

QUESTION BANK (SA-1)

Class-7

Subject-Physics

Theme 2 (UNIT 2): SPEED AND VELOCITY

A. MCQ (8)

1. Speed is:

- a) Distance $\times$ Time
- b) Distance $\div$ Time
- c) Time $\div$ Distance
- d) Displacement $\div$ Time

Answer: b) Distance $\div$ Time

2. Velocity is:

- a) Speed without direction
- b) Speed with direction
- c) Distance travelled
- d) Mass with direction

Answer: b) Speed with direction

3. SI unit of speed is:

- a) km
- b) m/s
- c) kg
- d) N

Answer: b) m/s

4. Which of the following is a scalar quantity?

- a) Velocity
- b) Force
- c) Speed
- d) Weight

Answer: c) Speed

5. Mass is measured using a:

- a) Spring balance
- b) Beam balance
- c) Stopwatch
- d) Measuring cylinder

Answer: b) Beam balance

6. Weight is measured using a:

- a) Beam balance
- b) Thermometer
- c) Spring balance
- d) Measuring tape

Answer: c) Spring balance

7. SI unit of mass is:

- a) Newton
- b) Kilogram
- c) Gram
- d) Metre

Answer: b) Kilogram

8. Weight depends on:

- a) Colour of the object
- b) Gravity
- c) Shape of the object
- d) Volume only

Answer: b) Gravity

B. Fill in the Blanks (8)

1. Speed = _____ ÷ Time.

Answer: Distance

2. Velocity is speed with _____.

Answer: Direction

3. The SI unit of speed is _____.

Answer: m/s

4. Mass is measured using a _____.

Answer: Beam balance

5. Weight is measured using a _____.

Answer: Spring balance

6. The SI unit of mass is _____.

Answer: Kilogram (kg)

7. The SI unit of weight is _____.

Answer: Newton (N)

8. Weight changes with _____.

Answer: Gravity

C. Define the Following (8)

1. Speed

Answer:

Speed is the **distance travelled by an object in unit time.**

Formula:

$$v = \frac{d}{t} \quad v = \frac{d}{t}$$

$$v_{\text{avg}} = \frac{d}{t} = \frac{60 \text{ m}}{5 \text{ s}} = 12 \text{ m/s}$$

ddd

60

m

ddd

ttt

5

s

ttt

average-rate model per 1 total d (m)

SI Unit: metre per second (m/s)

2. Velocity

Answer:

Velocity is the **speed of an object in a particular direction**. It is a **vector quantity** because it has both magnitude and direction.

3. Mass

Answer:

Mass is the **amount of matter present in an object**. It is measured using a **beam balance**.

SI Unit: kilogram (kg)

4. Weight

Answer:

Weight is the **gravitational force acting on an object**. It depends on the mass of the object and the acceleration due to gravity.

Formula:

$$F_g = mg$$

$$F_g = mg = (8)(9.8) = 78.4 \text{ N}$$

$$F_g = mg = (8)(9.8) = 78.4 \text{ N}$$

mmm

8.

kg

mmm

ggg

9.

m/s²

ggg

m=8kg F_g=78.4N g=9.8 m/s²

SI Unit: Newton (N)

5. Distance

Answer:

Distance is the **total length of the path travelled** by an object. It is a **scalar quantity**.

6. Displacement

Answer:

Displacement is the **shortest distance between the starting point and ending point in a particular direction**. It is a **vector quantity**.

7. Scalar Quantity

Answer:

A scalar quantity has **only magnitude and no direction**.

Examples: Mass, Speed, Distance, Time.

8. Vector Quantity

Answer:

A vector quantity has **both magnitude and direction**.

Examples: Velocity, Weight, Force, Displacement.

D. Differentiate Between (8)

1. Speed and Velocity

Speed

Distance travelled per unit time. Speed in a particular direction.

Scalar quantity.

Direction is not required.

Velocity

Vector quantity.

Direction is necessary.

2. Mass and Weight

Mass

Amount of matter in an object.

Constant everywhere.

Measured in kilogram (kg).

Measured using a beam balance.

Weight

Gravitational force acting on an object.

