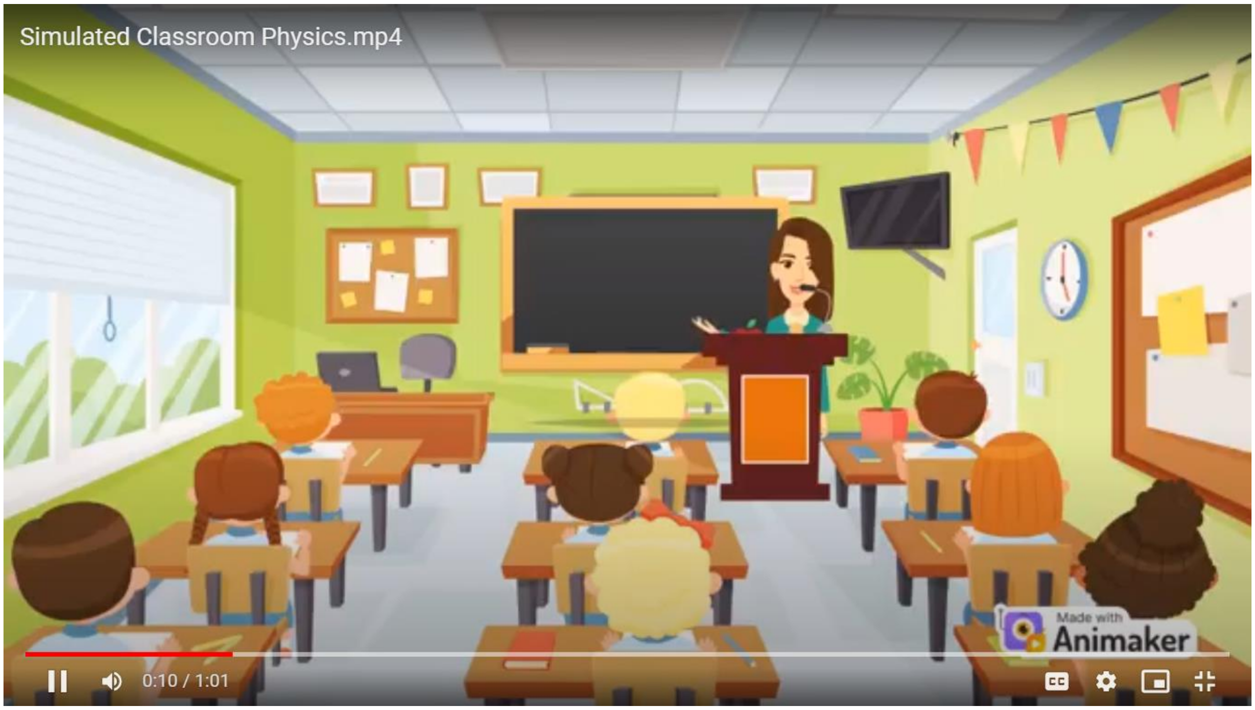
Simulated Experiments

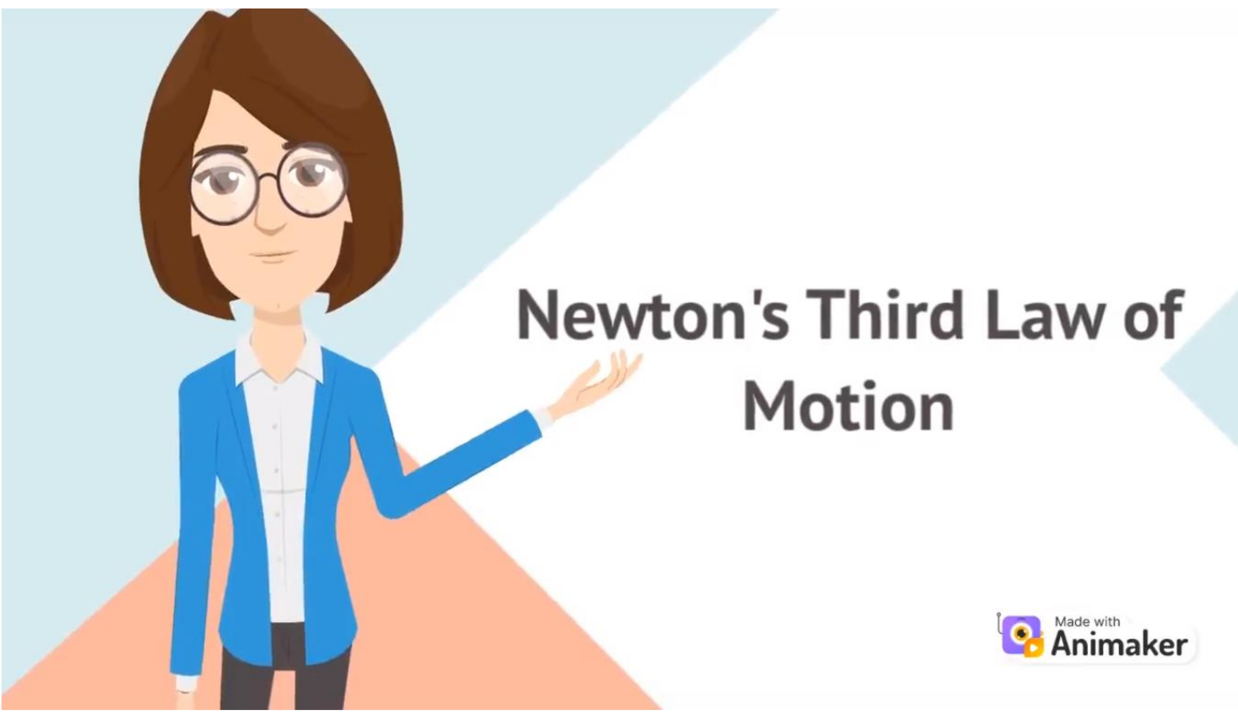


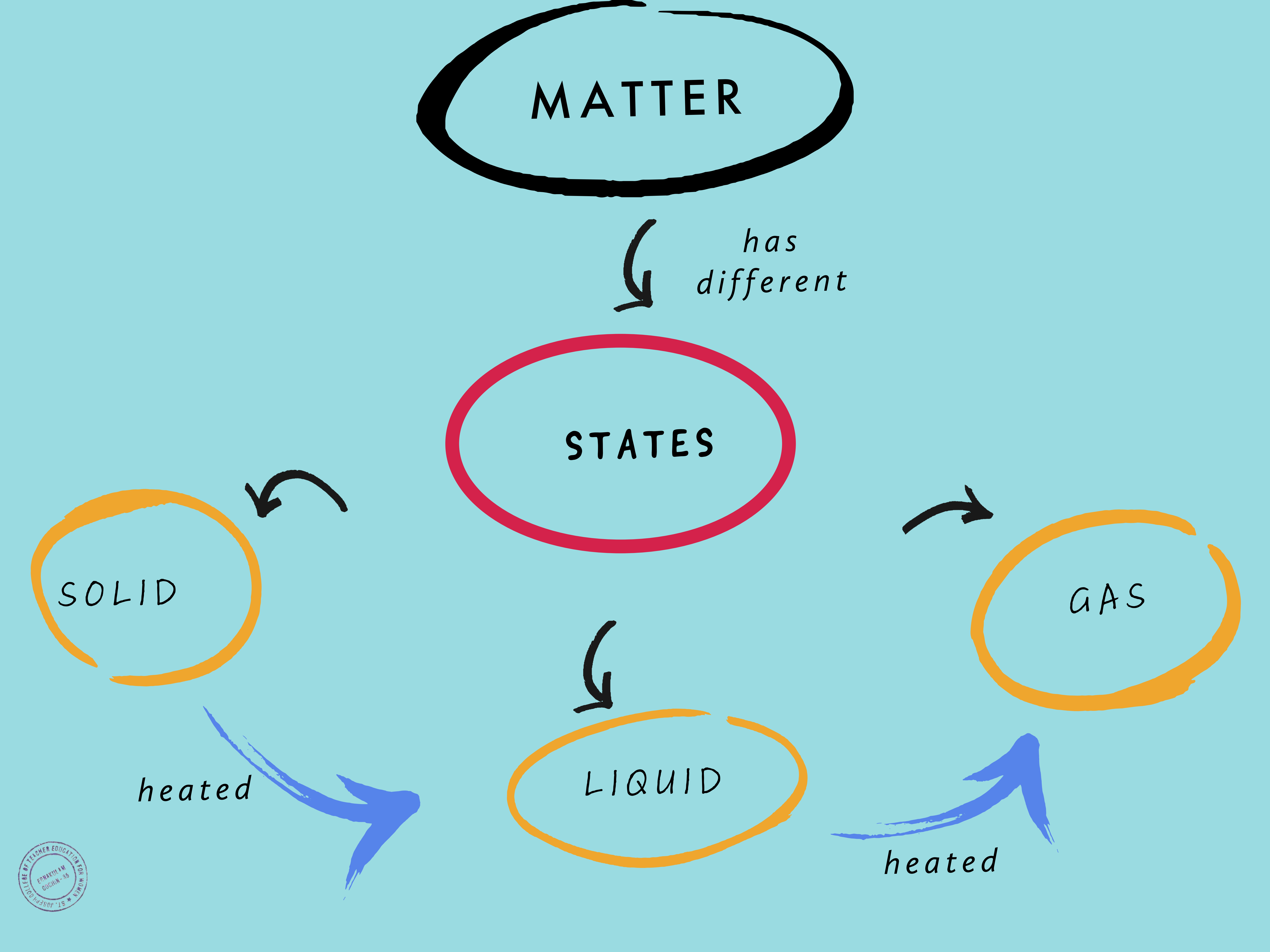



Pencil
Rays
Marginal
Principal
Many
None
Focal Length
100 cm
Diameter
80 cm
Focal Points (F)
2F Points
Virtual Image
Labels

Simulated Class room Creation





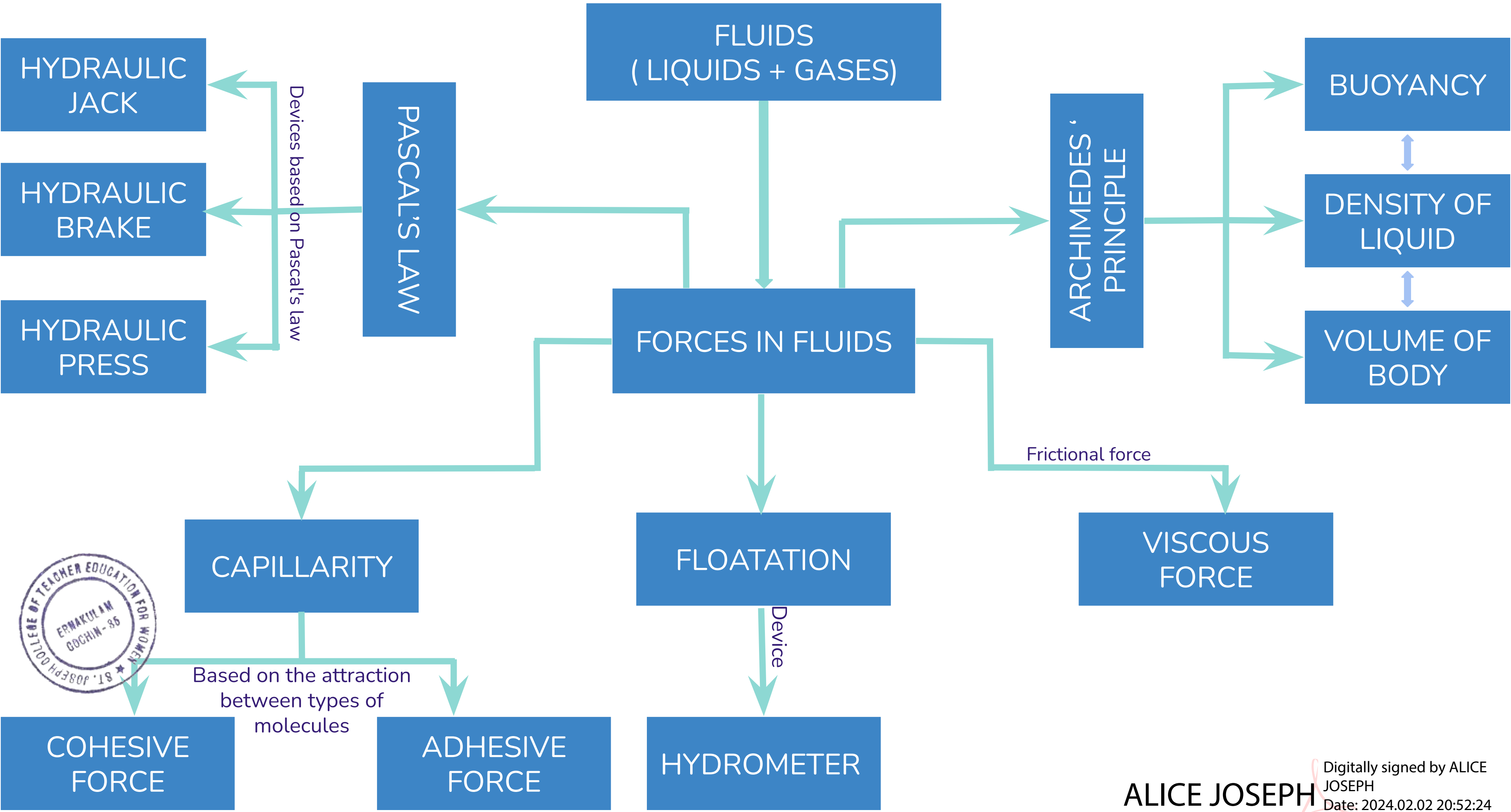

MATTER
has different
STATES
SOLID
LIQUID
GAS
heated
heated

CONCEPT MAP:

FORCES IN FLUIDS

Submitted by

TREESA TANIYA P A
PHYSICAL SCIENCE


FLUIDS
(LIQUIDS + GASES)
FORCES IN FLUIDS
PASCAL'S LAW
Devices based on Pascal's law
HYDRAULIC JACK
HYDRAULIC BRAKE
HYDRAULIC PRESS
ARCHIMEDES ' PRINCIPLE
BUOYANCY
DENSITY OF LIQUID
VOLUME OF BODY
CAPILLARITY
Based on the attraction between types of molecules
COHESIVE FORCE
ADHESIVE FORCE
FLOATATION
Device
HYDROMETER
Frictional force
VISCOUS FORCE

ST.JOSEPH COLLEGE OF TEACHER EDUCATION FOR WOMEN, ERNAKULAM

AUDIO BOOK

Submitted By,
Sahala Nayeem A A
First Year B.Ed. Physical Science

PREFACE

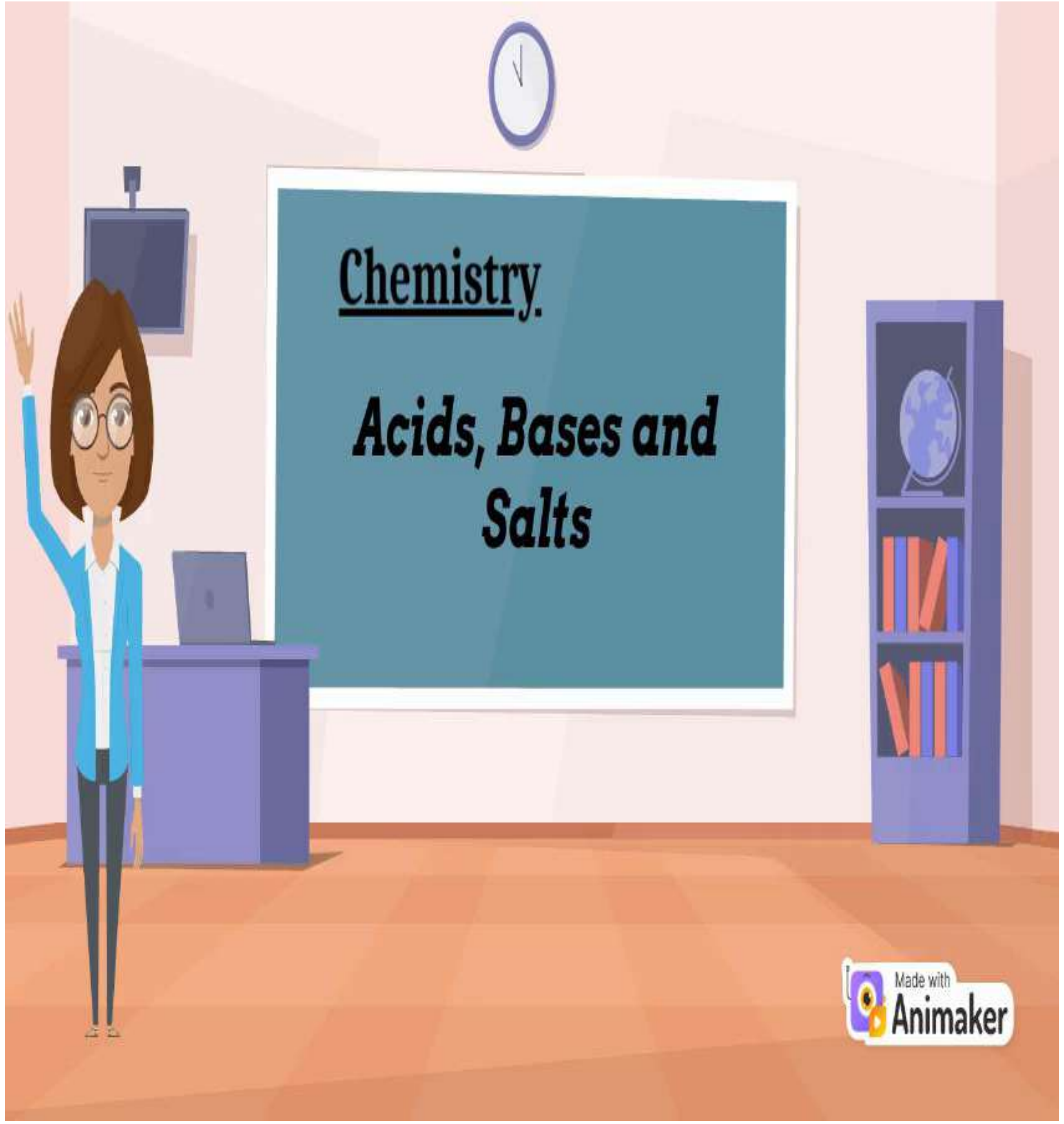
As a part of B.Ed curriculum, we are required to develop and present an ICT supported learning resource material for school pupils. I developed an audio book and the main objective of this audio book is to serve as a learning resource material for the blind students and to make their learning purpose much more easier.

This audio book is prepared based on the SCERT syllabus of Class IX. This audio book consists of two chapters titled “ACIDS, BASES AND SALTS” and “WORK, ENERGY AND POWER”. I hope this audio book will be helpful to all the students to enjoy and learn their syllabus.

CONTENTS

INTRODUCTION


SCIENCE


Chemistry
Acids, Bases and Salts
Made with Animaker

Acids

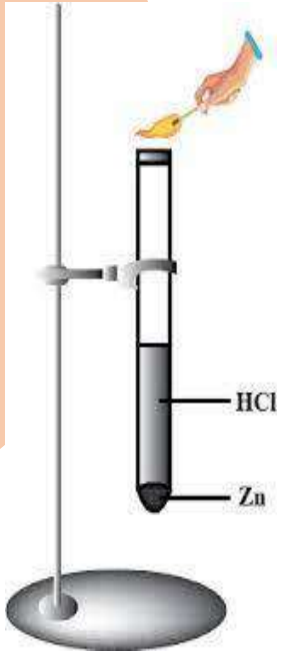


Can you identify the characteristics of above given examples?

SUBSTANCE	CHARACTERISTICS
Orange	Sour/sweet taste
Vinegar	Sour taste
Soap	Slippery/bitter
Lemon	Sour taste
Toothpaste	Slippery
Baking soda	Bitter taste

Let us do an experiment

Take a small piece of zinc in a test tube. Add 2 ml of dilute hydrochloric acid. Show a burning matchstick at the mouth of the test tube. Did you hear any sound?



The matchstick extinguished and the gas burnt with pop sound

Acids react with reactive metals to form hydrogen gas

Look at the examples for acids:

- **HCl**
- **HNO_3**
- **H_2SO_4**
- **CH_3COOH**

Which is the ion common in all the acids given above?

How can we define acids?

1. Acids are substances which can increase the concentration of Hydrogen (H^+) ions in an aqueous solution
2. The properties of acids are due to the presence of hydrogen ions in them

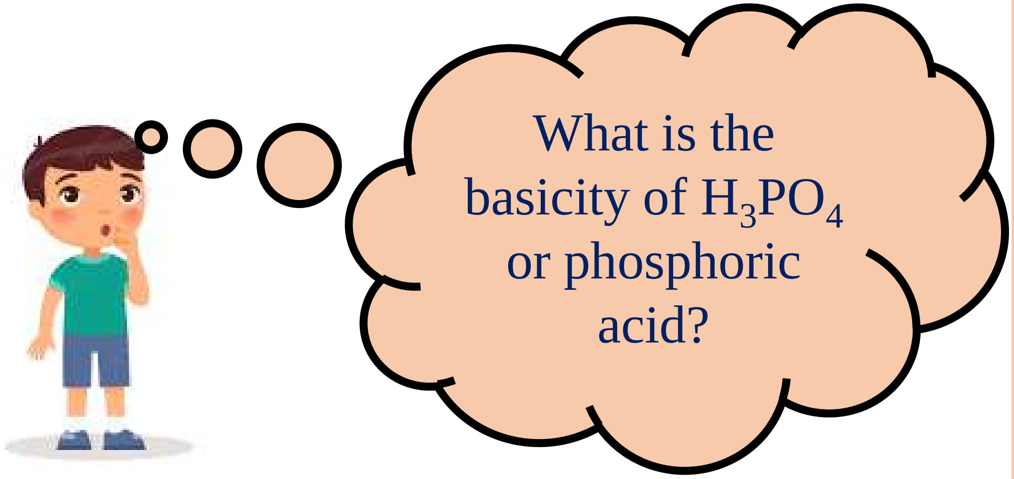
Basicity of acids

The number of hydrogen ions that can be donated by one molecule of an acid is its basicity. Based on the number of Hydrogen ions liberated it can be classified as monobasic, dibasic, tribasic acids etc.

- For the ionization of HCl, one hydrogen ion is liberated. So it is a monobasic acid.

  $HCl \longrightarrow H^{+} + Cl^{-}$

- H_2SO_4 is a dibasic acid.



ACID RAIN

In industrial areas the chances of air pollution are very high. In such regions gases like SO2 and NO2 reach the atmosphere in larger amounts. These gases dissolve in rain water and reach the soil as acids. This is known as acid rain.

Harmful effects of acid rain:

- Plants lose their ability of photosynthesis
- Damage of monuments
- Destroys the greenery
- It causes death and destruction of fish and corals

Measures that can be undertaken to prevent acid rain:

- Reduce the excessive use of fossil fuels
- Reduce the amount of sulphur compounds in fossil fuels
- Use more solar and wind power

BASES AND ALKALIES

- Alkalies are substances which can increase the concentration of hydroxide (OH^-) ions in an aqueous solution.
- All bases are not alkalies.
- Only water soluble bases are known as alkalies.
- NaOH and KOH are alkalies but $Al(OH)_3$ and $Cu(OH)_3$ are known as bases

EXAMPLES!!!

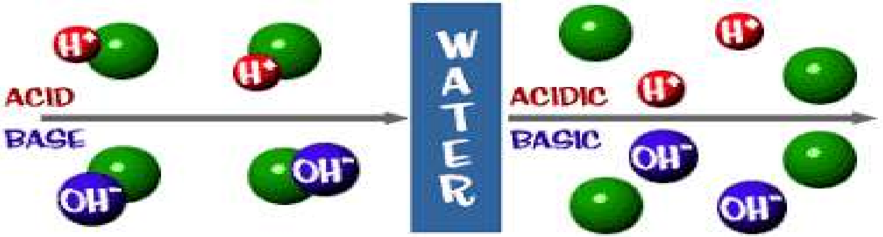
COMMON NAME	CHEMICAL NAME	CHEMICAL FORMULA
Caustic soda	Sodium hydroxide	$NaOH$
Milk of lime	Calcium hydroxide	$Ca(OH)_2$
Caustic potash	Potassium hydroxide	KOH

ARRHENIUS THEORY

Any acid or base, when dissolved in water dissociates into ions

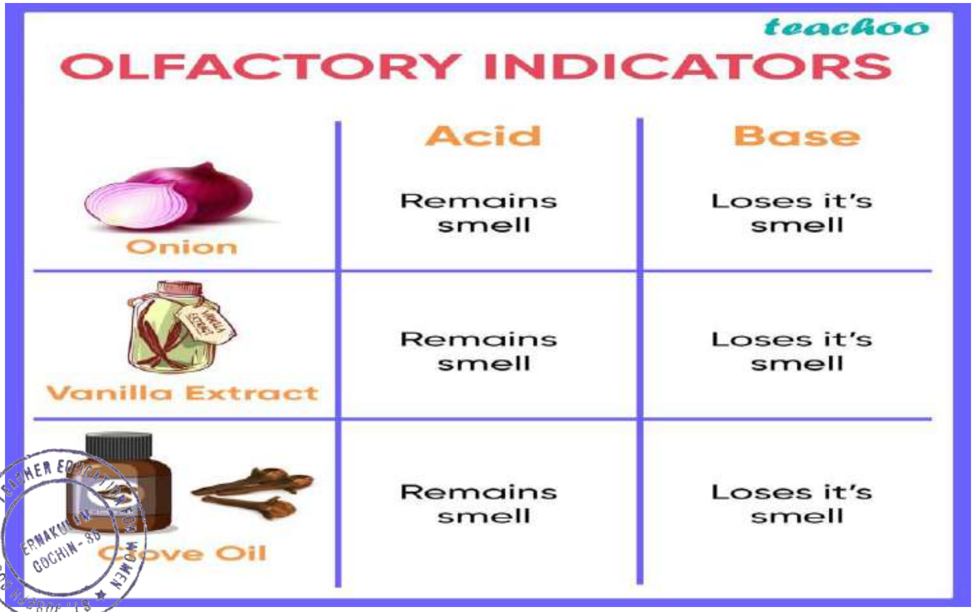
Acids are the substances which liberate hydrogen ions in aqueous solution

Bases are the substances which liberate hydroxide ions in aqueous solution



How can you identify acids and bases?

1. Olfactory Indicators: It is a substance whose smell varies when it is mixed with an acidic or basic solution

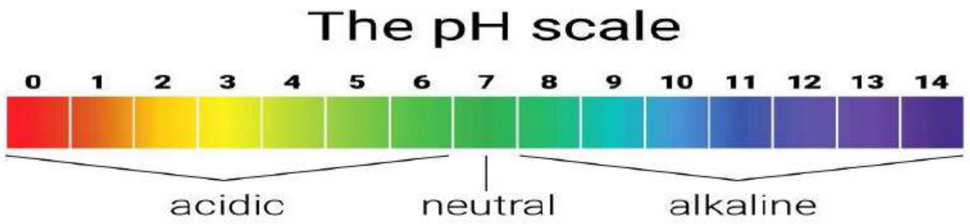

teachoo

OLFACTORY INDICATORS

	Acid	Base
Onion	Remains smell	Loses it's smell
Vanilla Extract	Remains smell	Loses it's smell
Clove Oil	Remains smell	Loses it's smell

2. pH Scale

The pH scale is the method used to express the acidic or basic nature of a substance based on the amount of Hydrogen ions present in their aqueous solutions.



pH Meter

It is a device used to measure the pH of solution. It measures the voltage between two electrodes and converts into pH value.

SALTS

Neutralisation reaction is the reaction in which acid and alkali react with each other to form salt and water. Salts are usually ionic compounds.

$$NaOH + HCl \longrightarrow Na^{+}Cl^{-} + H_2O$$

$$Mg(OH)_2 + 2HCl \longrightarrow Mg^{+}Cl_2^{-} + 2H_2O$$

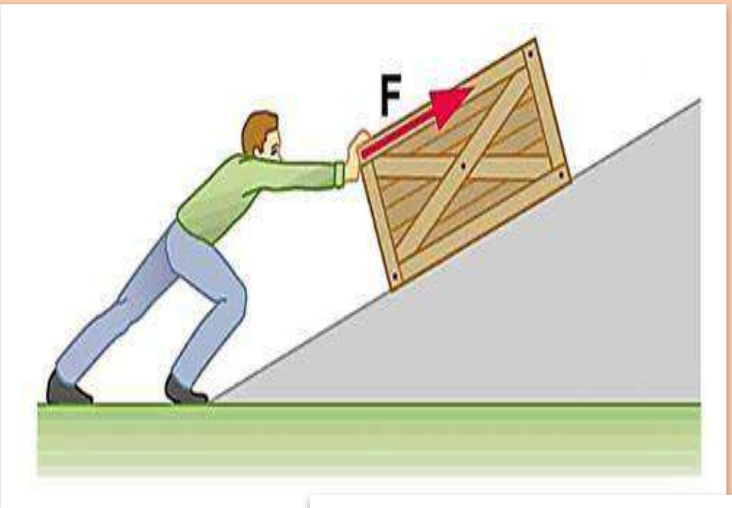
Salts are neutral or not?

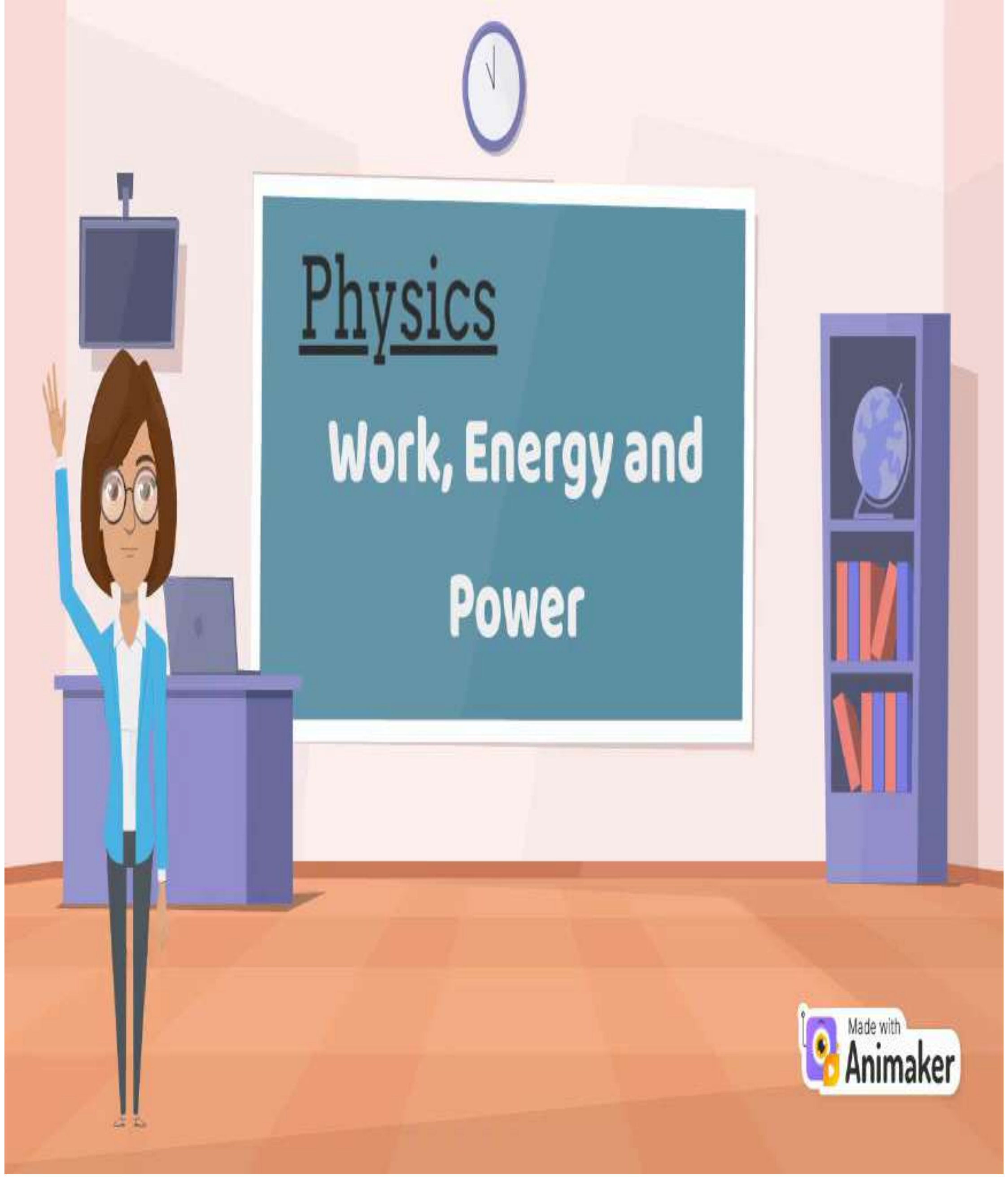
Salts dissociate into positive and negative ions when dissolved in water or melted. But, **salts are electrically neutral**. The sum of the charge of the positive and negative ions in a salt will be zero.

Uses Of Salts

Salt	Uses
Sodium Chloride	Used in food, preservatives, manufacture of soap
Sodium hydroxide	Used for making detergents, dyes, bleaches etc.
Sodium carbonate or washing soda	Used as cleansing agent
Sodium Bicarbonate or baking soda	Used as an antacid, baking powder etc.

WORK, ENERGY AND POWER





WORK

Work is said to be done only when a body undergoes displacement in the direction of the applied force

Factors affecting work

CASE 1

A boy pushed an object of mass 30 kg across a floor through 50 m. Another boy pushed an object of mass 50 kg across the same floor through 50 m. Both of them gave same speed for moving the objects.

Who applied the greater force?

CASE 2

A child pushed an object of mass 30kg across a horizontal floor through 20m. Another child pushed the same object through 30m, on the same floor with same speed.

Who pushed the object to a greater distance?

CASE 3

A body of mass m kg is placed on a table. If this body is raised through h metre, in which direction has the force to be applied on the body? If it raised to h metre, what would be the displacement?

If a force of F Newton is applied continuously on a body and the body undergoes a displacement of s metre in the direction of the force, then the work done by the applied force is,

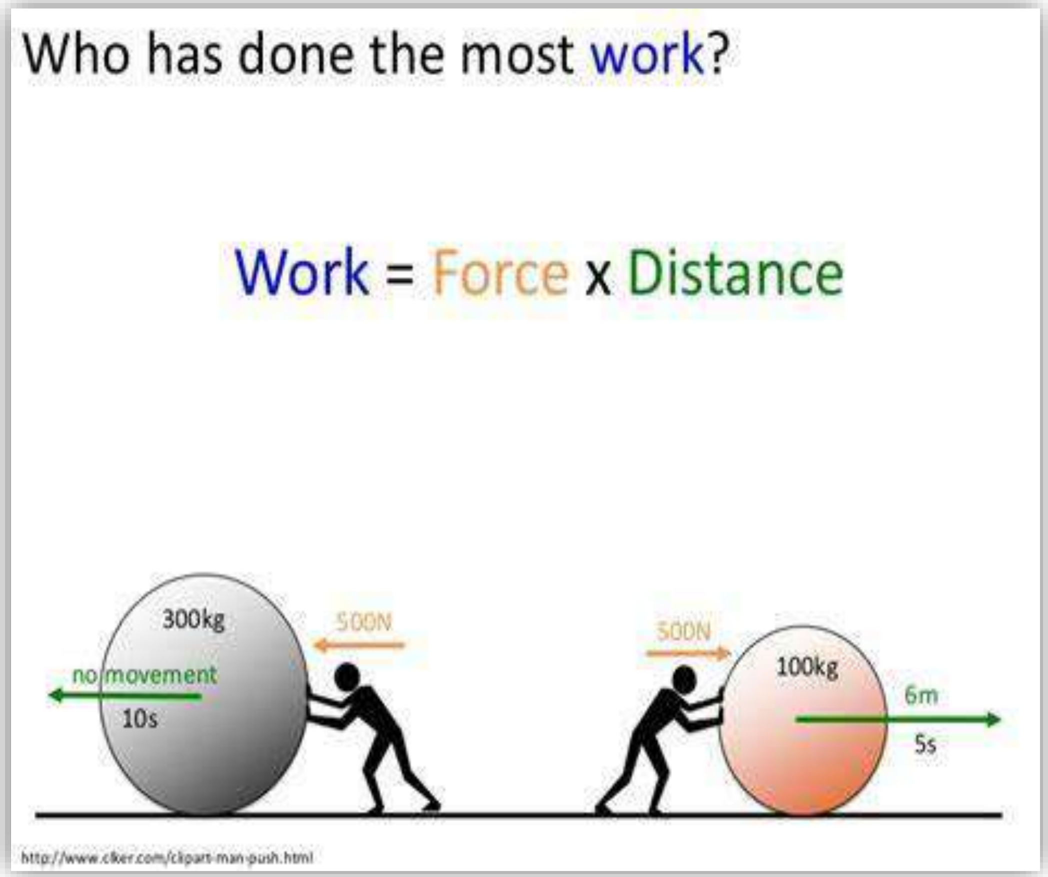
- **W= F *s**

When a body is raised to a height h, the work done against the gravitational force would be,

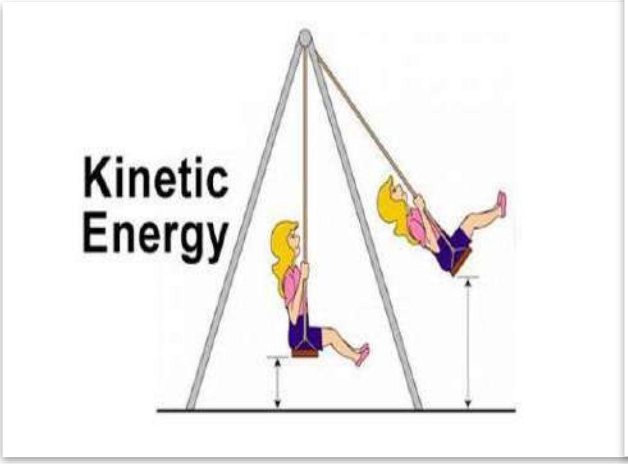
- **W = mgh**

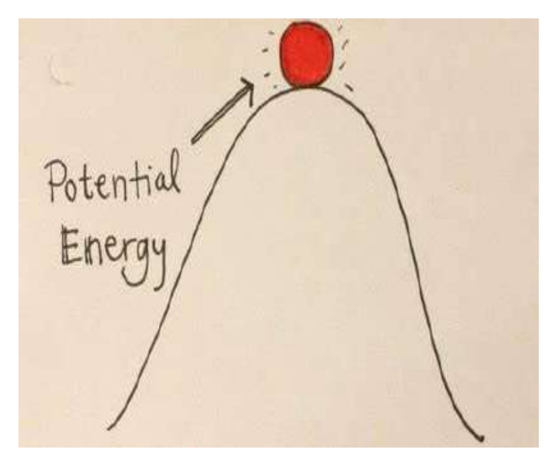
- Unit of work is Joules
- 1J is the amount of work done to raise a body of mass 100 g through a height of 1 m.

Find the answer!!



ENERGY





Energy is the capacity to do work

There are different forms of energy. Energy can be mainly divided into Kinetic Energy and Potential Energy

Kinetic Energy

DO THIS ACTIVITY

Arrange a toy car and a plastic ball on a smooth surface. Pull the toy car backwards a little and allow to hit the plastic ball. **What happens to the ball when the moving car hit it?**

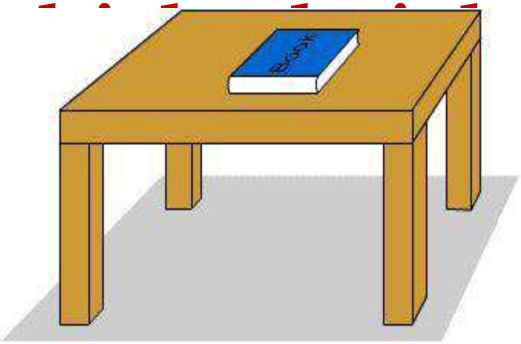
The energy possessed by a body by virtue of its motion is the kinetic energy. When a body of mass m moves with a velocity v, its kinetic energy will be,

$$K = \frac{1}{2} mv^2$$

Potential Energy

DO THIS ACTIVITY

Consider a book placed on a table. Is there any work done to lift the bodies? Against which force is work done here? Note the amount of work done to raise a body of mass m kg to different heights. At w… t from the floor … work done on t…



The energy possessed by a body by virtue of its position is the potential energy. Potential energy is equal to,

$$U = mgh$$

Here the work is done against the force of gravity So the energy increases as the height increases.

LAW OF CONSERVATION OF ENERGY

Look at the energy transformations in the following equipment

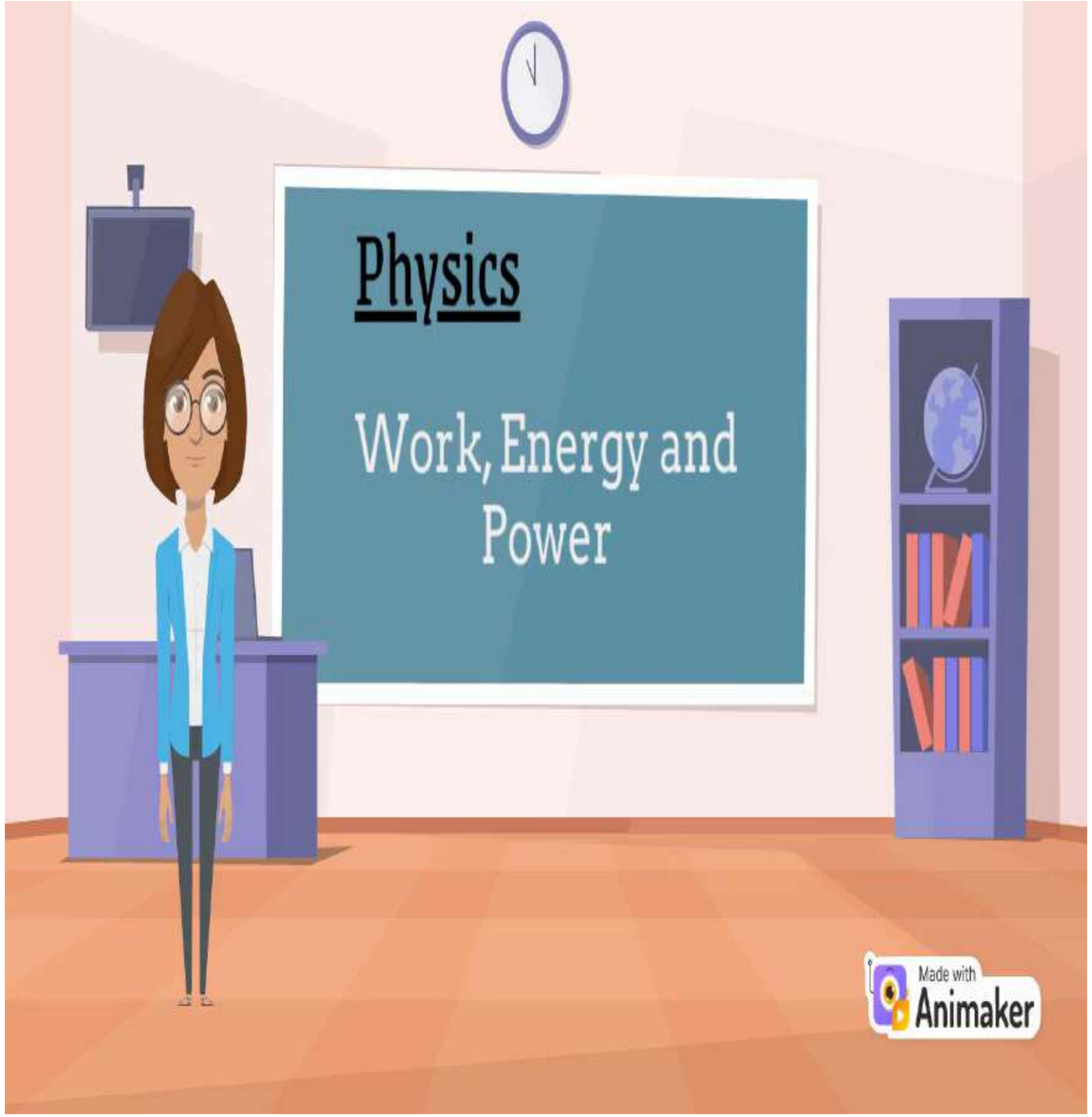
Equipment	Energy transformation
Electric generator	**Mechanical energy to electrical energy**
Fan	**Electrical energy to mechanical energy**
Electric iron box	**Electrical energy to heat energy**
Electric bulb	**Electrical energy to light energy**

In all the examples cited above energy is converted from one form to another.

Energy can neither be created nor destroyed. Energy can only be transformed from one form to another. This is the law of conservation of energy.

POWER

- Power is the work done per unit time or rate of doing work
- Power = $\frac{work}{time}$
- Unit of power is J/s or Watt(W)



CONCLUSION

ALICE JOSEPH Digitally signed by ALICE JOSEPH
Date: 2024.02.02 20:56:46 +05'30'

DIGITAL LAB MANUAL

SUBMITTED BY

APARNA S

FIRST YEAR B.Ed. PHYSICAL SCIENCE

DIGITAL LAB MANUAL

PREFACE

This digital version of laboratory manual was designed for students of class IX highlighting the importance of laboratory skills as well as the importance of digital resources in academics. The manual includes four different science experiments, divided into two different units having both physics and chemistry experiments.

Digital Laboratory Manual in Science for Class IX is an exercise to familiarize pupil with the general facilities, equipment, measuring instruments, chemicals and glassware, specimen available in a school science laboratory for making the activities more interesting, engaging through digital version making highly portable and accessible.

INTRODUCTION

TABLE OF CONTENT

UNIT-1

SOUND

EXPERIMENT

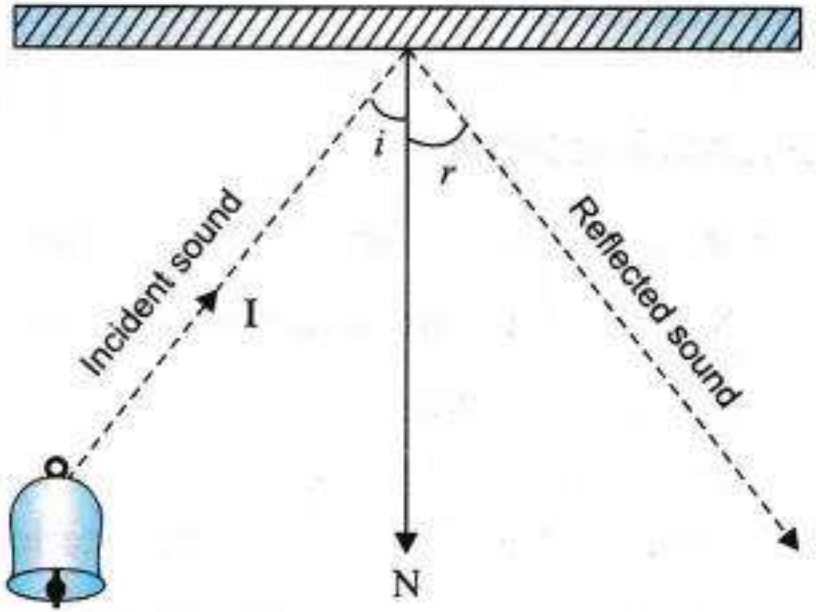
Aim

To verify the laws of reflection of sound.

Theory

1.Sound: It is a form of energy produced by vibration and it needs medium to propagate.

2.Reflection of sound: As light reflects when it strikes any hard object (opaque), sound also gets reflected when it strikes any object.



Reflection of Sound
$\angle i = \angle r$

Laws of Reflection of sound

1.The angle of incidence is always equal to the angle of reflection.

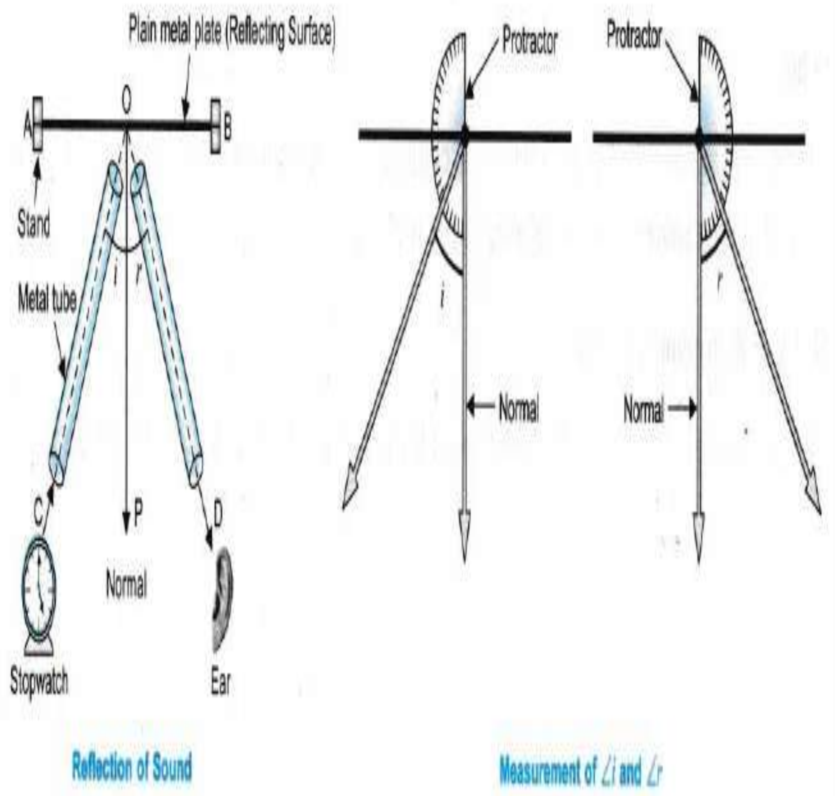
2.The incident sound wave, the normal and the reflected sound wave lie in the same plane

Materials Required

Two highly polished metal tubes made up of stainless steel or aluminium of length 25 cm and diameter 2 cm, a drawing sheet, metal plate, a geometrical set, thumb pins, drawing board/table, stopwatch, metal stand.

Procedure

1.Fix the white sheet on drawing board with thumb pin.



2.Draw a line AB to place the metal plate as reflecting surface with the help of metal stand, and draw normal OP to this line as shown in the figure.

3.Now draw a line OC making an angle of 30° with the line OP.

4.Place one metal tube near to the point O of normal and metal plate on the line OC.

5.Place the ticking watch closer to one end of this metal tube.

6.Now place the second tube so that its one end is near to the point O. Bring your ear close to the other end and adjust its position such that it collects the maximum reflected sound.

7.Mark the position of the tube when it collects the clear and maximum reflected sound.
8.Draw an extended line of reflected sound wave and mark it as OD.
9.Measure the angle of incidence and the angle of reflection.
10.Follow the above procedure and record your observation thrice.

Result

1.The angle of incidence is equal to the angle of reflection.
2.The incident, normal and reflected sound waves lie in the same plane

KAPWING

OBSERVATION TABLE

S.No.	Angle of Incidence ∠i	Angle of Reflection ∠r
1.	30°	30°
2.	35°	35°
3.	40°	40°

COLLEGE OF TEACHER EDUCATION FOR WOMEN ERNAKULAM COCHIN-35

VIVA VOCE

Question 1:

What produces sound?

Answer:

Vibration produces sound.

Question 2:

How do human beings produce sound?

Answer:

Due to the vibration of vocal cords.

Question 3:

Can sound travel through the vacuum?

Answer:

No.

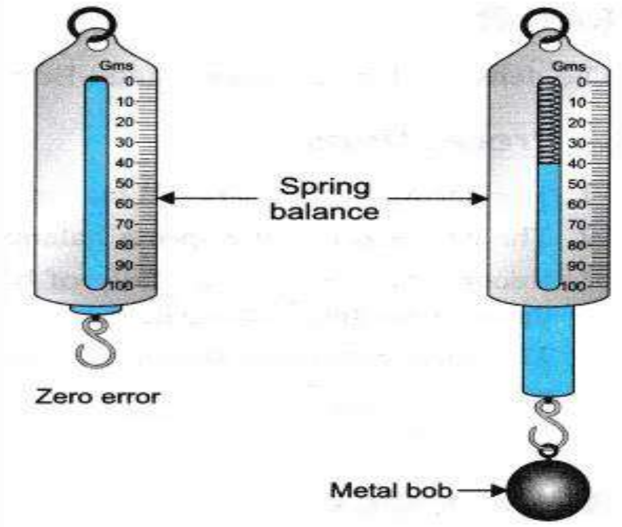
DENSITY OF SOLIDS
EXPERIMENT

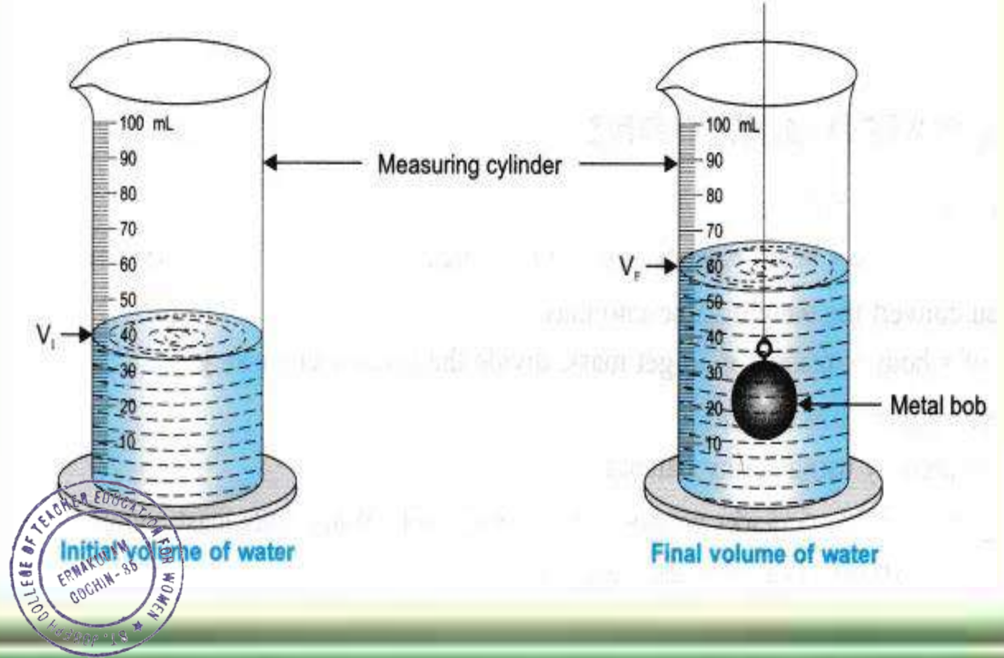
Aim

To determine the density of solid (denser than water) by using a spring balance and a measuring cylinder.

Theory

1.Density: The density of a substance is defined as the mass per unit volume,[D= M/V]
Here, D = Density of the body
M = Mass of the body
V = Volume of the body.
1.S.I. unit of density = Kgm^{-3} or Kg/m^{-3}
c.g.s. unit of density = g/cm^{-3} or $g\ cm^{-3}$





Weight

1.The force due to the gravitational attraction of the earth that acts on a body is called weight.

2.(Weight) Force = mass x acceleration.

Force = mass x acceleration due to gravity (g)

Force = mass x g

i.e Weight = m x g

3.Weight of a body = Force on the body.

4.S.I. unit = Newton = 1 kg m/s^2

N=1 kgf=1 kilogram force,

i.e g = 9.8 m/s^2

5.Weight is measured by spring balance.

Materials Required

A spring balance, a measuring cylinder, a beaker with water, a metal bob (or any body that is heavier than water and does not dissolve in water), a cotton string, a stand (optional).

Procedure

1.Tie a metal bob (or any solid) with the string of cotton to the hook of the spring balance. The spring balance should be checked for any error. Let the zero error be 'x'.

2.Hold the spring balance (or tie it to the stand), suspended with the metal bob in air. Measure the weight of the bob. Let its weight be 'W_F'

3.Pour the water in the measuring cylinder and record the initial volume of water, let it be 'V_1'

4.Suspend the metal bob into the measuring cylinder with water. The bob should not touch the base, nor the sides of the cylinder.

The water level rises, measure the increased water level, let this volume be 'V_F'

5.Record all your observations in the observation table and do the calculation to find the density of a given solid metal bob.

OBSERVATION TABLE

WEIGHT OF THE SOLID (METAL BOB) (M)

Initial Reading of Spring balance, x	Final Reading of spring balance with Metal Bob (W_F)	Weight of the Metal Bob $W = W_F - x$
0	400	400

1.Weight of the given Metal Bob = 400N
2.Mass of the Metal Bob = 400/9.8 = 40.8 g

VOLUME OF THE SOLID (METAL BOB) (V)

Initial Volume of water in cylinder V_1 (mL)	Final volume of water when Metal Bob is immersed V_F (mL)	Volume of the Metal Bob $V = V_F - V_1$
40	60	20

Volume of water displaced by solid (metal bob) = 20 mL

2.Density of a solid (metal bob) = 40.8g20ml = 2.04 g/cm3

Result

The density of given solid (Metal Bob) is 2.04 g/cm^3

VIVA VOCE

Question 1:

Define density.

Answer:

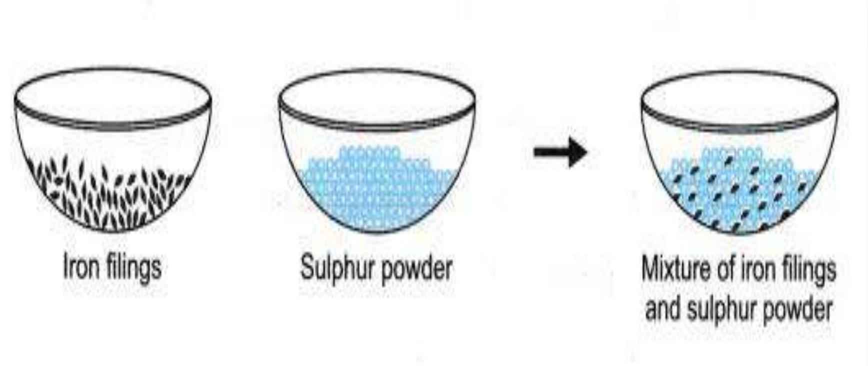
Density is defined as the mass per unit volume.

Question 2:

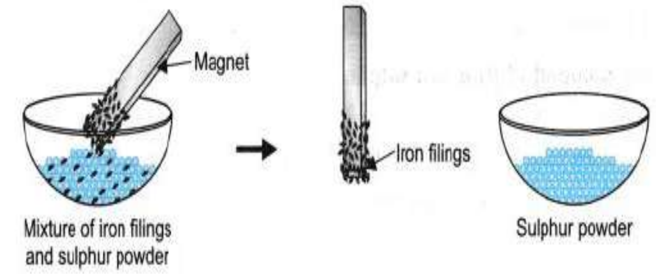
State the S.I. unit of density.

Answer:

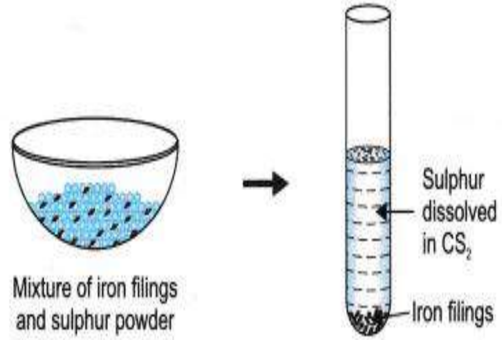
kg/m^3.



I.



II.



UNIT-2

MIXTURES AND COMPOUNDS

EXPERIMENT

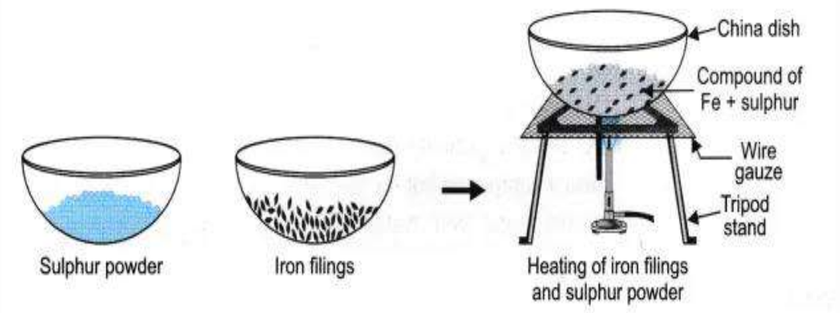
AIM

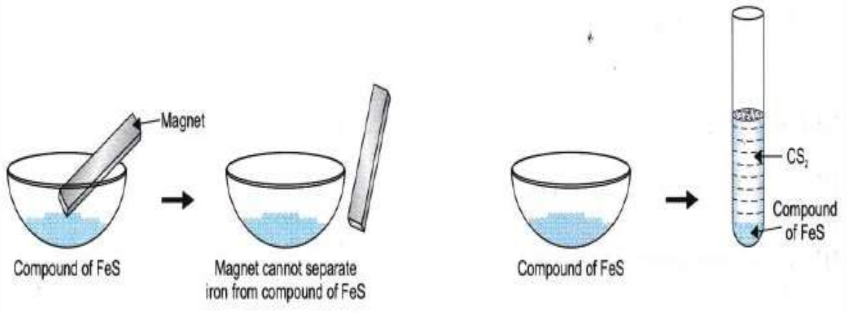
To prepare
1.a mixture
2.a compound
using iron filings and sulphur powder

THEORY

Mixture: When two or more than two substances mix together in any proportion physically and do not show any chemical change, retain their individual properties, then they form a mixture.

Compound: When two or more than two substances combine together chemically in a fixed ratio, such that they can be separated only by chemical means, then a compound is formed.





Materials Required

Test tubes, test tube stand, test tube holder, hard glass test tube, Bunsen burner, tripod stand, wire gauze, magnet, China dish and a watch glass.

Chemicals Required

Iron filings, sulphur powder, carbon disulphide

Procedure

1.Preparation of a mixture of iron and sulphur powder.

Take a pinch of iron filings and two pinch of sulphur powder, mix them thoroughly. The product obtained is mixture of iron and sulphur. Keep it in a watch glass (A).

2.Preparation of the compound of iron and sulphur.

Take a pinch of iron filing and a pinch of sulphur powder in a hard glass test tube. Hold it in a test tube holder, heat it on the flame till the contents glow. The reaction between sulphur and iron filings is seen in the test tube and iron sulphide is formed. Transfer the compound formed in a watch glass (B).

(The mixture of iron filing and sulphur powder can be heated in China dish)

Record your observations in the table.

OBSERVATION TABLE

	Experiment	Observations	Inference
1.	**Observe for appearance**	Watch glass (A) shows heterogenous mixture and (B) shows a black mass of homogeneous substance.	(A) is mixture which is heterogeneous and (B) is homogeneous substance.
2.	**Action with Magnet.** A bar magnet is rolled over both the watch glasses A and B.	Iron filings cling to magnet from watch glass (A) but not in (B).	Constituents of mixture (A) can be separated physically but not in (B) *i.e.*, compound.
3.	**Behaviour towards carbon disulphide.** Take components from watch glass (A) and (B) in separate test tubes and add carbon disulphide in it.	In test tube (A) sulphur dissolves in carbon disulphide and iron filings settles down. Whereas in other test tube (B) nothing dissolves.	Components of mixture can be separated by physical means. A is mixture. B is compound.
4.	**Effect of heat**	On heating mixture from watch glass (A) the components react together to form a compound but no change is seen in compound from watch glass (B).	The mixture components from watch glass (A) react together to form a chemical compound, but no change is seen in compound from watch glass (B).

RESULT

Mixtures and compounds differentiated clearly

VIVA VOCE

Question 1:

Is mixture a pure substance?

Answer:

No.

Question 2:

Is alloy a homogeneous or heterogeneous mixture?

Answer:

It is a homogeneous mixture.

Question 3:

Give one test to show that mixtures can be separated physically.

Answer:

Take sulphur + iron-mixture, roll magnet over it, iron filings clings to magnet

Melting Point of Ice and Boiling Point of Water

EXPERIMENT

AIM

To determine the melting point of ice and boiling point of water.

THEORY

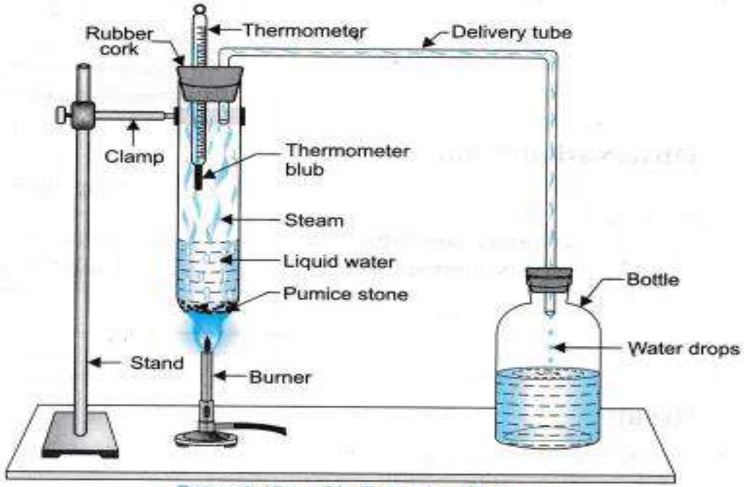
1.Melting Point: The temperature at which the solid changes into liquid at the atmospheric pressure is called melting point. For example, ice melts at 0°C to form water.
2.Boiling Point: The temperature at which the liquid boils and changes into gaseous state at the atmospheric pressure is called boiling point. For example, water boils at 100°C

5.Latent Heat of Fusion: The heat energy absorbed during the melting of ice is stored in the water formed, this energy is called latent heat of fusion.

4.Latent Heat of Vaporisation: The heat energy absorbed by water when it changed its phase to steam, this hidden heat is called latent heat of vaporisation.

Materials Required

Two thermometers, (Celsius scale), boiling tube, a glass rod, two iron stands, a bunsen burner, wire gauze, beakers, tripod stand, distilled water, ice cubes prepared from distilled water



Determination of boiling point of water.

Procedure

(A)To determine the boiling point of water.

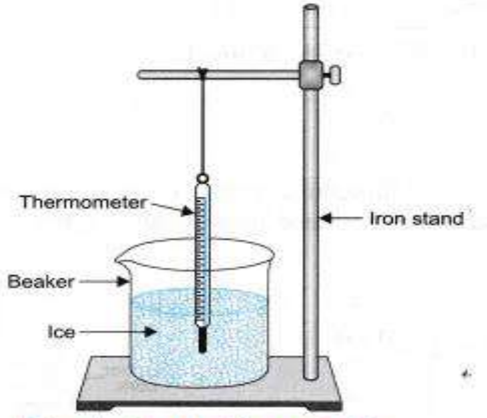
1.Take 25-30 ml of water in a boiling tube and add few pumice stones to it.

2.Clamp the boiling tube on iron stand with two holed cork, in one hole fix the thermometer and in the other one fix the delivery tube.

3.Place the thermometer above the water in the flask as shown in the figure.

4.Place a burner under the boiling tube.

5.Read the temperature and record it in the given observation table till the water boils. Record the reading after the time interval of 1 minute.



Determination of melting point of ice

To determine the melting point of ice.

1.Take a beaker half-filled with the dry crushed ice obtained from distilled water.

2.Suspend a Celsius thermometer from the clamp stand such that the bulb of the thermometer is completely surrounded by ice.

3.Read the thermometer reading and record the temperature after every 1 minute till the ice melts and the thermometer reading remains stationary for 2 minutes.

4.Note the readings in the observation table

Observation Table

Boiling Point of Water

S.No.	Temperature when water starts boiling (t_1°C)	Temperature when water continues to boil till constant (t_2°C)	Boiling point of water $\left(\frac{t_1+t_2}{2}\right)$°C
1.	99.8	100	99.9
2.	100	100	100

Melting Point of Ice

S.No.	Temperature when ice starts melting (t_1°C)	Temperature when ice melts completely (t_2°C)	Melting point of ice $\left(\frac{t_1+t_2}{2}\right)$
1.	0.5	0	0.25
[illegible]	0	0	0

Result

1.Boiling Point of water is 100 °C.
2.Melting point of ice is 0 °C.

VIVA VOCE

Question 1:
What is the melting point of pure water ice cubes?
Answer:
0°C.
Question 2:
What is the boiling point of pure water?
Answer:
100°C.
Question 3:
At what temperature will you get the latent heat of fusion for water?
Answer:
At 0°C.

THANKYOU

PUZZLE BOOK

Anjumol Paul
First Year B.Ed
Physical Science

PREFACE

Puzzle book is basically an activity book which contains a collection of puzzles. Puzzles helps to build cognitive and fine motor skills. Furthermore it will develop critical thinking and problem solving skills.

This puzzle book is prepared based on the SCERT syllabus of class 9.This puzzle book contains 20 crosswords, 10 picture game and 10 word game , covering the entire syllabus of class 9. I hope this puzzle book will help students to build self-confidence and boost their interest in learning.

CONTENT

INTRODUCTION


Made with
Animaker

CROSSWORDS

a

					3			
1	L	E			R			
		2	E		T			N
					O			

1: Negatively charged particle seen around the nucleus
2: Neutrally charged particles present inside the nucleus
3:Positively charged particle present inside the nucleus

b

										1 V						
3 E		E	2 C			O	N		G			I				Y
										L						
			T													
										C						
		4	N	I			S									

1: The number of electrons lost, gained or shared by an atom during chemical reaction
2: Positively charged ions
3: In a covalent bond the relative ability of each atom to attract the bonded pair of electrons towards itself.
4: Negatively charged ions

c

		1 I						
2 I	S		T			E		
		B						
	3	S			O	N		

1 : Atoms having same mass number but different atomic number.
2: Atoms of the same element having the same atomic number but different mass number.
3: Atoms with same number of neutrons.

d

		1 O					3	
					2 C		E	
		I						
4 R			U	C		I		N
					A		X	
		T						
		O			S			

1: The process of loss of electron.
2:Substances which alter the rate of chemical reactions without themselves undergoing any permanent chemical change.
3:The process in which oxidation and reduction take place simultaneously.
4: The process of gain of electrons.

e

1N		B		E	3G		S
	2P		R			D	
					U		

1: The elements of group 18 in the periodic table.
2:The horizontal rows in the periodic table.
3: The vertical column in the periodic table.

f

	1L	2	N	T		A		O	I			S
		C										
2M	E		A		L	O		D				
		I										
		O										
		E										

1: Inner transition elements from Lanthanum to Lutetium of period 6.
2: Inner transition elements from Actinium to Lawrencium of period 7.
3: Elements exhibiting the properties of both metals as well as non-metals.

g

					1				
		2A			A	L			S
		D			s				
3B		S	I			T			

1: substances which can increase the concentration of hydroxide ions in an aqueous solutions
2: Water soluble bases.
3: The number of hydrogen ions that can be donated by one molecule of an acid.

Downwards

2: Substance which can increase the concentration of hydrogen ions in aqueous soltions.

h

				1G		A		H			E
		2D	I		M			D			
				P							
				H							
				T							
3F	U		L		R			E			

1: Two dimensional sheets of hexagonal rings formed by carbon.
2:Hardest allotrope of carbon.
3: Allotrope of carbon which is a hollow structure consisting of pentagons and hexagons.

Downwards

1:The softest crystalline allotrope of carbon.

i

				$_1$C										
$_2$D		C	O			O			T		O	N		
				B										
			$_3$D		S			A	C			E		
				N										
				T										
				N										

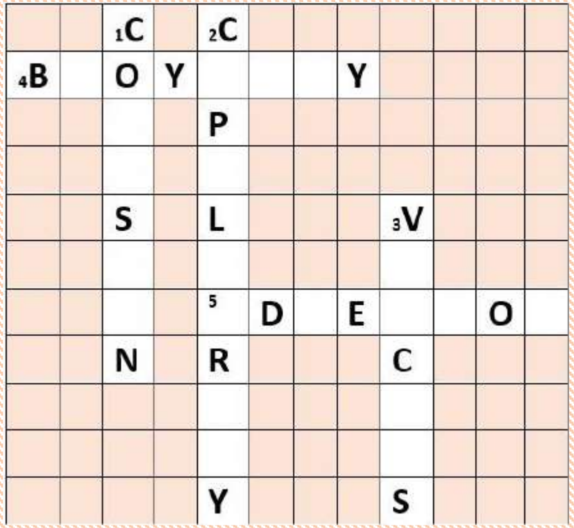
1: Chemical process in which a substance reacts rapidly with oxygen and gives off heat.
2: Chemical reaction in which one reactant breaks down into two or more products.
3: Reaction wherein the atom or a set of atoms is displaced by another atom in a molecule.

j

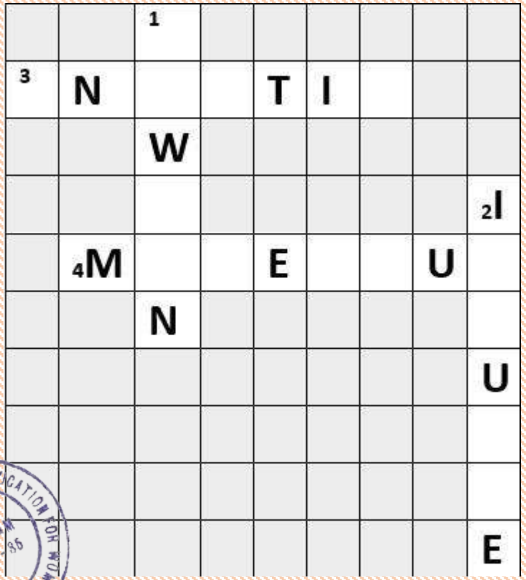
		$_1$A		$_2$N							
$_3$L		T			S						
				T							
		I		A							
		D									
				I							
	$_4$D	I			S		C				
				T							
			$_5$M		N			A			C
				N							

1:Medicine used to reduce acidity in stomach.
2:Chemical reaction in which acid and alkali react to nullify their individual properties.
3:A type of paper that changes colour in response to the pH of solution.
4: Acid in which basicity is 2
5: Acid in which basicity is 1

k



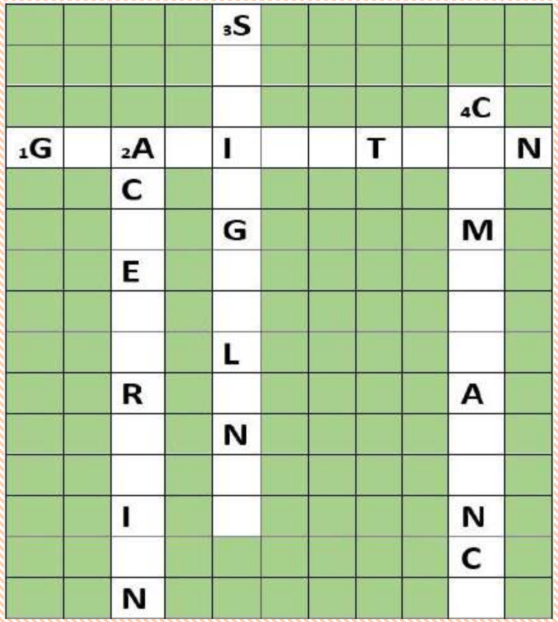
l



1:The intermolecular attraction between like molecules.
2:The rise or depression of a liquid in a narrow tube or a minute hole
3:The frictional force acting parallel to the layers of a liquid in motion, which try to prevent the relative motion between layer.
4:The upward force exerted by a fluid on a body which is immersed completely or partially in a fluid.
5:The tendency of dissimilar particles or surfaces to cling to one another.

1: SI unit of force
2:An effect of force acting over time to change the momentum of an object.
3:A property of matter by which it continues in its existing state of rest or uniform motion in a straight line ,unless that state is changed by an external force.
4: It is the product of mass and velocity.

m

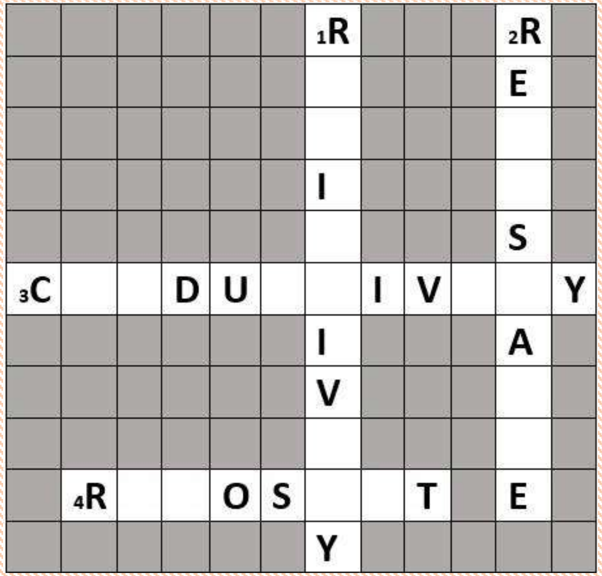


1. **Movement ,or a tendency to move towards a centre of gravity,as in the falling of bodies to the earth.**
2. **Rate of change of the velocity of an object with respect to time.**
3. **Instrument used to measure weight.**
4. **Instrument used to measure mass.**

n

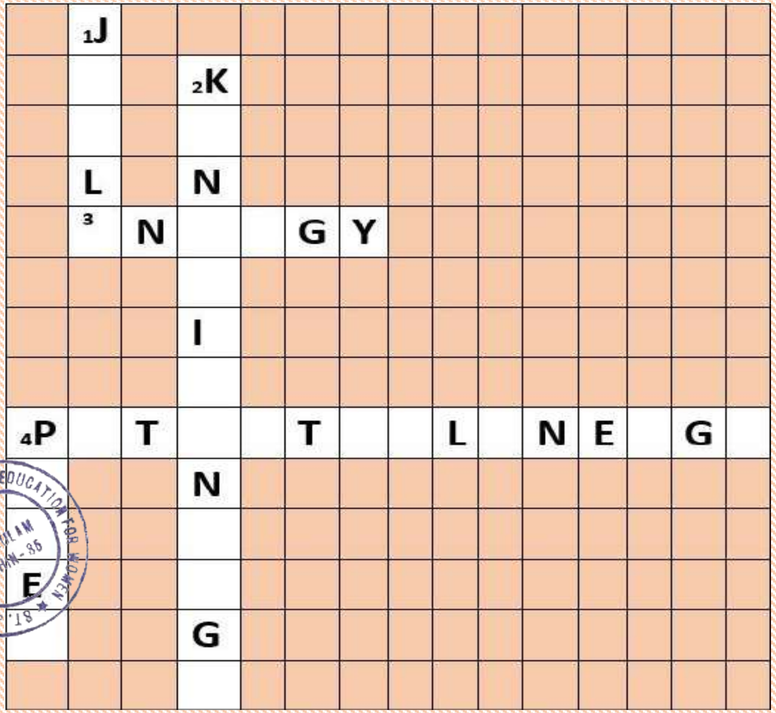
1:Device used to measure the potential difference and emf.
2:SI unit of electric resistance.
3:SI unit of electric charge.
4:Device used to measure current in a circuit.

o



1: The resistance of the conductor of unit length and unit area of cross section.
2: A measure of the opposition to current flow.
3: Reciprocal of resistivity.
4: Device used to regulate the current in a circuit by changing the resistance gradually.

p



1:SI unit of work.
2:Energy possessed by a body by virtue of its motion.
3: Capacity to do work.
4: The energy possessed by a body by virtue of its position.
Downwards
4: work done per unit time.

q

					4K						
1B		3		S		P				A	L
		R			P						
		H		2	E			O	N		
					R						
		E									
		S									

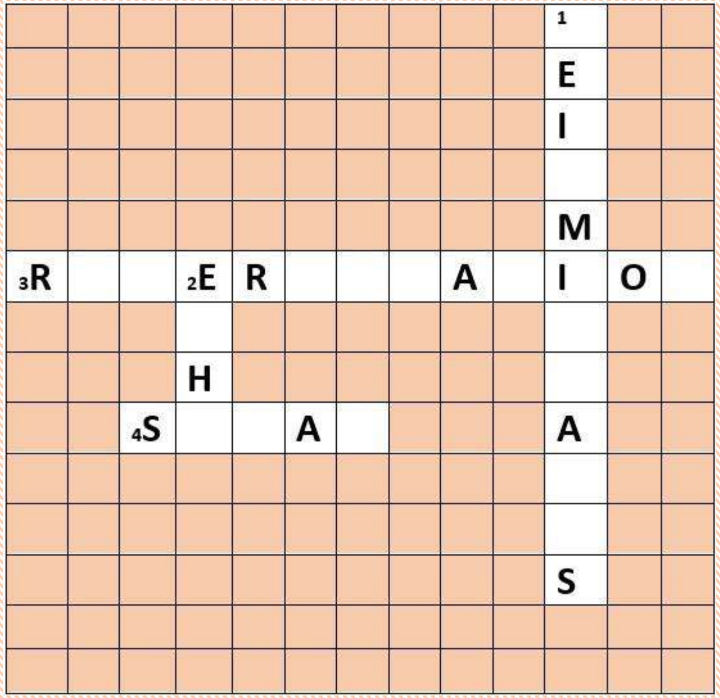
1: Scientist regarded as the father of pressure.
2:Scientist best known for his theory about law of gravity.
3: Scientist best known for his formulation of a hydrostatic principle known as Archimedes principle.
4:scientist who discovered that Earth and planets travel about the sun in elliptical orbits.

r

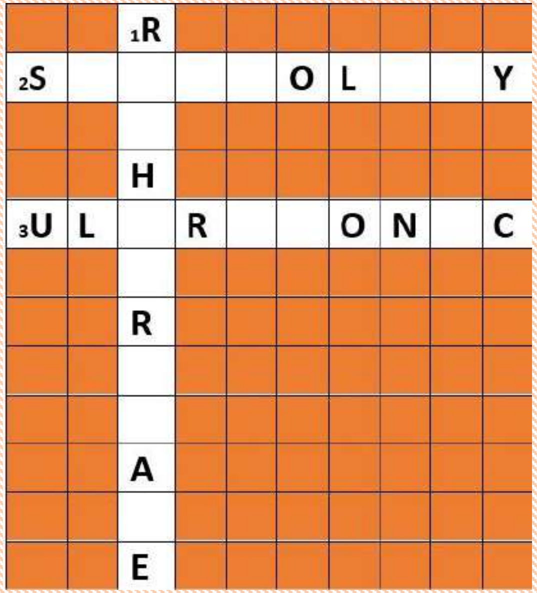
							3		
							P		
							E		
1	M	4P		I	T		D	E	
	2F	R			U		N	C	
		D							

1:Maximum displacement of a particle from its mean position.
2: Number of vibrations in one second.
3: Distance travelled by a wave in one second.
4: Time taken for a particle in a medium to make one complete vibration.

s



t

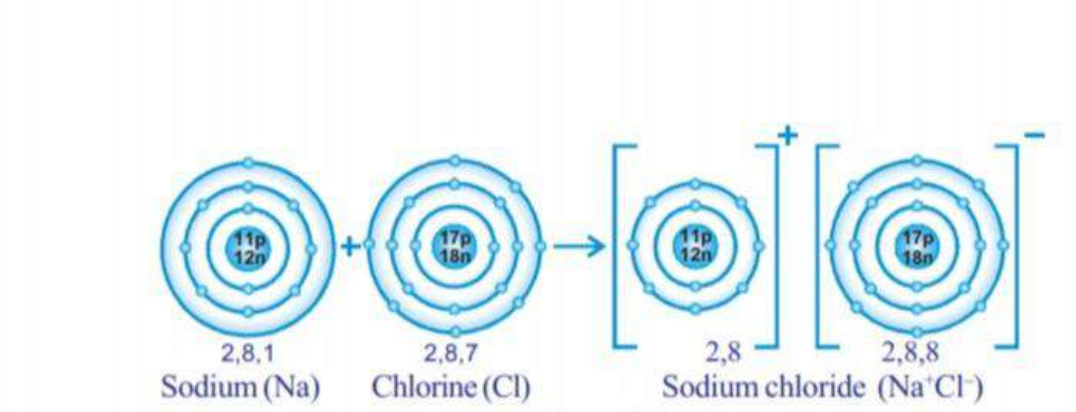


1: Waves originating from the epicentre of the earthquake.
2:The phenomenon of hearing a sound by reflection from a surface or obstacle,after hearing the original sound.
3: The persistence of sound as a result of multiple reflection.
4: Device that uses ultrasonic waves to measure the distance ,direction and speed of objects under water.

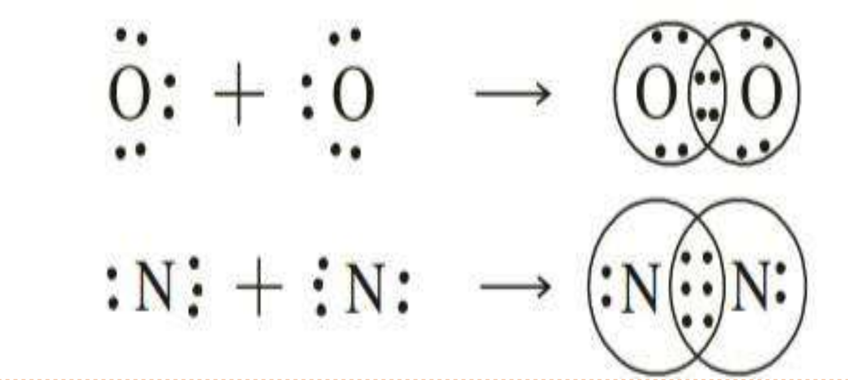
1: Intensity of earthquake is measured in ……………
2: Branch of science that deals with the study of seismic waves.
3: Sound with a frequency greater than 20000 Hz.

PICTURE GAME

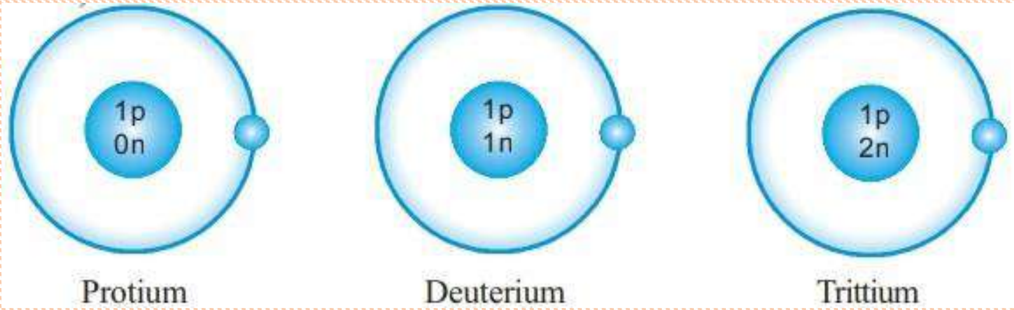
1. Carefully observe the picture and identify the type of bonding present ?



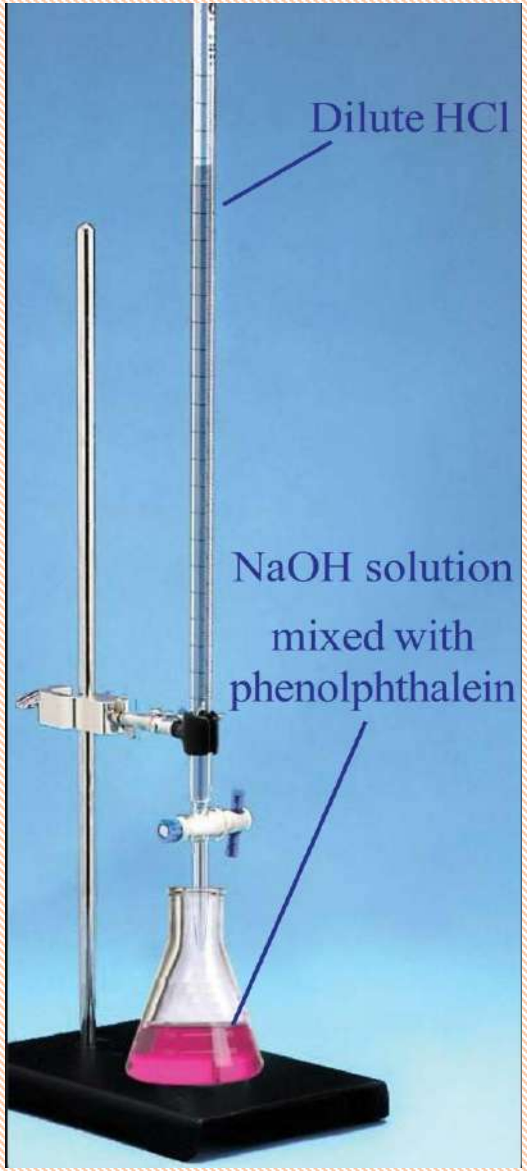
2. Comment on the type of bonding seen in the given figure.



3. Mention the name commonly used to denote the atoms shown in the figure .Also comment about the peculiarity of these atoms.

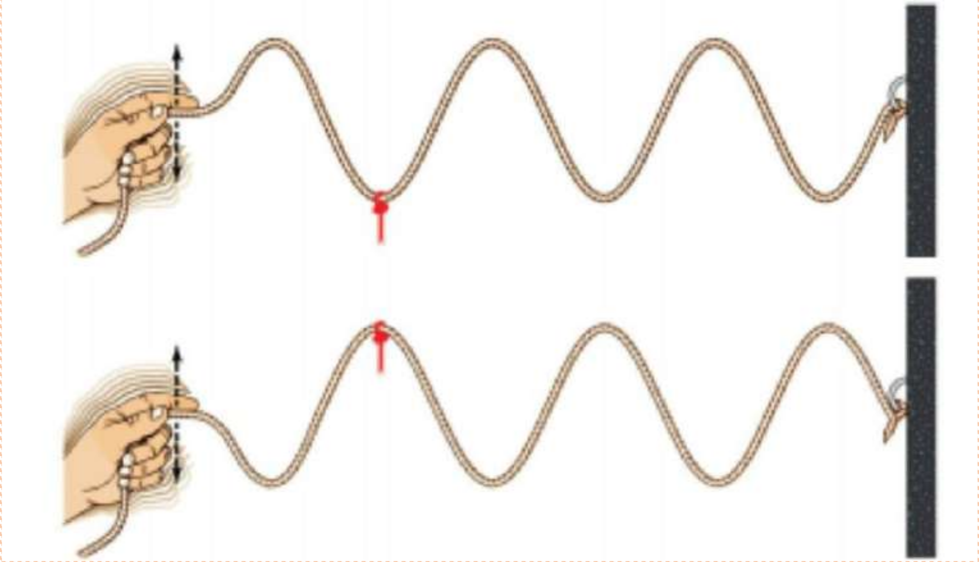


4. Carefully observe the picture and name the reaction takes place when Dil. HCl reacts with NaOH using phenolphthalein indicator



5. Name the gas liberated when Zn reacts with HCl

6. Identify the type of wave formed in the given figure and comment on the direction of propagation of wave.



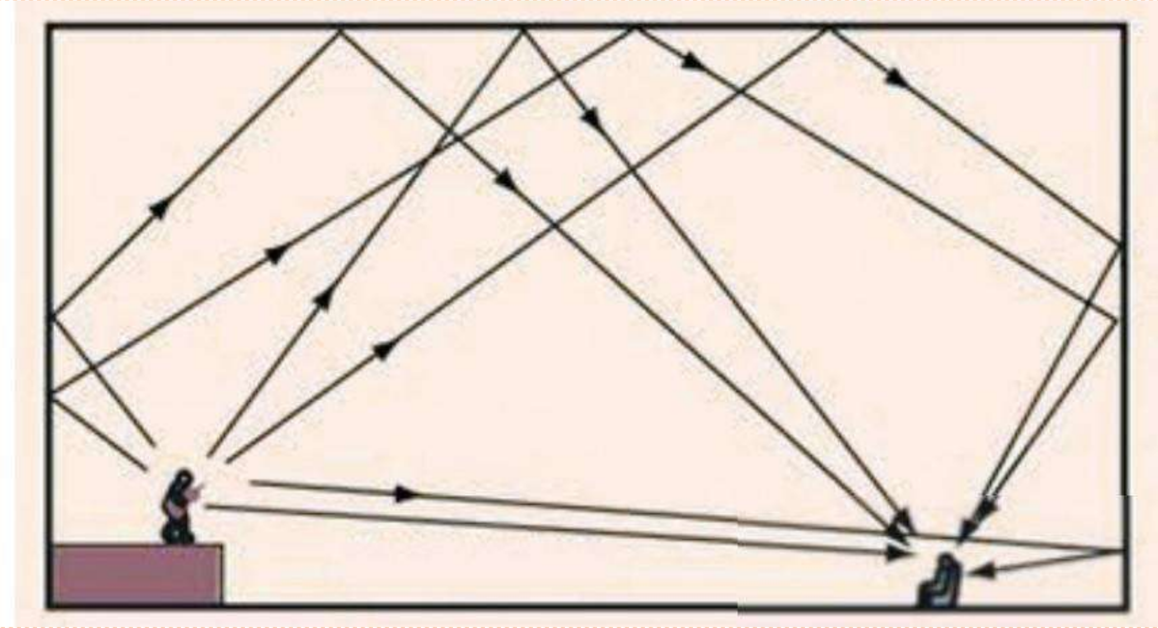
7. Which team will win and why?

TEAM A

TEAM B

8. Observe the picture and identify the force acting in the upward direction which is responsible for floating of a ship and blade in water.

9. Carefully observe the picture and identify the phenomenon depicted in the picture.



10. The instrument given in the figure is used for measuring the EMF and potential difference. Identify the instrument.

WORD GAME

Who Am I?

1.

I am the device , which is used to measure the relative density of a liquid.

2.

I am the force responsible for the spherical shape of water droplets on a leaf.

3.

I am the characteristic property of moving objects. I am measured as the product of the mass and velocity of a body.

4.

I am the force responsible for the circular motion of a stone, tied to a string during whirling.

5.

I am responsible for the downward falling of rain drops.

6.

I am the person who discovered electron.

7.

I am the attractive force that holds together various atoms in a molecule.

8.

I am the one who loss electron during a chemical reaction.

9.

I am the person who is regarded as the father of modern periodic table.

10.

I am the instrument used to measure pH of solution.

Answers

CROSSWORDS

a) 1.Electron
2.Neuton
3.Proton

b) 1:valency
2:cations
3:Electronegativity
4: Anions

c) 1:Isobars
2:Isotopes
3:Isotones

d) 1:Oxidation
2: Catalyst
3: Redox
4: Reduction

e) 1:Noblegas
2:Period
3:Group

f) 1:Lanthanoids
2: Actinoids
3:Metalloids

g) 1:Bases
2:Alkalies
3:Basicity
DOWNWARDS
2: Acid

h) 1:Graphene
2:Diamond
3:Fullerene
DOWNWARDS
1: Graphite

i)
1: Combustion
2: Decomposition
3: Displacement

j)
1: Antacid
2: Neutralisation
3: Basicity
4: Dibasic
5: Monobasic

k)
1: Cohesion
2: Capillarity
3: Viscous
4: Buoyancy
5: Adhesion

l)
1: Newton
2: Impulse
3: Inertia
4: Momentum

m)
1: Gravitation
2: Acceleration
3: Spring Balance
4: Common Balance

n)
1: Voltmeter
2: Ohm
3: Coulomb
4: Ammeter

o)
1: Resistivity
2: Resistance
3: Conductivity
4: Rheostat

p)
1: Joule
2: Kinetic Energy
3: Energy
4: Potential Energy
DOWNWARDS
4: Power

q)
1: Blaise Pascal
2: Newton
3: Archimedes
4: Kepler

r)
1: Amplitude
2: Frequency
3: Speed
4: Period

s)
1: Seismic waves
2: Echo
3: Reverberation
4: SONAR

t)
1: Richter scale
2: Seismology
3: Ultrasonic

Answers

PICTURE GAME

1: Ionic bonding
2: Covalent bonding
3: Isotopes
They are atoms of same element having same atomic number but different mass number
4: Neutralisation
5: Hydrogen
6: Transverse wave
In this waves,displacement of particle is perpendicular to the direction of propagation of waves.
7: Team A
Because a force of 400 N is applied by Team A whereas only a force of 300 N is applied by Team B.
8: Buoyancy
9: Reverberation
10: Voltmeter.

ANSWERS

WORD GAME

1: Hydrometer
2:Surface tension
3: Momentum
4:Centripetal force
5:Gravitation
6:J.J Thomson
7: Chemical bonding
8:Reducing agent
9: Dmitri Ivanovich Mendeleev
10:pH meter


Welcome

Submitted by
Vinny Pappachan
Physical Science

DIGITAL QUESTION BANK

ST.JOSEPH COLLEGE
OF TEACHER EDUCATION
FOR WOMEN, ERNAKULAM..

Vinny pappachan
Physical Science

15^{th} .SOLUTIONS

❖Soft Drinks.
❖True solution,colloid,suspension.
❖Concentration of solution.

4^{th} .PROPERTIES OF *MATTER*

❖Matter
❖Separate the component from mixtures.

15.Solutions

!.SOFT DRINKS

I].Fill in the blanks

a].which acid is contained in soft drink?

b].Soft drinks contains excess amounts of…..we don't feel the sour taste of the acids in them?

c]. MSG is……

d]……is used as a stimulating agent in chocolate.

e]…..give red color to drinks.

II].Multiple choice questions.

a].which chemical is used for ripening of fruits? [MSG,Tartrazine,Ethylene]

b].What is the name of the preservative used in pickle? [sodium benzoate ,phosphoric acid ,caffeine]

c].A substance which is used to give red color to drinks. [Amaranth,Ethephone,Calcium Carbide].

d].Find the odd one. (Ink,suspension,colloid,Tyndall effect)

e]. Which acid is used in soft drinks? . (carbonic acid, phosphoric acid, acetic acid)

III].Short Answers

a].What are the harmful side effects of adding coloring substances such as Metanil yellow, Lead chromate etc. to our food?.

b].What are the coloring materials used in food products?.

c].What are the flavouring agents used in food?.

d].what are the purposes of using various chemical substances in food?.

e].The regular use of fast food & packet food products are not good ?.Do you agree with this ?.Give reason.

IV].Match the following.

a].Soft drink	- 1 Flavoring agents.
b].Preservative	-2 Phosphoric acid
c].Erithrocine	-3 Caffeine
d].Stimulating agent	-4 coloring material
e].Aginomotto	-5 Sodium benzoate.