Changes with gravity.

Measured in newton (N).

Measured using a spring balance.

3. Distance and Displacement

Distance

Total path travelled.

Scalar quantity.

Displacement

Shortest distance with direction.

Vector quantity.

4. Beam Balance and Spring Balance

Beam Balance

Measures mass.

Reading in kg or g.

Spring Balance

Measures weight.

Reading in N.

5. Scalar and Vector Quantities

Scalar

Magnitude only.

Example: Mass.

Vector

Magnitude and direction.

Example: Velocity.

6. Mass and Density

Mass

Amount of matter.

Unit: kg

Density

Mass per unit volume.

Unit: kg/m^3

7. Speed and Average Speed

Speed**Average Speed**

Speed at a particular moment. Total distance $\div$ Total time.

8. Weight on Earth and Weight on Moon**Weight on Earth****Weight on Moon**

Greater because gravity is stronger. Smaller because gravity is weaker.

E. Numericals (8)

1. A car travels 150 km in 3 hours. Find its speed.

Answer:

Given:

- Distance = 150 km
- Time = 3 h

Formula:

Speed = Distance $\div$ Time

Calculation:

Speed = $150 \div 3 = 50$ km/h

Answer: 50 km/h

2. A train travels 360 km in 6 hours. Find its speed.

Answer:

Given:

- Distance = 360 km
- Time = 6 h

Formula:

Speed = Distance $\div$ Time

Calculation:

Speed = $360 \div 6 = 60$ km/h

Answer: 60 km/h

3. A cyclist covers 72 km in 4 hours. Find the speed.

Answer:

Given:

- Distance = 72 km
- Time = 4 h

Formula:

Speed = Distance $\div$ Time

Calculation:

Speed = $72 \div 4 = 18$ km/h

Answer: 18 km/h

4. A runner covers 400 m in 50 s. Find the speed.

Answer:

Given:

- Distance = 400 m
- Time = 50 s

Formula:

Speed = Distance $\div$ Time

Calculation:

Speed = $400 \div 50 = 8$ m/s

Answer: 8 m/s

5. A car moves 240 km towards east in 4 hours. Find its velocity.

Answer:

Given:

- Distance = 240 km
- Time = 4 h
- Direction = East

Formula:

$$\text{Velocity} = \text{Distance} \div \text{Time}$$

Calculation:

$$\text{Velocity} = 240 \div 4 = 60 \text{ km/h}$$

Answer: 60 km/h East

6. A person walks 600 m north in 10 minutes. Find the velocity.

Answer:

Given:

- Distance = 600 m
- Time = 10 min = 600 s
- Direction = North

Formula:

$$\text{Velocity} = \text{Distance} \div \text{Time}$$

Calculation:

$$\text{Velocity} = 600 \div 600 = 1 \text{ m/s}$$

Answer: 1 m/s North

7. A bag has a mass of 8 kg. If the gravitational force is 10 N/kg, find its weight.

Answer:

Given:

- Mass = 8 kg
- $g = 10 \text{ N/kg}$

Formula:

$$\text{Weight} = \text{Mass} \times \text{Gravity}$$

Calculation:

$$\text{Weight} = 8 \times 10 = 80 \text{ N}$$

Answer: 80 N

8. An object has a mass of 12 kg. Calculate its weight if $g = 10 \text{ N/kg}$.

Answer:

Given:

- Mass = 12 kg
- $g = 10 \text{ N/kg}$

Formula:

Weight = Mass $\times$ Gravity

Calculation:

Weight = $12 \times 10 = 120 \text{ N}$

Answer: 120 N

F. Give Reasons (8)

1. Why is velocity called a vector quantity?

Answer:

Velocity is called a **vector quantity** because it has both **magnitude (speed)** and **direction**. If the direction changes, the velocity also changes.

2. Why is speed called a scalar quantity?

Answer:

Speed is called a **scalar quantity** because it has only **magnitude** and does not have any direction.

3. Why can two objects have the same speed but different velocities?

Answer:

Two objects can have the same speed but different velocities if they move in **different directions**.