V].True or False

a].Soft drinks contain a large quantity of citric acid.(T/F).

b].Aginomotto is not a flavouring agent.(T/F).

c].Tartrazine gives red color to food products.(T /F).

d].Caffeine is used a stimulating agent in chocolate.(T /F).

e].Amaranth gives red colour to drinks?.(T /F).

VI].Essay

a].What are the harmful effects of acids , sugar, Caffeine etc.that are added to soft drinks?.

b].Find out the chemicals used in chocolates and such sweets. Compare their merits and demerits?.

c].A friend of yours who participated in a seminar on soft drinks made the following statement "Excessive use of cola drinks will adversely affect our health and also the economic situation". How far do you agree with this statement?.

d].Is it desirable to use preservatives in drinks?

e].Does the regular intake of such synthetic drinks cause the entry of harmful chemicals to our body?.

2.True solution, Colloid, Suspension.

I].Fill in the blanks

a].Paint: colloid ; Muddy water : ………..

b].Air mixed with moisture ; solution ;mist: …….

c].Light can't conduct : Suspension; path of the light is not visible : …….

d]. Sugar solution : true solution
milk : ……..

e].Colloids : heterogeneous.
True solution : ………..

II].Multiple choice questions.

a].Example of colloid.
(Blood, Muddy water, Smoke).

b].which one is not the property of colloid?.
(Heterogeneous, Homogeneous, none of these)

c].which is the true solution.
(Chloride in water ,fog ,chalk and water)

d]. Size of particle in a true solution.
(<1nm ,1nm- 100nm ,>100 nm).

e]. How does diffusion take place in colloids?.
(Diffuse quickly, Diffuse slowly, Do not diffuse).

III].Short Answers.

a].What is a colloid?.
b].Why milk is seen as a white?.
c].Find out whether the statement given below is correct or not. Give reason for your answer?
" muddy water is a suspension".
d].How do true solution , colloid & suspension differ with regard to particle size.?.
e]. What is Tyndall effect? Write 2 properties of colloid?.

IV].Match the following.

a].colloid -1 charcoal
b].Homogeneous mixture -2 muddy water
c].scattering of light -3 Tyndall effect
d]. Suspension -4 True solution
e]. Heterogeneous mixture -5 blood.

V].True or False.

a].Atmospheric air is an example for suspension. (T /F) .
b].Substance containing more than one component are called mixtures. (T /F) .
c].Particles of milk can easier to filtered off using a filter paper. (T /F) .
d].Colloids are heterogeneous in nature.(T/F).
e].Colloidal particles do not settle down & can't be filtered out. (T/F).

VI]. Essay.

a].Consolidate the peculiarities of colloids and compare it with the peculiarities of solutions and suspensions.
b].Have you noticed that the path of the light beam can be clearly seen due to the dust particles in a cinema theatre and in smart classrooms where visuals are shown using a projector ? What is the reason behind this?.
c].write the properties and examples of colloids.
d].What are the differences between colloids and solutions.?.
e].How do true solution , colloid and suspension differ with regard to particle size, filtering, ability to settle down, existence of particles.

3. Concentration of solution.

I]. Fill in the blanks.

a]. The solubility will …… with increases in the temperature.

b]. substances containing more than one component are called ……

c]. In a sugar solution , sugar is the …(1)…and water is the …(2)…..

d]. A solution in which maximum amount of solute dissolved is it's …….

e]. The component present in the solution in greater quantity is the …..

II]. Multiple choice Questions.

a]. In a sugar solution sugar is the …….
(solute, solvent, solution).

b]. The solute in soda water is …..& solvent is the water.
(soda, oxygen. Carbon dioxide, carbonic acid)

c]. Brass is a solid solution. The solute in it is zinc .Which is the solvent?
(Tin,Brass,Copper,Bronze)

d]. substances containing more than one component are called….
(mixtures,compound,unsaturated solution)

e]. Find the odd one.
(sea water, Alloy of metal,Petrol,Muddy water).

III]. Match the Following.

a]. Muddy water -1 Temperature
b]. Bronze -2 Heterogeneous
c]. Carbon dioxide -3 Solute
d]. Solubility - 4Copper + Tin.
e]. Alloy of metal -5 Homogeneous

IV]. True or False.

a]. The solvent in soda water is Carbon dioxide.(T / F)

b]. The substance which dissolved is the solute.(T/F).

c]. When adding more of the solvent , conversion of a saturated solution to an unsaturated solution occures.(T/F).

d]. Turpentine is used for removing the paint stain.(T/F).

e]. Bronze is not a solid solution (T/F).

V]. Short Answers.

a]. You know that soda water is prepared By dissolving carbon dioxide in water. What is done to increase the solubility of carbon dioxide?.

b].what is meant by solubility?
c].What are the two factors that influence the solubility?
d].What is meant solvent,solute,solution?.
e].Is there any change in the amount of solute dissolved when the temperature changes?

VI].Essay.

a].What is a crystal?.How can it be grown?.
b].prepare a note on:
- conversion of unsaturated solution to saturated solution.
-conversion of a saturated solution to an unsaturated solution.
c].what is the influence of temperature on the solubility of substances, give example?
d].what is the difference between saturated and supersaturated solution?
e].How will you prepare a supersaturated solution of common salt?.

4.Properties of matter.

1.Matter

I].Fill in the blanks.

a].On heating force of attraction between molecules ……..
b].In ……… substances molecules exist very close.
c].Formation of mixture: physical change.
Formation of compound : …………..
d]……….is responsible for the change of state of matter.
e].When molecular movement increases, diffusion will ………

II].Multiple choice Questions.

a].which of the following is matter?
(Heat, shadow, sunlight, Air)
b].The particles of a substances are …….
Packed in the solid state.
(Loosely, Closely)
c].The quantity of matter in a body is called it's …….(volume, mass, weight)

d].Any object or anything that takes up space & has mass is called……
(stuff, Gas,Matter,Atoms).

e].Dry ice means…
(Solid CO_2, solid carbon monoxide, solid sulphurdioxide, solid water).

III].Match the following.

a].4th state of matter	- liquid
b].Lemonade	- Plasma
c].Neither shape nor volume	- heat
d].Change of state of matter	- Solid CO_2
e].Dry ice	- Gases.

IV].True or False.

a].Gases have mass.(T/F)

b].Light is a matter.(T/F)

c].A solid has it's own shape & take up space.(T/F).

d].Liquids are usually easier to pour than solids.(T/F).

e].Steam is an example of Gas.(T/F).

V].Short answers

a].What are the characteristics of particles of matter?

b].What are the properties of liquids?

c].Gases have no definite shape or volume compared to solids and liquids .Why?.

d].what is the difference between pure substances and mixtures?.

e].A wooden table should be called a solid. Give reasons.

VI].Essay.

a].What are the three   states of matter?.Define each of them with two example.

b].What is diffusion?.write more example for diffusion from daily life. What is the relation between the movement of molecule and diffusion in different state?

c].What is the difference between pure substances & mixtures . Give examples.

d].Explain why, water is not a mixture?

e].An incense stick has fragrance .But the fragrance fills the room only when the stick is lit. why do the fragrance spreads quickly in the room when the incense stick is lit?

2.Separate the component from mixtures.

I].Fill in the blanks.

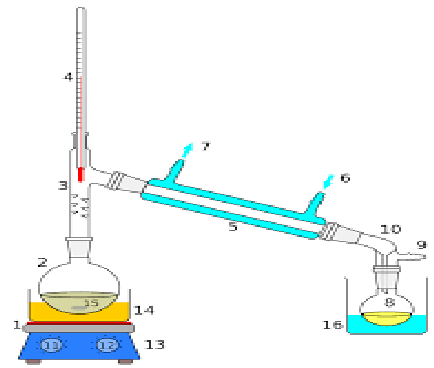
a].On heating a solid directly changes to gas is called ….

b]……. is used to separate the mixture of immiscible liquids.

c].The change of water vapor into water is called….

d].solid directly changes into a gas is called ……

e].Name the process.



II].Multiple choice Questions.

a].In distillation which component evaporates.
(Water, salt solution, salt)

b].Spirit kept open in a watch glass disappear after some time. which among the following phenomena are responsible for this?
(sublimation,distilation,Evaporation,Diffusion).

c].The method of separating the solvent by vaporization of the solution is called ….
(Evaporation, Diffusion, Distillation)

d].Change of water vapour into water is called …..
(condensation,diffusion,fusion).

e].Steam condenses to form water , attractive force …….
(Increases, Decreases).

III].Match the following.

a].Camphor &glass powder - 1.evaporation.
b].Sugar solution –2.using separating funnel.
c].petrol &kerosene - 3.sublimation
d].separation of cream from milk- 4.fractional distillation
e].oxygen from liquid air- 5.centrifugation.

IV].True or False.

a].Tea leaves can be separated by filtration.(T/F).
b].coloured substances are separated by centrifugation.(T/F)

c].Petrol & kerosene from crude oil can be separated by fractional distillation.(T/F).

d].A mixture of two miscible liquids can be separated by the process called distillation .(T/F).

e].Centrifugation is the process to separate particles of colloidal solution.(T/F).

V].Short Answers.

a].write 3 uses of centrifugation.

b].what is chromatography?

c].Observe the picture & write down the procedure.

d].what you meant by fractional distillation?

e].What is distillation?

VI].Essay.

a].You are given a mixture of sand ,water and mustard oil. How will you separate .?.

b].What is the importance of evaporation?.where is this technique used on a large scale?.

c].what is centrifugation?.Give any four application.

d].What is the difference between distillation & fractional distillation?.

e].Note on chromatography.

Answers

1.Soft drinks.

I].Fill in the blanks.

a].Phosphoric acid

b].sugar

c].Monosodium glutamate

d].Caffeine.

e].Amaranth.

II].MCQs.

a].Ethylene.

b].Sodium Benzoate.

c].Amaranth.

d].Suspension.

e].Phosphoric acid.

III].Short Answers.

a].affect kidney,liver,brain –foetal abnormalities –mutation of genes.

b].Tartrazine,Erithrocine,Indigo-Carmine

c].MSG, esters,common salt

d].for color,taste,smell.

e].Agree.chemicals which are harmful –malnutrition.

IV].Match the Following.

a]2

b].5

c].4

d].3

e].1.

V].T / F

a].T

b]F

c].F

d].T

e].T

VI].Essay

a].soft drinks contain phosphoric acid, citric acid –enamel of tooth is attacked by these –large quantity of sugar-tooth decay-caffeine –stimulating agent alkaloid stimulates central nerve system –harmful.

b].sugar ,cocoa,milk,fat -no nutrients -caffeine-affect the health –lack of appetite, tension –damage of kidney -liver.

c].not get nutrition from soft drinks –mal nutrition-sugar,saccarin –preservatives-health problems -regular use-high price –financial loss lack of appetite, acidity, tooth decay –affect health.

d].No –not get any nutrition –malnutrition –sugar-saccharin –carbon dioxide –high price -financial loss, lack of appetite, acidity, tooth decay.

e]. cocoa,milk,fat -no nutrients -caffeine-affect the health –lack of appetite, tension –damage of kidney -liver. nutrition-sugar,saccarin –preservatives-health problems -regular use-high price –financial loss lack of appetite, acidity, tooth decay –affect health.

True solution , Colloid, Suspension

I].Fill in the blanks.

a].Suspension
b].True solution
c].Colloid
d].Colloid
e].Homogeneous

II].MCQs

a].Blood
b].Homogeneous
c].Chloride in water.
d].<1nm
e].Diffuse slowly.

III].Short Answers.

a].Is a mixture –neither a solution nor a suspension. eg : milk,smoke.

b].milk is a colloid the colloidal particles protein& fat scatter light .

c].Correct. Particles of muddy water are visible it's particles settle down &filtered off.

d].Solution -<1nm -colloid 1nm-100nm –suspension >100nm.

e].The scattering of light by colloidal particles –Particles are visible through a microscope –do not settle down –can not be filtered out.

VI].Match the following

a].5
b].4
c].3
d].2
e].1

V].T / F

a].F

b].T

c].F

d].T

e].T

VI].Essay.

a].True solution –particle size <1nm – homogeneous mixture –particles can not be seen even with a microscope- transparent –not scatter light – colloids -1nm-100nm- heterogeneous translucent suspension –quite big >100nm.

b].Dust particles is in the form of colloid. The path of light inside the colloid become visible –solute particles big enough –to scatter light scattered enters our eyes.

c].particles are visible through poweful microscope – do not settle down – ca not filtered out heterogeneous –muddy in nature translucent eg:milk ,Ink.

d]. True solution –particle size <1nm –homogeneous mixture – particles can not be seen even with a microscope-transparent – not scatter light –colloids -1nm-100nm- heterogeneous translucent .

e].true solution -<1nm-as a single molecule -does not settle down-can not filtered Colloid-1nm-100nm-as very big molecule –donot settle down cant be filtered using ordinary filter paper.

Suspension->100nm –molecules extremely big – settle down can be filtered.Eg:muddy water.

Concentration of Solution

I].Fill in the blanks.

a].Increases
b].Mixture.
c].1,solute.2,solvent
d].saturated solution
e].Solvent

II].MCQs.

a].solute
b].CO_2
c].Copper
d].mixtures
e].Muddy water.

III].Match the following.

a].2
b].4
c].3
d].1
e].5.

IV].T / F

a].F
b].T
c].T
d].T
e].F

V].Short Answers.

a].at low pressure carbon dioxide dissolves only in small quantities.so it is dissolved in water using high pressure.

b].At a given temperature the maximum amount of solute dissolves in 100 gm of solvent.

c].T and P.

d].solute dissolves in solvent- The component present in the solution in lesser quantity ,solute –in greater quantity –solvent.

e].Yes.solubility increases with increase in temperature.

VI].Essay

a].A crystal is clear shaped ppt of solute –slow evaporation – prepare a saturated solution of common salt in water – evaporating in room temperature –common salt crystals out.

b].-(1) adding necessary amount of solute –lowering the temperature to the level where the dissolved solute is sufficient.-evaporating out the solvent.

 -(2)-Heating the saturated solution - adding more of the solvent.

c].solubility increases with increase in temperature-Eg solubility of sodium chloride increases with increase in temperature-solubility of some salt decreases with increase in temperature Eg.calcium sulphate.

d].The solution obtained by dissolving maximum amount of solute at a given temperature – saturated –exist in equilibrium state with the pure solute.

On adding more solute to saturated - heating it –solute dissolve –brought back to ordinary temperature –

e].process-take some water –salt – dissolve –heat –bring to room temperature get supersaturated solution of common salt.

2.Properties of Matter.

Matter

I].Fill in the blanks.

a].Increases.
b].Solid
c].Chemical changes.
d].Heat energy.
e].Increases.

II].MCQs.

a].Air
b].closely.
c].Mass
d].Matter
e].Solid CO_2.

III].Match the Following.

a].2.
b].1
c].4
d].5
e].3.

IV].T \ F

a].T
b].F
c].T
d].T
e].T.

V].Short Answers.

a].Have space between them-are continuously moving-attract each other.
b].particles are close to each other ,no fixed shape-take the shape of the container –fixed volume –flow easily

c].The attraction between the molecules is very less –maximum freedom of movement-due to that no definite shape or volume.

d].materials made of particles of identical nature are called pure substances-substances made of particles of different nature are called mixtures.

e].It has a definite shape and volume It is very rigid and can not be compressed.

VI].Essay.

a].solids-standard volume and shape most closely packed –diffusion slowly E.g.. Wood, stone

Liquid –definite volume can flow – less rigid-fast diffusion less closely packed –not a definite shape- – Eg:milk ,oil

.

Gases-neither definite shape nor definite volume shape-can flow –very fast diffusion –not rigid least closely packed -E.g.: air ,Oxygen.

b].Diffusion is the spontaneous mixing of different particles having freedom of movement.

-E.g.: ripening of fruit, Exposing kerosene, petrol.

-Molecular movement increases ,diffusion will also increases.

c]. materials made of particles of identical nature are called pure substances-substances made of particles of different nature are called mixtures.

Pure substances: gold,sugar,salt, Aluminium,hydrogen,copper.

Mixture: soda water, Tea , sea water ,salt solution, soil.

d].Water can not be separated into its constituents-hydrogen and oxygen by Physical methods-

The properties of water are entirely

Different from those of it's constituents , hydrogen and oxygen-

Water has a fixed boiling point .

e].It spread to other parts-molecules fill in the empty space-diffusion.

Separate the component from Mixtures

I].Fill in the Blanks.

a].Sublimation

b].Separating funnel.

c].Condensation

d].sublimation

e].Distillation.

II].MCQs

a].Water

b].Evaporation & Diffusion

c].Evaporation

d].Condensation.

e].Increases

III].Match the Following.

a].3

b].1

c].2

d].5

e].4

IV].T/ F.

a].T
b].F
c].T
d].F
e].T

V].Short Answers.

a]. Separation of blood plasma in a clinical lab- used in diaries and home to separate butter from cream-used in washing machines to squeeze out water from wet clothes.

b].process of separation of different
Components of a mixture by adsorbing them over a suitable material.

c]. In the process of sublimation, the compound which converts from solid to directly in the vapour is called sublimate. Hence, on heating ammonium chloride, it gets converted into white vapours. The gaseous form of ammonium chloride can be cooled easily to get a pure solid.

d]. the process of separating the constituents of a liquid mixture by heating it and condensing separately the components according to their different boiling points.

e] the selective boiling and subsequent condensation of a component in a liquid mixture. It is a separation technique that can be used to either increase the concentration of a particular component in the mixture or to obtain (almost) pure components from the mixture.

VI]Essay.

a]. Mixture of mustard oil and water is immiscible liquid (liquids which do not mix each other) and they are separated by using separating funnel. This method of separation is based on the difference in densities of the liquids.-

--

-If we have a mixture of sand, water and mustard oil then these processes can be separated by filtration and a separating funnel. Firstly as we know both mustard oil and water are immiscible so this mixture can be easily separated by a separating funnel.

b]. Evaporation is a very important part of the water cycle. Heat from the sun, or solar energy, powers the evaporation process. It soaks up moisture from soil in a garden, as well as the biggest oceans and lakes.

-is used to separate solids dissolved in liquids, mainly water.- used on a large scale to obtain common salt from sea water.

c]. Centrifugation is a method of separating molecules having different densities by spinning them in solution around an axis (in a centrifuge rotor) at high speed. It is one of the most useful and frequently employed techniques in the molecular biology laboratory.-Used in diagnostic laboratories for blood and urine test-.Used in dairies and home to separate butter from cream-Used in a washing machines to squeeze out water from wet clothes-

d]distillation, process involving the conversion of a liquid into vapor that is subsequently condensed back to liquid form. -It is exemplified at its simplest when steam from a kettle becomes deposited as drops of distilled water on a cold surface-Fractional distillation is a type of distillation which involves the separation of miscible liquids. The process involves repeated distillations and condensations and the mixture is usually separated into component parts.

e]. is a process for separating components of a mixture. To get the process started- the mixture is dissolved in a substance called the mobile phase- which carries it through a second substance called the stationary phase--based on the principle where molecules in mixture applied onto the surface or into the solid, and fluid stationary phase (stable phase) is separating from each other while moving with the aid of a mobile phase. method used by scientists for separating organic and inorganic compounds so that they can be analyzed and studied.

ALICE JOSEPH

Digitally signed by ALICE JOSEPH
Date: 2024.02.02 21:21:49 +05'30'

SCIENCE

DIGITAL QUIZ BOOK

SUBMITTED BY
MUHZINA MUHAMMED BASHEER
PHYSICAL SCIENCE OPTIONAL

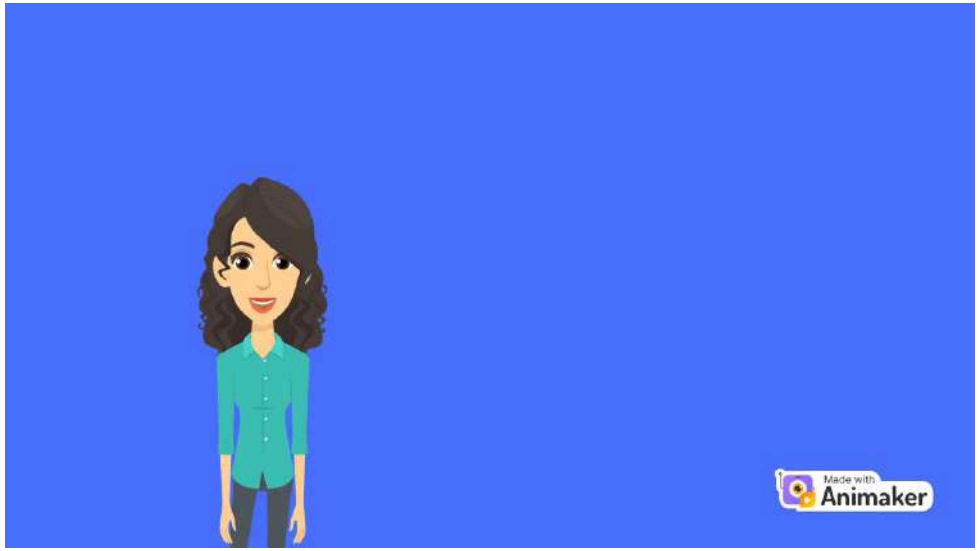
Preface

This science digital quiz book is made for
Class 9 which describes the chapters in SCERT
textbook.The question in this
quiz book is selected in such a way that the
students can undergoe a self evaluation
and their understanding of
each concept .it also focus on inculcating
their scientific enquiry and understanding the subject
.the quiz book make them
Excited, motivated and provide an oppurtunity
for self assesment

TABLE OF CONTENTS

INTRODUCTION

ANIMATED CLASSROOM



CHEMISTRY QUIZ BOOK

1.Which among the postulates not belong to Daltons Atomic Theory?

A .Matter is made up of minute particles called atoms

B. Atoms is the smallest particle that can Take part in chemical reaction

C.Atoms of different elements differ in their Properties and mass

D.Atoms can be divided

ANSWER: D.atoms can be divided

2.Which rays of electromagnetic radiation is used By Rutherford for the gold foil experiment?

A. Alpha B.beta
B. C.gamma D.Cosmic

ANSWER: Alpha

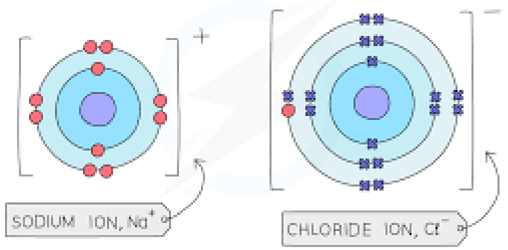
3.What is the charge of neutron?

A Negative
C -1

B positive
D neutral

ANSWER: Neutral

4.Go through the picture and identify the bonding Shown here?



A ionic bonding
B covalent bonding
C hydrogen bonding
D coordinate bonding

ANSWER: ionic bonding

5. Among the given molecules which one is polar?

A H_2 B O_2
C N_2 D HCl

ANSWER: HCl

6." In achemical reaction mass can neither be created nor be destroyed".identify this law?

A law of conservation of mass
B Law of reactions
C law of conservation of energy
D Laws of nature

ANSWER: Law of conservation of mass

7.Which gas is evolved when magnesium reacts with concentrated HCl?

A Oxygen
B Nitrogen
C Chlorine
D None of the above

ANSWER: Hydrogen

8. What happens to the rate of reaction when the concentration of reactants increases?

A Rate increases
B Rate decreases
C No change
D Reaction stops

ANSWER : Rate increases

9.Among the scientist who is known as the "father of periodic table"?

A Dobereiner
B Newlands
C Lavoisier
D Mendeleev

ANSWER : Mendeleev

10. Which group of periodic table contains the Noble gases ?

A 18
B 9
C 5
D 4

ANSWER : 18

11.What happens to ionisation energy down a group?

A No change
B Increases
C Decreases
D Become steady

ANSWER: Decreases

12. Which among this is a Metalloid ?

A Copper
B Silicon
C Carbon
D Gold

ANSWER :Silicon

13. What is the basicity of HCl?

A 0
B 2
C 1
D 3

ANSWER : 1

14.What is the PH value of neutral solution ?

A 0
B 3
C 7
D 5

ANSWER : 7

15. Which is the device used to measure the pH Of a solution ?

A Thermometer
B pH meter
C hydrometer
D barometer

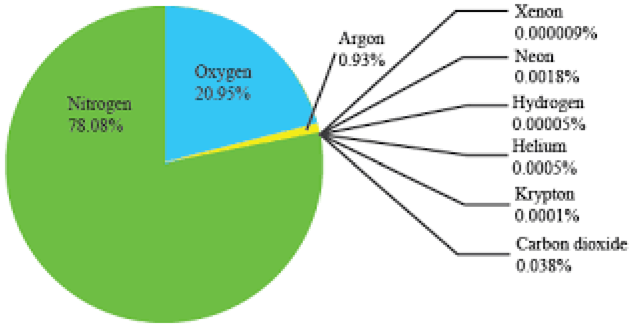
ANSWER : pH meter

16.Name the chemical name of baking soda?

A Sodium chloride
B Sodium carbonate
C calcium sulphate
D copper sulphate

ANSWER : Sodium bicarbonate

17. Identify the most abundant gas in atmosphere from the picture given below?



A Argon
B oxygen
C nitrogen
D hydrogen

ANSWER :Nitrogen

18. Which among the allotrope of carbon is hardest?

A Diamond
B Graphite

ANSWER: Diamond

19. Which among the properties not belong to graphite?

A conductor of electricity
B grey in color
C soft and slippery
D hard

ANSWER: hard

20 . Identify the element with atomic number 11?

A N
B Na
C K
D Mg

ANSWER :Na

PHYSICS QUIZ BOOK

1.Identify the substances having density lower than water?

A kerosene
B saline water
C mercury
D honey

ANSWER : Kerosene

2.When a body is fully immersed in a fluid the volume of displaced fluid is .... to the volume of the body

A equal
B higher
C lower
D having no change

ANSWER : Equal

3. Which device is used for measuring relative density of a liquid ?

A barometer
B pH meter
C Thermometer
D lactometer

ANSWER : Hydrometer

4. Identify pascals law from the below laws?

A The pressure applied to any part of the enclosed liquid will be transmitted equally in all directions through the liquid.
B every object will remain at rest or in uniform motion in a straight line unless compelled to change its state by the action of an external force.
C Force is equal to the rate of change of momentum. For a constant mass, force equals mass times Acceleration
D for every action (force) in nature there is an equal and opposite reaction.

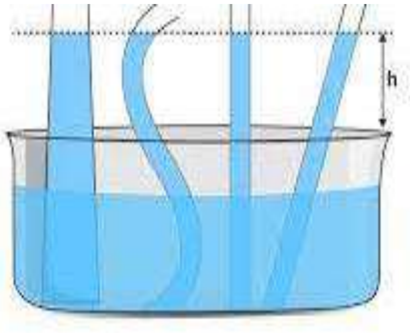
ANSWER : The pressure applied to any part of the enclosed liquid will be transmitted equally in all directions
through the liquid

5. What is the unit of force?

A newton
B meter/second
C metre
D Joules

ANSWER: Newton

6. From the figure given below which tube is having the gratest capillary rise?



1 2 3 4

A 4
B 3
C 2
D 1

ANSWER: 3

7.Chose the right ones where adhesion is make use of?

A A water drop is composed of water molecules that like to stick together

B Mercury atoms are strongly attracted to each other; they bead together on surfaces

C dew drops hanging from the leaves of a plant.

D cloth get wet

ANSWER: dew drops hanging from the leaves of a plant.

8.What is the unit of momentum ?

A Kgm/s

B metre

C Kg/s

D m/s

ANSWER :Kgm/s

9.At which part of earth a body experience maximum Force of attraction?

A middle
B equator
C poles
D same everywhere

ANSWER : poles

10.From the instances given below,identify the one where work is done?

A a cricket ball hit by a bat
B a wall is pushed
C Climbing stairs
D climbing stairs with a load on head

ANSWER :a cricket ball hit by a bat

11. Which is the energy possessed by a body by virtue of its motion?

A static energy
B mechanical energy
C kinetic energy
D Potential energy

ANSWER : Kinetic energy

12.What is the potential energy of a object place At ground?

A low
B high
C zero
D equal to kinetic energy

ANSWER : Zero

13.What is the unit of power?

A metre
B watt
C kelvin
D joule

ANSWER : Watt

14.Identify the energy conversion takes place in a cell?

A chemical energy to electrical energy
B mechanical energy to electrical energy
C electrical energy to light energy
D light energy to electrical energy

ANSWER : Chemical energy to electrical energy

15. When resistance increases ,what happens to current?

A increases
B decreases
C no affect for current
D affect only voltage

ANSWER: Decreases

16.Whch among the factors doesn't affect the resistance of a conductor ?

A length of conductor
B nature of material
C area of cross section
D Color

ANSWER : Color

17.Rheostat is a device used to regulate current by changing what ?

A thickness
B current
C resistance
D voltage

ANSWER : Resistance

18.What is called the number of vibrations in One second for a wave?

A wavelength
B amplitude
C frequency
D period

ANSWER: Frequency

19.What is the use of SONAR?

A To measure distance,direction and speed of objects under water

B to determine density of water

C for measuring pressure of ocean

D for measuring average rainfall

ANSWER : To measure distance ,direction and speed of objects under water

20.Expand DART ?

A deep sky assessment and reporting of tsunami

B deep ocean assessment and reporting of tsunami

C deep ocean assessment and reporting of tides and tsunami

D deep ocean assessment and reporting of tides

ANSWER: deep ocean assessment and reporting of tsunami

THE END

ALICE JOSEPH

Digitally signed by ALICE JOSEPH
Date: 2024.02.02 21:23:28 +05'30'

DIGITAL ALBUM OF SCIENTISTS

ST. JOSEPH COLLEGE OF TEACHER EDUCATION FOR WOMEN,ERNAKULAM

Aiswarya Lakshmi S
Physical Science

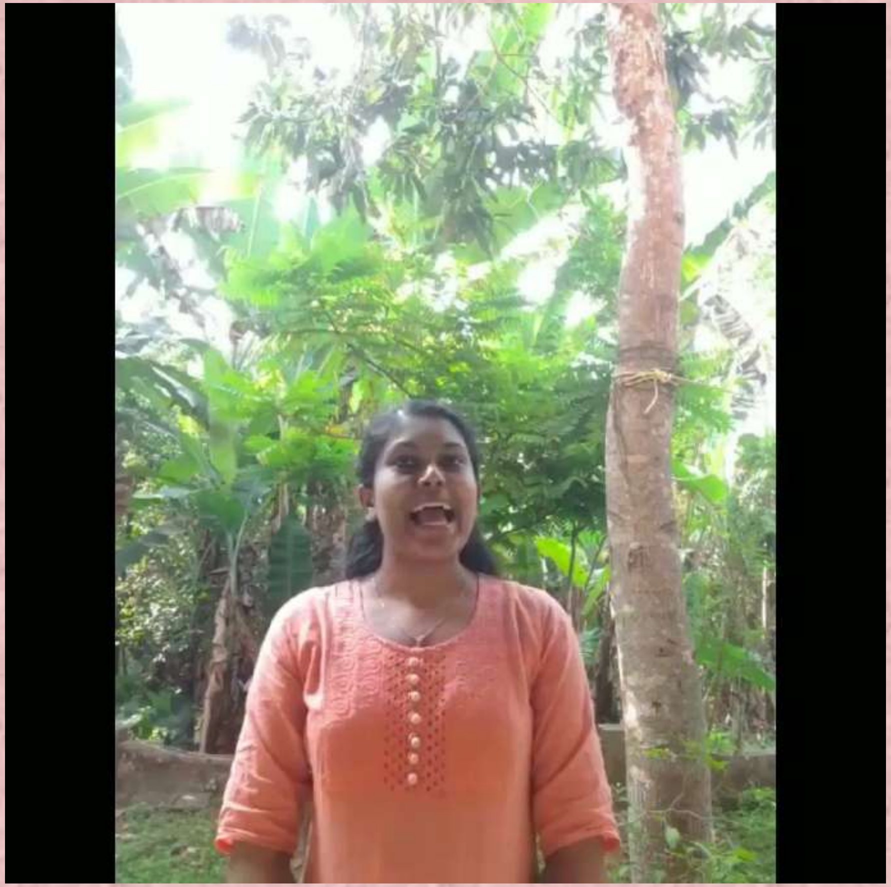
PREFACE

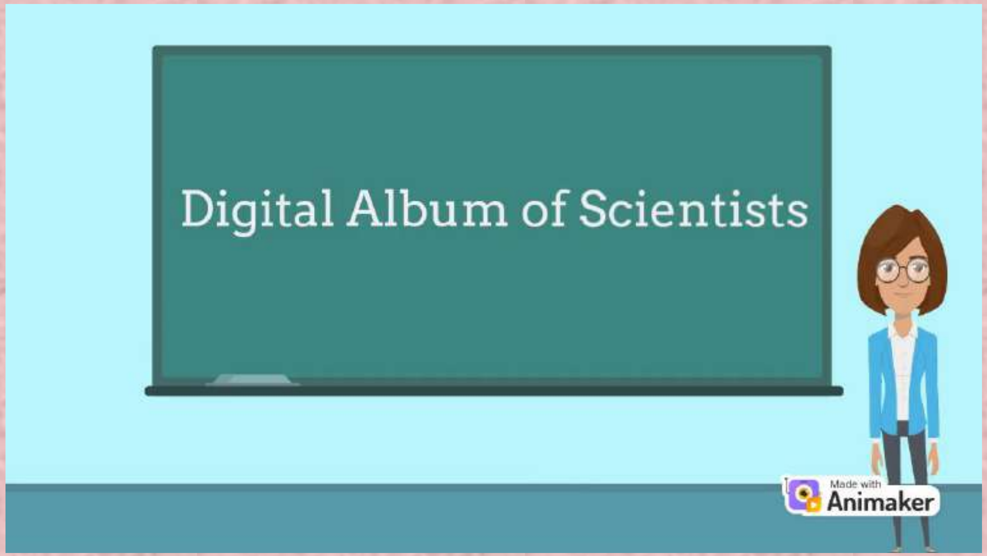
I developed a digital album and the main objective of this album is to serve as a learning resource material for students and make their learning purpose much more easier.

This audio book is prepared based on the SCERT syllabus of class 8. This album consists of two sections titled as “Chemistry Scientists Album” , “Physics Scientists Album”. I hope this digital album will be helpful to all the students to enjoy and learn their syllabus.

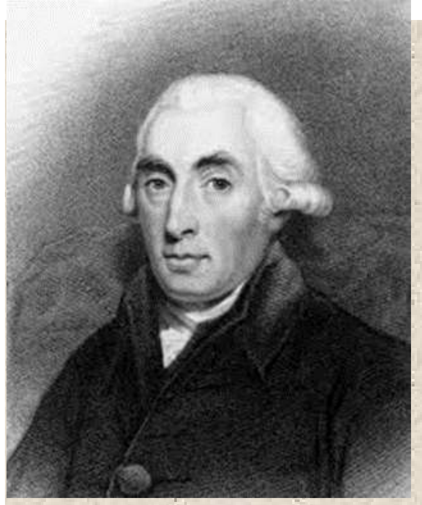
CONTENTS

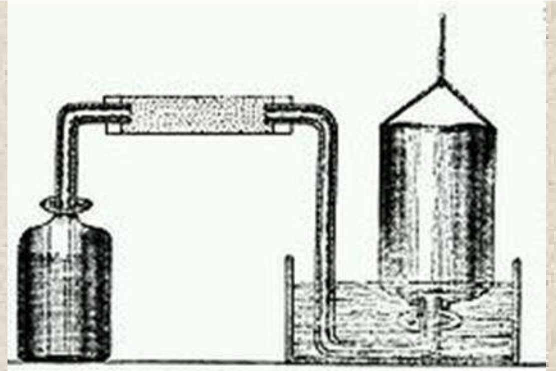
INTRODUCTION




Digital Album of Scientists
Made with
Animaker

CHEMISTRY SCIENTISTS ALBUM





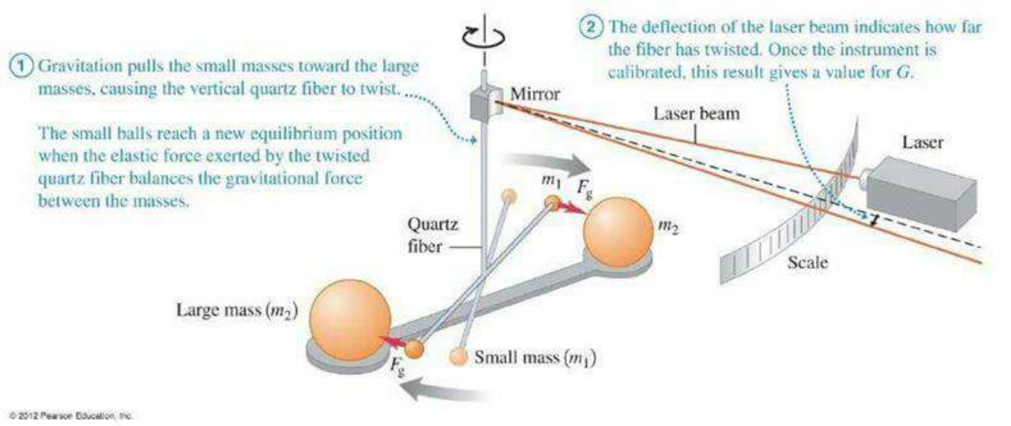


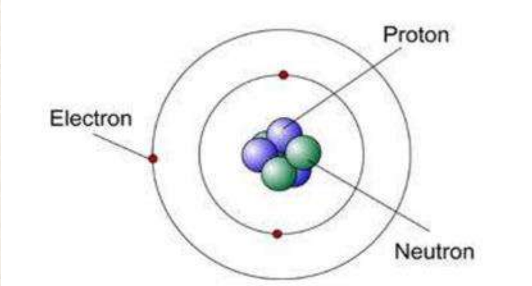
Figure 2 – The apparatus used by Cavendish to measure the magnitude of the universal gravitational constant.

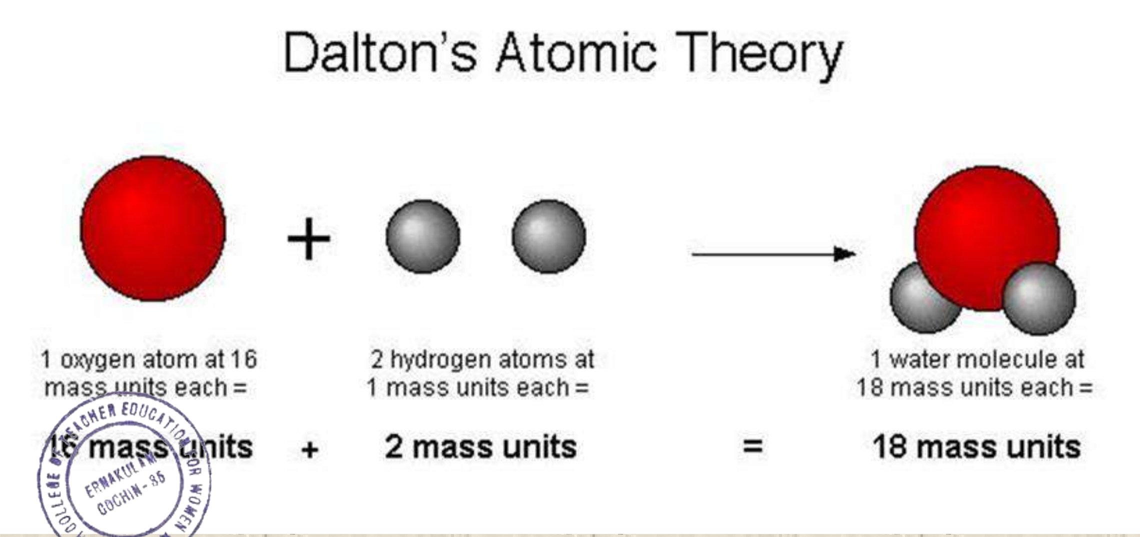
Henry Cavendish (1731-1810)

- English natural philosopher and scientist, chemist and physicist.
- Born: 10 October 1731, Nice, France
- Died: 24 February 1810, London, United Kingdom
- Discovered : Hydrogen
- Awards : Copley Metal
- Nationality : British, French
- Siblings : Frederick Cavendish

Contributions

- He is the first to recognize hydrogen gas.
- His observation led to the accurate value for gravitational constant and earth's mass.
- He founded the study of the properties of dielectrics and distinguish clearly between quantity of electricity which is known as potential.



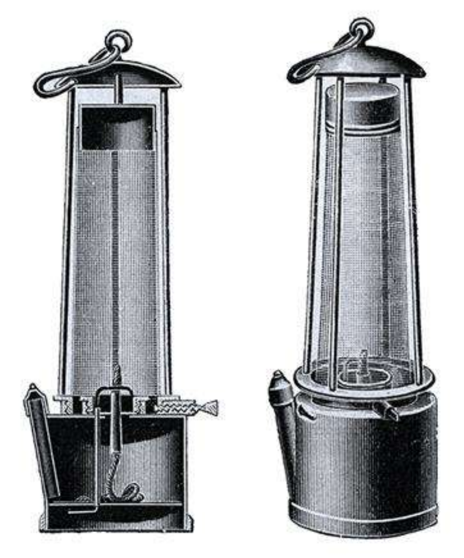


John Dalton (1766-1844)

- English chemist, physicist and meteorologist.
- He is best known for introducing the atomic theory into chemistry.
- Born: 6 September 1766, Eaglesfield, United Kingdom
- Died: 27 July 1844, Manchester, United Kingdom
- Nationality: British, English
- Awards: Royal Medal

Contributions

- Famous for research on relativity on atom.
- A book called " A New System of Chemical Philosophy" was published.
- Published a paper on the topic "Daltonism"
- Discovered the composition of ether and butylene.



Sir Humphry Davy (1778-1829)

- British chemist and inventor.
- Born:17 December 1778,Penzance, United Kingdom
- Died:29 May 1829, Geneva, Switzerland
- Spouse: Jane Apreece (1812-1829)
- Award: Copley Medal, Royal Medal, Rumford Medal
- Nationality: British

Contributions

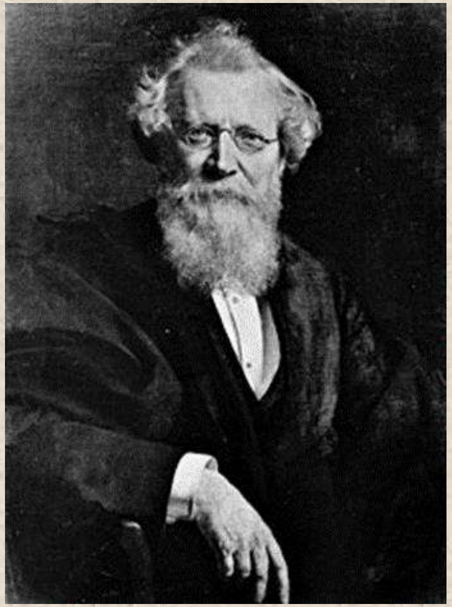
Using electrolysis he isolated many elements for the first time. Sodium,Pottasium in 1807 and Calcium,Strontium,Barium,Magnesium in 1808.
In 1799 he experimented ansthetic properties of nitrous acid and coined it as " laughing gas"
Inventor of Miner's Safety Lamp

Berzelius (1779-1848)

- Swedish chemist.
- One of the founders of modern chemistry.
- Born: 20 August 1779, Vaversunda, Sweden
- Died: 7 August 1848, Stockholm, Sweden
- Discovered: Selenium, Silicon, Cerium, Thorium
- Nationality: Swedish
- Spouse: Elisabeth Poppius (m. 1835–1848)
- Siblings: Flora Berzelius
- Awards: Copley Medal

Contributions

- Demonstrated the power of an electrochemical cell to decompose chemicals into pairs of electrically opposite constituents.
- Discovered and isolated several new elements including silicon, selenium, thorium and cerium.
- Berzelius is also credited with originating the chemical terms catalysis, polymer, isomer, and allotrope.
- He was the first person to make the distinction between organic compounds, and inorganic compounds

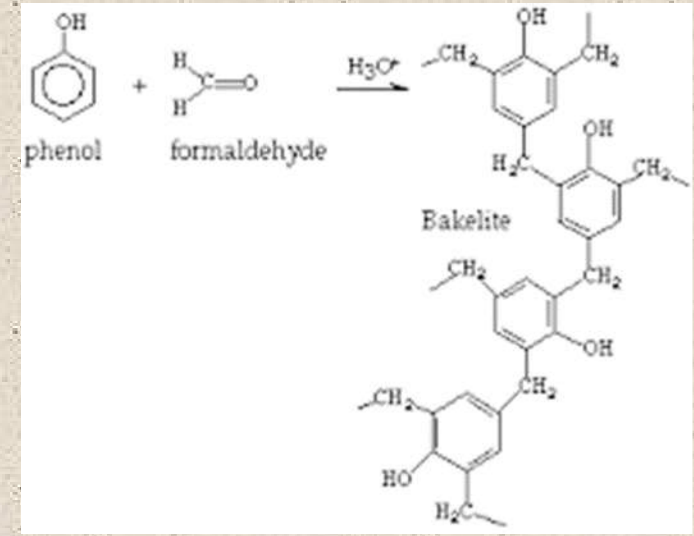


August Wilhelm Von Hofmann (1818-1892)

- German chemist
- Born: 8 April 1818
- Giessen, Germany
- Died: 5 May 1892 (aged 74),Berlin, Germany
- Known for
- Hofmann rearrangement
- Hofmann elimination
- Hofmann voltammeters
- Hofmann– Loffler reaction
- Hofmann– Martius rearrangement
- Ball-and-stick model

Contributions

First research, on coal tar, led to the development of practical methods for obtaining benzene and toluene and converting them into nitro compounds and amines.
 Other work he prepared the three ethyl amines and tetraethyl ammonium compounds and established their structural relationship to ammonia.
He also developed a method for determining the molecular weights of liquids from vapor densities.
A Hofmann voltmeter is an apparatus for electrolyzing water, invented.



Leo Bakeland (1863-1944)

- ❖ Belgian chemist.
- ❖ Born: 14 November 1863, Sint-Martens-Latem, Belgium
- ❖ Died: 23 February 1944, Beacon, New York, United States
- ❖ Awards: Perkin Medal, Franklin Medal, John Scott Legacy Medal and Premium
- ❖ Education: Ghent University (1882)
- ❖ Nationality: American, Belgian

Contributions

- ❖ Bakeland's search, begun in 1905, for a synthetic substitute for shellac led to the discovery of Bakelite, a condensation product of formaldehyde and phenol that is produced at high temperature and pressure.
- ❖ Bakeland was the first to find a method of forming it into the thermosetting plastic.

PHYSICS SCIENTISTS ALBUM

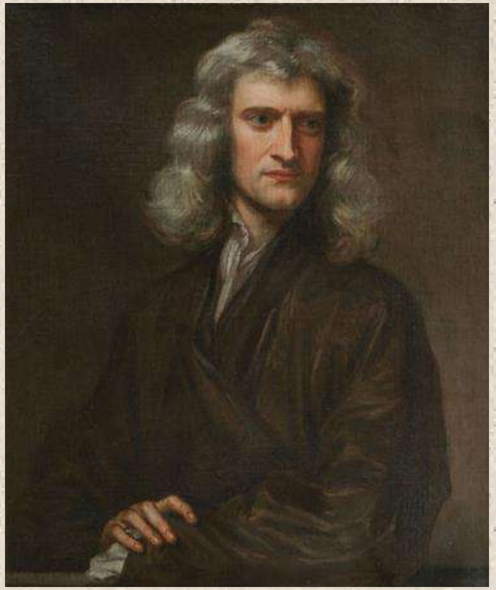
Blaise Pascal (1623-1662)

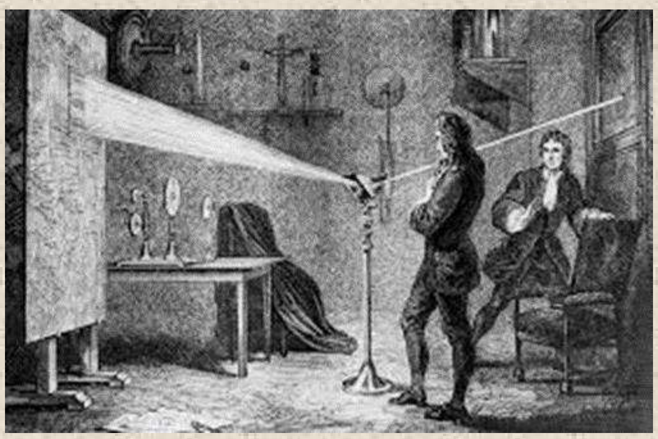
- French mathematician, physicist, inventor, philosopher, and Catholic writer.
- Born: 19 June 1623, Clermont-Ferrand, France
- Died: 19 August 1662, Paris, France
- Nationality: French

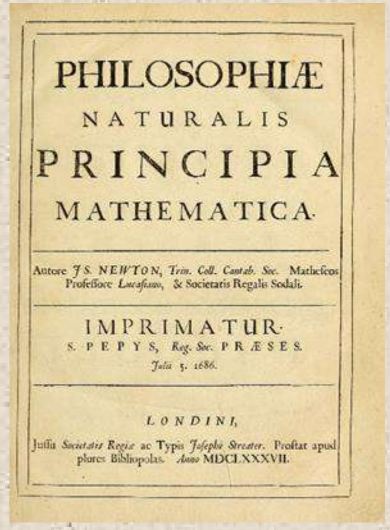
Contributions

- Invented the syringe
- Invented hydraulic press
- Helped with the study of Pascal law of pressure
- Helped with the theory of probability
- Helped with the study of cycloid
- Invented the Pascal's Triangle
- 1st digital calculator

Sir Isaac newton (1643-1727)







PHILOSOPHIÆ
NATURALIS
PRINCIPIA
MATHEMATICA.

Autore *J S. NEWTON, Trin. Coll. Cantab. Soc.* Matheseos Professore *Lucasiano*, & Societatis Regalis Sodali.

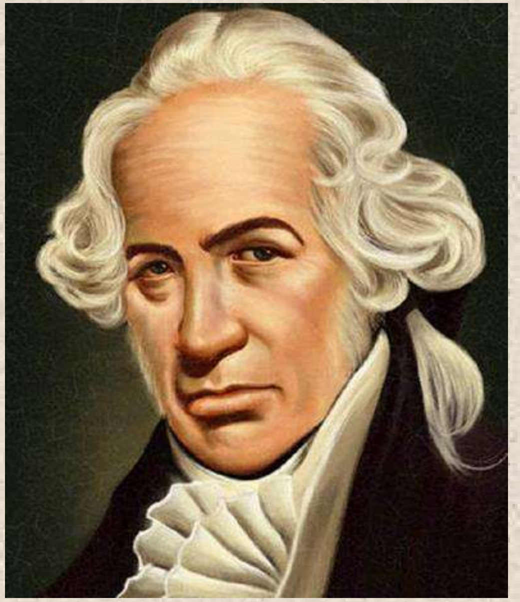
IMPRIMATUR.
S. PEPYS, *Reg. Soc.* PRÆSES.
Julii 5. 1686.

LONDINI,

Jussu *Societatis Regiæ* ac Typis *Josephi Streater*. Prostat apud plures Bibliopolas. *Anno* MDCLXXXVII.

- ❖ English mathematician, physicist, astronomer, alchemist, theologian, and author, widely recognized as one of the greatest mathematicians and physicists and among the most influential scientists of all time.
- ❖ Born: 4 January 1643, Woolsthorpe Manor House, United Kingdom
- ❖ Died: 31 March 1727, Kensington, London, United Kingdom
- ❖ Full name: Sir Isaac Newton
- ❖ Nationality: British, English
- ❖ Place of burial: Westminster Abbey, London, United Kingdom
- ❖ Contributions

- ❖ Greatest contribution of science was the laws of motion.
- ❖ Compare effects of gravitational force on earth, on the moon and within the space.
- ❖ Invented calculus and explain the nature of white light.
- ❖ Author of the book “ Principia Mathematica”

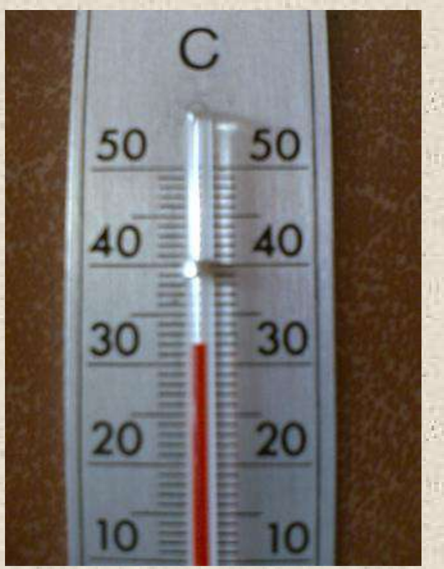


Daniel Gabriel Fahrenheit (1686-1736)

- Physicist, inventor, and scientific instrument maker.
- Born: 24 May 1686, Gdańsk, Poland
- Died: 16 September 1736, The Hague, Netherlands
- Awards: Fellow of the Royal Society
- Nationality: Dutch, German, Polish

Contributions

- Invented the mercury thermometer.
- Fahrenheit suggested that this principle be used when building barometric devices.
- Another of his contributions has to do with the creation of an instrument that served to pump liquids.
- Created a hygrometer, which was an instrument that was used to measure humidity.



Anders Celsius (1701-1744)

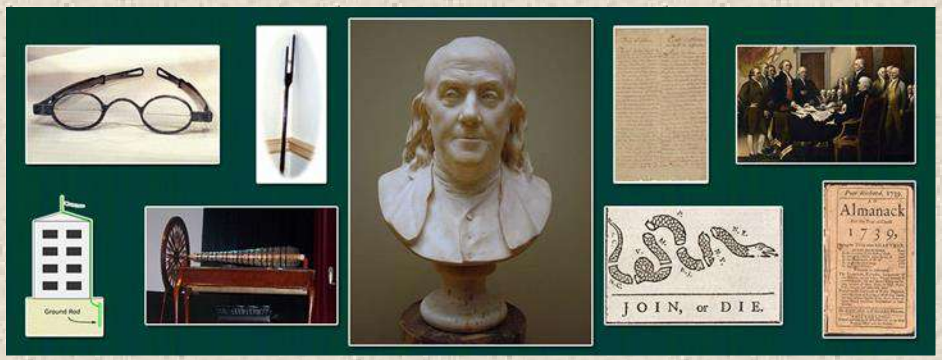
- Swedish astronomer, physicist and mathematician.
- He was professor of astronomy at Uppsala University from 1730 to 1744, but traveled from 1732 to 1735 visiting notable observatories in Germany, Italy and France.
- Born: 27 November 1701, Uppsala, Sweden
- Died: 25 April 1744, Uppsala, Sweden
- Nationality: Swedish
- Awards: Fellow of the Royal Society
- Place of burial: Church of Old Uppsala, Uppsala, Sweden.

Contributions

Celsius important contributions include determining the shape and size of the Earth; gauging the magnitude of the stars in the constellation Aries; publishing a catalog of 300 stars and their magnitudes; observing eclipses and other astronomical events; and preparing a study that revealed that the Nordic countries were slowly rising above the sea level of the Baltic. His most famous contribution falls in the area of temperature, and the one he is remembered most for is the creation of the Celsius temperature scale.

Benjamin franklin (1706-1790)

- ❖ American polymath who was active as a writer, scientist, inventor, statesman, diplomat, printer, publisher, and political philosopher.
- ❖ Born: 17 January 1706, Milk Street, Boston, Massachusetts, United States
- ❖ Died: 17 April 1790, Philadelphia, Pennsylvania, United States



Contributions

- ❖ Invented many useful items- Franklin stove, bifocals, lightning rod, swim flippers and glass harmonica.
- ❖ Never patented anything.
- ❖ After retiring and serving from militia, his love of electricity began to show through electric discoveries
- ❖ Major contributions are :

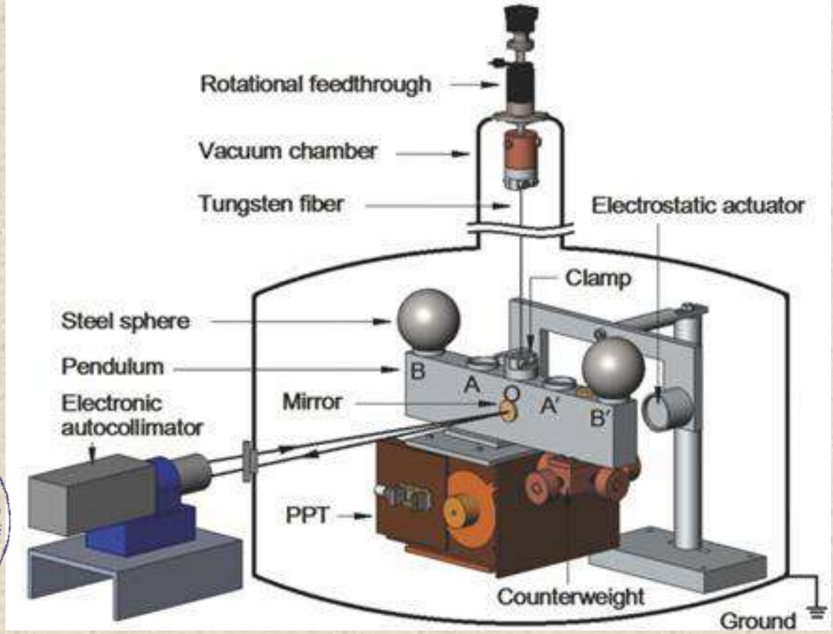
1. Lightning was electricity.
2. Creation of words like positive, negative and battery.
3. Lightning rod or KITE Experiment of 1752

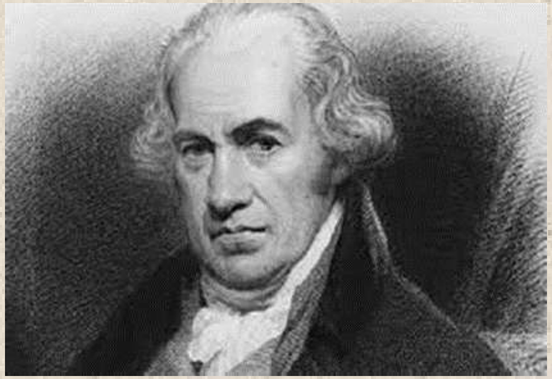
Charles-Augustin de Coulomb (1736-1806)

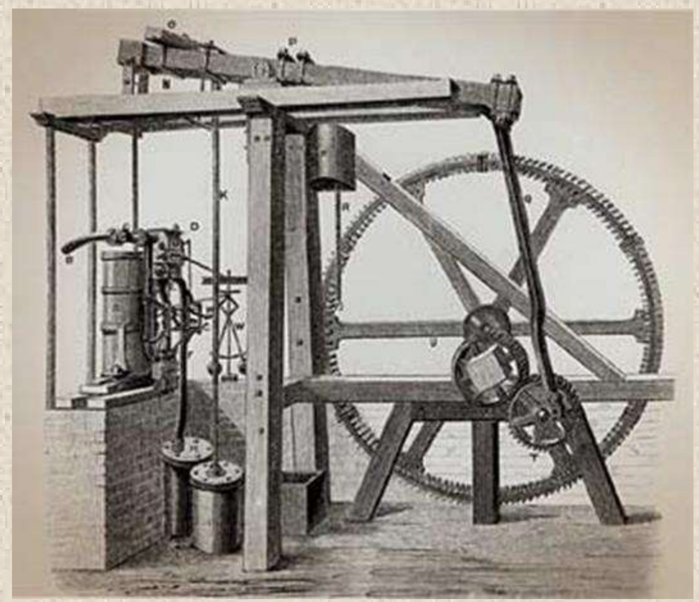
❖ French officer, engineer, and physicist. He is best known as the eponymous discoverer of what is now called Coulomb's law, the description of the electrostatic force of attraction and repulsion. He also did important work on friction.
❖ Born: 14 June 1736, Angoulême, France
❖ Died: 23 August 1806, Paris, France
❖ Nationality: French

Contributions

❖ Coulomb’s main contributions were in the fields of electricity, magnetism, applied mechanics, friction studies, and torsion.
❖ Introduced Coulomb’s Law





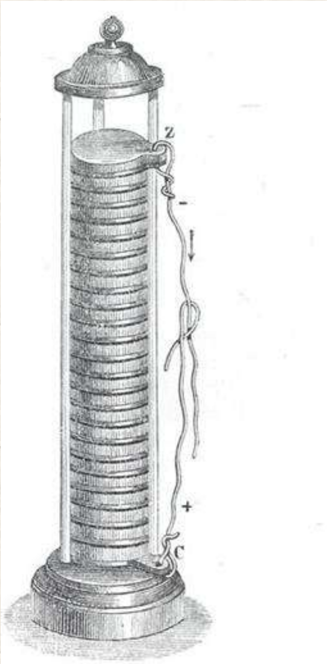


James Watt (1736-1819)

- ❖ Scottish inventor, mechanical engineer, and chemist.
- ❖ Born: 19 January 1736, Greenock, United Kingdom
- ❖ Died: 25 August 1819, Heath field Hall
- ❖ Nationality: British, Scottish

Contributions

- ❖ Developed the concept of horsepower.
- ❖ Invented the copy mill rotatory engine, double-action engine and steam indicator.
- ❖ "Watt" the unit of power named after him.
- ❖ Improved the technology of steam engine thus giving industrial revolution a huge momentum.



Alessandro Volta (1745-1827)

- Italian physicist and chemist
- Born: 18 February 1745, Como, Italy
- Died: 5 March 1827, Como, Italy
- Nationality: Italian
- Pioneer of electricity and power
- Inventor of the electric battery and the discoverer of methane.

Contributions

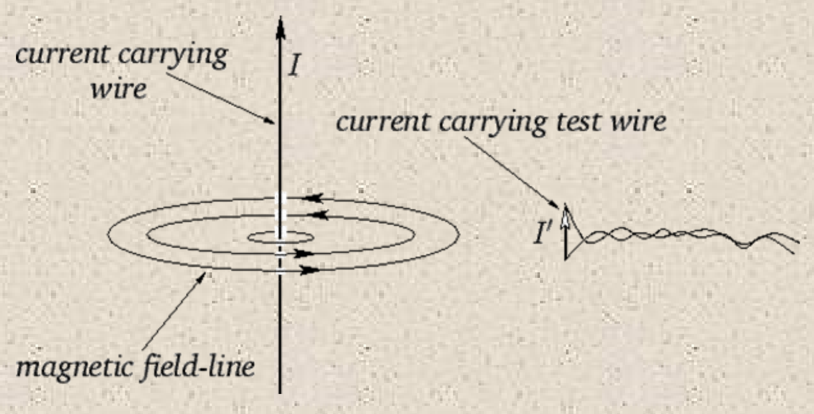
In 1774 he invented electrophorus, a device that produced charges of static electricity.
He also invented eudiometer, to explode the gases inside.
Invented the first electric battery voltaic pile, which consists of copper and zinc plates separated by disc of paper. Attached to the top and bottom of the pile was a copper wire. When volta closed the circuit, electricity flowed through the pile.

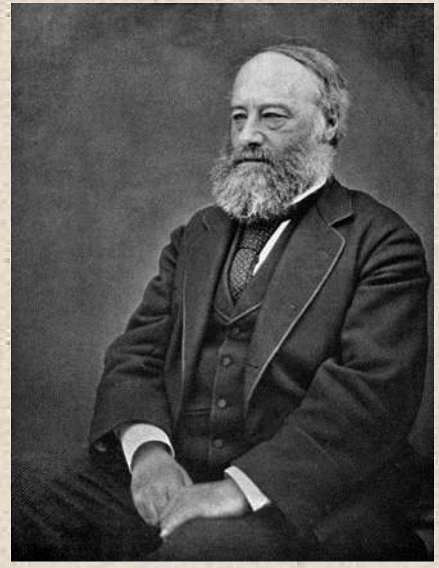
Andre-Marie Ampère (1775-1836)

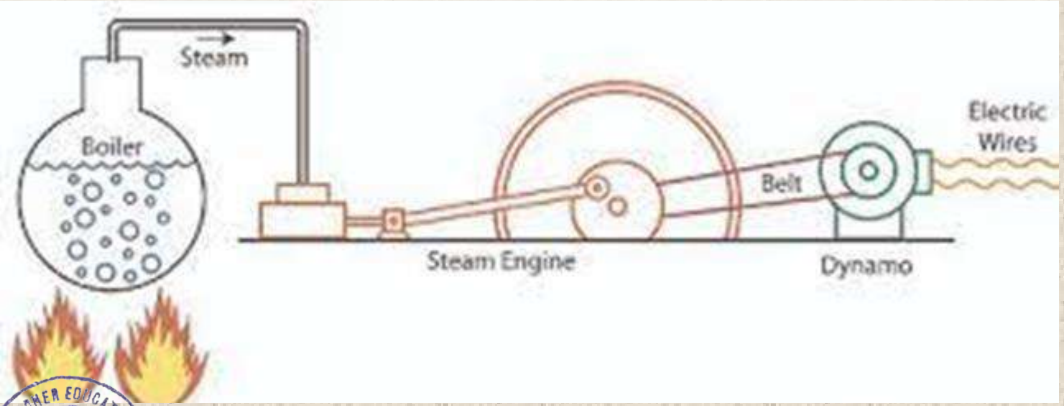
- French physicist and mathematician.
- Born: 20 January 1775, Lyon, France
- Died: 10 June 1836, Marseille, France
- Nationality: French
- Place of burial: Montmartre Cemetery, Paris, France

Contributions

- Discovered the magnetic effect of a coil with a current a "solenoid"
- Introduce the terms 'electrostatics', 'electrodynamics', 'electromotive force', 'tension', 'galvanometer', 'electric current'
- Ampere proposed taken for the direction of direct electric current the one which is positive electricity moves.





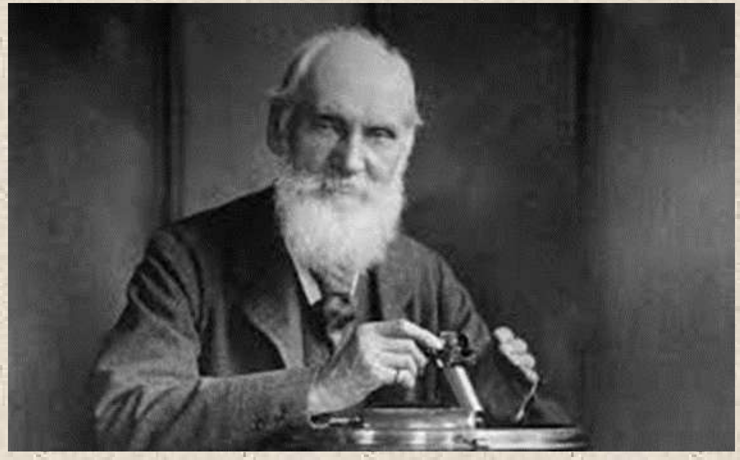


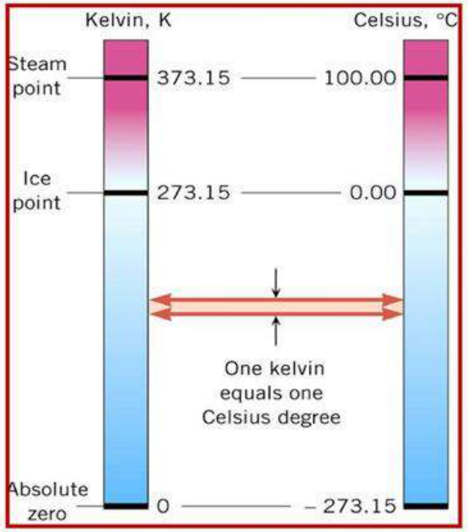
James Prescott Joule (1818-1889)

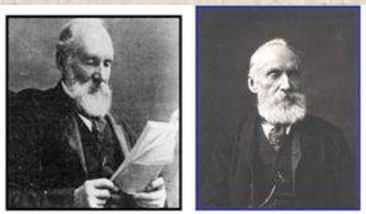
- English physicist, mathematician and brewer, born in Salford, Lancashire.
- Born: 24 December 1818, Salford, United Kingdom
- Died: 11 October 1889, Sale, United Kingdom
- Education: The University of Edinburgh (1871), University of Oxford (1860), Trinity College Dublin (1857)
- Awards: Copley Medal, Royal Medal
- Nationality: British, English

Contributions

- On 1845 he was able to demonstrate in a paddle-wheel experiment which involves the shaft and paddles being driven by a falling weight suspended from a pulley, that the same amount of work, however done always produced the same amount of heat. This enabled Joule to conclude that heat is a form of energy. The mechanical equivalent of heat is constant and is represented by the symbol J







Kelvin Temperature Scale

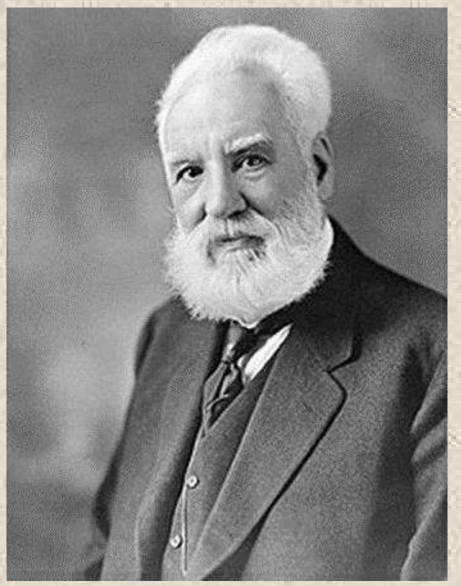
$$T = T_c + 273.15$$

William Thomson, 1st Baron Kelvin(1824-1907)

- British mathematician, mathematical physicist and engineer.
- Born: 26 June 1824, Belfast, United Kingdom
- Died: 17 December 1907, Largs, United Kingdom
- Full name: William Thomson
- Awards: Copley Medal 1883, Matteucci Medal 1876, Royal Medal 1856, John Fritz Medal 1905, Albert Medal 1879, Royal Society Bakerian Medal 1856, Smith's Prize for Examination Performance 1845,Poncelet Prize 1873.

Contributions

- Published 661 scientific papers
- Held 70 patents.
- Supervised the laying of first transatlantic cable
- Helped Pierre and Marie curie for the discovery of radium.
- First to make the detailed analysis on ocean tides.

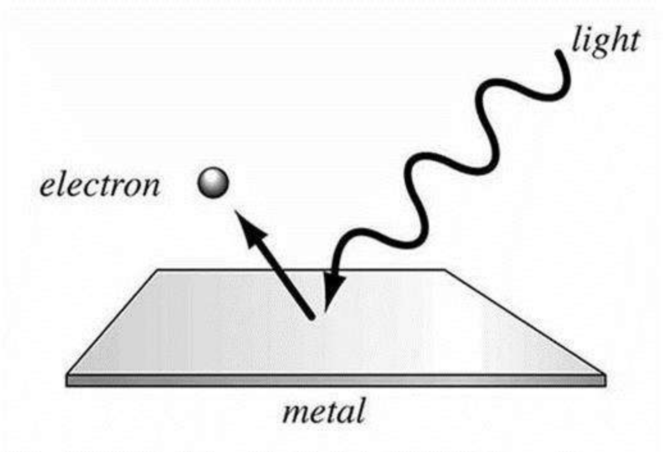


Alexander Graham Bell (1847-1922)

- ❖ Scottish-born inventor, scientist and engineer who is credited with patenting the first practical telephone.
- ❖ Born: 3 March 1847, Edinburgh, United Kingdom
- ❖ Died: 2 August 1922, Beinn Bhreagh
- ❖ Spouse: Mabel Gardiner Hubbard (m. 1877–1922)
- ❖ Nationality: American, Canadian, Scottish

Contributions

- ❖ Bell developed his first invention at age 14. The simple agricultural device served the purpose of removing wheat husks and involved a nail brush and paddle connected into a rotary-brushing wheel, which greatly reduced the time and labor required to husk wheat.
- ❖ Developed harmonic telegraph.
- ❖ Invented metal detector, hydrofoil boat.



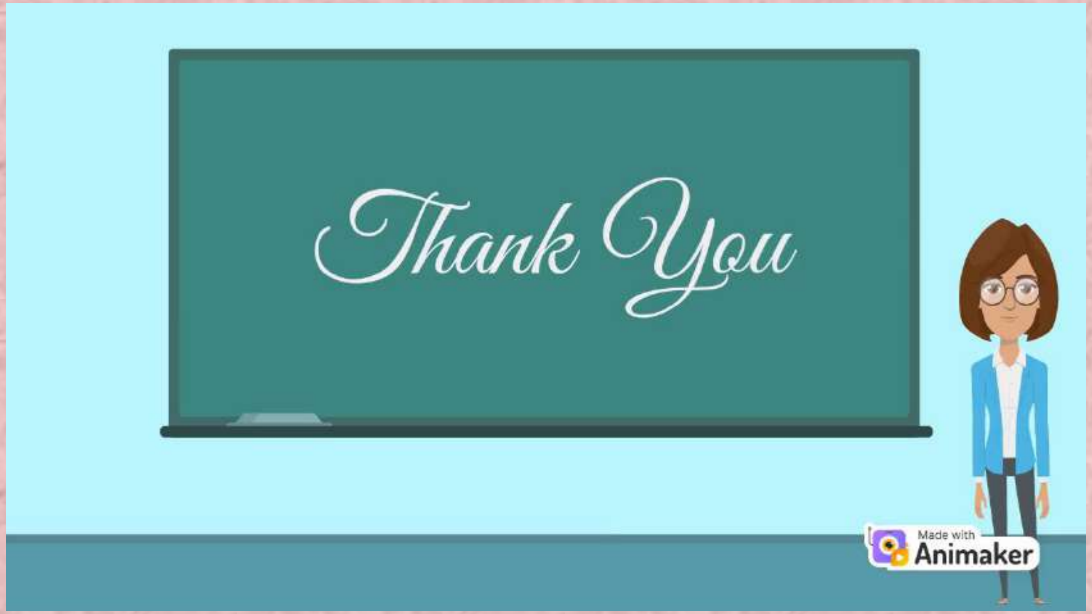
Heinrich Hertz (1857-1894)

- German physicist who first conclusively proved the existence of the electromagnetic waves predicted by James Clerk Maxwell's equations of electromagnetism.
- Born: 22 February 1857, Hamburg, Germany
- Died: 1 January 1894, Bonn, Germany
- Full name: Heinrich Rudolf Hertz
- Education: Humboldt University of Berlin (1878–1880), MORE
- Awards: Rumford Medal

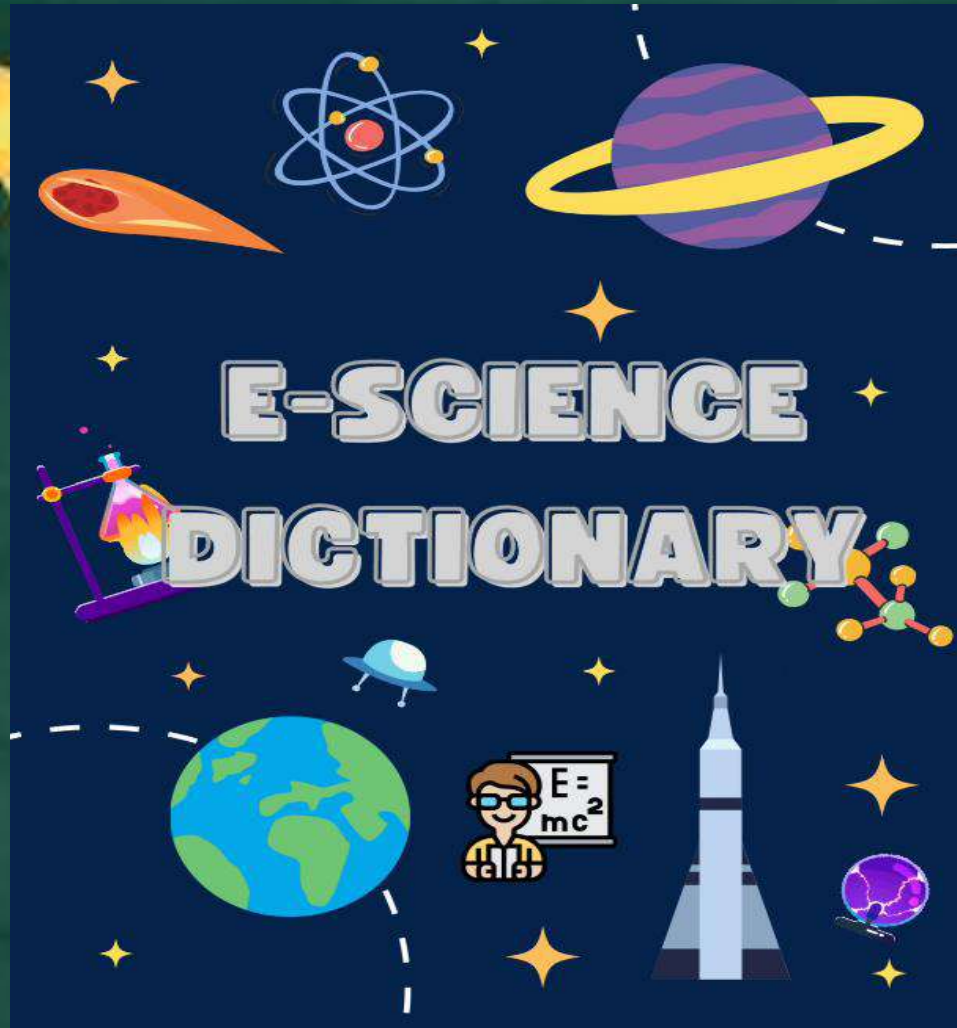
Contributions

- He proved that electric current has negligible mass.
- He compare Maxwell’s Theory with other competing theories.
- Discovered radio waves.
- Proved Maxwell’s electromagnetic theory of light.
- Laid foundations for modern communication technology.
- First who discover photoelectric effect.

CONCLUSION



Thank You


E-SCIENCE
DICTIONARY
E =
mc2

AGATHA CYRIAC

FIRST YEAR

PHYSICAL SCIENCE

E- SCIENCE DICTIONARY

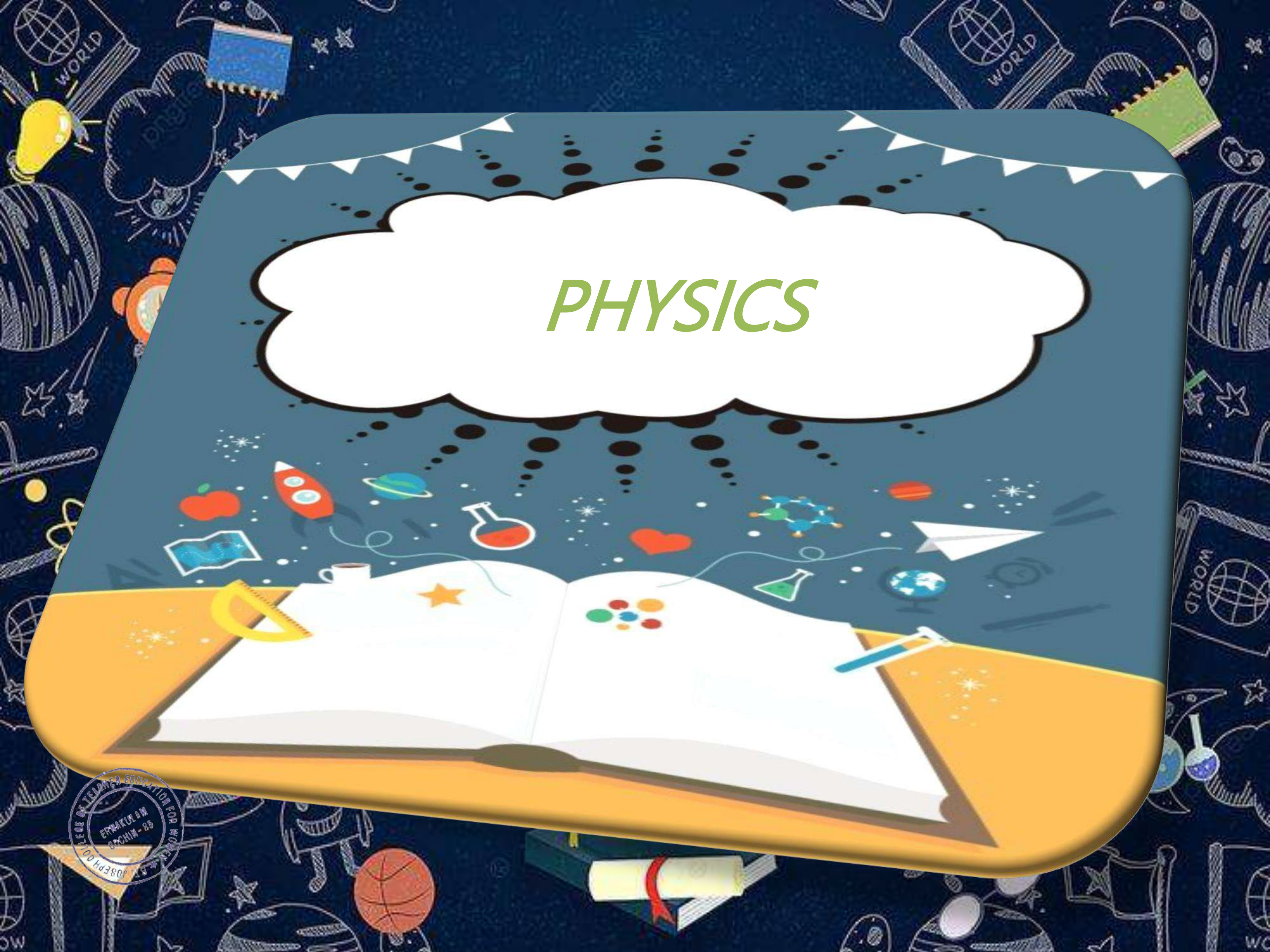
PREFACE

This e- science dictionary has been developed for the IX^th grade students. It consists of 52 words in total – 26 words from the physics chapters and 26 words from the chemistry chapters . There are a couple of words which has been introduced to improve the additional knowledge of the students. This e- science dictionary comes with an additional feature that is, it is an audiobook! By clicking the audio button near each word, students will be able to learn the correct prenonciation and definition of each word. This e- science dictionary also provides the noun, adjectives, or verb forms of the word.

Enjoy learning!

INDEX

INTRODUCTION


PHYSICS

A

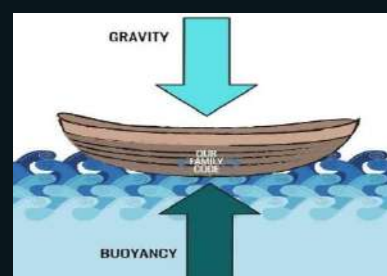
Amplitude
Noun: amplitude

/ˈamplɪtjuːd/
The maximum extent of a vibration or oscillation, measured from the position of equilibrium.

B

Buoyancy
Noun:buoyancy

/ˈbɔɪənsi/
The ability or tendency of something to float in water or other fluid.
Adj. Buoyant.



C

Centripetal
Adjective: centripetal

/ˌsɛntrɪˈpiːt(ə)l,sɛnˈtrɪpɪt(ə)l/
Moving or tending to move towards a centre.

D

Decibel

Noun: decibel

/ˈdɛsɪbɛl/

A unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale.

E

Energy

Noun: energy

/ˈɛnədʒi/

The ability to do work.

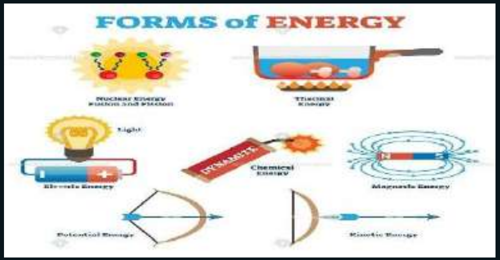
F

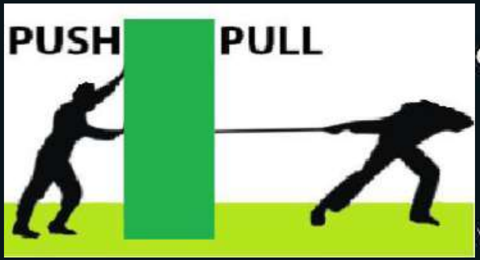
Force

Noun: force

/fɔːs/

An influence tending to change the motion of a body or produce motion or stress in a stationary body.





G

Gravity

Noun: gravity

/ˈgravɪti/

The force that attracts a body towards the centre of the earth, or towards any other physical body having mass.

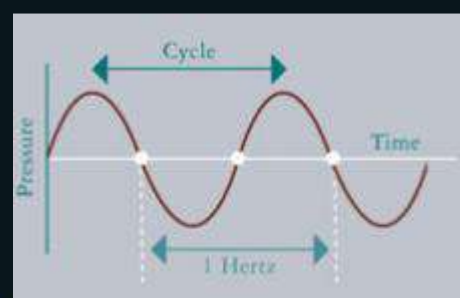
H

Hertz

Noun: hertz

/həːts/

The SI unit of frequency, equal to one cycle per second.



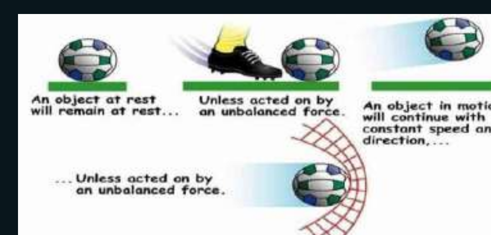
I

Inertia

Noun: inertia

/ɪˈnəːʃə/

A property of matter by which it continues in its existing state of rest or uniform motion in a straight line, unless that state is changed by an external force.



J

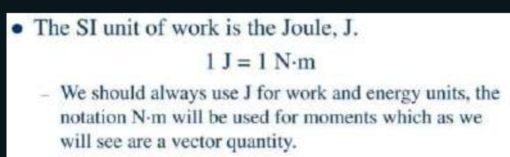
Joule

Noun: joule

plural noun: joules

/dʒuːl/

The SI unit of work or energy, equal to the work done by a force of one newton when its point of application moves one metre in the direction of action of the force, equivalent to one 3600th of a watt-hour.



- The SI unit of work is the Joule, J.

  1 J = 1 N·m

  – We should always use J for work and energy units, the notation N·m will be used for moments which as we will see are a vector quantity.

K

Kinetic energy

Noun: Kinetic energy

Energy which a body possesses by virtue of being in motion.

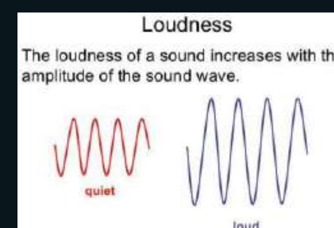
L

Loudness

Noun: loudness

Adj. Loud

Is a measure of the response of the ear to the sound.



M

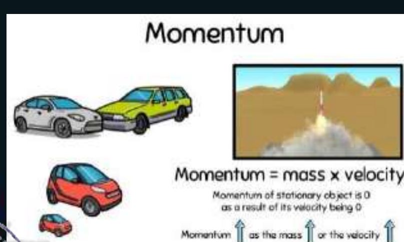
Momentum

Noun: momentum

Pl. Momenta

/mə(ʊ)ˈmɛntəm/

The quantity of motion of a moving body, measured as a product of its mass and velocity.



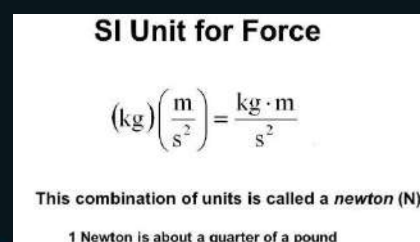
N

Newton

Noun: Newton

/ˈnjuːt(ə)n/

The SI unit of force. It is equal to the force that would give a mass of one kilogram an acceleration of one metre per second, and is equivalent to 100,000 dynes.



SI Unit for Force

$$(\mathrm{kg})\left(\frac{\mathrm{m}}{\mathrm{s}^2}\right) = \frac{\mathrm{kg}\cdot\mathrm{m}}{\mathrm{s}^2}$$

This combination of units is called a *newton* (N).

1 Newton is about a quarter of a pound

O

Oscillation

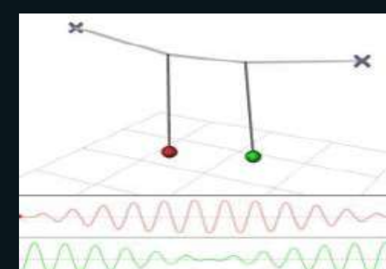
Noun: oscillation

V. Oscillate

Adjs. Oscillating

/ˌɒsɪˈleɪʃn/

Movement back and forth in a regular rhythm.



P

Potential energy

Noun: potential energy

The energy possessed by a body by virtue of its position relative to others, stresses within itself, electric charge, and other factors.

Q

Quantum

Noun: quantum

/ˈkwɒntəm/

A discrete quantity of energy proportional in magnitude to the frequency of the radiation it represents.

R

Reverberation

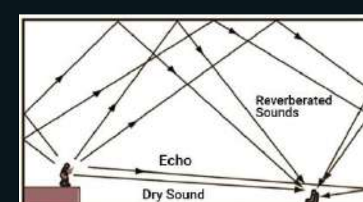
Noun:reverberation

V. Reverberate

Adj. reverberant

/rɪˌvəːbəˈreɪʃn/

Prolongation of a sound; resonance.



S

Sonic boom

Noun: sonic boom

A loud explosive noise caused by the shock wave from an aircraft or other object travelling faster than the speed of sound.

T

Tension

Noun: tension

/ˈtɛnʃ(ə)n/

A strained state or condition resulting from forceTensions act in opposition to each other.

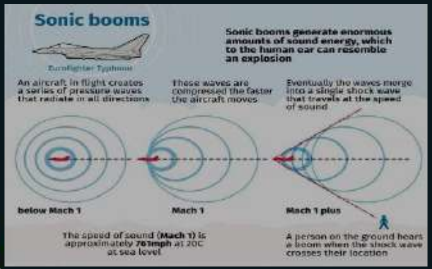
U

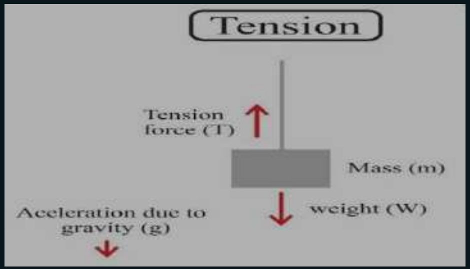
Ultrasound

Noun: ultrasound

/ˈʌltrəsaʊnd/

Sound or other vibrations having an ultrasonic frequency, particularly as used in medical imaging.





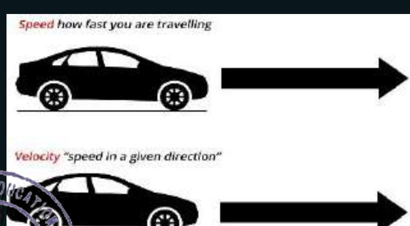
V

Velocity

Noun: velocity

/vɪˈlɒsɪti/

The speed of something in a given direction.



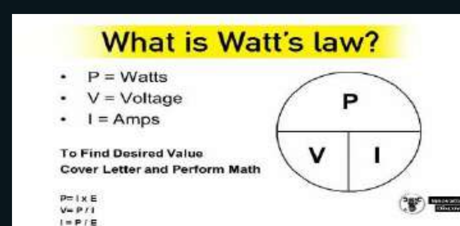
W

Watt

Noun: watt

/wɒt/

The SI unit of power, equivalent to one joule per second, corresponding to the rate of consumption of energy in an electric circuit where the potential difference is one volt and the current one ampere.



X

X-ray

Noun: x-ray

/ˈɛksreɪ/

An electromagnetic wave of high energy and very short wavelength, which is able to pass through many materials opaque to light.

Y

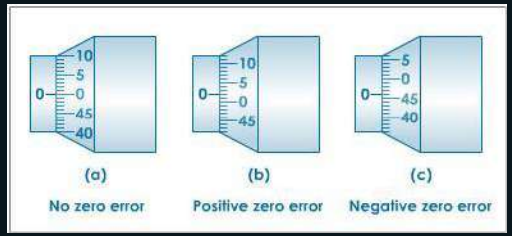
Young's modulus

Noun: Young's modulus

unpunctuated: Youngs modulus

/jʌŋz/

A measure of elasticity, equal to the ratio of the stress acting on a substance to the strain produced.

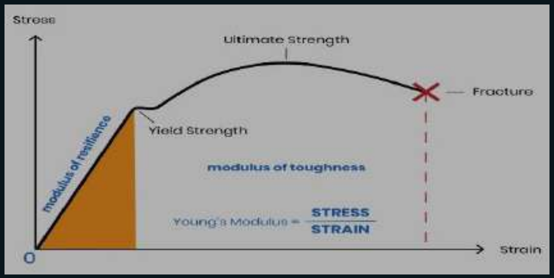


Z

Zero error

Noun: zero error

It is a type of error in which an instrument gives a reading when the true reading at that time is zero.



CHEMISTRY

A

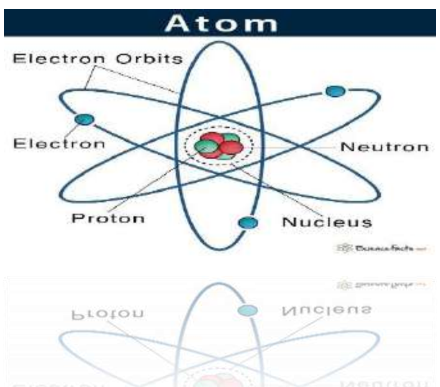
Atom

Noun: atom

Plural noun: atoms

/ˈatəm/

The smallest particle of a chemical element that can exist.



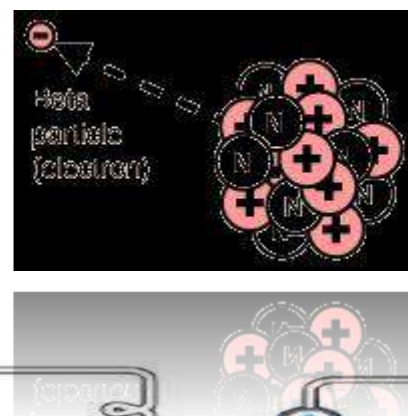
B

Beta particle

Noun: beta particle

Plural noun: beta particles

A fast-moving electron emitted by radioactive decay of substances



C

Colloid

Noun: colloid

/ˈkɒlɔɪd/

A homogeneous non-crystalline substance consisting of large molecules or ultramicroscopic particles of one substance dispersed through a second substance.

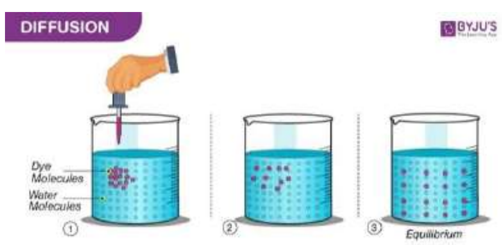
D

Diffusion

Noun: diffusion

/dɪˈfjuːʒ(ə)n/

The intermingling of substances by the natural movement of their particles.



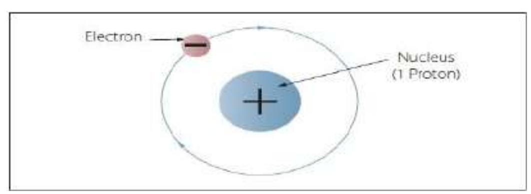
E

Electron

Noun : electron

/ɪˈlɛktrɒn/

A stable subatomic particle with a charge of negative electricity, found in all atoms and acting as the primary carrier of electricity in solids.



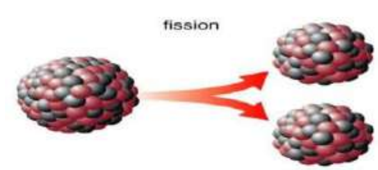
F

Fission

Noun: fission

/ˈfɪʃ(ə)n/

Division or splitting into two or more parts.

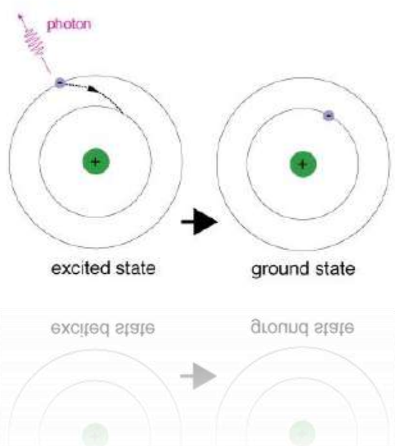


G

Ground state

Noun: ground state

The lowest energy state of an atom or other particle.



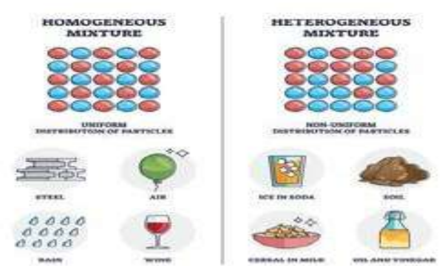
H

Heterogeneous

Adj: heterogeneous

/ˌhɛt(ə)rə(ʊ)ˈdʒiːnɪəs/

Of or denoting a process involving substances in different phases (solid, liquid, or gaseous).



I

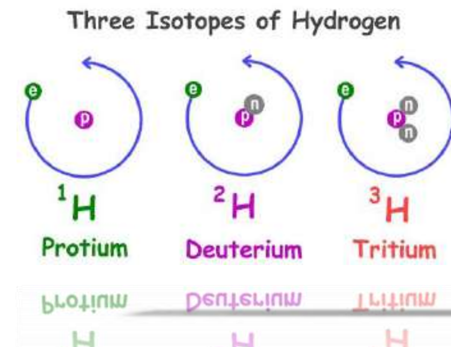
Isotope

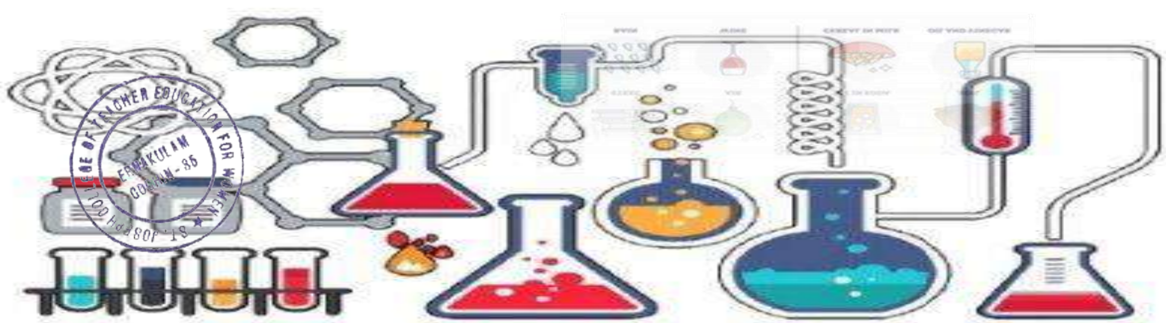
Noun: isotope

Plural noun: isotopes

/ˈʌɪsətəʊp/

Is one of two or more species of atoms of a chemical element with the same atomic number and position in the periodic table and nearly identical chemical behavior but with different atomic masses s.





J

Jodium or Jod

Jodium is the Latin name for the element iodine.Also known as: iodine, iodes, iode

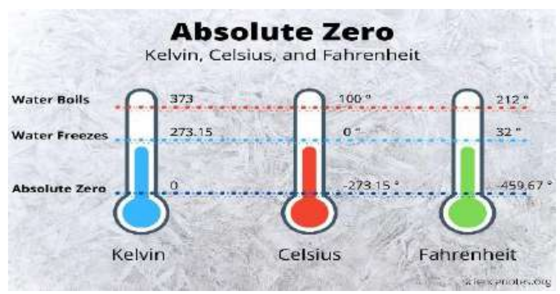
K

Kelvin

Noun: Kelvin

/ˈkɛlvɪn/

The SI base unit of thermodynamic temperature



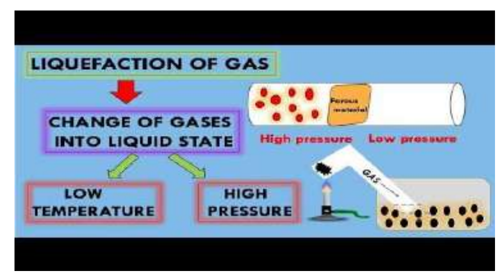
L

Liquefaction

Noun: liquefaction

/lɪkwɪˈfakʃ(ə)n/

The process of making something, especially a gas, liquid.



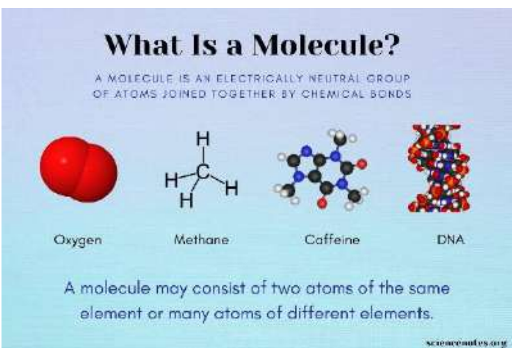
M

Molecule

Noun: molecule

/ˈmɒlɪkjuːl/

A group of atoms bonded together, representing the smallest fundamental unit of a chemical compound that can take part in a chemical reaction.



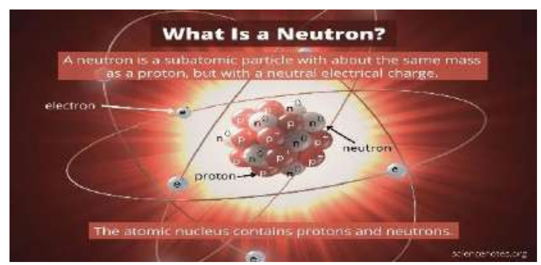
N

Neutron

Noun: neutron

/ˈnjuːtrɒn/

A subatomic particle of about the same mass as a proton but without an electric charge, present in all atomic nuclei except those of ordinary hydrogen.



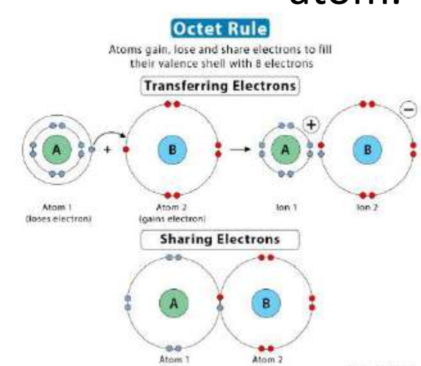
O

Octet

Noun: octet

/ɒkˈtɛt/

A stable group of eight electrons occupying a single shell in an atom.



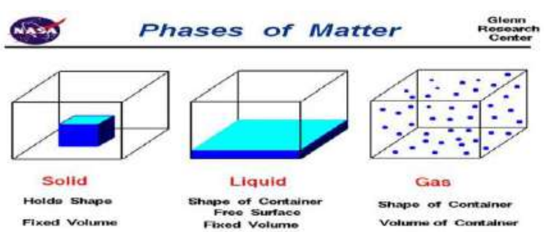
P

Phase

Noun: phase

/feɪz/

A distinct and homogeneous form of matter (i.e. a particular solid, liquid, or gas) separated by its surface from other forms.



Q

Quicklime

Noun: quicklime

/ˈkwɪklʌɪm/

Awhite caustic alkaline substance consisting of calcium oxide, which is obtained by heating limestone and which combines with water with the production of much heat; lime.

R

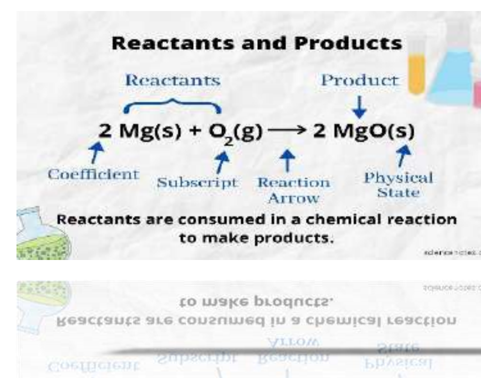
Reactant

Noun: reactant

Plural noun: reactants

/rɪˈakt(ə)nt/

A substance that takes part in and undergoes change during a reaction.



S

Sublimation

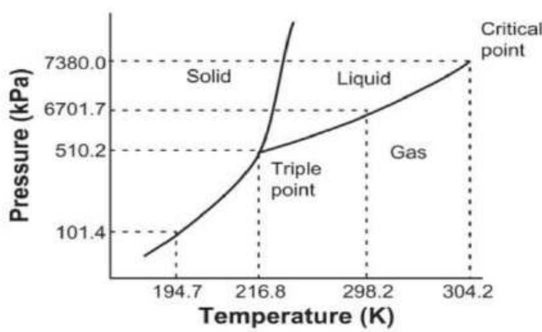
Sublimation is the transition of a substance directly from the solid to the gas state, without passing through the liquid state.

T

Triple point

Noun: triple point

The temperature and pressure at which the solid, liquid, and vapour phases of a pure substance can coexist in equilibrium.



U

Universal Solvent

A chemical that dissolves most substances. While water is often called the universal solvent, most nonpolar molecules are insoluble in it.

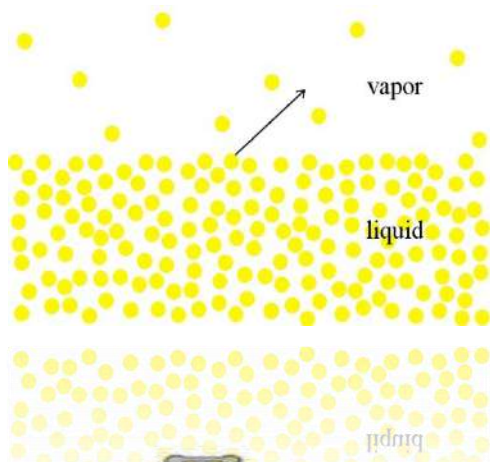
V

Volatile

djective: volatile

/ˈvɒlətʌɪl/

A substance that readily vaporizes at normal temperature.



W

Wismuth

Wismuth is an old name for the element bismuth.

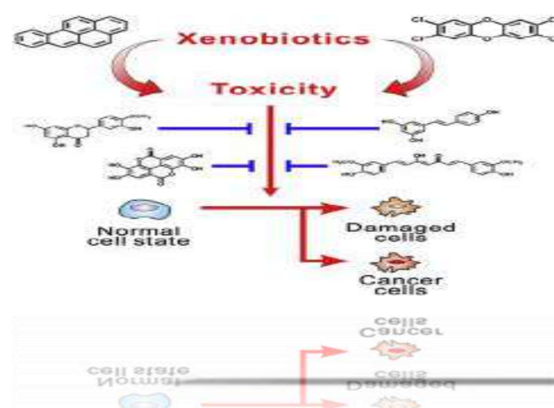
X

Xenobiotic

Adjective:xenobiotic

/ˌzɛnə(ʊ)bʌɪˈɒtɪk/

Relating to or denoting a substance, typically a synthetic chemical, that is foreign to the body or to an ecological system.



Y

Yellowcake

Noun: yellowcake

/ˈjɛlə(ʊ)keɪk/

Impure uranium oxide obtained during processing of uranium ore.

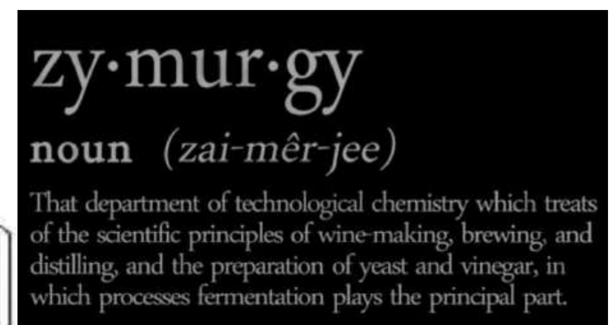
Z

Zymurgy

Noun: zymurgy

/ˈzʌɪməːdʒi/

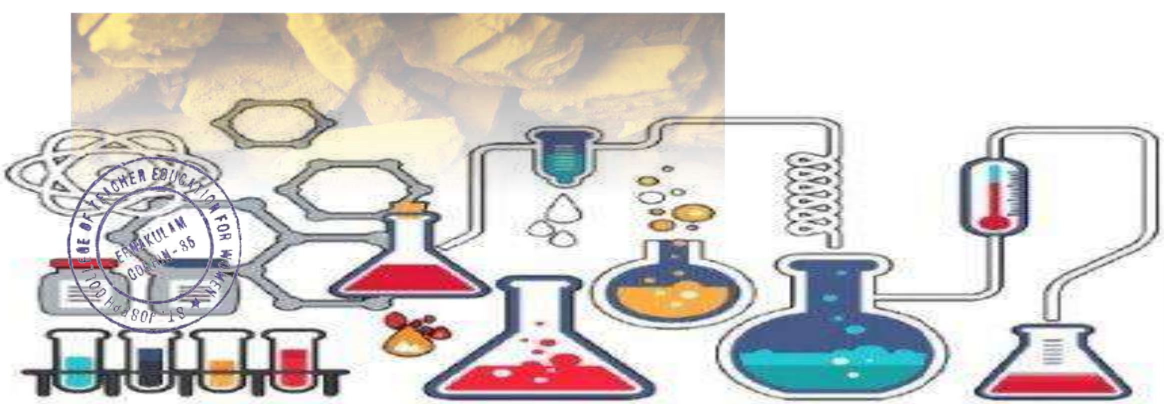
The study or practice of fermentation in brewing, winemaking, or distilling



zy·mur·gy

noun *(zai-mêr-jee)*

That department of technological chemistry which treats of the scientific principles of wine-making, brewing, and distilling, and the preparation of yeast and vinegar, in which processes fermentation plays the principal part.



THANK YOU!

UNIT BOOK

ST. JOSEPH COLLEGE OF TEACHER EDUCATION FOR WOMEN, ERNAKULAM

Submitted By
ASHNA K J
PHYSICAL SCIENCE(2022-24)


Made with
Animaker

FUNDAMENTAL QUANTITIES

The physical quantities which do not depend on any other physical quantities for their measurements

FUNDAMENTAL UNITS

Fundamental units are all those units which are independent of any other unit

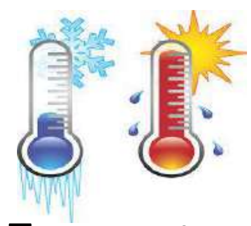
7 FUNDAMENTAL QUANTITIES

Length

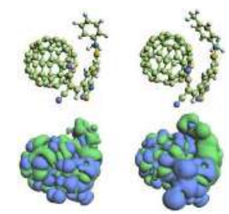
Mass

Time

Electric current



Temperature



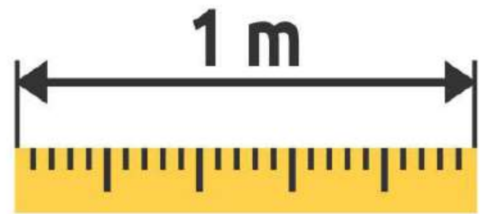
Amount of substances

Luminous intensity

Fundamental Quantities

No.	Quantities	unit
1.	Length	meter [m]
2.	Mass	kilogram [kg]
3.	Time	second [s]
4.	Electric current	ampere [A]
5.	Temperature	kelvin [K]
6.	Amount of substance	mole [mol]
7.	Luminous intensity	candela { cd }

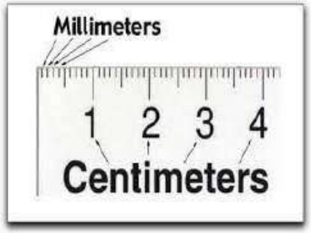
(1) LENGTH



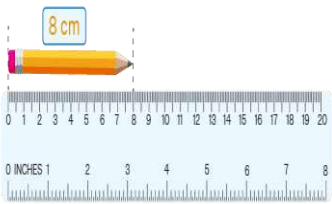
SI unit= metre
Symbol= m

*Other units of Length

- millimetre (mm)
- centimetre (cm)
- Kilometre(km



1mm=0.001m



1cm=10mm

1m=100cm

1km=1000m

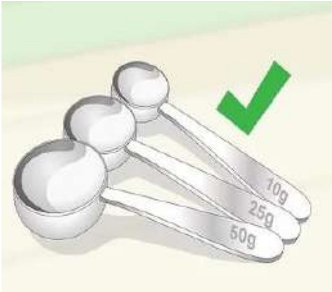
(2) MASS

SI unit= kilogram
Symbol=kg

***Other units of Mass**

- Milligram (mg)
- Gram (g)
- Tonne(t)

1mg=0.001g



1g=1000mg

1kg=1000g

1 tonne=1000kg

(3) TIME

SI unit= second
Symbol= s

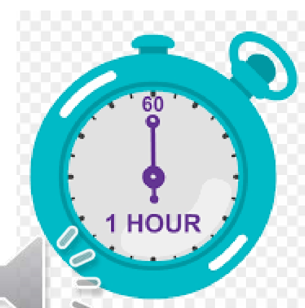
* Other units of time

- Millisecond (msec)
- Minute (min)
- Hour (h)

1 msec= 0.001 s

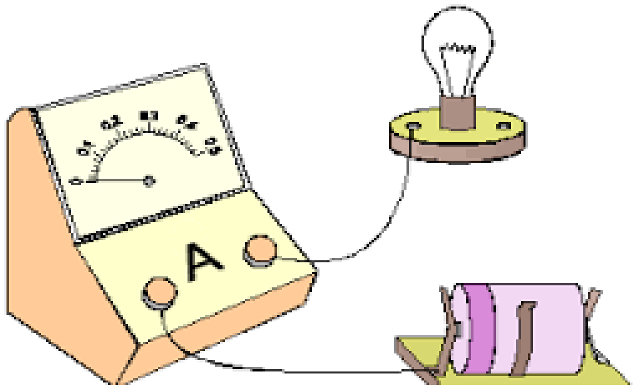
1s=1000msec

1 min=60s



1h=60min

(4) Electric Current



SI unit= ampere

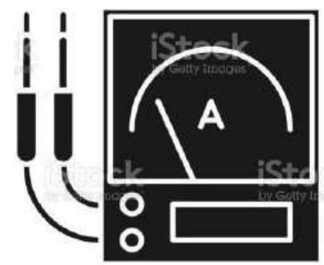
Symbol=A

*** Other units of Electric current**

- Microampere(μA)
- Milliampere(mA)
- Kiloampere(kA)

$1\mu A = 10^{-6} A$

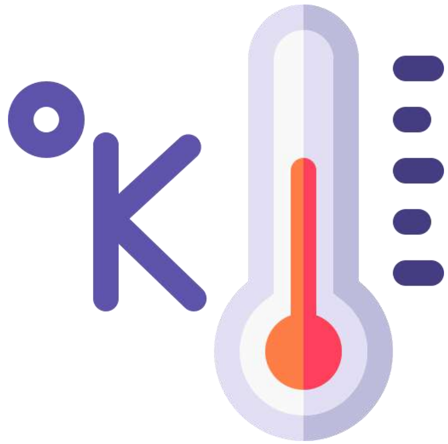
$1mA = 10^{-3} A$



1A=1000mA

$1kA = 10^{3} A$

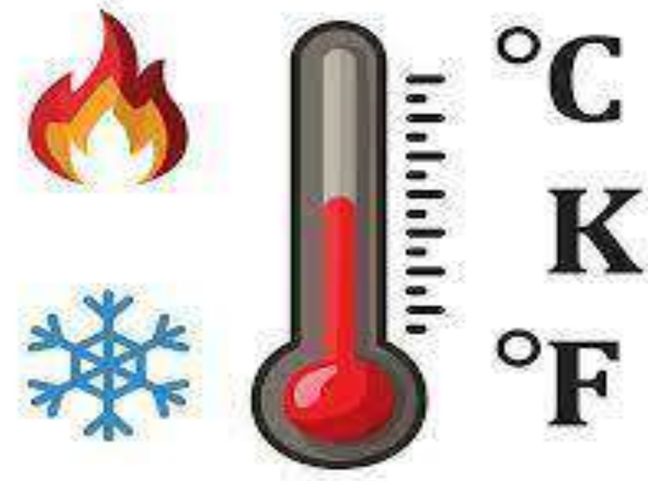
(5) TEMPERATURE



SI unit= Kelvin
Symbol=K

*** Other units of temperature**

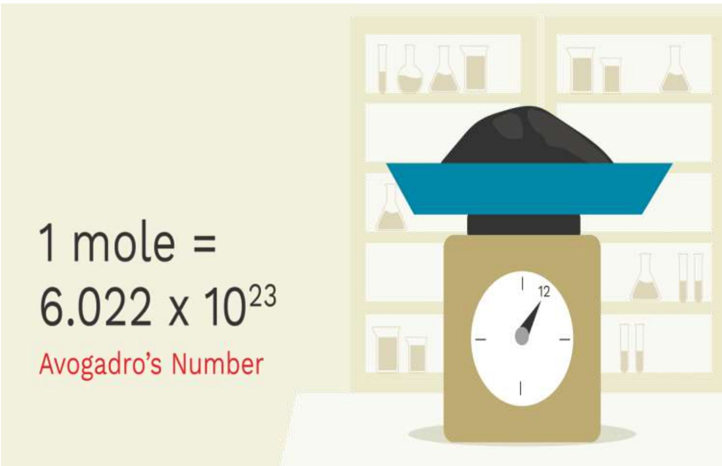
- Fahrenheit (°F)
- Celsius (°C)



Unit conversion

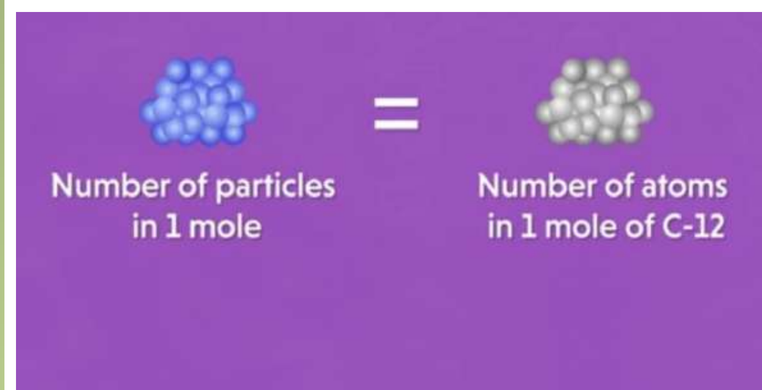
$$\frac{C}{5}=\frac{F-32}{9}=\frac{K-273}{5}$$

(6) AMOUNT OF SUBSTANCE



SI unit=mole
Symbol=mol

Amount of substance that contains the same number of atoms/molecules/particles as there are atoms in 12 grams of carbon-12



(7) LUMINOUS INTENSITY

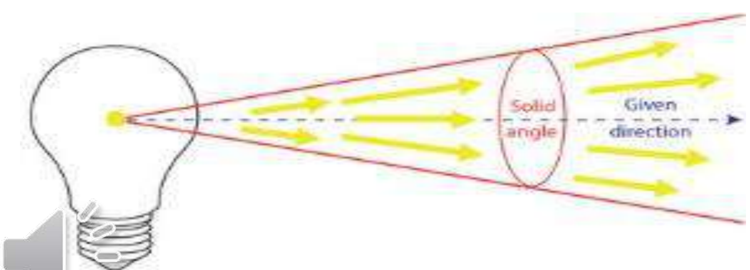
CANDELA

SI unit=candela
Symbol=cd

LUMINOUS INTENSITY

Luminous intensity is the luminous power or the quantity of visible light emitted by a light source in a given direction per unit solid angle.

Luminous power per unit solid angle emitted by a light source in a particular direction



DERIVED QUANTITIES

The quantities derived from the fundamental quantities are referred to as derived quantities.

DERIVED UNITS

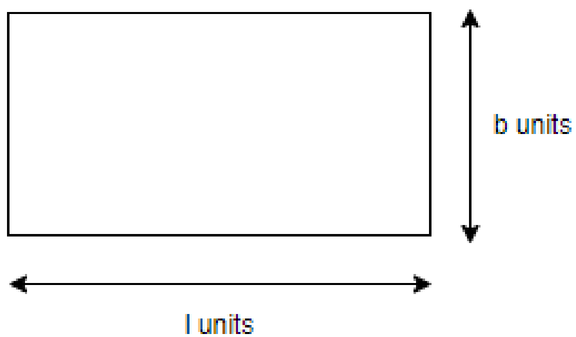
Any unit derived from one of the seven fundamental units is defined as derived units.

sciencenotes.org

Derived Units

Quantity	Name	Symbol	Base Units
Area	square meter	A	m^2
Volume	cubic meter	V	m^3
Density	kilogram per cubic meter	ρ	kg/m^3
Speed	meters per second	v	m/s
Acceleration	meters per second squared	a	m/s^2
Pressure	pascal	Pa	$kg\,m^{-1}s^{-2}$
Force	newton	N	$kg\,m\,s^{-2}$
Energy	joule	J	$kg\,m^2\,s^{-2}$
Frequency	hertz	Hz	s^{-1}
Power	watt	W	$kg\,m^2\,s^{-3}$
Voltage	volt	V	$kg\,m^2\,s^{-3}A^{-1}$
Charge	coulomb	C	A s

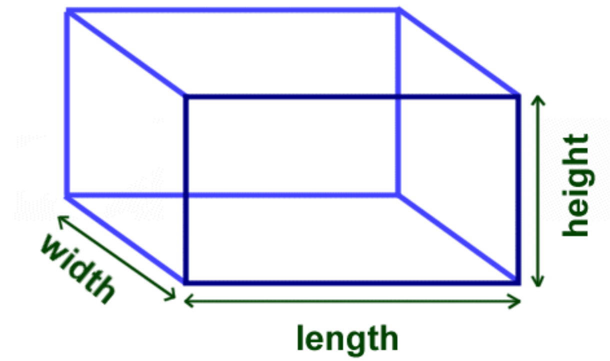
AREA



Area = l×b
Unit of l=m
Unit of b=m
Unit of Area=m×m=m^2

SI unit=square meter
Symbol=m^2

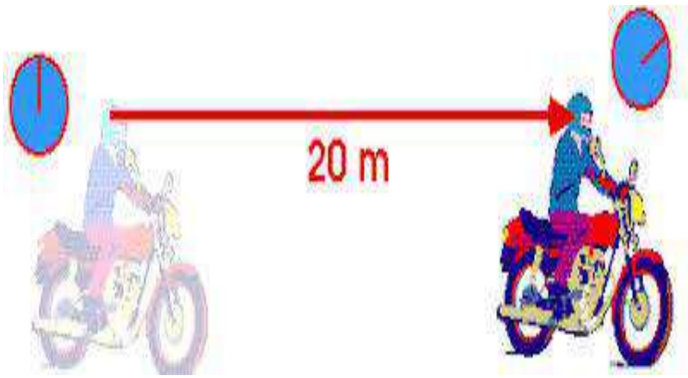
VOLUME



Volume =l×b×h
Unit of l=m
Unit of b=m
Unit of h=m
Unit of area=m^3

SI unit=cubic meter
Symbol=m^3

SPEED



Speed=$\frac{distance}{time}$

Unit of distance=m

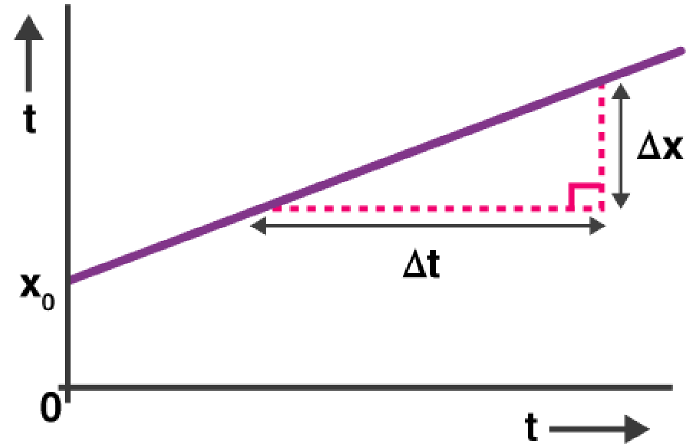
Unit of time=s

Unit of speed=$^{m}/_{s}$

SI unit=metre per second

Symbol=$^{m}/_{s}$

VELOCITY



Velocity=$\frac{displacement}{change\ in\ time}$

Unit of displacement=m

Unit of time=s

Unit of velocity=$^{m}/_{s}$

SI unit=metre per second

Symbol=$^{m}/_{s}$

ACCELERATION

Acceleration=$\frac{change\ in\ velocity}{change\ in\ time}$

Unit of velocity=${}^{m}/_{s}$

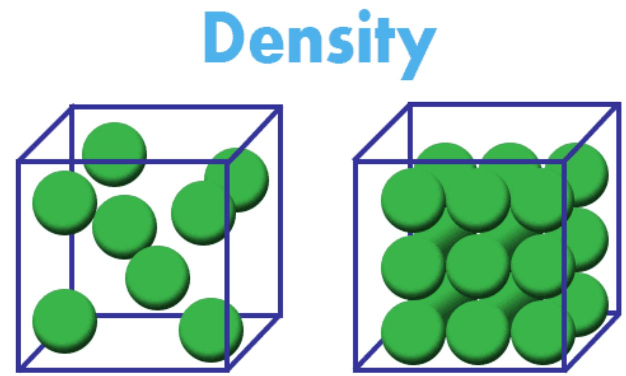
Unit of time=s

Unit of acceleration=$\frac{{}^{m}/_{s}}{s}$=${}^{m}/_{s^2}$

SI unit=metre per second square

Symbol=${}^{m}/_{s^2}$

DENSITY



Density=$\frac{mass}{volume}$

Unit of mass=kg

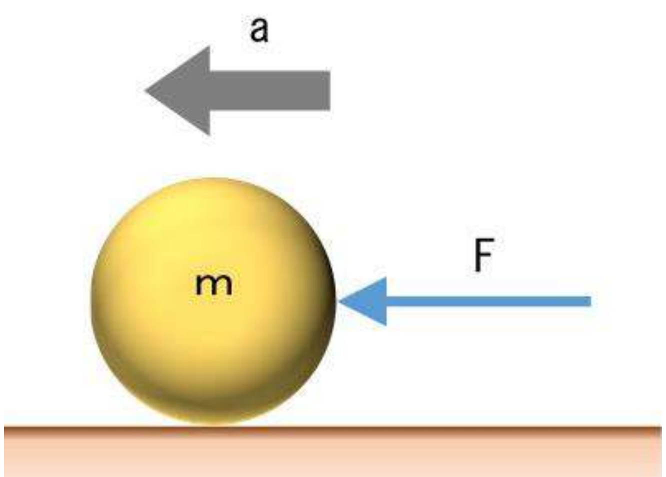
Unit of volume=m^3

Unit of density=${}^{kg}/_{m^3}$

SI unit=kilogram per metre cube

Symbol=${}^{kg}/_{m^3}$

FORCE



Force=mass×acceleration

Unit of mass=kg

Unit of acceleration=$^{m}/_{s^2}$

Unit of force=kg×$^{m}/_{s^2}$=Newton

SI unit=Newton

Symbol=N

PRESSURE

Pressure=$\frac{force}{area}$

Unit of force=N

Unit of area=m^2

Unit of pressure=$^{N}/_{m^2}$=Pascal

SI unit=Pascal

Symbol=Pa

FREQUENCY

Frequency is the number of oscillations produced in one second.

Frequency=$\frac{1}{T}$

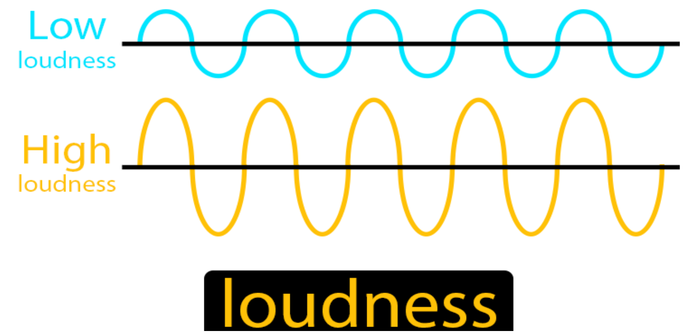
Unit of Time=s

Unit of frequency=$\frac{1}{s}$=Hertz

SI unit=Hertz

Symbol=Hz

LOUDNESS

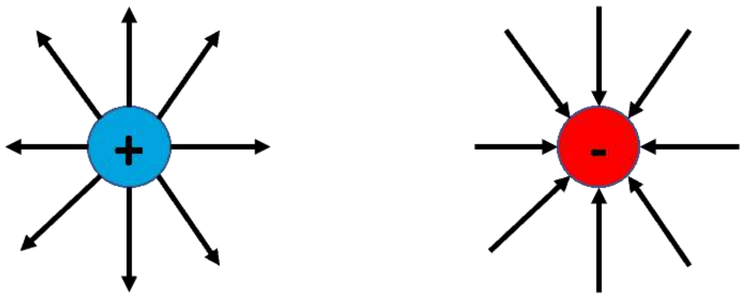


The attribute of a sound that determines the magnitude of the auditory sensation produced and that primarily depends on the amplitude of the sound wave involved.

SI unit=decibel

Symbol=dB

ELECTRIC CHARGE



Positive Charge

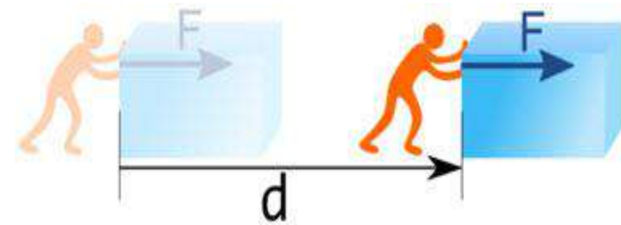
Negative Charge

Electric charge is the property of subatomic particles that causes it to experience a force when placed in an electric and magnetic field.

Electric charge,q=It
Unit of I=Ampere
Unit of t=s
Unit of electric charge=As=Coulomb

SI unit=Coulomb
Symbol=C

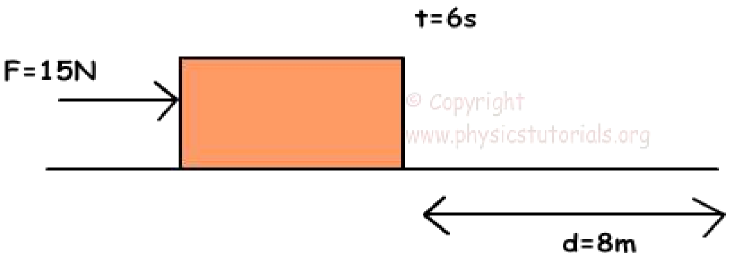
WORK



Work=Force×displacement
Unit of force=N
Unit of displacement=m
Unit of work=Nm=Joule

SI unit=Joule
Symbol=J

POWER



Power=$\frac{work}{time}$

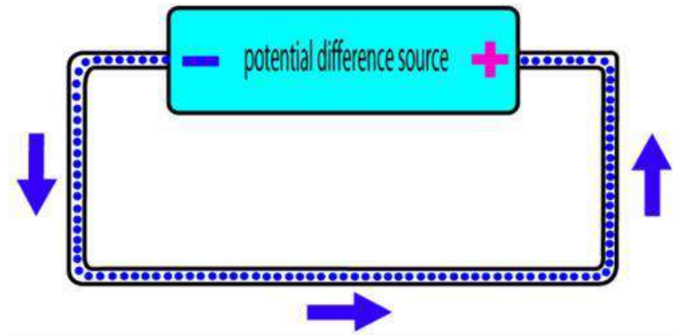
Unit of work=J

Unit of time=s

Unit of power=$^{J}/_{s}$=Watt

SI unit=Watt
Symbol=W

POTENTIAL DIFFERENCE



Potential difference=$\frac{work\ done}{charge}$

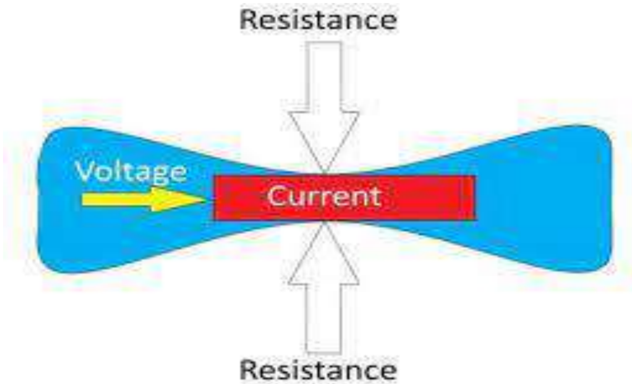
Unit of work=J

Unit of charge=C

Unit of potential difference=$^{J}/_{C}$=Volt

SI unit=Volt
Symbol=V

RESISTANCE



R=$\frac{V}{I}$

Unit of V=V

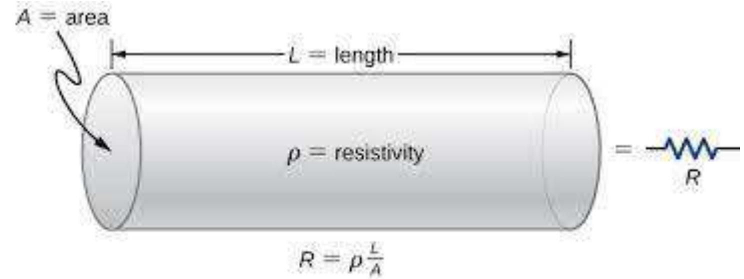
Unit of I=A

Unit of R=$^{V}/_{A}$=Ohm

SI unit=Ohm

Symbol=Ω

RESISTIVITY



R=ρ$\frac{l}{A}$

P=$\frac{RA}{l}$

Unit of resistance=Ω

Unit of area=m^2

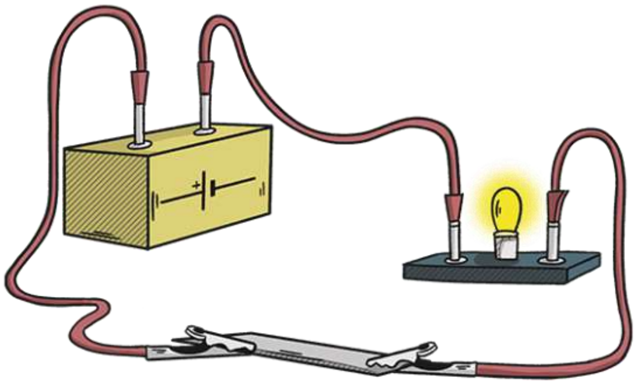
Unit of length=m

Unit of resistivity,ρ=Ωm

SI unit=Ohm metre

Symbol=Ωm

CONDUCTIVITY



A material's conductivity is the extent that it allows an electric current to flow through it.

Conductivity=$\frac{1}{\rho}$

Unit of resistivity=Ωm

Unit of conductivity=$\Omega^{-1}m^{-1}$

SI unit=ohm inverse metre inverse

Symbol=$\Omega^{-1}m^{-1}$

CAPACITANCE

Capacitance is the capability of a material object or device to store electric charge.

Capacitance,C=$\frac{Q}{V}$

Unit of Q=C

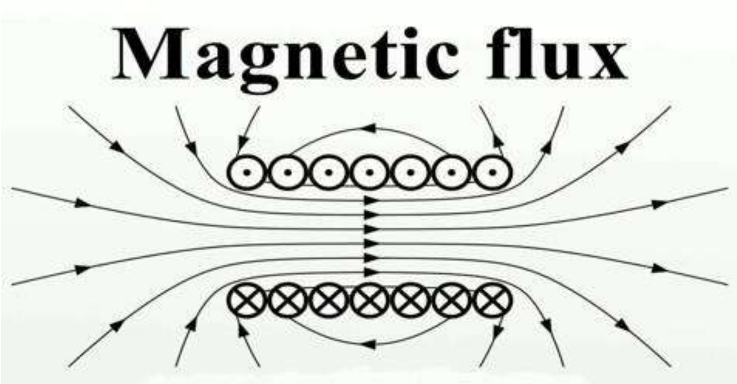
Unit of V=V

Unit of capacitance=$\frac{C}{V}$=Farad

SI unit=Farad

Symbol=F

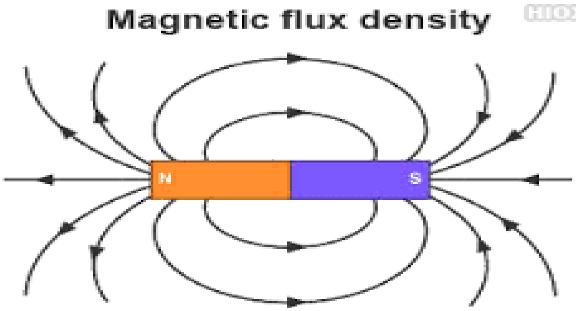
MAGNETIC FLUX



Quantity of magnetic field linked to a surface area is known as magnetic flux (φ).

SI unit=Weber
Symbol=Wb

MAGNETIC FLUX DENSITY

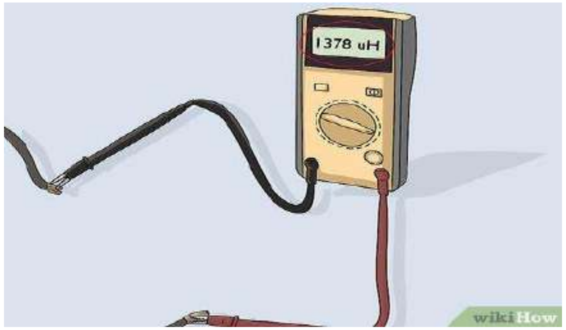


The number of lines of force passing through a unit area of material is known as magnetic flux density(B).

B=$\frac{\varphi}{A}$
Unit of ϕ=Wb
Unit of A=m^2
Unit of B=${}^{Wb}/_{m^2}$=Tesla

SI unit=Tesla
Symbol=T

INDUCTANCE

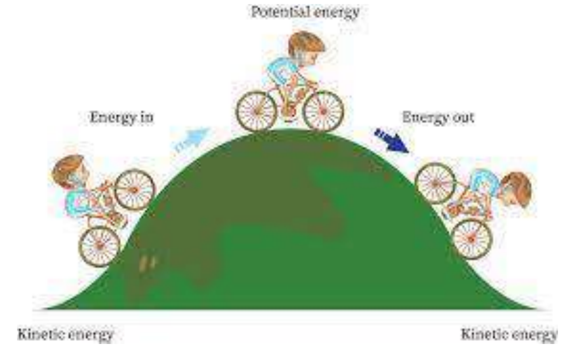


The tendency of an electrical conductor to oppose a change in the electrical current flowing through it

Inductance, L=$\frac{\emptyset}{I}$
Unit ofϕ=Wb
Unit of I=A
Unit of L=$^{Wb}/_{A}$=Henry

SI unit=Henry
Symbol=H

ENERGY

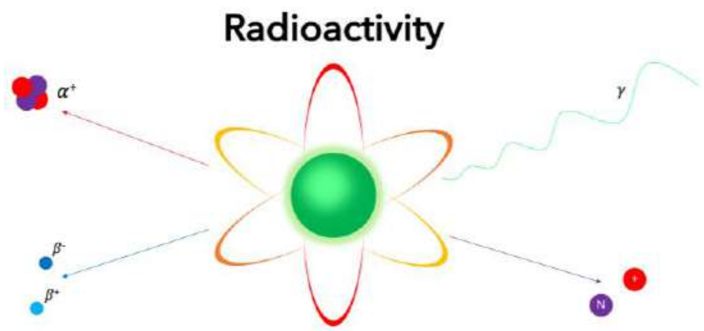


The capacity for doing work.

Kinetic energy=$\frac{1}{2}$mv^2
Unit of mass=kg
Unit of velocity=$^{m}/_{s}$
Unit of energy=kg$^{m}/_{s}$=Joule

SI unit=Joule
Symbol=J

RADIOACTIVITY



The emission of ionizing radiation or particles caused by the spontaneous disintegration of atomic nuclei.

SI unit= Becquerel
Symbol=Bq

I becquerel= 1 radioactive decay per second

Dear learners…
I hope you find this unit book useful in your learning

ALICE JOSEPH

Digitally signed by ALICE JOSEPH
Date: 2024.02.02 21:29:08 +05'30'

Akshaya K S
1st B.ED. Physical Science
St. Joseph College Of Teacher Education For Women , Ernakulam

WORKBOOK

INDEX

This workbook is meant for 8 Std students of State syllabus.This deals with the Chapters 11 (Force and Pressure) and Chapter 12 (Friction) and will serve as the supporting for learning the content.

By working through this workbook, the students are able to

1.Develop problem solving skills in the topic of Force and Pressure, and Friction.

2.Apply the principle for required situation in the topic of Force and Pressure, Friction.

3.Design experiment in the topic of Force and Pressure, Friction.

4.Develop interest in the topic of Force and Pressure, Friction.


InShOt
InShOt


Workbook for class 8
Exploring Knowledge
11-12 Chapters
By AKSHAYA K S
ST. JOSEPH COLLEGE OF TEACHER EDUCATION FOR WOMEN
ERNAKULAM COCHIN-23


Force
and
Pressure

WORKSHEET 1

FILL IN THE BLANKS

1.Forces that work on an object at rest are …………….. forces.

a.Uniform b.Nonuniform c.Balanced d.Unbalanced

2………………..is used to exert force.

a.Energy b.Pressure c.Strength d.Power

3.The invisible attraction force that earth exerts on all sorts of matter is called ………………… Force.

a.Nuclear b.Electrical c.Kinetic d.Gravitational

4……………….. is defined as the force exerted per unit area.

a.Thrust b.Pressure c.Pull d.Push

5.The ………………… Of an object is the measure of force of gravity produced on it.

a.Mass b.Volume c.Weight d.Quantity

WORKSHEET 2

MATCH THE FOLLOWING

A	B
1.Force	a.Contact force
2.Pressure	b.Measure of gravity on object
3.Friction	c.Force per unit area
4.Gravity	d.Push and pull
5.Weight	e.Action at a distance force

WORKSHEET 3

SHORT ANSWER QUESTIONS

1.Which force is responsible for downward movement of a parachutes? Will he come down with the same speed without the parachute?

……

……

2.Two thermocol balls held close to each other move away from each other. When they are released, name the force which might be responsible for this phenomenon. Explain.

……

……

3.How does an applied force changes the speed of an object?

……

……

4.What are the effects of force on an object?

……

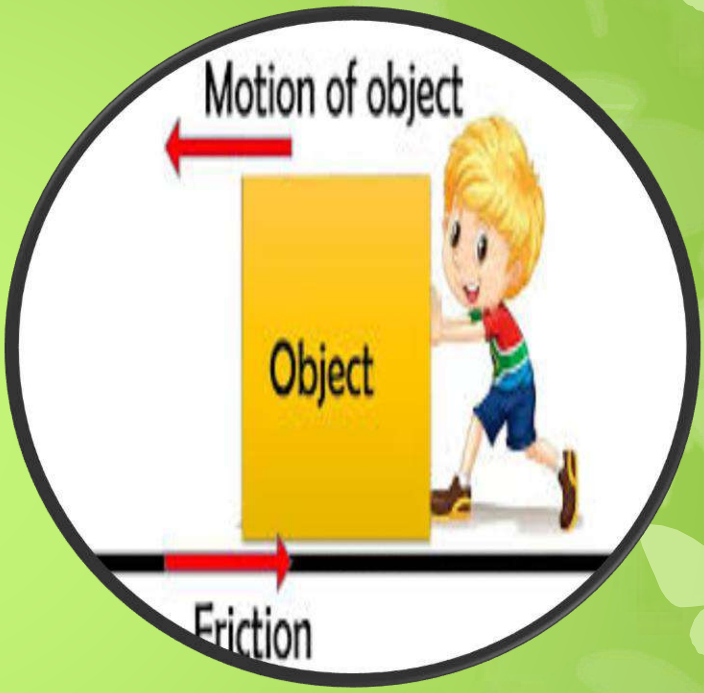
……

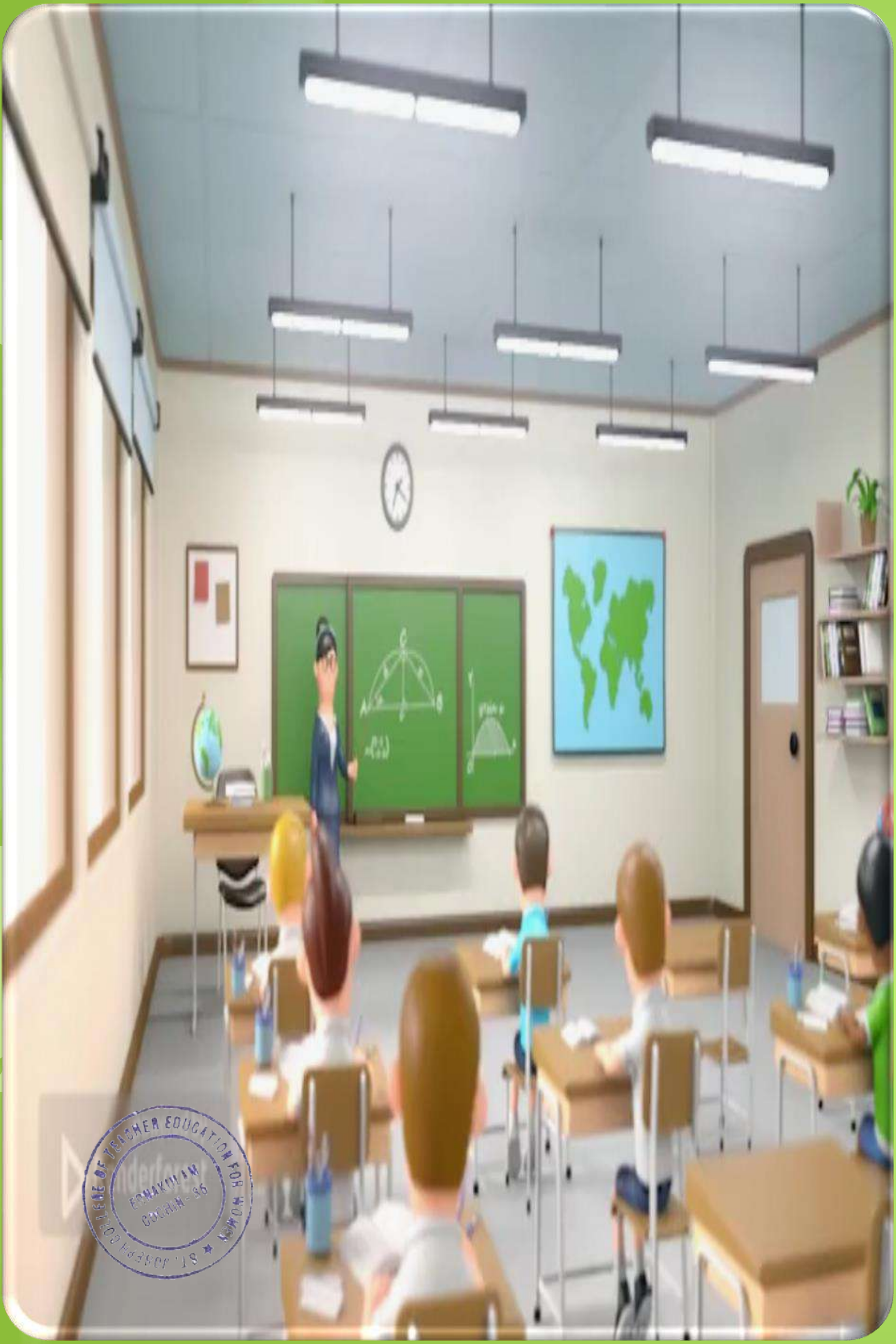
5.An archer shoots an arrow in the air horizontally. However, after moving some distance, the arrow falls to the ground. Name the initial force that sets the arrow in motion. Explain why the arrow ultimately falls down.

……

………………………………………………………………………………………………………


FRICTION


Motion of object
Object
Friction



WORKSHEET 1

TRUE OR FALSE

1.Friction opposes the motion between the surfaces in contact with each other.

Ans:

2.Friction is independent on the nature of surfaces.

Ans:

3.Friction produces heat.

Ans:

4.Sliding friction is lesser than static friction.

Ans:

5.Sprinkling of powder on carrom board increases friction.

Ans:

WORKSHEET 2
MULTIPLE CHOICE QUESTIONS

1.Friction is a
(a) non-contact force (b) contact force
(c) magnetic force (d) electrostatic force
Ans:

2.Which of the following produces least friction?
(a) Sliding friction (b) Rolling friction
(c) Composite friction (d) Static friction
Ans:

3.Friction always
(a) opposes the motion (b) helps the motion
(c) both (a) and (b) (d) none of these
Ans:

4.Friction can be reduced by using
(a) oil (b) grease
(c) powder (d) all of these
Ans:

5.Static friction is less than
(a) sliding friction (b) rolling friction
(c) both (a) and (b) (d) none of these
Ans:

WORKSHEET 3

SHORT ANSWER QUESTIONS

1.Suppose your writing desk is tilted a little. A book kept on it starts sliding down. Show the direction of frictional force acting on it.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

2. You spill a bucket of soapy water on a marble floor accidentally. Would it make it easier or more difficult for you to walk on the floor? Why?

…………………………………………………………………………………………………

…………………………………………………………………………………………………

3. Explain why sportsmen use shoes with spikes.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

4. Iqbal has to push a lighter box and Seema has to push a similar heavier box on the same floor. Who will have to apply a larger force and why?

…………………………………………………………………………………………………

…………………………………………………………………………………………………

5. Explain why objects moving in fluids must have special shapes.

…………………………………………………………………………………………………

…………………………………………………………………………………………………

THANK YOU

EXPLORING
KNOWLEDGE

St. Joseph College of Teacher Education for Women Ernakulam

SCIENCE IN EVERYDAY LIFE

Submitted by,

ANN SARA V ALIAS

SCIENCE IN EVERYDAY LIFE

CONTENTS

- Corrosion
- Capillary rise
- Newton’s third law of motion

Welcome..

1. CORROSION

CORROSION OF METALS

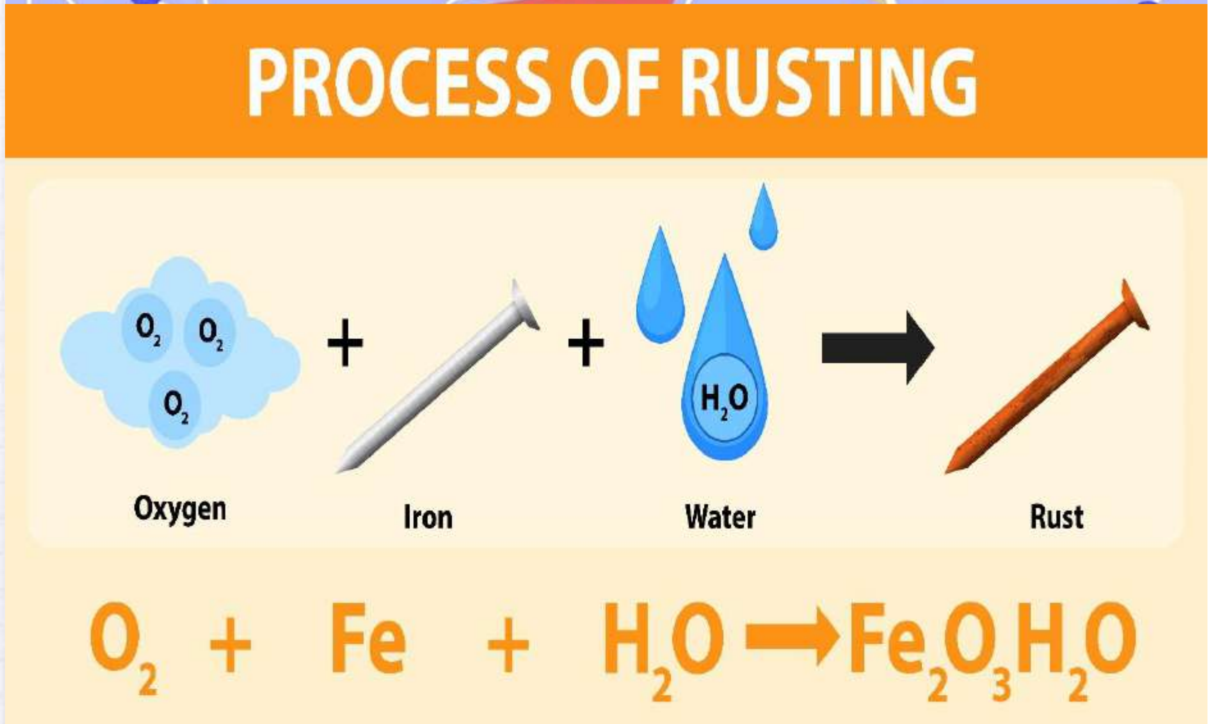
It is a natural process in which a metal is converted to a more chemically stable form, such as oxide, hydroxide, or sulphide which leads to the gradual destruction of the material.

Eg: 1) Rusting of iron

2) Green coating on copper

3) Blackening of silver

Let’s discover rusting in detail



Let’s do an experiment

Methods to prevent rusting

1) Painting

2) Adding oil or grease

3) Galvanizing

2. CAPILLARY RISE

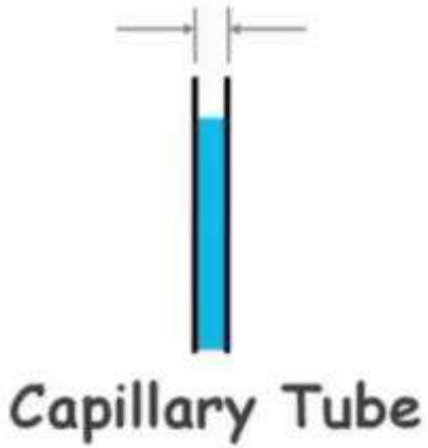
CAPILLARITY

The phenomenon in which liquid spontaneously rises or falls in a narrow space such as a thin tube or in the voids of porous materials.

Eg: Kerosene rising through wick, walls getting wet in rainy season, land ploughing in summer etc.

Have a look at the video

Have a look at the science behind it..



Points to be noted..

- Attraction between molecules of the same type is called cohesion
- Attraction between molecules of different type is called adhesion
- Capillary rise occurs when adhesive force is greater than the cohesive force
- When cohesive force is greater than adhesive force, capillary fall take place
- Capillary rise increases with decrease in diameter

3. NEWTON'S THIRD LAW OF MOTION

NEWTON'S THIRD LAW OF MOTION

- To every action, there is an equal and opposite reaction.
- Action and reaction are forces that are experienced on different objects at the same time.
- When two bodies interact, the force acting on one can be taken as ACTION and the opposite force acting on the second is the REACTION.

Take a look at this video

EXAMPLES

Launching of rockets

Gun firing

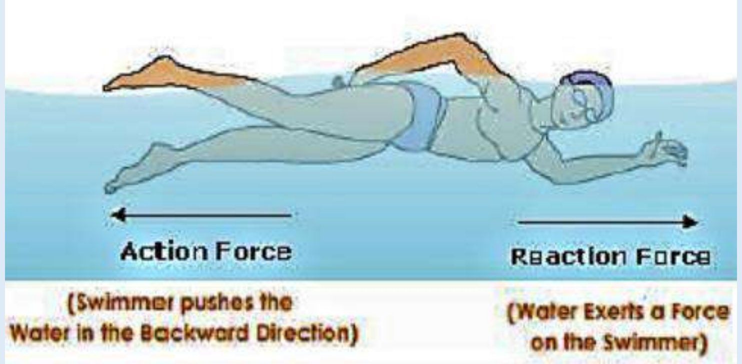
Walking

Let's summarize..

1. Corrosion

2. Capillary rise

3. Newton's third law of motion



THANK YOU !

CH₂
H₂O
H₂O
liquid
nitropen

E- FORMULA BOOK

ARUNIMA C.H
PHYSICAL SCIENCE


CREATED USING
POWTOON

Physics Formula Book Class 8^{th} and 9^{th}

Relative density of a substance

$$= \frac{density\ of\ sustance}{density\ of\ water}$$

Eg:

Relative density of a kerosene

$$= \frac{density\ of\ kerosene}{density\ of\ water} = \frac{810\ kg/m^3}{1000\ kg/m^3}$$

$$= .81$$

Displacement (s)

Total change in the position of the object along with the direction of motion

Formula

$$s = d_2 - d_1$$

d_1 =initial position
d_2 =final position

Velocity (u)

Displacement of a body in a unit time

Formula

$$\frac{displacement}{time}$$

$$= \mathrm{u} = \frac{s}{t}$$

s=displacement
u =velocity
t=time

Acceleration(a)

Acceleration is the rate of change of the velocity of an object with respect to time.

Formula

$$\boldsymbol{a} = \frac{\textbf{change in velocity}}{\textbf{time}}$$

$$\boldsymbol{a} = \frac{\boldsymbol{v-u}}{\boldsymbol{t}}$$

a=acceleration
u=initial velocity
v=final velocity

Pascal's Law

Pascal's law says that pressure applied to an enclosed fluid will be transmitted without a change in magnitude to every point of the fluid and the walls of the container. The pressure at any point in the fluid is equal in all directions .

Formula

$$F = PA$$

$$P = \frac{F}{A}$$

F=Force
P=Pressure
A=Area

Equations of motion

Equations of motion are equations that describe the behavior of a physical system in terms of its motion as a function of time. There are 3 equations of motion

Formula

$$v = u + at \ldots\ldots(1)$$

$$s = ut + \frac{1}{2}at^2 \ldots(2)$$

$$v^2 = u^2 + 2as..(3)$$

(1) Velocity – Time relation
(2) Position – Time relation
(3) Position – Velocity relation

Momentum(p)

Momentum is a characteristic property of moving objects. It is measured as the product of mass of the body and velocity

Formula

$$momentum = mass \times velocity$$

$$p = m \times v$$

Newton's Second Law of Motion

The rate of change of momentum of a Body is directly proportional to the Unbalanced external force acting on it .

Formula

$$F \propto \frac{m(v-u)}{t}$$

$$F \propto ma$$

$$F = kma$$

$$F = ma$$

k=1

F=force

v-u=a=acceleration

m=mass

t=time

Impulse

Impulsive force is a very large force
Acting for a very short time .

Formula

$$impulse = Force \times time$$
$$= F \times t$$
$$= m\frac{(v-u)}{t} \times t$$
$$= mv - mu$$
$$= change\ in\ final\ and\ initial\ momentum$$

This is called impulse – momentum principle

Newton's Third Law of Motion

To every action there is an equal and opposite reaction

Action and reaction are forces
If action is force applied by body A on Body B ………(F_{AB})
Then reaction is the force applied by Body B on body A………(F_{BA})

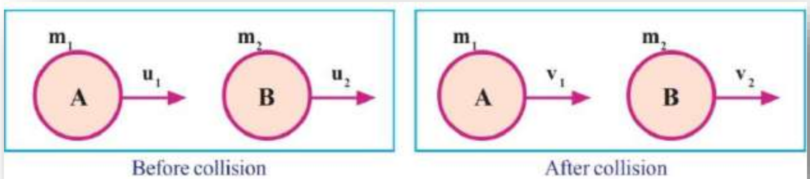
Formula

According to law

$$F_{AB} = -F_{BA}$$

Law of conservation of Momentum

In the absence of an external force , the Total momentum of a system is a Constant



Formula

$$\boldsymbol{F = \frac{m(v-u)}{t}}$$

$F_{AB} = m_1 \frac{(v_1 - u_1)}{t}$ $\quad$ $F_{BA} = m_2 \frac{(v_2 - u_2)}{t}$

According to third law of newton

$$F_{AB} = -F_{BA}$$

$$m_1 \frac{(v_1 - u_1)}{t} = -m_2 \frac{(v_2 - u_2)}{t}$$

$$m_1 v_1 - m_1 u_1 = m_2 v_2 - m_2 u_2$$

$$m_1 v_1 + m_1 v_1 = m_1 u_1 + m_2 u_2$$

Total momentum after collision is equal To total momentum before collision

$$m_1 v_1 + m_1 v_1 = m_1 u_1 + m_2 u_2$$

Centripetal force (F_c)and Centripetal acceleration (a_c)

The acceleration experienced by an object in a circular motion , along The radius , towards the centre of the circle , is known as centripetal acceleration . The force that creates a centripetal acceleration is called Centripetal force. Centripetal acceleration and centripetal force are directed towards the centre .

Formula

Centripetal force , (F_C) = $\frac{mv^2}{r}$

Centripetal acceleration , (a_c) = $\frac{v^2}{r}$

m=mass
v=velocity
r=radius of circle

Universal Law of Gravitation

All bodies in the universe attract each other. The force of mutual attraction between the two bodies is directly proportional to the product of their masses and inversely proportional to square of the distance between them.

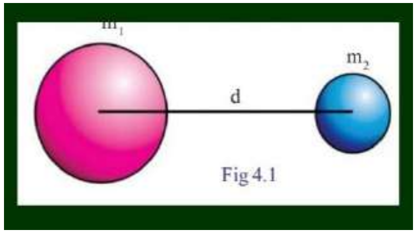


Fig 4.1

If two bodies of mass m_1 and m_2 are separated by a distance d
Then

Formula

$$F \propto m_1 m_2$$
$$F \propto \frac{1}{d^2}$$
$$F \propto \frac{m_1 m_2}{d^2}$$
$$F = G\frac{m_1 m_2}{d^2}$$

$G = gravitational\ constant$
$= 6.67 \times 10^{-11} Nm^2/Kg^2$

Orbital velocity

Orbital velocity is the velocity at which a planet revolves around the other Sun Through the orbit

Formula

$$v = \frac{2\pi r}{T}$$

$2\pi r = circumference\ of\ orbit$
T = Time = Orbital period

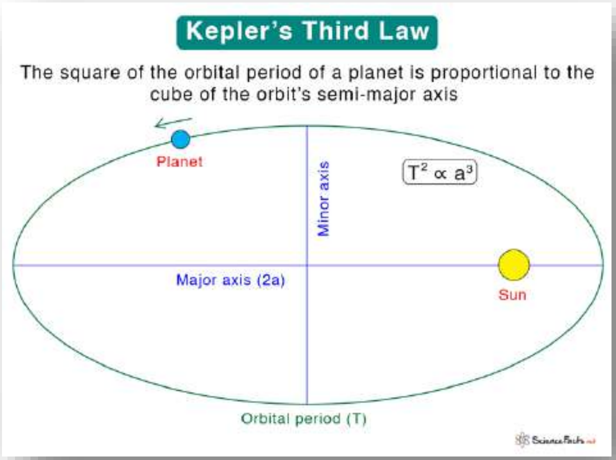
Kepler's Third Law

The cube of mean distance (r) of a Planet from the Sun is directly proportional to the square of its orbital period (T)

Formula

$$r^3 \propto T^2$$

$$ie.\ \frac{r^3}{T^2} = constant$$



Force of gravity

If mass of earth is M , R its radius and m the mass of an object placed on the earth , then attractive force between them is

Formula

$$F = G\frac{Mm}{R^2}$$

Acceleration due to gravity (g)

Objects are accelerated towards the earth due to the force of attraction of earth . This acceleration is known as acceleration due to gravity

Formula

$$F = G\frac{Mm}{R^2}$$

$$mg = G\frac{Mm}{R^2}$$

$$g = G\frac{M}{R^2}$$

$$g = \frac{6.7 \times 10^{-11} Nm^2 kg^{-2} \times 6 \times 10^{24} kg}{(6.4 \times 10^6)^2}$$

$$= 9.8\frac{m}{s^2}$$

mg = weight of the body

Work

If a force of 'F' newton is applied continuously on a body and the undergoes a displacement of 's' metre in the direction of the force, then the work done by the applied Force is

Formula

$$W = F\,s$$

When a body is raised to a height h , the work done against the gravitational force is

Formula

$$W = mgh$$

m=mass
h=height
g=acceleration due to gravity
F=force
s=displacement
W=work done

Force

when a body tends to modify or change the state by an external cause, it is called Force

Formula

$$F = m \times a$$

m=mass
a=acceleration

Density

Mass per unit volume of a substance

Formula

$$Density = \frac{mass}{valume}$$

Speed

Distance travelled in unit time

Formula

$$Speed = \frac{distance}{time}$$

Average Speed

Formula

$$Average\ speed = \frac{total\ distance\ travelled}{time\ taken\ to\ travel\ the\ distance}$$

Energy

Energy is the capacity to do work

Kinetic Energy(K)

The energy possessed by a body by virtue of its motion

Formula

$$K = \frac{1}{2}mv^2$$

$$K = \frac{1}{2}\frac{m^2v^2}{m}$$

$$K = \frac{1}{2}\frac{P^2}{m}$$

P=momentum=mv
m=mass
v=velocity

Work Energy Principle

Workdone =Change in Kinetic Energy

Formula

$$W = \frac{1}{2}mv^2 - \frac{1}{2}mu^2$$

u=initial velocity
v=final velocity

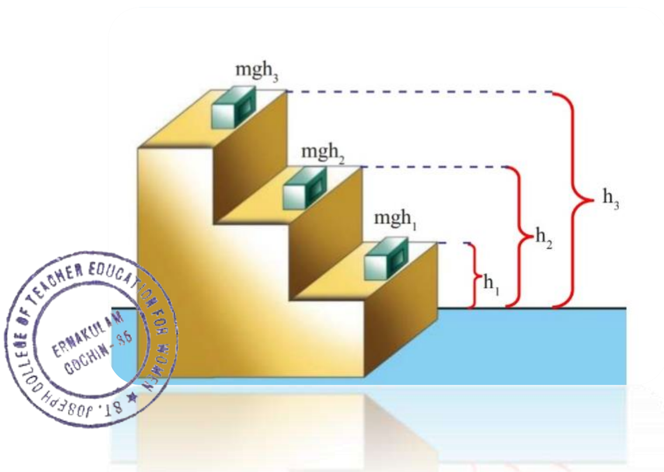
Potential Energy(U)

Energy possessed by a body by virtue of its position .

Formula

$$U = mgh$$

m= mass
g = acceleration due to gravity
h= height



Power

Workdone per unit time or rate of doing work is power

Formula

$$Power = \frac{work}{time}$$

$$P = \frac{W}{t}$$

Electric Current

It is the flow of electric charges

Formula

$$I = \frac{Quantity\ of\ charge}{Time\ taken}$$

$$I = \frac{Q}{t}$$

Q = quantity of charge
t = time taken

Ohm's Law

When temperature remains constant, the current through a conductor is directly proportional to the potential difference between its ends . In other words the ratio of potential difference to the current is a constant

Formula

$$V \propto I$$

$$\frac{V}{I} = a\ constant$$

$\frac{V}{I} = R =$ Resistance (Ω (*spelled as ohm*))

Resistance is the measure of opposition to current flow in an electric circuit

V = Potential difference
I = Electric current

Resistivity (ρ)

Resistivity of a substance is the resistance of the conductor of unit length and unit area of cross-section. The resistivity of a substance is a constant at a fixed temperature . But it will be different for different materials.

Resistance of a conductor increases with increase in length (l) of the conductor and decreases with increase in the area of cross-section(A)

Formula

$$R \propto l$$

$$R \propto \frac{1}{\mathrm{A}}$$

$$R = constant \times \frac{l}{A}$$

$$R = \rho \times \frac{l}{A}$$

$$\rho = \frac{RA}{l}$$

$$at\ A = 1\ and\ l = 1$$

$$\rho = R$$

Conductivity(σ)

The conductivity of a conductor is the reciprocal of its resistivity .

Formula

$$\sigma = \frac{1}{\rho}$$

Period(T)

Period of a wave is the time taken
For a particle in a medium to make
One complete vibration.

Frequency(f)

Frequency is the number of vibrations
In one second.

Formula

$$f = \frac{1}{T}$$

Wave Length(λ)

Wave length is the distance travelled by
a wave in a time of one period(T)

Speed of a Wave(v)

Speed of a wave is the distance travelled by the wave in one second.

Formula

$$v = \frac{\lambda}{T}$$

$$= \frac{1}{T} \times \lambda$$

$$= f\lambda$$

Pressure(P)

The total normal force experienced by a surface is thrust

Thrust per unit area is pressure

Formula

$$Pressure = \frac{Thrust}{Area}$$

$$P = \frac{F}{A}$$

Focal Length(f)

Distance from pole of a mirror to its principal focus is the focal length

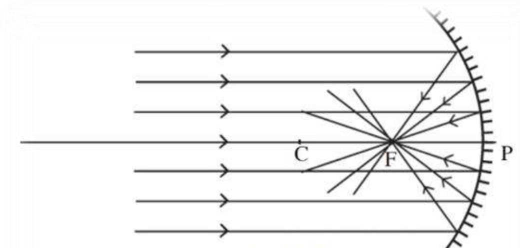


Fig. 18.5

In the above figure it is PF

PF $= f$

For spherical mirror

$$f = \frac{radius\ of\ curvature}{2}$$

$$f = \frac{R}{2}$$

Magnification(m)

It is the ration of height of the image to height of the object .

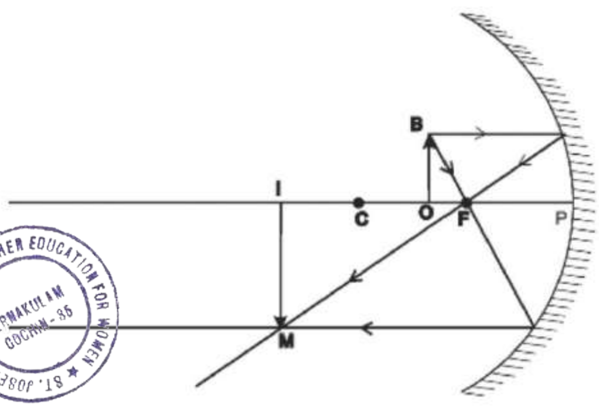
It is the number that indicates how many times the size of the object is the size of the image .

Formula

$$m = \frac{height\ of\ image}{height\ of\ object}$$

$$m = \frac{IM}{OB}$$

$$m = \frac{h_I}{h_O}$$



CHEMISTRY FORMULA BOOK CLASS 8TH AND 9TH

Symbols of all elements in periodic table

Name of the Element	Symbol of the Element	Atomic Number
Hydrogen	H	1
Helium	He	2
Lithium	Li	3
Beryllium	Be	4
Boron	B	5
Carbon	C	6
Nitrogen	N	7
Oxygen	O	8
Fluorine	F	9
Neon	Ne	10
Sodium	Na	11
Magnesium	Mg	12
Aluminium	Al	13
Silicon	Si	14
Phosphorus	P	15
Sulfur	S	16
Chlorine	Cl	17
Argon	Ar	18
Potassium	K	19
Calcium	Ca	20
Scandium	Sc	21
Titanium	Ti	22
Vanadium	V	23
Chromium	Cr	24
Manganese	Mn	25
Iron	Fe	26
Cobalt	Co	27
Nickel	Ni	28
Copper	Cu	29
Zinc	Zn	30
Gallium	Ga	31
Germanium	Ge	32
Arsenic	As	33
Selenium	Se	34
Bromine	Br	35
Krypton	Kr	36
Rubidium	Rb	37
Strontium	Sr	38
Yttrium	Y	39
Zirconium	Zr	40
Niobium	Nb	41
Molybdenum	Mo	42
Technetium	Tc	43
Ruthenium	Ru	44
Rhodium	Rh	45
Palladium	Pd	46
Silver	Ag	47
Cadmium	Cd	48
Indium	In	49
Tin	Sn	50
Antimony	Sb	51
Tellurium	Te	52
Iodine	I	53
Xenon	Xe	54
Cesium	Cs	55
Barium	Ba	56
Lanthanum	La	57
Cerium	Ce	58
Praseodymium	Pr	59
Neodymium	Nd	60
Promethium	Pm	61
Samarium	Sm	62
Europium	Eu	63
Gadolinium	Gd	64
Terbium	Tb	65
Dysprosium	Dy	66
Holmium	Ho	67
Erbium	Er	68
Thulium	Tm	69
Ytterbium	Yb	70
Lutetium	Lu	71
Hafnium	Hf	72
Tantalum	Ta	73
Tungsten	W	74
Rhenium	Re	75
Osmium	Os	76
Iridium	Ir	77
Platinum	Pt	78
Gold	Au	79
Mercury	Hg	80

Thallium	Tl	81
Lead	Pb	82
Bismuth	Bi	83
Polonium	Po	84
Astatine	At	85
Radon	Rn	86
Francium	Fr	87
Radium	Ra	88
Actinium	Ac	89
Thorium	Th	90
Protactinium	Pa	91
Uranium	U	92
Neptunium	Np	93
Plutonium	Pu	94
Americium	Am	95
Curium	Cm	96
Berkelium	Bk	97
Californium	Cf	98
Einsteinium	Es	99
Fermium	Fm	100
Mendelevium	Md	101
Nobelium	No	102
Lawrencium	Lr	103
Rutherfordium	Rf	104
Dubnium	Db	105
Seaborgium	Sg	106
Bohrium	Bh	107
Hassium	Hs	108
Meitnerium	Mt	109
Darmstadtium	Ds	110
Roentgenium	Rg	111
Copernicium	Cn	112
Nihonium	Nh	113
Flerovium	Fl	114
Moscovium	Mc	115
Livermorium	Lv	116
Tennessine	Ts	117
Oganesson	Og	118

Maximum number of electrons that can be accommodated in a given shell of an atom

Formula

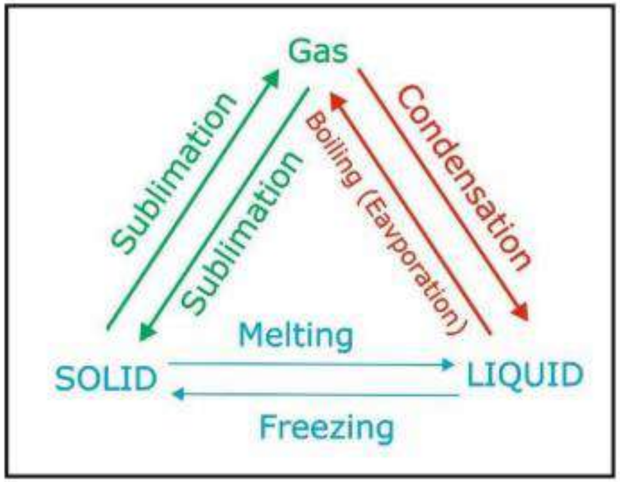
$$2n^2$$

Shell name	Shell number (n)	Number of electrons ($2n^2$)
K	1	2
L	2	8
M	3	18

Etc….

n = shell number

Change of state



Some common chemical formulas

$NaCl$	Sodium chloride
H_2O	Water
$C_6H_{12}O_6$	Glucose
C_2H_6O	Alcohol
$CaSO_4$	Sulfate Group
H_2S	Hydrogen Sulfide
$NaCl$	Salt
O_2	Oxygen
C_2H_6O	Ethanol
$C_9H_8O_4$	Aspirin
HCl	Hydrochloric Acid
$Zn(NO_3)_2$	Zinc
CO	Carbon Monoxide
$NaOH$	Sodium Hydroxide
$NaCN$	Sodium Cyanide
$Ca(CN)_2$	Calcium Cyanide

$C_2H_4O_2$	Vinegar
NH_3	Ammonia
MgCl2	Magnesium Chloride
$C_2H_4O_2$	Acetic Acid
C_4H_{10}	Butane
NO_3^-	Nitrate
CuO	Copper Oxide
N_2	Nitrogen
CO_2	Carbon Dioxide
H_2SO_4	Sulfuric Acid
CH_4	Methane
$C_{12}H_{22}O_{11}$	Sucrose
C_3H_8	Propane
$NaHCO_3$	Baking Soda
$LiCl$	Lithium chloride
F_2	Fluoride
H_2O_2	Peroxide
$C_8H_{10}N_4O_2$	Caffeine
$NaCl$	Sodium Chloride

Some common acids

Name	Chemical formula
Hydrochloric acid	HCl
Nitric acid	HNO_3
Phosphoric acid	H_3PO_4
Sulfuric acid	H_2SO_4
Acetic acid	CH_3COOH

Some common bases

Name	Chemical formula
Calcium hydroxide	$Ca(OH)_2$
Sodium hydroxide	$NaOH$
Sodium hydrogen carbonate	$NaHCO_3$
Magnesium hydroxide	$Mg(OH)_2$
Ammonia	NH_3

Some common salts

Chemical name	Common name	Chemical formula
Calcium oxychloride	Bleaching powder	$CaOCl_2$
Sodium carbonate decahydrate	Washing soda	$Na_2CO_3.10H_2O$
Sodium hydrogen carbonate	Baking soda	$NaHCO_3$
Sodium Chloride	Common salt	$NaCl$

HOPE YOU ALL ENJOYED LEARNING

ALICE JOSEPH

Digitally signed by ALICE JOSEPH
Date: 2024.02.02 21:33:33 +05'30'

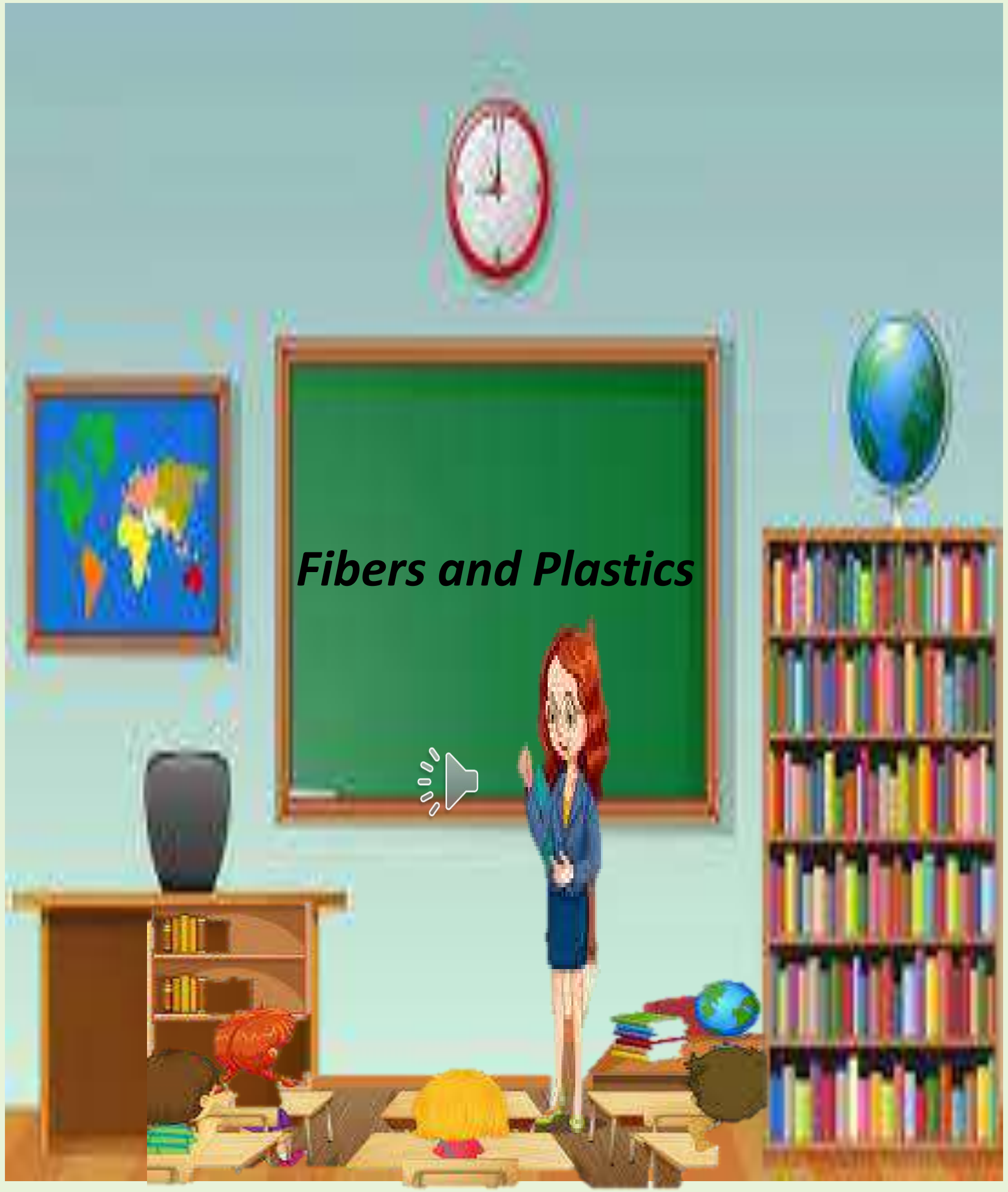
ST. JOSEPH COLLEGE OF TEACHER EDUCATION FOR WOMEN ERNAKULAM

DIYA N C
PHYSICAL SCIENCE

GUIDE BOOK

SUBMITTED BY
DIYA N C
FIRST YEAR PHYSICAL SCIENCE

Let Us Start……………



Defnition:-

POLYMER

They are macromolecules formed by the combination of large number of simple molecules(monomers).

Natural Fibers

They are naturally occurring fibers that humans derive from plants or animals

Synthetic Fibers

Fibres that are made or created by humans are Known as synthetic fibres

Plastics

Plastics are polymers having properties different from those of fibers .These are substances that changed the very face of human life .

plastics are synthetic polymers.Diferent types of plastics are used for manufacturing a number of products from household utensils to artificial heart valves.

Thermoplastics

Plastics, which gets deformed easily on heating and can be bent easily are known as Thermoplastics.

Thermosetting plastics

Plastics, which when moulded once, can not be softened by heating.

Biodegradable and Non-Biodegradable Materials

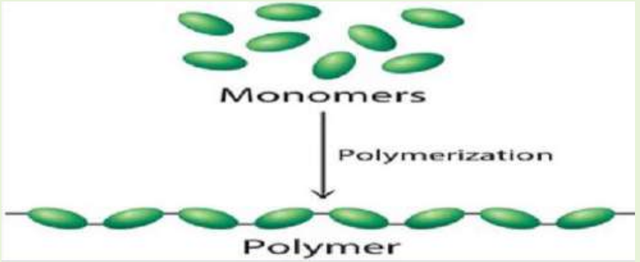
A material that decomposes through natur process is biodegradable .
Materials that are not easily decomposed by natural processes is termed as non-biodegradable.

Environmental Effects on plastic

Plastic takes several years to decompose, it is not environmental friendly.It cause pollution.
The burning process in the synthetic material is quite slow and it does not get completely burnt easily. And it releases lots of poisonous fumes into the atmosphere causing air pollution in the process.

Experiments And Examples:-

Polymers (eg):- ***Molecules like glucose and aminoacids are monomers . Starch and protein are respectively the polymers formed from them.***



Thermoplastic and Thermosetting plastic (exp):-

Natural and Synthetic Fibers (eg):-

Questions and Answer:-

- *Polymers are macromolecules formed by the combination of many monomers.*
  a) How are polymers classified?
  b) Classify the following?
  Cotton,Wool,Nylon,Silk, Terylene, Jute, Polyester

a) On the basis of its formation as natural and manmade.
On the basis of structure as linear, branched chain, cross linked chain.
On the basis of process as addition polymer and condensation polymer.
On the basis of molecular strength as fibers and plastics.
b) Natural:- Cotton, Wool, Silk, Jute.
Man made :- Nylon, Terylene, Polyester.

❑ Some monomers and polymers are given in the following table

MONOMER	POLYMER
Ethene	polyethene
Propene	polypropene
Styrene	polystyrene
Vinyl Chloride	Poly Vinyl Chloride

a) What is meant by the terms monomer and polymer?

b) What is the common system of nomenclature of polymers? Analyse the table and find out.

a) Monomer- A Simple molecule with a definite structure.

Polymer- Large molecule formed by the combination of many monomers

b) Add the prefix 'poly' to monomer molecule.

❑ Natural fibers and synthetic fibers are used in the field of textile manufacturing.

a) Compare their merits and demerits and tabulate.

b) Which of these clothes is most suited for the following situations? Give reason.

i. While cooking in the kitchen

ii. To wear during summer

MERITS	DEMERITS
Comfortable to wear	Less available
Natural	Costly
Suitable for any climate	Colour fades
Organic decomposition take place	Not long lasting
It will not harm the body	Forms reases easily

b) Clothes using natural fibers

i) Does not catch fire.

ii) More air circulation , absorbs the sweat.

❑ You known what thermoplastic and thermosetting plastics are.

a) Which of these plastics cannot be recycled?

b) You might have noticed that those who collect old plastics do not accept certain type of plastic articles . What are they? What may be the reason for this?

a) Thermosetting plastic.

b) Thermosetting plastic- because they cannot be recycled.

- Some argue that plastics are to be completely banned as they cause environmental pollution .what is your view?

Without plastic ,we cannot manage daily life. Control the use of plastic , avoid disposable plastic products and use thermoplastic materials.

- The School science club has decided to conduct a propaganda for creating awareness about pollution due to plastics . Prepare some posters for this.

i)Avoid disposable plastic products use glass, ceramic utensils or natural substances

ii) Don't dump plastic materials in soil.

iii)Use paper or natural materials for decorations.

- What suggestions can you propose to relies the concept of 'plastic waste – free school'? List your findings.

Let us practice 4R's to reduce the use of plastics to the maximum extent as well as to avoid the pollution caused by plastic.

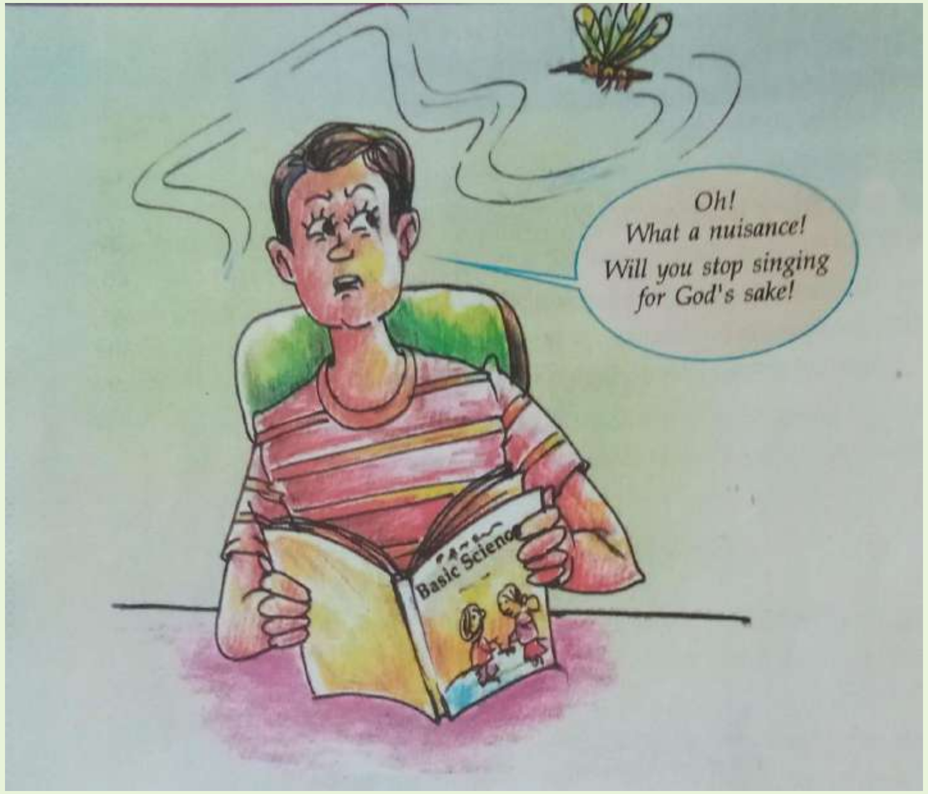
Reduce-plastics

Reuse – plastics

Refuse – plastics

Recycle –plastics

…………………………………


Oh!
What a nuisance!
Will you stop singing
for God's sake!
Basic Science

SOUND

Sound:-

Sound is a form of energy is familiar to us and necessary for communication .
To experience three components are essential: Source of sound, medium and the ear.

Source of sound:-

The sources that produces sound is called sources of sound . we can classify the sources of sound into Two:- Natural Source of sound and manmade sources of sound
Sound is produced by the vibration of object. The object produces sound is called the source of sound.

Natural frequency :-

When a body is set into vibration it vibrates with particular frequency of its own this frequency is called natural frequency.

Pitch and Loudness:-

The sharpness of sound heard is called pitch and it depends on frequency of sound.
Loudness is the measure of audibility of a person and this depends mainly on frequency of sound and the sensory ability of the ear.

Propagation of sound :-

A medium is necessary for sound to propagate. Sound is propagated not only through air but also through other substances . Loss of hearing is a disability of ear. The people having damage to ear by birth effect many difficulties for communication, for ability to speak etc.

Limit of audibility:-

We cannot hear sound of all frequencies. We can hear the sound of frequency less than 20Hz and 20000Hz. Sounds with frequency less than 20Hz are called infrasonic and that greater than 20000Hz are called ultrasonic. Ultrasonic sounds are used in instrument sonar and in medical field.

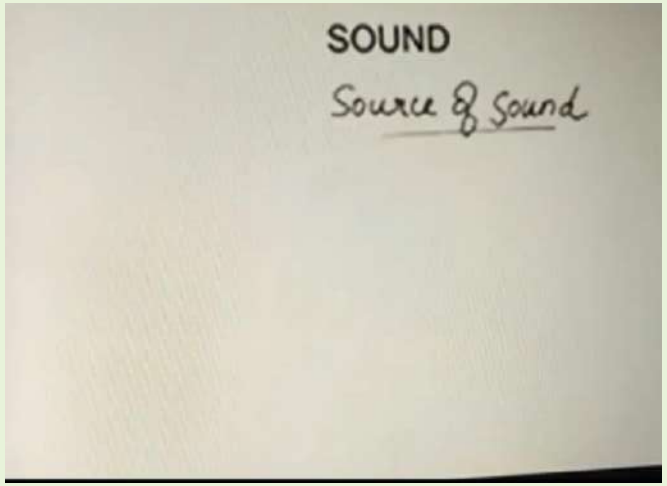
Noise pollution:-

Noise effects not only ear but mental, emotional level and physical problems. Reduce the use of air horns , use silencers in vehicles, planting tress etc

Are some ways to reduce noise pollution.

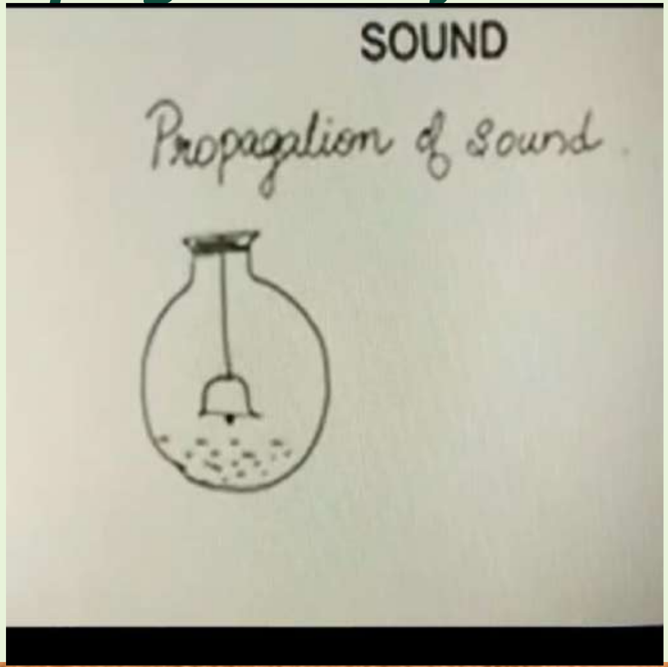
Experiments and examples:-

Source of sound :



Natural frequency:

Propagation of sound:



For easy learning

1)The sharpness of sound is………….

Pitch

2) What are the characterstics of sound.

loudness,pitch

3)What is loudness?

It is the sensation of hearing on human being.

4) What is the range of audibility of human beings?

20Hz to 20kHz

5) What are infrasonic and ultrasonics?

Sound of frequency less than 20Hz is infrasonics

Sound of frequency higher than 20 kHz is ultrasonics.

6) Due to the vibration of ……………in flute , Sound is produced.

Air

7) Loudness is measured in …………….unit

Decibell

Questions:-

1) If a turning fork vibrates 480 times in one seconds , what would be its natural frequency ?

Natural frequency-480Hz

2) If a simple pendulum oscillates 10 times in 10 second, what would be its frequency?

Frequency, $f = n/t = 10/10 = 1$ Hz.

3) What are the factors influence natural frequency of a body?

Length , surface area , area of cross section , tension and nature of the material.

4) The frequency of certain turning forks are given below. Find out which among these have the highest and the smallest pitches.

(256 Hz , 512 Hz , 480 Hz, 288 Hz)

Highest pitch : 512 Hz ,Lowest pitch : 256 Hz

5) In the source of sound given below , vibration in which produce main part produces sound?

a. Chenda b. flute c. vocal cord

b. Chenda – diaphragm b. flute – air c. vocal cord – larynx

6) Design an activity to prove that sound can be propagated even through solid substances.

Using a string and trays of matchboxes , a toyphone can be made.

7) ‘ Bats can catch prey even in the dark ‘. Do you agree with this statement? Explain your inference.

Agree with this statement.

Bats produce ultrasonic waves while flying. By analyzing the waves reflected from the obstacles, it can easily catch its prey.

8) How do human beings contribute to noise pollution ?

Sound of vehicles , sound of air horn , loud speaker , Fire works etc. are contributed by human beings and the cause sound pollution.

9) Which unit represents loudness?

(Hz , m/s ,dB , W)

dB

…………………………..

Thank you……

ALICE JOSEPH

Digitally signed by ALICE JOSEPH
Date: 2024.02.02 21:35:03 +05'30'

PROJECT BOOK

SUBMITTED BY
ANILA SHAJU
FIRST YEAR B.Ed.
PHYSICAL SCIENCE

ST JOSEPH COLLEGE OF TEACHER EDUCATION FOR WOMEN, ERNAKULAM

PROJECT BOOK

ANILA SHAJU
FIRST YEAR B.Ed. PHYSICAL SCIENCE

CERTIFICATE

This is to certify that “(student name)” student of class -10 has successfully completed his physics project on (topic) Under the guidance of Mr/Ms_________________

Internal Examiner External Examiner

ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my physics teacher "--------" for their able guidance and support in completing my project.

I would also like to extend my gratitude to the Principal Sir"--------------" for providing me all the facility that was required.

Date :

Student Name

preface

I am presenting a project on the topic "------------------- "in subject physics.

I tried my best to make this project wonderful.

I hope u like the project.

INDEX

LIST OF TABLES

LIST OF FIGURE

PHYSICS PROJECT

OHM’S LAW

INTRODUCTION

Ohm's law is one of the most popular and important laws that help us define the relationship between voltage, current and resistance. The law was first established by a German physicist named Georg Simon Ohm and was the most important theory that described the quantitative characteristics of the physics of electricity.

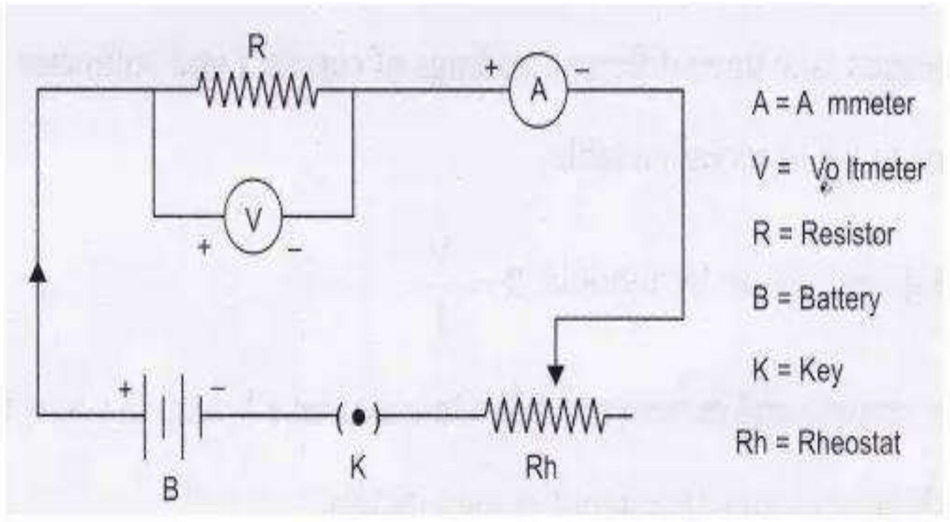
Ohm's law can be also be considered as an empirical law. It can be used in developing conclusions or in reasoning while conducting many experiments especially in showing that current for some materials is approximately proportional to the electric field.

NEED AND SIGNIFICANCE

Ohm's Law is identified as V = I x R, where V is the voltage, I is the current and R is the resistance (in Ohms). The formula may be shown as I = V / R and R = V / I.

Provided that the resistance and current, can determine voltage very easily using the formulation V = I x R. It is seen from the equation that if either the current or the resistance is raised in a circuit (while the other is unchanged), the voltage will also have to increase.

CIRCUIT DIAGRAM



EXPERIMENT DESIGNING

AIM

To study the dependence of potential difference (V) across a resistor on the current (I) passing through it and determine its resistance. Also plot a graph between V and I**.**

THEORY

Ohm's Law: The potential difference, V across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it, provided its temperature is the same. This is Ohm's law.

$V \propto I$

.'. $V = IR$, (Here R = Constant for the given metallic wire)

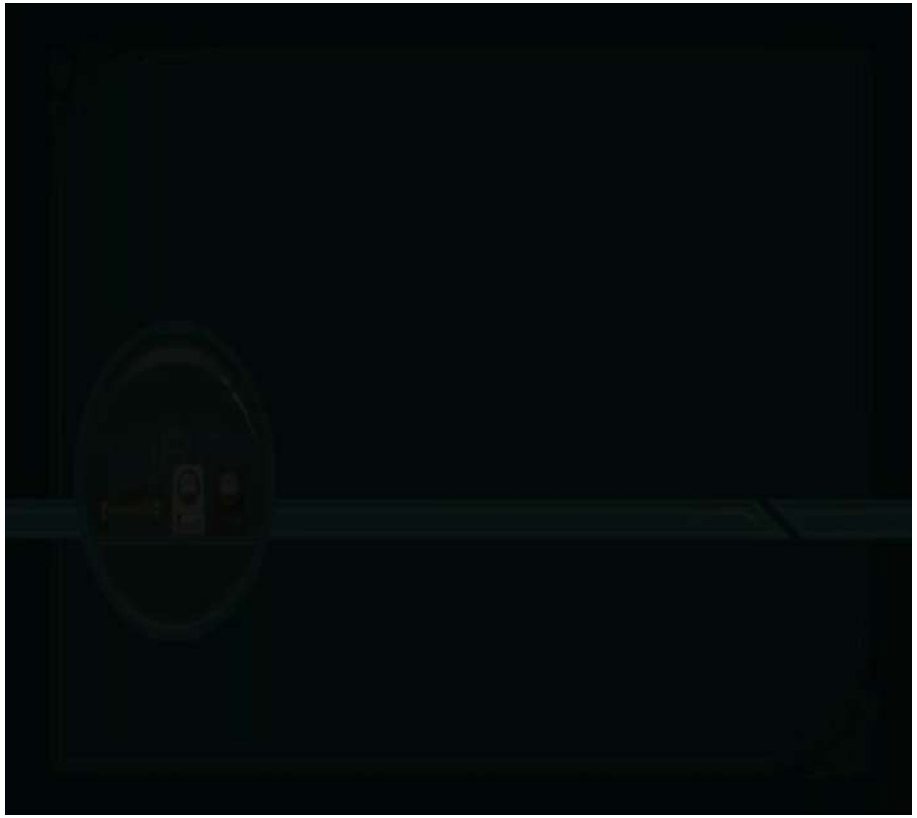
- The SI unit of resistance is Ohm (Ω).
- $R=V/I$
- **One Ohm:** If the potential difference across the ends of a conductor is 1 volt and the current flowing through it is 1 ampere, then the resistance of the conductor R is 1 ohm.

- **One Ohm:** If the potential difference across the ends of a conductor is 1 volt and the current flowing through it is 1 ampere, then the resistance of the conductor R is 1 ohm

$$1 \text{ Ohm} = \frac{1 \text{ Volt}}{1 \text{ Ampere}}$$

HYPOTHESIS

The higher the voltage, then the higher current, meaning that the voltage is directly proportional to the current



MATERIAL REQUIRED

- A battery,
- An insulated copper wire (cut into 10 pieces)
- A key
- An ammeter
- A voltmeter
- A rheostat
- A resistor
- A piece of sand paper.

PROCEDURE

1) Keep the devices as shown in the circuit diagram.
2) Connect them with the connecting wires and keep the key open.
3) Positive terminal of the battery is connected to the positive terminal of the ammeter.
4) Check the +ve and -ve terminals of voltmeter before connecting it in the circuit.
5) Once the circuit is connected, insert the key and check the rheostat, adjust its slider and see whether the ammeter and voltmeter readings are shown.
6) By using the slider of rheostat take three different readings of current 1 and voltmeter V.
7) Record your observations in the observation table.
8) Calculate resistance of a given resistor by formula R=V/I.
9) Plot a graph of voltmeter reading and current reading. On x axis take V and on y axis take I.
10) Resistance increases with increase in temperature of pure metals.

OBSERVATION AND CALCULATION

A. Least count of ammeter and voltmeter

S. No.		Ammeter (A)	Voltmeter (V)
1.	Range	0 – 0.5 A	0-0.1 V
2.	Least Count	0.01 A	0.01 V
3.	Zero Error (e)	0	0
4.	Zero Correction	0	0

PRECAUTIONS

1. The connecting wires should be thick copper wires and the insulation of their ends should be removed using the sand paper.

2. Connections should be tight otherwise some external resistance may introduce in the circuit.

3. Connections should be made as per the circuit. Before closing the circuit show the connections to the teacher to take the readings.

4. The ammeter should be connected in series with the resister such that the current enters at the positive terminal and leaves at the negative terminal of the ammeter.

B. For reading of ammeter and voltmeter

S. No.	Current in Ampere (I) (Ammeter Reading)		Potential difference in Volts (V) (Voltmeter Reading)		Resistance in Ohms R = V/I(Ω)
	Observed	Corrected	Observed	Corrected	
1.	0	0.02	0	0.04	R_1 =2 Ω
2.	0	0.03	0	0.06	R_2 = 2 Ω
3.	0	0.04	0	0.08	R_3 = 2Ω

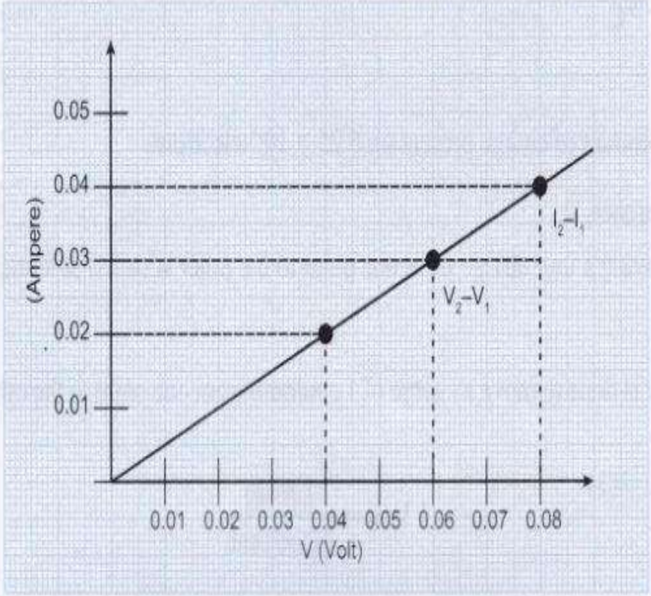
5. Voltmeter should always be connected in parallel to resistor.

6. Calculate the least count of voltmeter and ammeter correctly.

7. The pointers of the ammeter and voltmeter should be at zero mark when no current flows through the circuit.

8. Current should be passed through the circuit for a short time while taking observations; otherwise current would cause unnecessary heating in the circuit. Heating may change the resistance of resisters.

$$\therefore \text{ Mean value of R} = \frac{R_1 + R_2 + R_3}{3} = \frac{2+2+2}{3} = 2\Omega$$



Graph between current and voltage

RESULT

1.The value of R is found to be same and constant in all three readings.

2.The resistance of a resistor is ratio of potential difference V and current I.

3.The graph of V and I is a straight line. This shows that V∝I. This verifies Ohm's law.

BIBLIOGRAPHY

1)https://en.wikipedia.org/wiki/Ohm's_law

2)https://www.toppr.com/guides/physics/electricity/ohms-law-and-resistan

CHEMISTRY PROJECT

BOILING POINT OF WATER

INTRODUCTION

Water can boil, raise temperature or decrease air pressure, in two ways. At sea level, it is the pressure of air that causes water to boil at 100oC. Water can boil at a much lower temperature in vacuum, where there's no air. That is, if not for the skin that keeps the blood pressurized, body temperature would be sufficient to cause the blood to boil with water. At low air pressure the water boils significantly below 100 **oC** at temperatures.

The boiling point of water is the temperature at which the liquid water vapor pressure is equal to the pressure surrounding the body, and the body transforms into a vapour. The boiling point is the temperature for a particular liquid to boil at

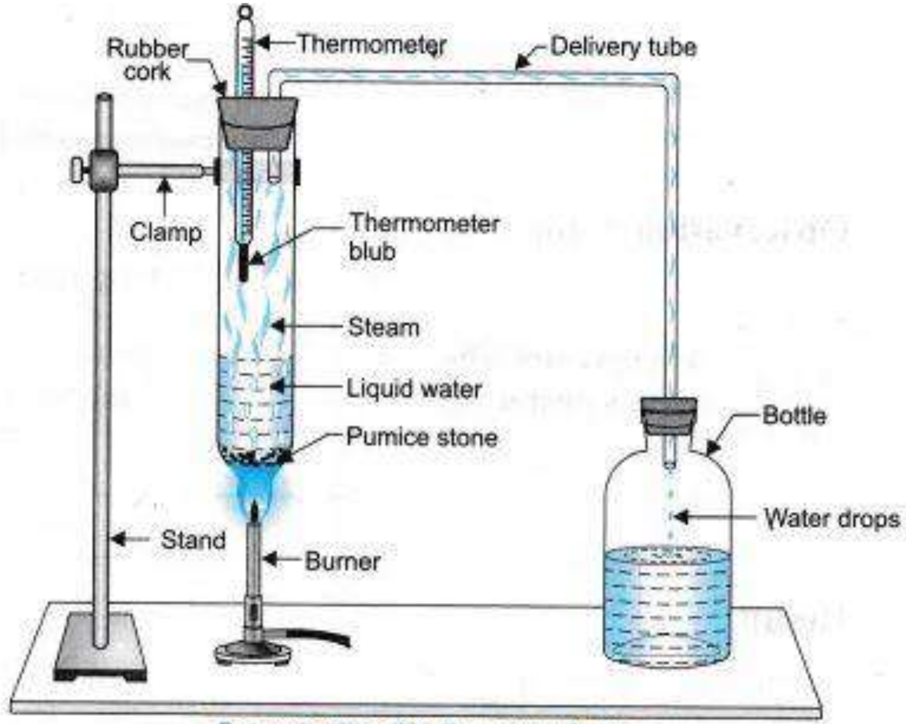
NEED AND SIGNIFICANCE

The boiling point of a liquid depends on temperature, atmospheric pressure, and the vapor pressure of the liquid. When the atmospheric pressure is equal to the vapor pressure of the liquid, boiling will begin.

The boiling point is the temperature at which a material changes from a liquid to a gas (boils)

knowing melting and boiling points for substances can aid in production, manipulation, molding, and setting of products. It can also be useful in knowing safety information.

EXPERIMENTAL SETUP



Determination of boiling point of water.

EXPERIMENT SETUP

AIM

To determine the boiling point of water.

Theory

1. **Boiling Point:** The temperature at which the liquid boils and changes into gaseous state at the atmospheric pressure is called boiling point. For example, water boils at 100°C to form water vapour (at 76 cm pressure).

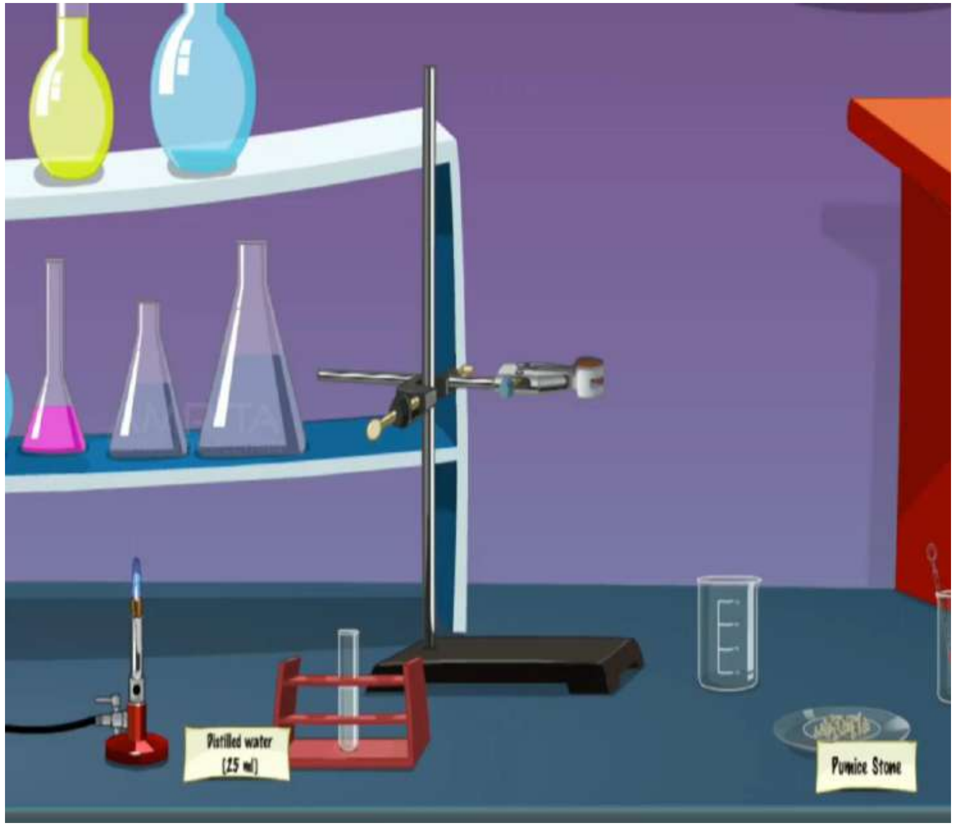
2. **Latent Heat of Vaporisation:** The heat energy absorbed by water when it changed its phase to steam, this hidden heat is called latent heat of vaporisation

HYPOTHESIS

If the salt concentration increases then the boiling point of water will increase

MATERIAL REQUIRED

1) Delivery tube
2) Thermometer
3) Pieces of pumice stone
4) Burner
5) Rubber cork with two bores
6) Boiling tube
7) Distilled water
8) 250ml beaker
9) Iron stand with clump



PROCEDURE

1.Take 25-30 ml of water in a boiling tube and add few pumice stones to it.

2.Clamp the boiling tube on iron stand with two holed cork, in one hole fix the thermometer and in the other one fix the delivery tube.

3.Place the thermometer above the water in the flask as shown in the figure and record its temperature.

4.Place a burner under the boiling tube.

5.Read the temperature and record it in the given observation table till the water boils. Record the reading after the time interval of 1 minute.

OBSEVATION

S.No	Temperature when water start boiling(t1°C)	Temperature when water continues to boil till constant(t2°C)	Boiling point of water(t1+t2)/2°C
1	99.8	100	99.9
2	100	100	100

PRECAUTIONS

- Choose a better quality thermometer whose graduated scale is clearly readable.
- Record the temperature in whole numbers.
- While reading the thermometer the eye level should be parallel with mercury level.
- Dip only the bulb of thermometer into water/ice.
- Thermometer should not touch the walls of beaker or boiling tube.

Result

1.Boiling Point of water is 100 °C.

2.Once the boiling point is attained the temperature reading on thermometer does not change for sometime.

BIBLIOGRAPHY

1. Boiling Point. Wikipedia. On-line. December 14, 2013. http://en.wikipedia.org/wiki/Boiling_point
2. Chemical Interactions: Prentice Hall Science Explorer. Needham, Massachusetts. Pearson Education Inc. 2005.

THANK YOU

ST.JOSEPH COLLEGE OF TEACHER EDUCATION
FOR WOMEN, ERNAKULAM

SUBMITTED BY

TREESA TANIYA P A

PHYSICAL SCIENCE

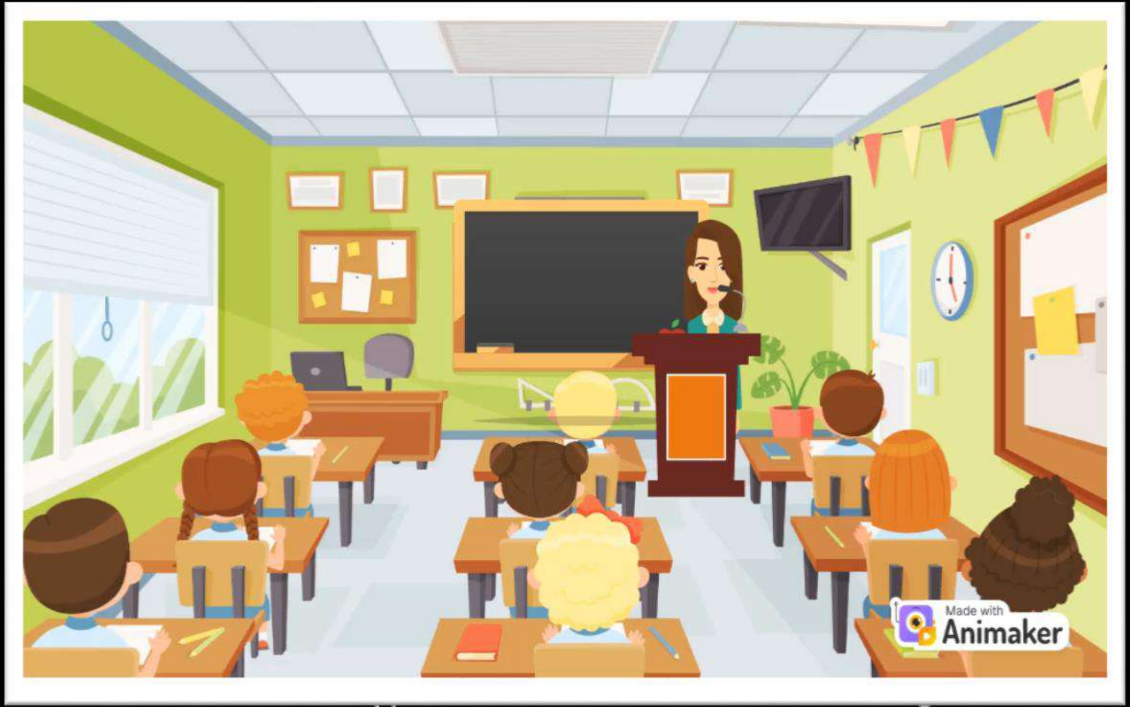
E- CONTENT

CLASS VIII

CHEMISTRY

UNIT 17- FIBRES AND PLASTICS

PLASTICS

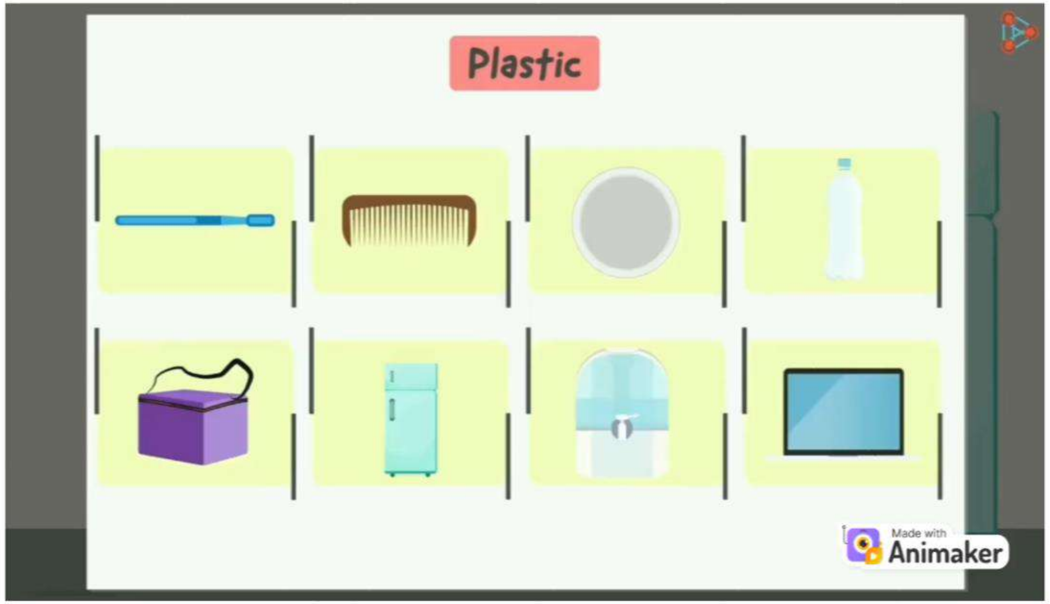


What are plastics?

Plastics are polymers having properties different from those of fibers. Plastics are synthetic polymers.

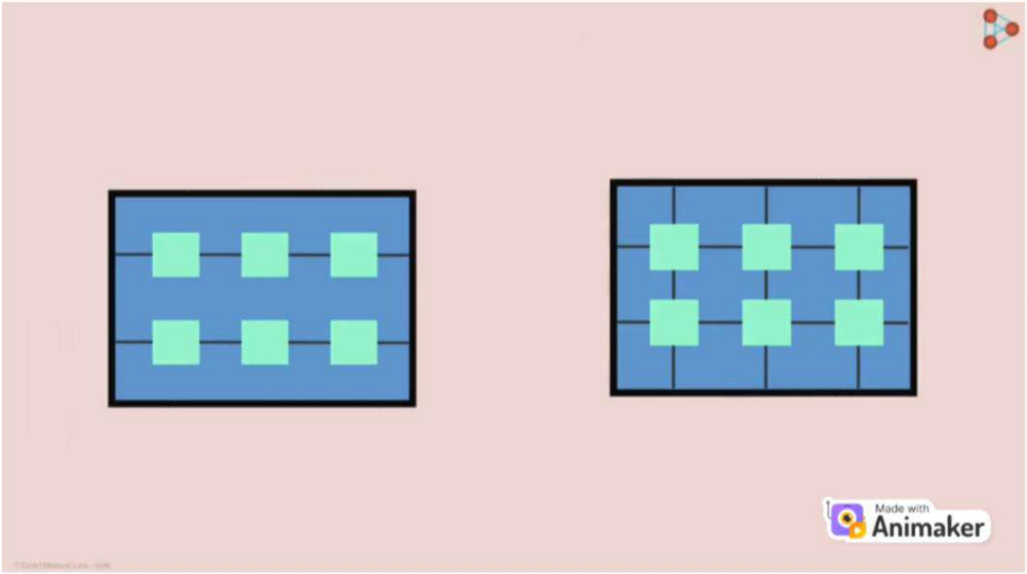
Plastic got its name from the Greek word ‘plastikos’ which means ‘with alterable shape’.

Different types of plastics are used for manufacturing a number of products from household utensils to artificial heart valves.



Plastics with diverse properties have been prepared nowadays making them more useful.

Structure of plastic



Plastics consist of large molecules called polymers.

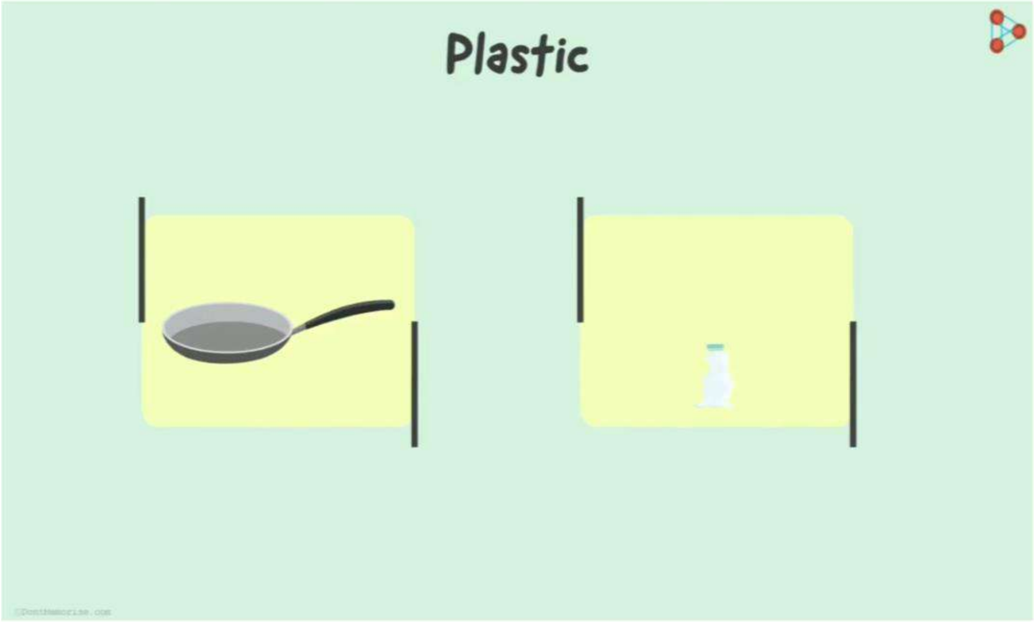
Polymers consist of many identical small particles strung together like a chain and these individual small particles are called monomers.

Classification of plastic

Let us perform an experiment:

Observed the changes? What may be the reason? Let us find out.

The reason…



Thermoplastic & Thermosetting Plastic

Plastics can be classified into two types based on the changes that occur while heating.

Thermoplastic	Thermosetting plastic
Gets softened on heating and hardened on cooling	Remains soft when heated during its manufacture, and gets hardened permanently on cooling
This process can be repeated any number of times.	Once hardened, they cannot be remoulded by heating
Undergo physical change on heating.	On heating undergo chemical change along with physical change.
Examples: PVC, Polythene	Examples: Melamine, Bakelite

ACTIVITY

Categorize the various plastic objects that you come across in your day-to-day life into thermoplastics or thermosetting plastics based on what you learned.

SUMMARY

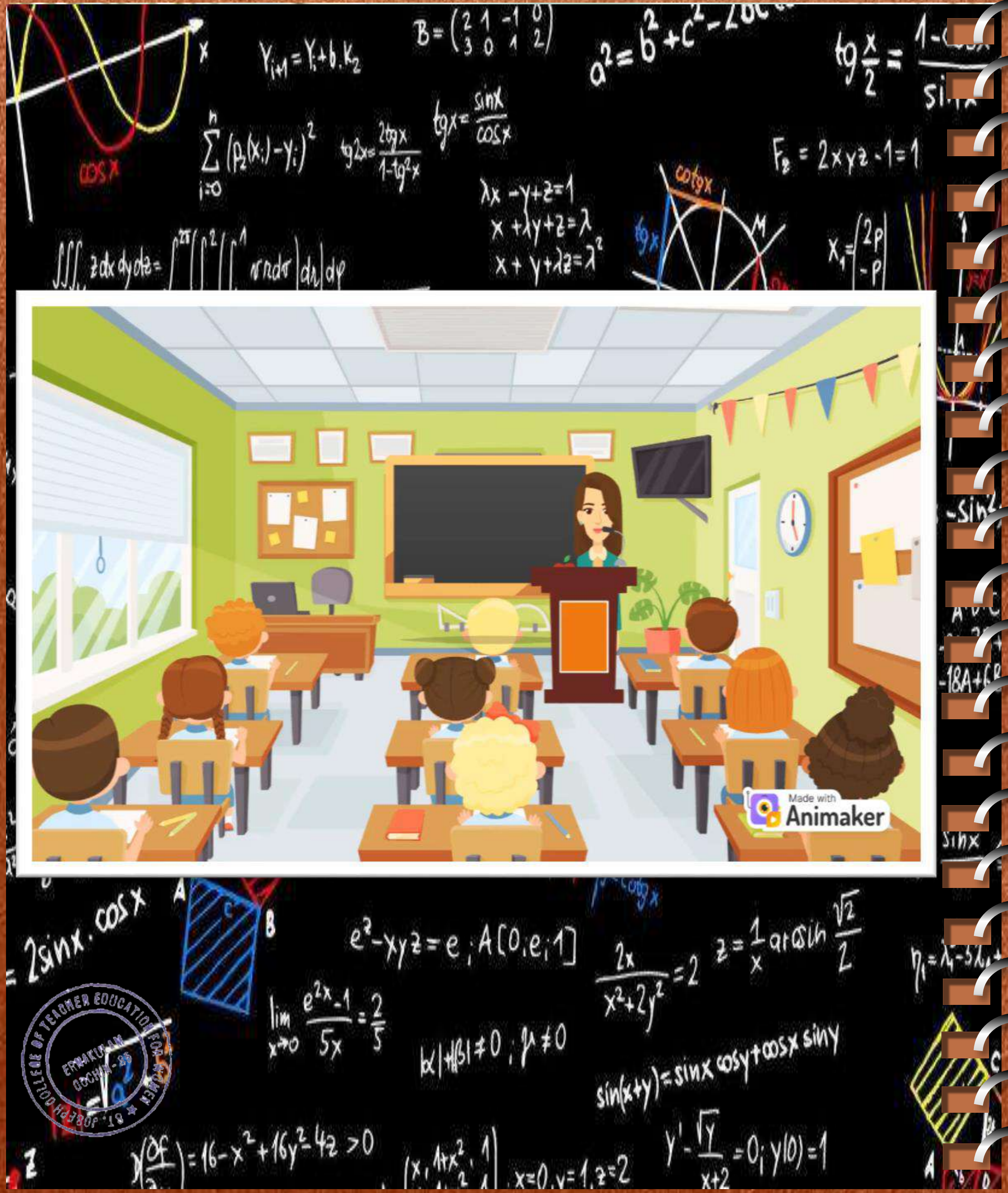
1. Plastics are synthetic polymers.
2. Plastics consist of large molecules called polymers.
3. Different types of plastics are used for manufacturing a number of products from household utensils to artificial heart valves.
4. The plastic that gets softened on heating and hardened on cooling is thermoplastic. This process can be repeated any number of times.
5. The plastic which remains soft when heated during its manufacture, and gets hardened permanently on cooling is a thermosetting plastic.

CLASS IX

PHYSICS

UNIT 4- GRAVITATION

UNIVERSAL LAW OF GRAVITATION



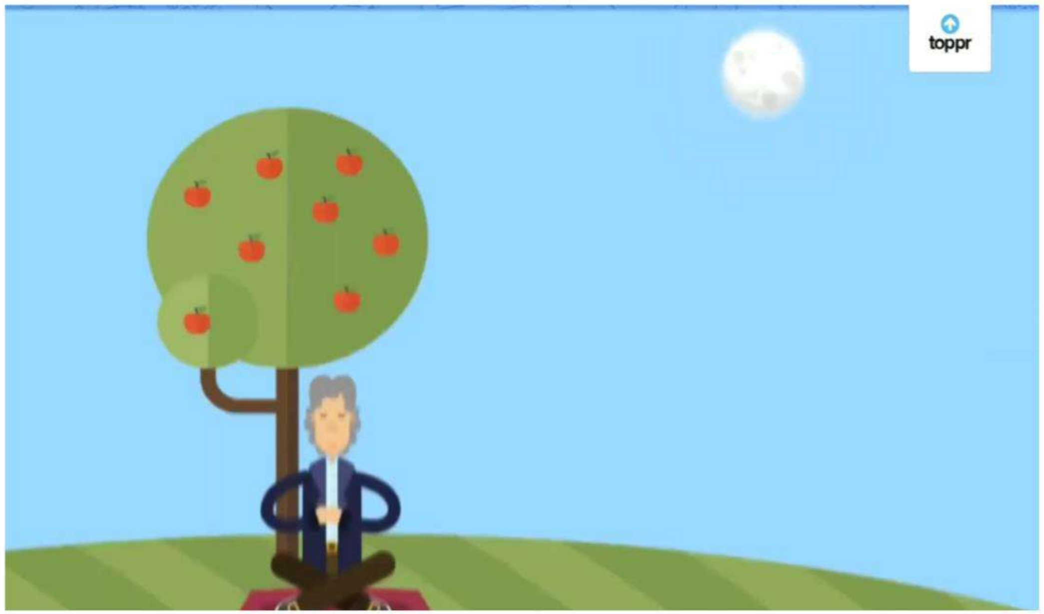
Why does the following happen?

Observe the following video:

The reason…

Now that you know the reason, let us see how it all began.

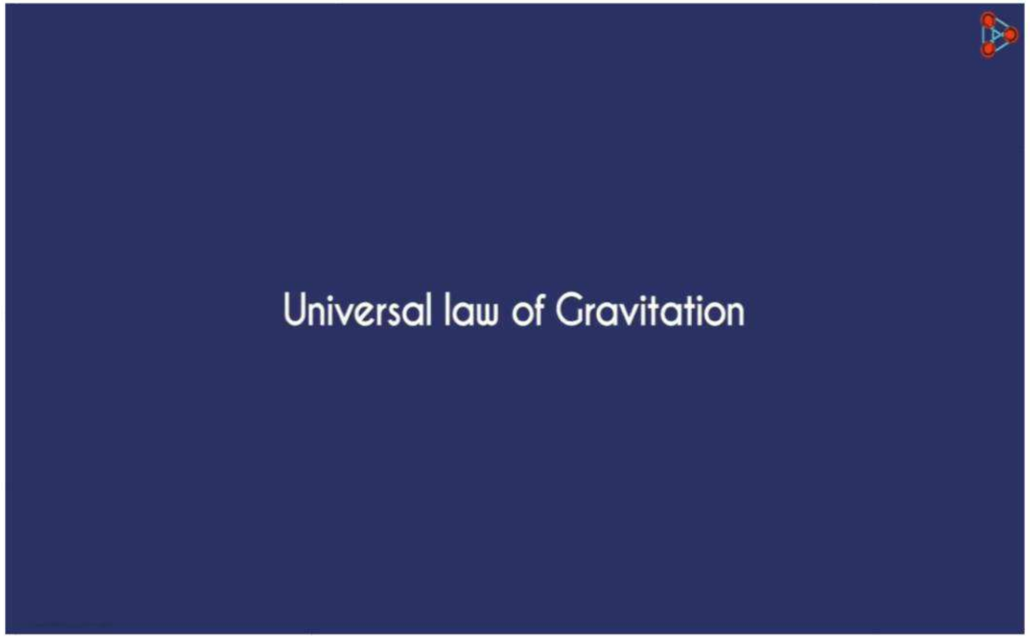
The beginning…



Sir Isaac Newton arrived at the law of gravitation on the basis of the observations made by Kepler, Galileo, etc.

Thereafter, he put forward the universal law of gravitation which is applicable to all bodies in the universe.

Universal Law of Gravitation



Newton's Universal Law of Gravitation and laws of motion revolutionized the study of physics

ACTIVITY

State 5 examples where the universal law of gravitation is applied in your daily living.

SUMMARY

1. Gravity is a force that attracts a body towards the center of the earth or any other physical body having mass.

2. Gravitational force is a vector quantity.

3. Sir Isaac Newton arrived at the law of gravitation on the basis of the observations made by Kepler, Galileo, etc.

4. Newton's Universal Law of Gravitation states that every particle attracts every other particle in the universe with a force directly proportional to the product of the masses and inversely proportional to the square of the distance between them.

5. The universal law of gravitation is applicable to all bodies in the universe.

THANK YOU

REFERENCES

- https://www.byjus.com
- https://www.scertbooks.guru
- https://en.wikipedia.org
- https://spaceplace.nasa.gov
- https://www.youtube.com

Blog

More ▾ rosejesnamg@gmail.com New Post Design Sign Out

Wissen

Thursday, March 16, 2023

Article

Article

at March 16, 2023

Friday, March 3, 2023

Experience as a Physical science teacher

https://drive.google.com/file/d/13Zx0WiJwslDn6RffwP96h3gdYVUpXoFH/view?usp=drivesdk

at March 03, 2023

Friday, January 7, 2022

Programmed learning material
https://docs.google.com/presentation/d/14X9nEeif1TiJcRA6Y2ODZ3Z5iRm9dTei/edit?usp=drivesdk&ouid=112456970787138027397&rtpof=true&sd=true

at January 07, 2022

Home

Subscribe to: Posts (Atom)

Article

Article

Experience as a Physical science teacher
https://drive.google.com/file/d/13Zx0WiJwslDn6RffwP96h3gdYVUpXoFH/view?usp=drivesdk

(no title)
Programmed learning material
https://docs.google.com/presentation/d/14X9nEeif1TiJcRA6Y2ODZ3Z5iRm9dTei/edit?usp=drivesdk&ouid=11245697078...

Search This Blog

Search

Home

Report Abuse

Blog Archive
March 2023 (2)
January 2022 (1)

About Me

Jesna George
View my complete profile

Ethereal theme. Powered by Blogger.

St. Joseph’s College Of Teacher Education For Women, Ernakulam

Submitted By,

Bivya Sukumar

DATED:15/08/2022

Med Science Education

E CONTENT
in
SCIENCE

PREFACE

The function of education is to give children a desire to learn and to teach them how to use their minds and where to go to acquire facts when their curiosity is aroused. Science is the knowledge that man has gained through the process of experimentation, observation and analysis. Science very efficiently plays the role of being a faithful servant of man. In every walk of life, science is there to serve us. I have great pleasure in presenting this power point presentation on ‘science in everyday life’.

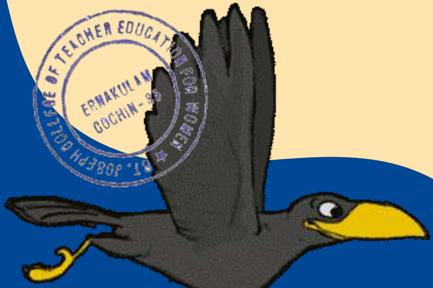
This digital work has been prepared to provide an idea and knowledge about the science happening in our day to day life. The presentation is designed by keeping the academic needs of students. This material will be extremely useful to all high school level students.

Study of science should be made a joyous experience by making use of this learning material. Let this learning material help you in cultivating scientific temper and satisfying your curiosities.

Table of contents

THE THIRSTY CROW

Archimedes' principle



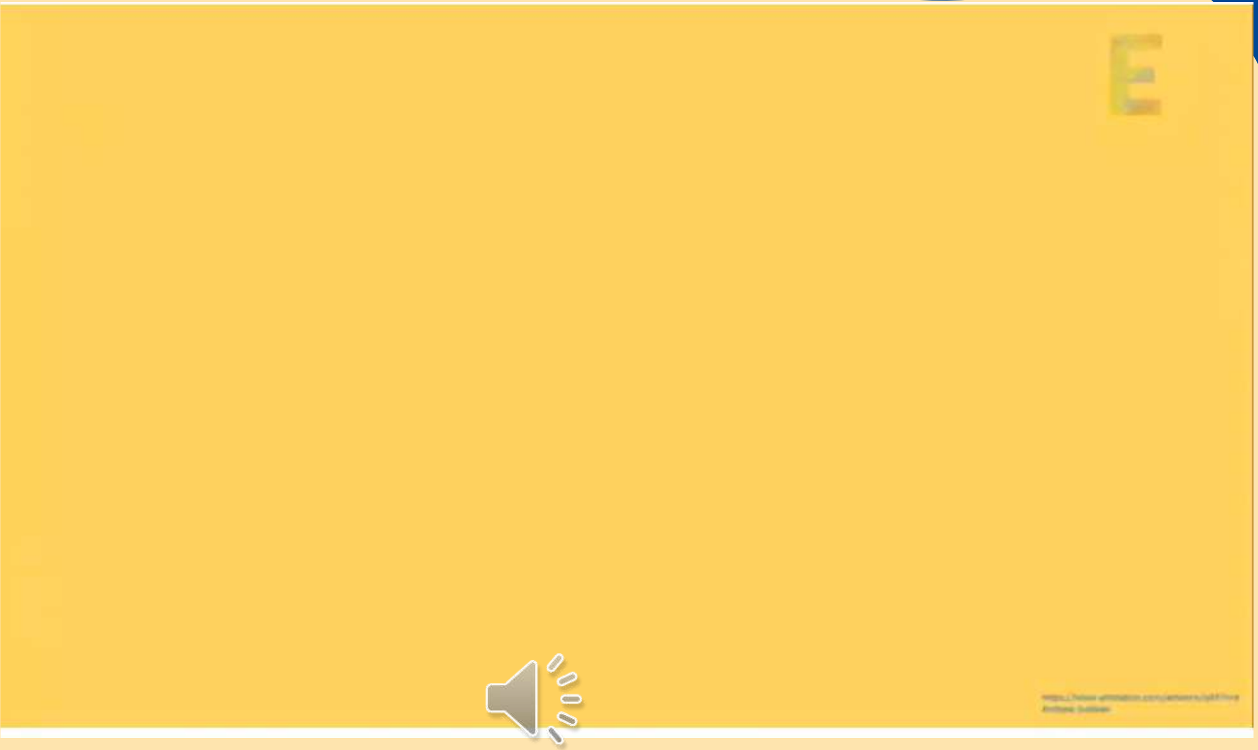
Go to next slide

ARCHIMEDES' PRINCIPLE

When an object is immersed partially or completely in a fluid, the buoyancy experienced by it will be equal to the weight of the fluid displaced by it.

Buoyant force = weight of the liquid displaced

Go to next slide



Go to
next slide

'What Goes Up Must Come Down'

What will happen when you throw a ball?

Gravitation

Go to next slide

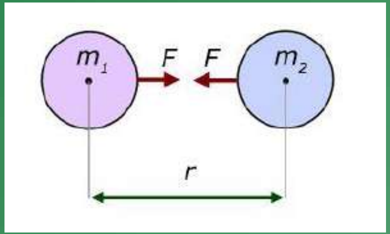
Gravitation

Gravitation is a force that exists among all material objects in the universe. For any two objects or particles having nonzero mass, the force of gravity tends to attract them towards each other.

Universal law of gravitation

$$F = \frac{Gm_1m_2}{r^2}$$

$G = 6.67 \times 10^{-11} Nm^2/Kg^2$



Go to next slide

How a ball point pen works ?

Go to next slide

Go to
next slide

ACIDS

- Tastes sour
- Proton donors
- Increase H^+ ion concentration
- pH < 7
- Turns blue litmus to red

BASES

- Tastes bitter
- Proton acceptors
- Increase OH^- ion concentration
- pH > 7
- Turns red litmus to blue

Go to next slide

Neutralisation Reaction

What happens when an acid reacts with a base ?

Go to next slide

Conclusion

Archimedes' Principle

Gravitation

Acids and bases

Go to next slide

Thank You

ALICE JOSEPH
Digitally signed by ALICE JOSEPH
Date: 2024.02.02 21:40:00 +05'30'


GRAVITATIONAL
LENSING
TREESA TANIYA. P. A.

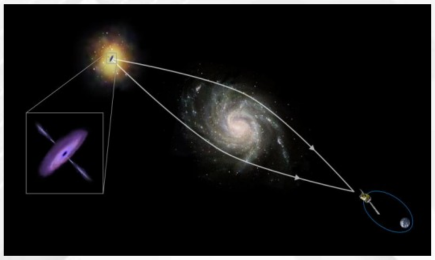
CONTENT:

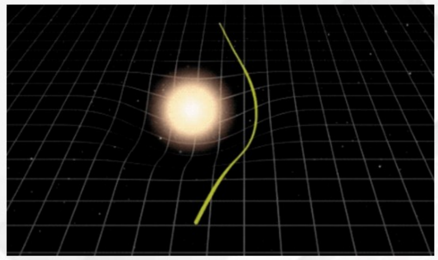
2

HISTORY:

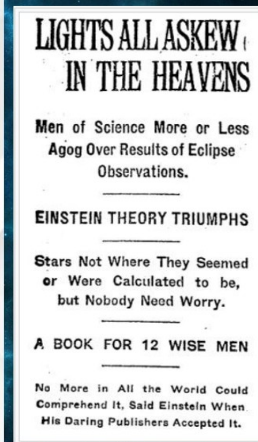
- On November 1915, Albert Einstein published his theory of general relativity.

- Predicts massive objects distort the fabric of space-time





- Confirmation: Arthur Eddington observed lensing around Sun (Solar eclipse, May 29, 1919)



LIGHTS ALL ASKEW IN THE HEAVENS

Men of Science More or Less Agog Over Results of Eclipse Observations.

EINSTEIN THEORY TRIUMPHS

Stars Not Where They Seemed or Were Calculated to be, but Nobody Need Worry.

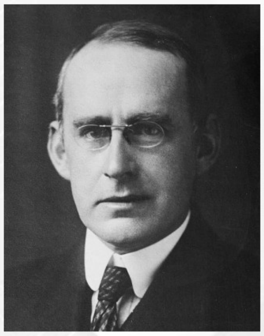
A BOOK FOR 12 WISE MEN

No More in All the World Could Comprehend It, Said Einstein When His Daring Publishers Accepted It.

The New York Times of November 10, 1919, reported on Einstein's confirmed prediction

3

The Solar Eclipse that changed the way we see the world



Arthur Stanley Eddington

- Measurements of the positions of the stars in the Hyades cluster in January and February of 1919 recorded
- Eddington set sail for Principe, Africa, sending a second ship to Sobral, Brazil in May to record measurements of position of stars during eclipse
- Comparison of measurements would prove if theory was valid
- Analysed results supported Einstein's new theory

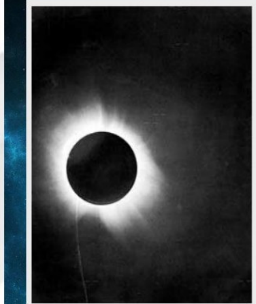
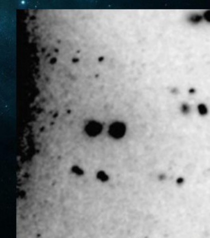


Photo: Royal Society of London

One of Eddington's photographs of the May 29, 1919, solar eclipse. The photo was presented in his 1920 paper announcing the successful test of general relativity.

"None of us can know what the world is, the way we used to know it. Einstein says that time is not the same for all of us, but different for each one of us. Its very had to conceive of such separate views, of such relative ways of seeing. Today is the first day of a new world, that is much harder to live in, but certain. More lonely. But which has at its heart human endeavour. One man has shown us how. Look at what one man can do. In this mans work, in the beautiful complexity of the new universe he has shown us. I for one have no doubt. I can hear God think."

-Sir Arthur Eddington



GRAVITATIONAL LENSING:

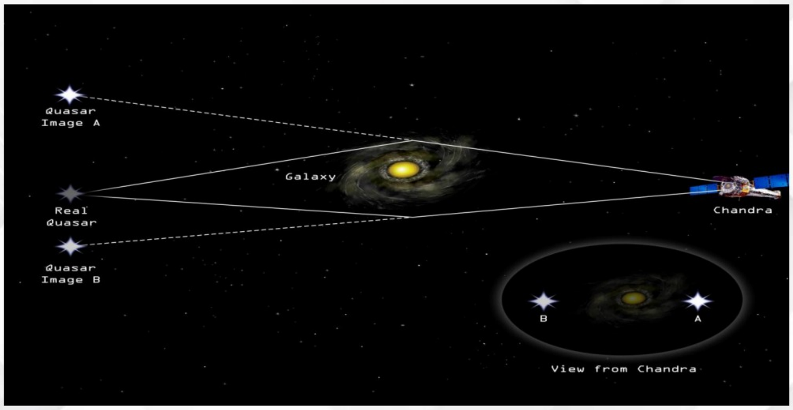


Fig.1: Gravitational lensing

A gravitational lens occur when huge amount of matter creates a gravitational field that distorts and magnifies the light from distant galaxies that are behind it but in the same line of sight.

https://chandra.harvard.edu
https://hubblesite.org/contents/articles/gravitational-lensing

5

THE FIRST GRAVITATIONAL LENS

- Discovered in 1979 by astronomers Dennis Walsh, Robert F. Carswell and Ray J. Weymann
- Identified the Twin Quasar Q0957+561: two quasars lying very close to each other with similar distances and spectra.
- Were actually same object whose light had split into two paths by the gravitational influence of an intervening galaxy YGKOW G1, 4 billion light-years from Earth and directly in our line of sight

Fig.2: The Twin Quasar by the Hubble Space Telescope

Fig.3: Cheshire Cat

https://www.galactic-hunter.com
https://esahubble.org

TYPES OF LENSING:

STRONG LENSING

WEAK LENSING

MICROLENSING

Fig.4: ABELL 2218
https://hubblesite.org

7

STRONG LENSING

- Multiple images from the same object
- Detected by large scale galaxy surveys

GALAXY LENSING

- When background source is quasar, strong lensed images are point-like multiple images
- When background source is a galaxy, strong lensed images are arcs or rings

- Eg: Einstein's Cross (Q2237+0305) at a distance of 8 billion lightyears

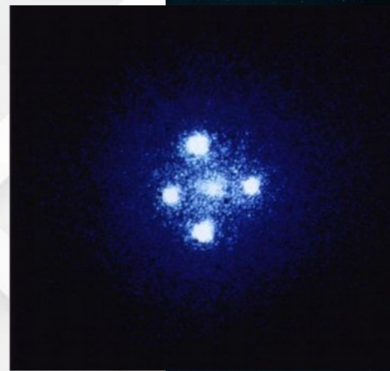


Fig.5: Einstein's Cross: four images from one quasar

https://www.nasa.gov

8

Fig.6: The Cosmic Horseshoe- A gravitational lens surrounding a galaxy from the group of Luminous Red Galaxies.

https://apod.nasa.gov

9

CLUSTER LENSING

- produce both strong lensing (multiple images, arcs or rings) and weak lensing effects (ellipticity distortions)

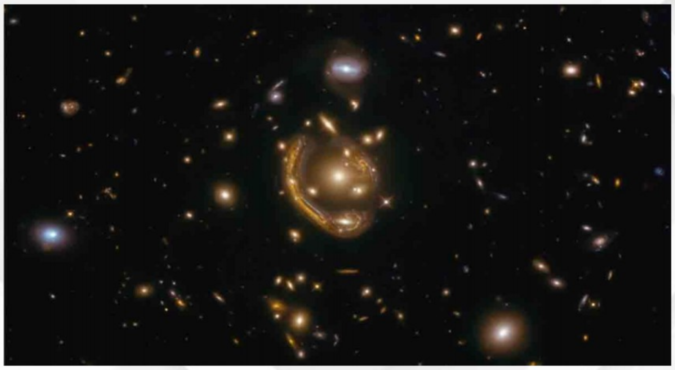


Fig.7: Located in the southern constellation of Fornax, GAL-CLUS-022058-38303 was nicknamed the ‘Molten Ring’ by the Hubble astronomers.

https://www.nasa.gov

WEAK LENSING

- Occurs when the lens lies relatively far from the line of sight between the observer and the background source
- Only a single image is produced, subject to mild magnification and distortion
- Only detectable by studying effects on large numbers of background sources

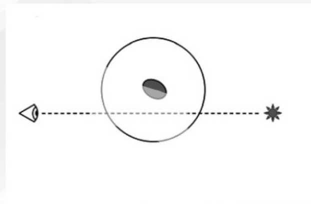


Fig.8: Weak lensing

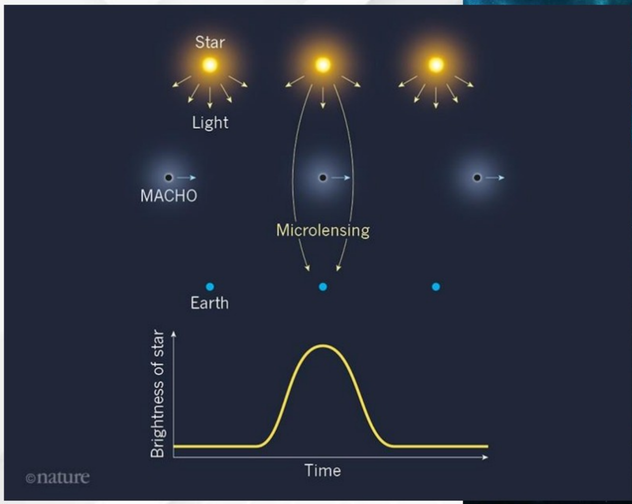
- Difficult to measure for an individual galaxy
- Galaxies clustered closer together exhibit similar lensing patterns

https://www.researchgate.net

11

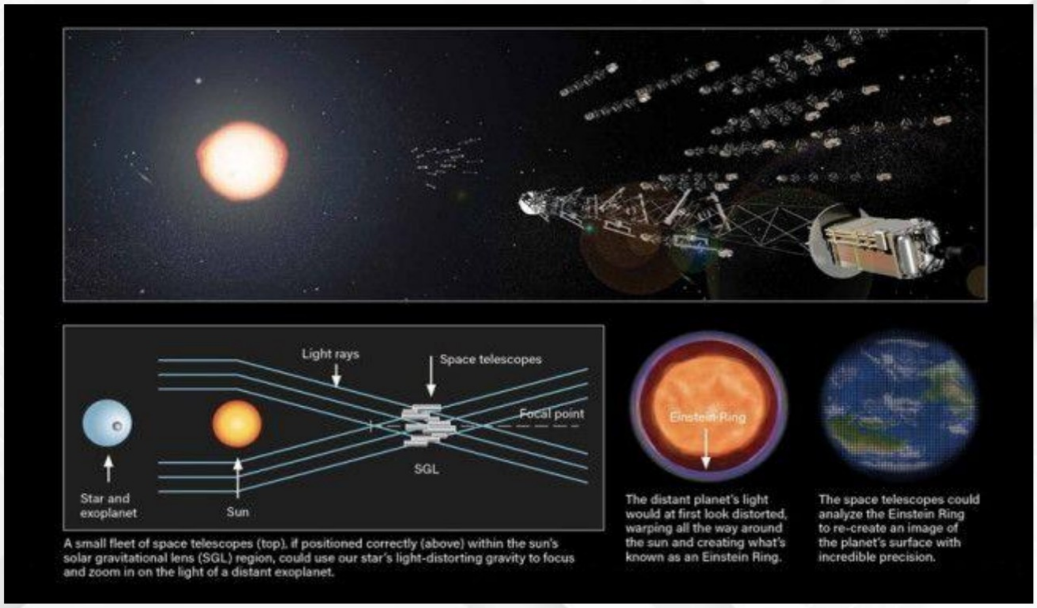
MICROLENSING

- No distortion in shape
- Amount of light visible from object changes periodically
- Light from distant star is bent and enhanced by the gravitational field of closer star
- Used to search for very faint or invisible objects such as brown dwarfs, neutron stars, old white dwarfs or black holes, which might make up the dark matter. These are collectively known as massive compact halo objects or MACHOs
- Also for discovering exoplanets



12

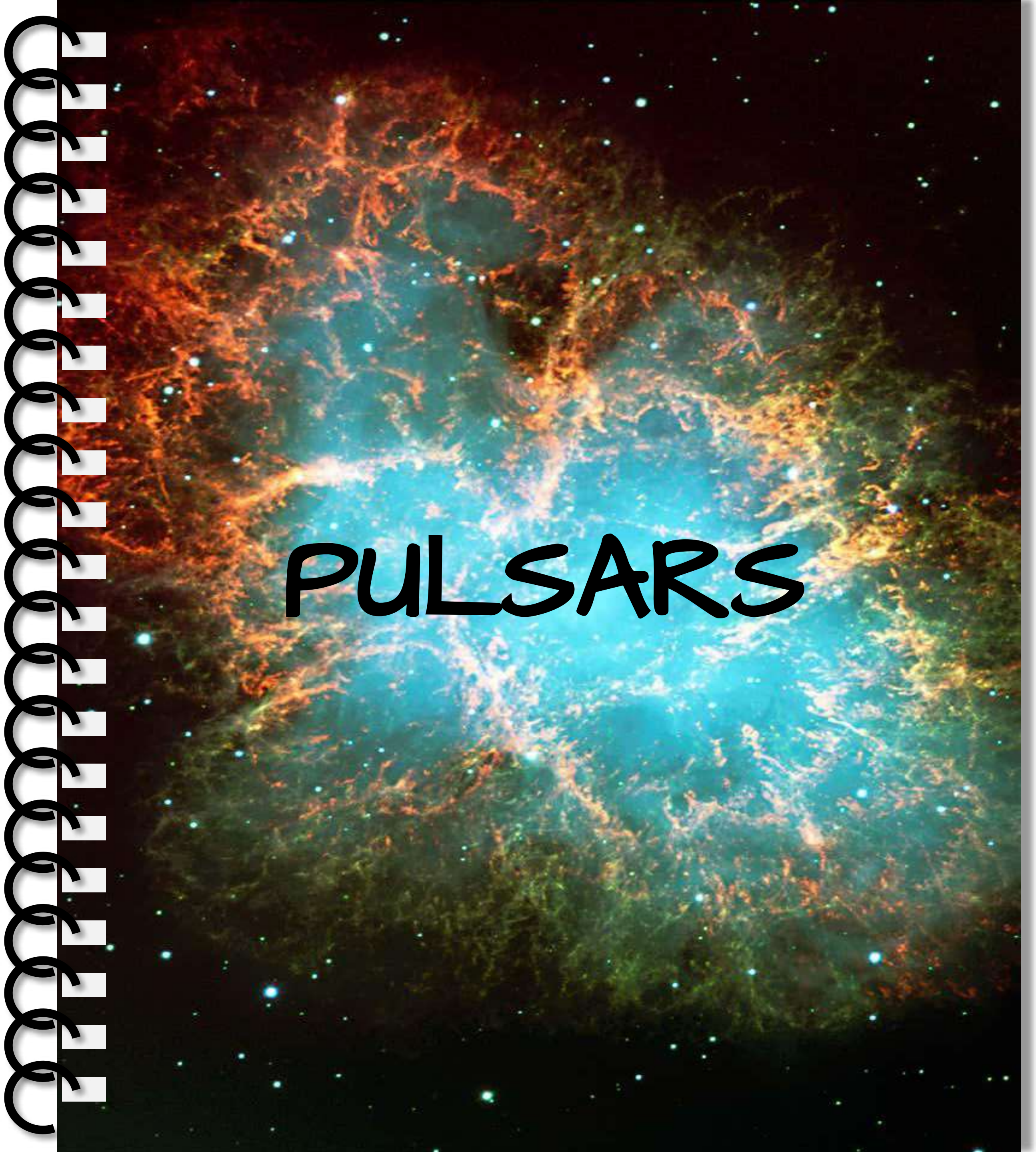
SOLAR GRAVITATIONAL LENS:



https://apod.nasa.gov/

A SGL is a theoretical method of using the Sun as a large lens with the physical effect called gravitational lensing. It is considered the best method to directly image habitable exoplanets.

13


PULSARS

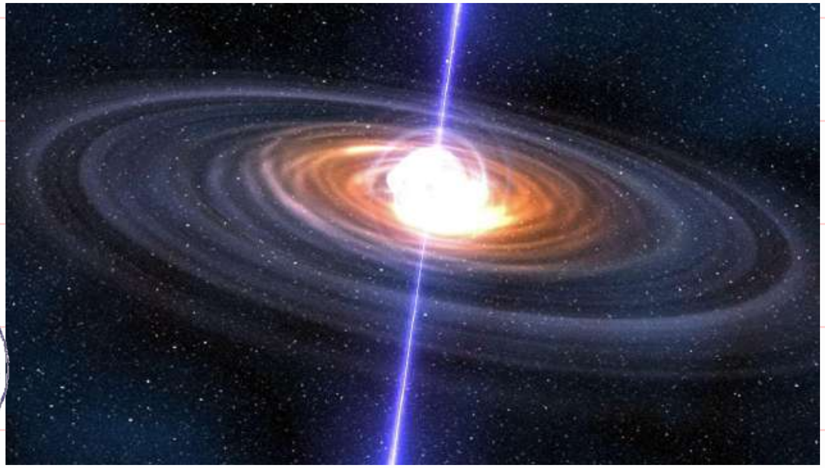
Introduction

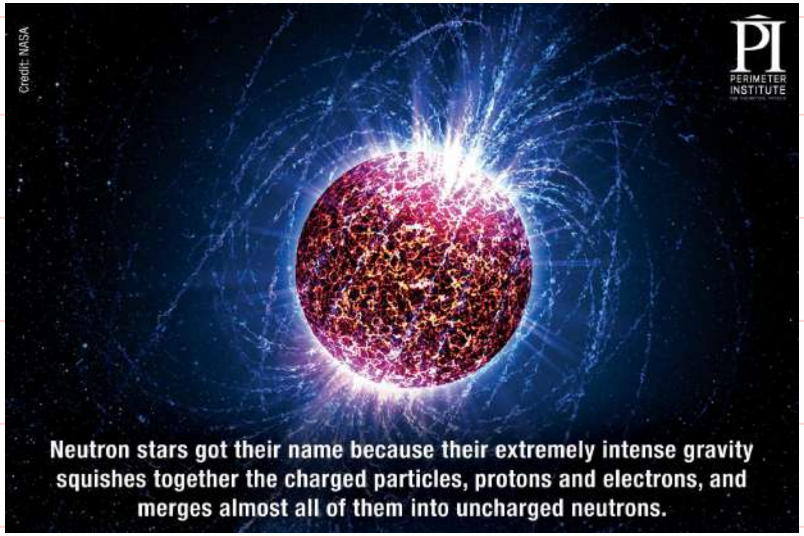
The cosmos provides the only laboratory where sufficiently extreme conditions are ever achieved to test new ideas on particle physics. By studying things like neutron stars, we are in effect learning something about fundamental physics.

-Sir Martin Reez

Pulsar

A pulsar is a rapidly rotating neutron star. A neutron star is one of the end points of the life of a massive star, after it explodes in a supernova explosion. The neutron star which retains a strong magnetic field produces pulses of radiation along that field. This magnetic field is not aligned with the rotation axis of the neutron star.

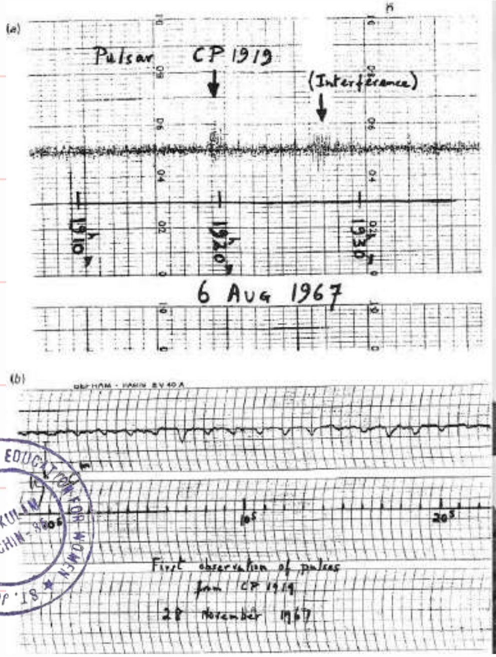




We observe these pulses of radiation whenever the magnetic pole is visible. The pulses come at the same rate as the rotation of the neutron star, and thus, appear periodic. Neutron stars for which we see such pulses are called "pulsars".

Discovery

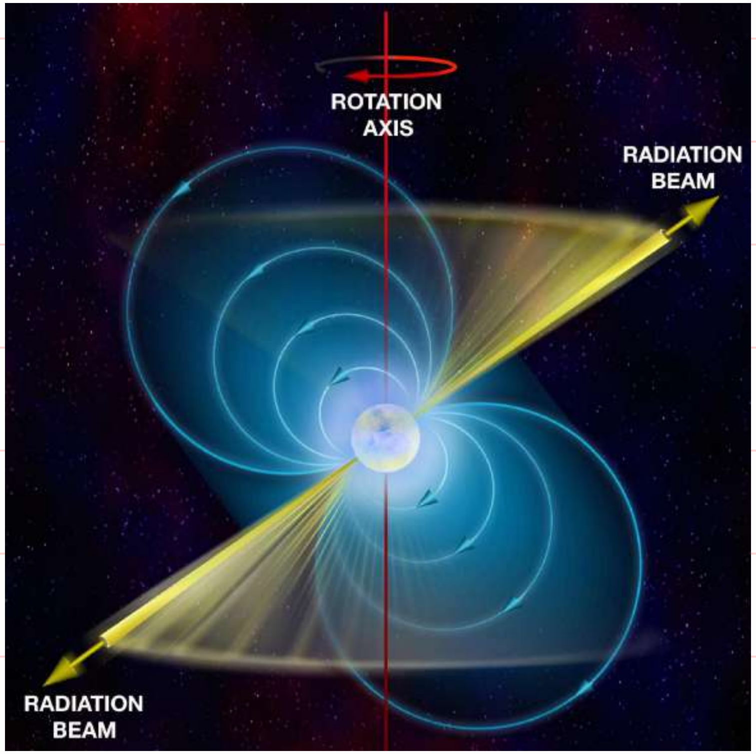
Professor Dame Jocelyn Bell Burnell discovered pulsars in 1967 while she was a postgraduate student at New Hall (now Murray Edwards College) carrying out research at Cambridge's Cavendish Laboratory with Antony Hewish.



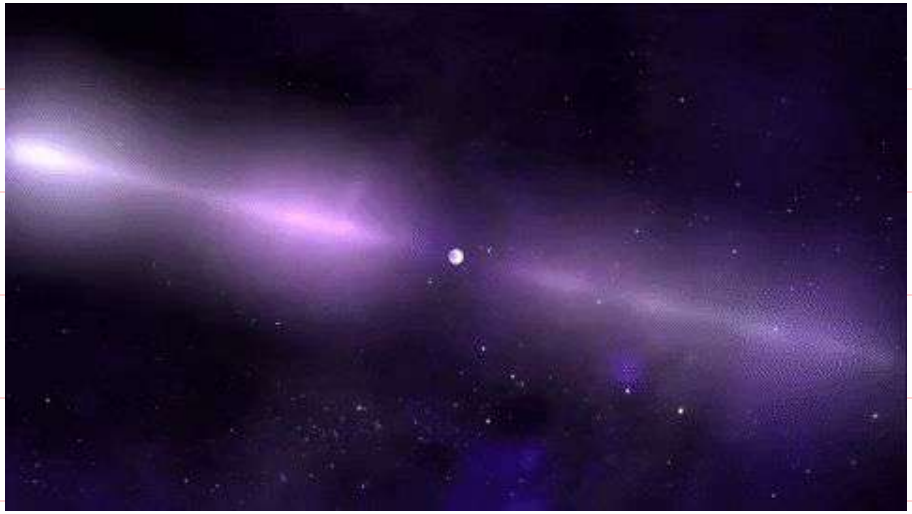
How pulsars are formed?

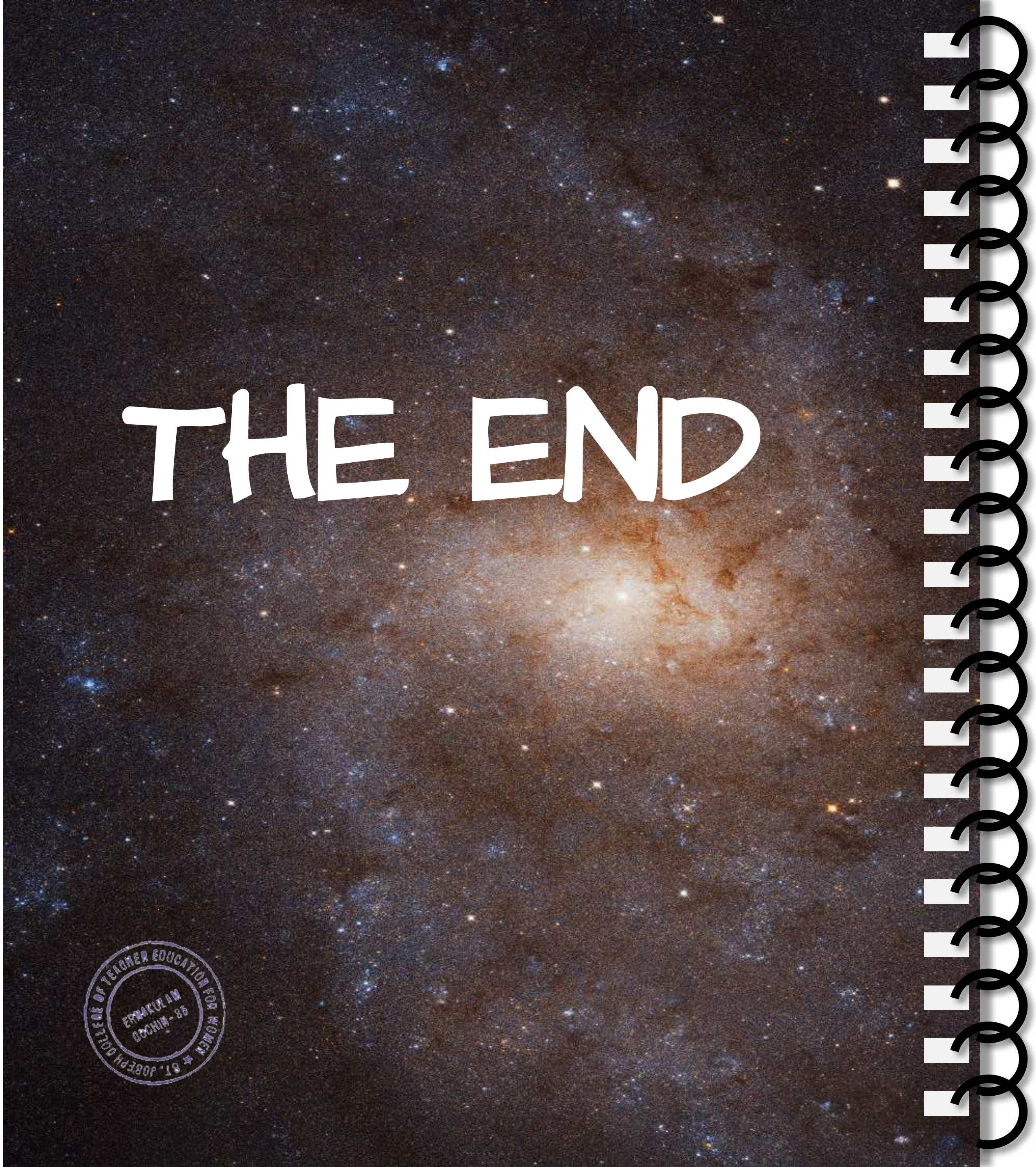
Pulsars aren't really stars — or at least they aren't "living" stars. Pulsars belong to a family of objects called neutron stars that form when a star more massive than the sun runs out of fuel in its core and collapses in on itself.

This stellar death typically creates a massive explosion called a supernova. The neutron star is the dense nugget of material left over after this explosive death.



Lighthouse effect of pulsars




THE END
ST. JOSEPH COLLEGE OF TEACHER EDUCATION FOR WOMEN
ERNAKULAM
COCHIN - 35

PROGRAMMED LEARNING MATERIAL

SUBMITTED BY

VANDANA S

1ST B.ED. PHYSICAL SCIENCE

NEXT

PREFACE

At this time, the word educational technology covers a wide range of applications. Hardware and software learning sequences are examples of instructional technology. The teaching machines, computer-assisted instruction, learner-controlled instruction, and CCTV are all included in the hardware. Programmed learning material in the form of a book or a teaching machine, as well as numerous sorts of self-instructional materials, are examples of software instructional sequences. The most relevant illustration of the most recent notion in instructional technology is programmed learning. It's a self-instructional device and educational innovation. It is not only a technique for effective learning, but it is also a successful feedback mechanism for changing instructor behaviour. Prof. B.F Skinner's laboratory research are largely responsible for the introduction of programmed learning on the educational arena. The primary historical connections in the evolving chain of important events prior to Skinner are the concepts of "Conditioning" as articulated by Pavlov and Watson and the "Law of Effect" as formulated by Thorndike. Skinner's method of moulding behaviour was dubbed 'operant conditioning,' and it eventually became the foundation for programmed learning technology. It has now become a well-established instructional technology.

NEXT

INDEX

NEXT

INTRODUCTION

NEXT

Overview

This is a Programmed learning material (PLM) based on the topic “WORK,ENERGY AND POWER” for 9th grade students. This is an interactive learning material wherein the learner is required to solve issues, make decisions, search for information, test assumptions, and take risks, rather than simply going through the motions and trying to absorb the information.

The first frame talks about work and the second frame deals with energy.The third and fourth frames are assigned to help the learner know more about the two major type of energies : Potential energy and Kinetic energy.The final frame gives the learner an insight into the concept of power.Each frame consists of the concept and a question in agreement with the concept.The learner is expected to first read through the concept,understand the concept and finally answer the question.Click on the answer you feel right.

Summer may be dimming, but remember that you are a lamp. Every new piece of knowledge makes you shine brighter and brighter to light up the world.Good luck for your learning experience!

NEXT

LINEAR PROGRAMMED LEARNING MATERIAL

NEXT

FRAME 1 → FRAME 2 → FRAME 3 → FRAME 4 → FRAME 5

NEXT

INSTRUCTIONS

1. Each frame has a concept explained followed by a question in agreement to the concept.
2. The students are expected to choose the right answer to the Multiple Choice Questions with 4 options.
3. On giving the right answer,the student can move to the next frame

NEXT

FRAME 1

WORK

NEXT

Objects undergo displacement when a force is applied on them.For work to be done a force must be applied on the object and there must be a motion or displacement in the direction of the applied force.Work has magnitude alone and no direction.Hence work done is a scalar quantity.The formula for work done is ,

$$W = F.d = Fd\cos\theta$$

Where , F = force applied in Newton

d = displacement in metres

θ = angle between force and displacement

The unit of work is “Nm” or Joule .

Displacement is the shortest distance between the initial and final points

NEXT

Question : A railway potter, Arun ,is carrying a suitcase on his head and is walking forward.Another potter Rahul uses a trolley to carry the suitcase.He applied a force in the forward direction and the trolley moves forward.Which one of the following statements is correct?

1) Arun did more work

2) Rahul did more work

3) Both did not do any work

4) Both did the same amount of work

FRAME 2

ENERGY

NEXT

We need energy to do anything and everything.Energy is nothing but the ability do work.Since energy is found everywhere, there are different forms of energy like mechanical,nuclear,chemical,gravitational and heat to name a few.

All forms of energy are either kinetic energy or potential energy.

The law of conservation of energy is universal and is stated as follows :

"Energy can neither be created nor be destroyed.It can only be converted or transformed from one form to another.The unit of energy is "Joule".

Total energy = Kinetic energy + Potential energy

NEXT

Question: **If the energy content of an object is 1000J and when checked later it is found to be 900J.What happened to the 100J energy?**

1)The object transferred some of its energy to its surroundings.

2) Energy was destroyed.

3) The object absorbed additional energy from its surroundings.

4) Energy was created.

FRAME 3

POTENTIAL ENERGY

NEXT

An object can store energy by virtue of its position.For instance, a drawn bow stores energy as a result of its position.When it was in its original position (i.e. when not drawn) ,there is no energy stored in the bow.Yet

when its position is altered from its usual equilibrium position,the bow is able to

store energy by virtue of its position.This stored energy is called potential energy.

The gravitational potential energy of an object at a point above the ground is

defined as work done in in raising it from the ground to that point against gravity.

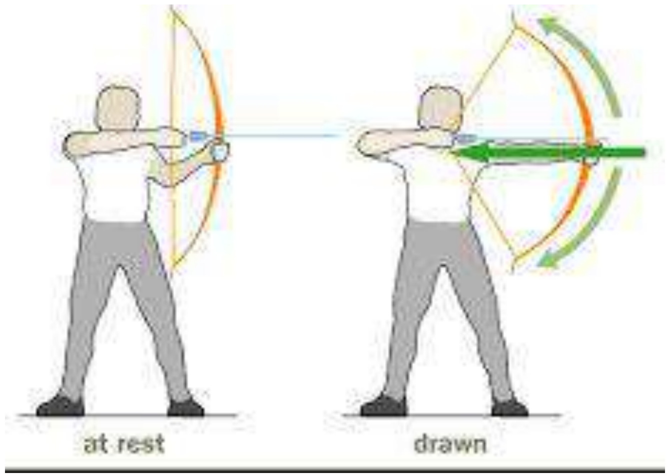
It is given by the formula , Potential energy = m×g×h

m = mass of the object

g = acceleration due to gravity = 9.8 m/s^2

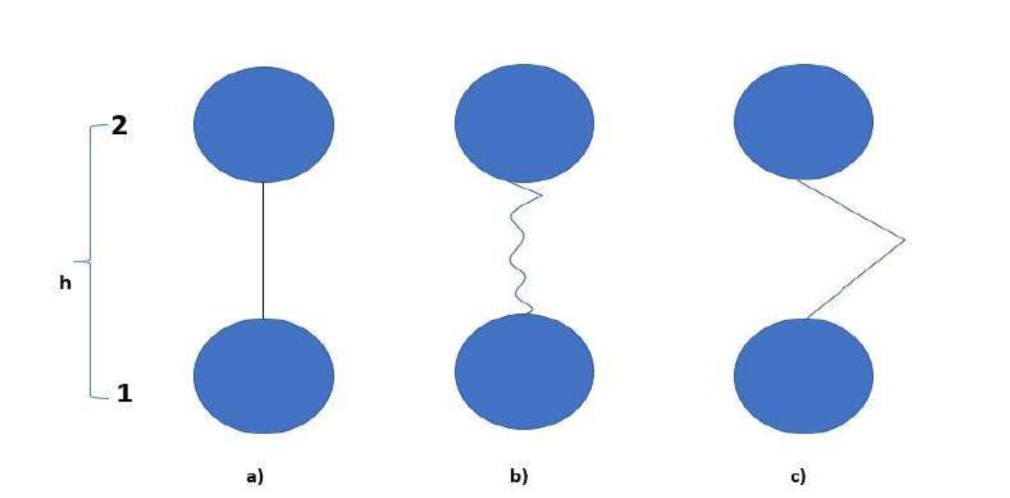
h = height above the ground in metres

Unit of potential energy is kgm^2s^{-2} or Joule.



NEXT

Question: A ball of mass "m" is raised from point 1 to 2 against gravity in three different ways as shown in the figure 1.Which of the following statements is true,



1) Potential energy is negative in b).
2) Potential energy is zero in a).
3) Potential energy is in the order b >c > a
4) Potential energy is same in all cases.

FRAME 4
KINETIC ENERGY

NEXT

To accelerate an object,we need to apply a force and to apply a force we need to do some work.When work is done on an object energy is transferred to the object and the object moves with a new constant speed.We call the energy that is transferred, kinetic energy.In other words kinetic energy is the amount of work a body can do before coming to rest.

Kinetic energy is dependant on mass of the object and the speed achieved.It is given by the formula :

$$\text{Kinetic energy} = \frac{1}{2}\, m \times v^2$$

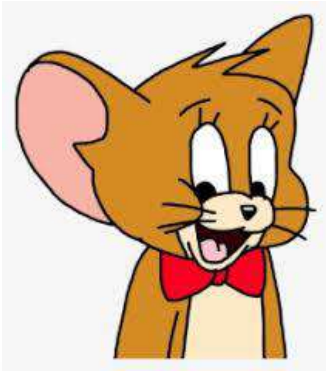
where,

m = mass of the object

v = velocity attained due to the applied force

The unit of Kinetic energy is kgm^2s^{-2} or Joule.

Anything in motion possess kinetic energy.



NEXT

Question: A cricket ball and a football have same kinetic energy.Which one of them
will move faster? (Hint: Cricket ball is lighter than football).

1. Cricket ball
2. Football
3. Both has equal speeds
4. Both remain stationary

FRAME 5
POWER

NEXT

Let us consider two weightlifters “A“and “B”.Both of them are lifting a mass of 100kg to a height of 2 metres.”A” finds it difficult to lift the weight at first and so he lifts the mass slowly, whereas “B” lifts it easily and fastly.’The work done in both the cases is

$$W = m\times g\times h = 100kg \times \ 9.8\ m/s^2 \times 2m = 1960\ J$$

Their actions can be distinguished in physics by the term “power”.Power measures the rate at which work is done.

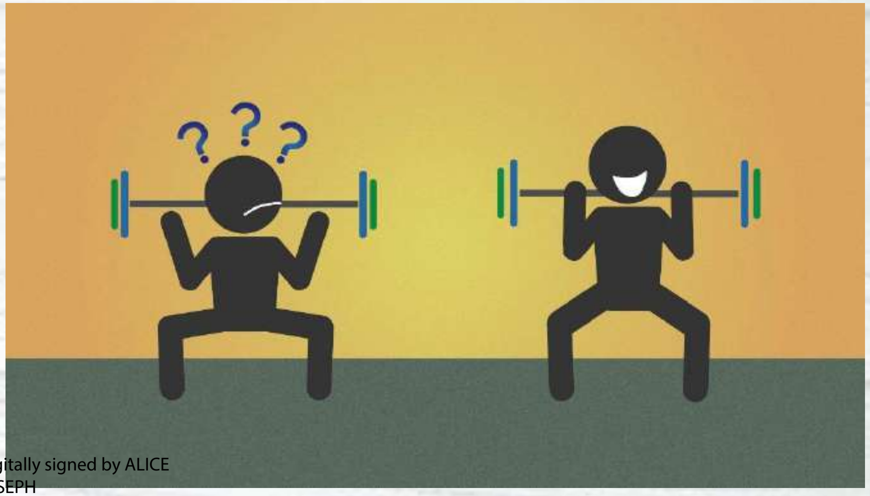
$$\text{Power} = \frac{\text{WORK DONE}}{\text{TIME}}$$

The unit of power is J/s or Watt.

NEXT

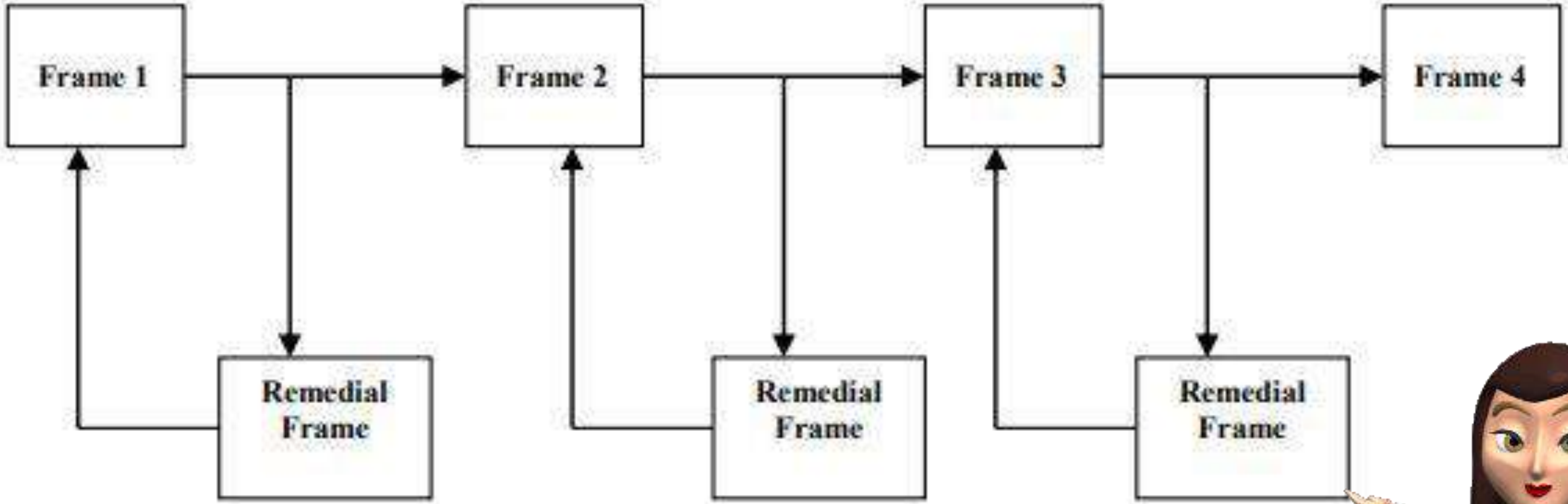
Question : Will and Ben are in the weightlifting room.Will lifts 100kg barbell over his head to a height of 1m ,10 times in one minute. Ben lifts 100kg barbell over his head 10times in 10 seconds again to the same height of 1m.__________ did more work and _________ has more power.

1. **Both did same amount of work, Ben.**
2. **Both did same amount of work, Will.**
3. **Ben,Ben.**
4. **Will,Ben.**



BRANCHED PROGRAMMED LEARNING MATERIAL

NEXT


Frame 1
Frame 2
Frame 3
Frame 4
Remedial Frame
Remedial Frame
Remedial Frame

NEXT

Instructions

1. Each frame has concept described in it.
2. The frame is then followed by a question with 4 options,of which only one answer is right.
3. If the student selects the correct answer he can move on to the next frame.If the student selects wrong answer,he will be redirected to a remedial frame.
4. The student needs to click the teacher icon to get the explanation in the remedial frame.
5. The student will be reverted back to the initial frame from the remedial frame.
6. The student can proceed to next frame only after giving the right choice to the question in the previous frame.

NEXT

FRAME 1

WORK

NEXT

Objects undergo displacement when a force is applied on them.For work to be done a force must be applied on the object and there must be a motion or displacement in the direction of the applied force.Work has magnitude alone and no direction.Hence work done is a scalar quantity.The formula for work done is ,

$$W = F.d = Fd\cos\theta$$

Where , F = force applied in Newton

d = displacement in metres

θ = angle between force and displacement

The unit of work is “Nm” or Joule .

Displacement is the shortest distance between the initial and final points

NEXT

Question : A railway potter, Arun ,is carrying a suitcase on his head and is walking forward.Another potter Rahul uses a trolley to carry the suitcase.He applied a force in the forward direction and the trolley moves forward.Which one of the following statements is correct?

1) Arun did more work

2) Rahul did more work

3) Both did not do any work

4) Both did the same amount of work

FRAME 2

ENERGY

NEXT

We need energy to do anything and everything.Energy is nothing but the ability do work.Since energy is found everywhere, there are different forms of energy like mechanical,nuclear,chemical,gravitational and heat to name a few.

All forms of energy are either kinetic energy or potential energy.

The law of conservation of energy is universal and is stated as follows :

"Energy can neither be created nor be destroyed.It can only be converted or transformed from one form to another.The unit of energy is "Joule".

Total energy =
Kinetic energy +
Potential energy

NEXT

Question: If the energy content of an object is 1000J and when checked later it is found to be 900J.What happened to the 100J energy?

1)The object transferred some of its energy to its surroundings.

2) Energy was destroyed.

3) The object absorbed additional energy from its surroundings.

4) Energy was created.

FRAME 3

POTENTIAL ENERGY

NEXT

An object can store energy by virtue of its position.For instance, a drawn bow stores energy as a result of its position.When it was in its original position (i.e. when no drawn) ,there is no energy stored in the bow.Yet

when its position is altered from its usual equilibrium position,the bow is able to

store energy by virtue of its position.This stored energy is called potential energy.

The gravitational potential energy of an object at a point above the ground is

defined as work done in in raising it from the ground to that point against gravity.

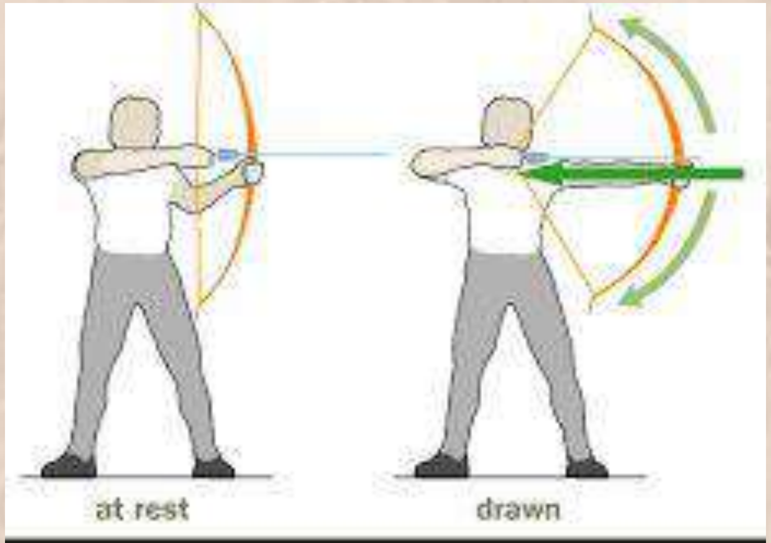
It is given by the formula , Potential energy = m×g×h

m = mass of the object

g = acceleration due to gravity = 9.8 m/s^2

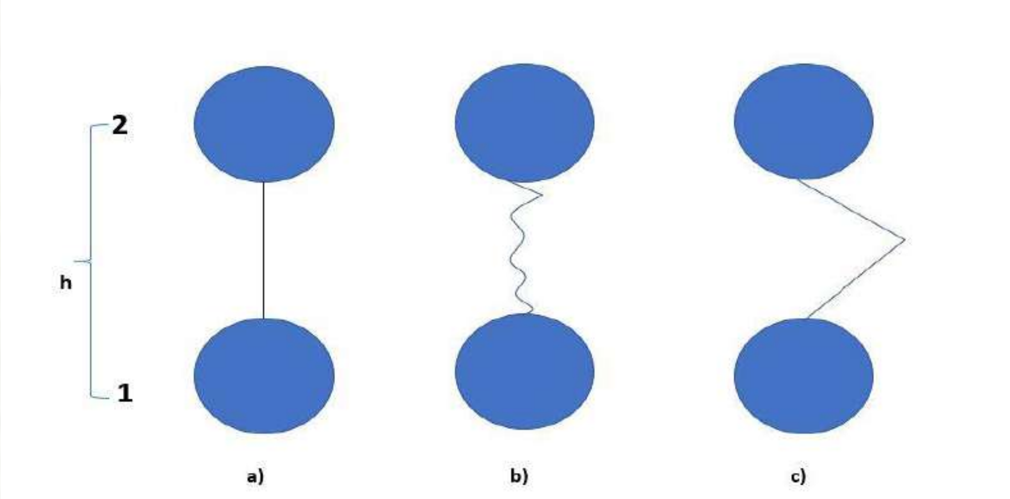
h = height above the ground in metres

Unit of potential energy is kgm^2s^{-2} or Joule.



NEXT

Question: A ball of mass "m" is raised from point 1 to 2 against gravity in three different ways as shown in the figure 1.Which of the following statements is true,



1) Potential energy is negative in b).
2) Potential energy is zero in a).
3) Potential energy is in the order b >c > a
4) Potential energy is same in all cases.

FRAME 4
KINETIC ENERGY

NEXT

To accelerate an object,we need to apply a force and to apply a force we need to do some work.When work is done on an object energy is transferred to the object and the object moves with a new constant speed.We call the energy that is transferred, kinetic energy.In other words kinetic energy is the amount of work a body can do before coming to rest.

Kinetic energy is dependant on mass of the object and the speed achieved.It is given by the formula :

$$\text{Kinetic energy} = \frac{1}{2}\, m \times v^2$$

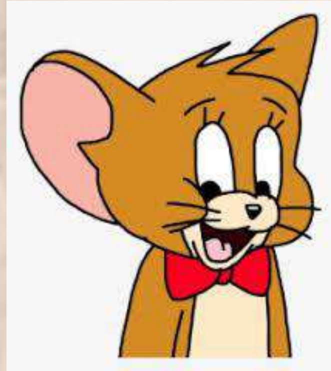
where,

m = mass of the object

v = velocity attained due to the applied forc

The unit of Kinetic energy is kgm^2s^{-2} or Joule.

Anything in motion possess kinetic energy.



NEXT

Question: A cricket ball and a football have same kinetic energy.Which one of them will move faster? (Hint: Cricket ball is lighter than football).

1. Cricket ball
2. Football
3. Both has equal speeds
4. Both remain stationary

FRAME 5
POWER

NEXT

Let us consider two weightlifters “A“and “B”.Both of them are lifting a mass of 100kg to a height of 2 metres.”A” finds it difficult to lift the weight at first and so he lifts the mass slowly, whereas “B” lifts it easily and fastly.’The work done in both the cases is

$$W = m \times g \times h = 100kg \times 9.8\ m/s^2 \times 2m = 1960\ J$$

Their actions can be distinguished in physics by the term “power”.Power measures the rate at which work is done.

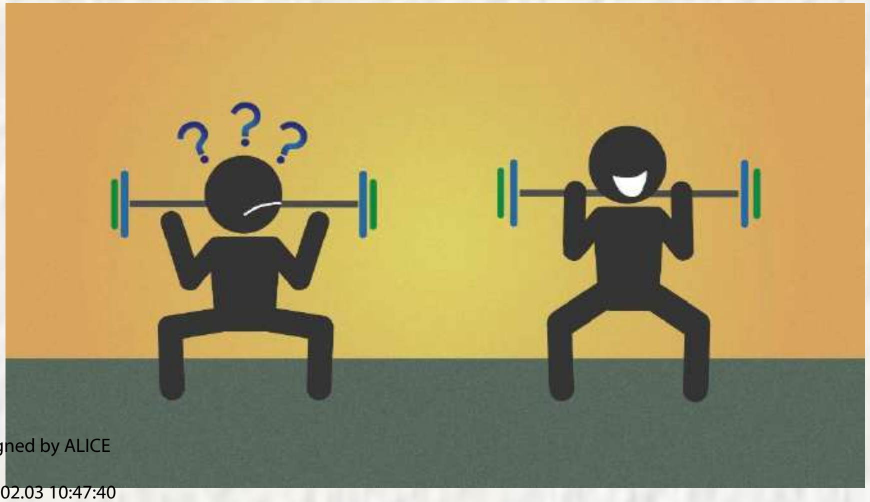
$$\text{Power} = \frac{\text{WORK DONE}}{\text{TIME}}$$

The unit of power is J/s or Watt.

NEXT

Question : Will and Ben are in the weightlifting room.Will lifts 100kg barbell over his head to a height of 1m ,10 times in one minute. Ben lifts 100kg barbell over his head 10times in 10 seconds again to the same height of 1m.__________ did more work and ________ has more power.

1. Both did same amount of work, Ben.
2. Both did same amount of work, Will.
3. Ben,Ben.
4. Will,Ben.



REMEDIAL FRAMES

HIP HIP HOOREYYY!!! YOU GOT IT RIGHT

Energy can neither be created nor be destroyed.It can be transferred so that total energy of the system remains unchanged

Go to frame 3

Your second part is right champ
But first part went wrong!

Work done depends only on the initial and final positions since it is stored as potential energy.Here Will and Ben ,both lifted the barbell to the same height

Go to frame 5

OOPS!
You have got it wrong

In both the cases ,the potter moves in the forward direction,but there is considerable difference in the way they are carrying the loads.Arun carried the load on head i.e. applies force upward whereas Rahul used the trolley i.e. he applied force in the forward direction.

Go to frame 1

SORRY…..YOU ANSWER IS NOT CORRECT

If the object absorbed additional energy from the surroundings,the energy would have increased from 1000J to 1100J.

Go to frame 2

Exactly champ!!
You are right.

Rahul pushed the trolley in the forward direction and the displacement is also in the forward direction.

Go to frame 2

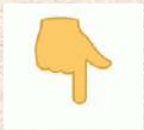
SORRY..
YOU ARE
WRONG

Potential energy is dependant on mass,acceleration due to gravity and height to which the object is raised.Height and mass can never be negative.Also “g” is a constant.

Go to frame 3

OOPS!
YOU ARE
WRONG

Energy can never be created.The total energy of the system always remains a constant.



Go to frame 2

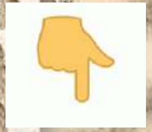
OOPS!!
YOU ARE
WRONG THIS
TIME

Potential energy depends only on the initial and final position of the object.

Go to frame 3

NO..YOU HAVE GOT IT WRONG DEAR

Energy can neither be created nor be destroyed. Energy can only be transformed from one form to another.



Go to frame 2

OH DEAR.. YOU ARE WRONG

Potential energy is zero only if the object has not moved from the reference point.Here it moved to a height "h" against gravity

Go to frame 3

YES Ben has more power.But Will did not do more work

Work done depends only on the initial and final positions since it is stored as potential energy.Here Will and Ben ,bith lifted the barbell to the same height

Go to frame 5

NAILED IT!!!
YOU ARE RIGHT

Potential energy depends only on the initial and final positions.In all the three cases ,the object is raised to the same height "h"

Go to frame 4

I am impressed champ…you are right

Cricket ball is lighter than football .So as mass decreases speed must increase to maintain equal kinetic energies.

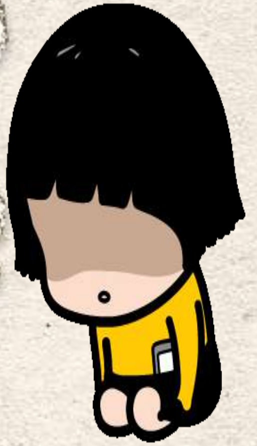
Go to frame 5

Sorry you are wrong

Arun did not do any work as force is perpendicular to displacement.But Rahul did work as force and displacement is in same direction

[Go to frame 1]

Oh No!!
It’s wrong
dear



Football is heavier than cricket ball.To maintain equal kinetic energies the speed of football should be less when compared with cricket ball

[Go to frame 4]

Partially right! Indeed both did the same amount of work.But is power the same for both?

No!Power is not the same for both Ben and Will since they took different amount of time.Power is given by ,

$$P=\frac{\text{WORK DONE}}{\text{TIME}}$$

i.e. Power is inversely proportional to time.

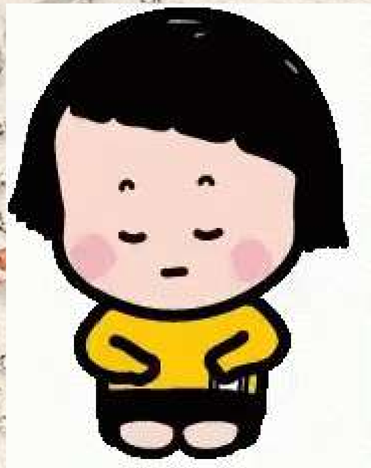
Go to frame 5

OH NO!
INCORRECT
RESPONSE

Potter Arun is carrying a heavy load on his head and is moving forward i.e. he is applying a force in the upward direction but moves forward.We say work is done when displacement is along the direction of applied force.

Go to frame 1

SORRY YOU ARE WRONG!



Kinetic energy is the energy possessed by moving objects alone and not stationary objects

Go to frame 4

Correct
Correct
Correct

Work done is stored here as potential energy.Work done, W= m×g×h = 100kg×9.8×1m =980J

Work done is same in both case as mass and height is constant in both cases.

Power $= \frac{\text{Work done}}{\text{Time}}$

For Ben , P $= \frac{980J}{10S}$ = 98 Watts

For Will,P $= \frac{980J}{60S}$ =16.33Watts

So Ben has more power

CLICK ME…YOU ARE DONE

WHOOPS!!!
IT’S WRONG

Frame 4 option 3

Same kinetic energy does not imply the velocities are the same.Kinetic energy depends not only on velocity but also mass.

[Go to frame 4]

THANK YOU...

ALICE JOSEPH

Digitally signed by ALICE JOSEPH
Date: 2024.02.03 10:49:29 +05'30'