4. Why does weight change from place to place but mass does not?

Answer:

Weight depends on the **gravitational force**, which changes from place to place. Mass is the amount of matter in an object and **remains the same everywhere**.

5. Why is a beam balance used to measure mass?

Answer:

A beam balance compares the mass of an object with known standard masses. Therefore, it measures **mass accurately**.

6. Why is a spring balance used to measure weight?

Answer:

A spring balance measures the **force due to gravity** acting on an object. Since weight is a force, it is measured using a spring balance.

7. Why is average speed useful during a journey?

Answer:

The speed of a vehicle changes during a journey. Average speed gives the **overall speed** by considering the total distance travelled and the total time taken.

8. Why is direction important in velocity?

Answer:

Velocity includes both **speed and direction**. Without direction, only speed can be determined, not velocity.

G. Answer the Following (8)

1. What is speed?

Answer:

Speed is the **distance travelled by an object in unit time**. It tells us how fast or slow an object is moving.

Formula:

Speed = Distance ÷ Time

SI Unit: metre per second (m/s).

2. What is velocity?

Answer:

Velocity is the **speed of an object in a particular direction**. It has both **magnitude and direction**, so it is called a **vector quantity**.

Formula:

Velocity = Displacement ÷ Time

SI Unit: metre per second (m/s).

3. What is mass?

Answer:

Mass is the **amount of matter present in an object**. It remains the same everywhere and is measured using a **beam balance**.

SI Unit: kilogram (kg).

4. What is weight?

Answer:

Weight is the **force with which the Earth attracts an object due to gravity**. Weight depends on the mass of the object and the value of gravity.

Formula:

Weight = Mass × Gravity ($W = m \times g$)

SI Unit: Newton (N).

5. State any four differences between mass and weight.

Answer:

Mass	Weight
Amount of matter.	Gravitational force on an object.
Constant everywhere.	Changes with gravity.
Measured in kilogram (kg).	Measured in newton (N).

Mass

Measured using a beam balance.

Weight

Measured using a spring balance.

6. Why is velocity called a vector quantity?

Answer:

Velocity is called a **vector quantity** because it has **both magnitude and direction**. A change in either speed or direction changes the velocity of an object.

7. Explain average speed with an example.

Answer:

Average speed is the **total distance travelled divided by the total time taken**.

Formula:

Average Speed = Total Distance ÷ Total Time

Example:

A car travels **180 km in 3 hours**.

Average Speed = $180 \div 3 = 60 \text{ km/h}$

8. Explain the relation between mass and weight.

Answer:

Mass and weight are related by the formula:

Weight = Mass × Gravity (W = m × g)

Mass is the amount of matter in an object, whereas weight is the gravitational force acting on it. Therefore, **weight changes with gravity, but mass remains constant**.

Theme 3 (Unit 1): ENERGY AND THEIR UNITS

A. MCQ (8)

1. Energy is the ability to:

- a) Sleep
- b) Do work
- c) Eat food
- d) Increase mass

Answer: b) Do work

2. Work is said to be done when:

- a) A force acts without movement
- b) A force moves an object
- c) An object remains at rest
- d) A body has mass

Answer: b) A force moves an object

3. SI unit of work is:

- a) Watt
- b) Joule
- c) Newton
- d) Kilogram

Answer: b) Joule

4. SI unit of energy is:

- a) Joule
- b) Watt
- c) Newton
- d) Metre

Answer: a) Joule

5. Which of the following has energy?

- a) A stationary wall
- b) A moving car
- c) A ruler
- d) A table

Answer: b) A moving car

6. Which quantity is measured in joules?

- a) Speed
- b) Work
- c) Mass
- d) Time

Answer: b) Work

7. Work is done only when there is:

- a) Force only
- b) Displacement only
- c) Force and displacement
- d) Mass only

Answer: c) Force and displacement

8. Which form of energy is stored in food?

- a) Chemical energy
- b) Sound energy
- c) Light energy
- d) Heat energy

Answer: a) Chemical energy

B. Fill in the Blanks (8)

1. Energy is the ability to do _____.

Answer: Work

2. Work is measured in _____.

Answer: Joule

3. The SI unit of energy is _____.

Answer: Joule

4. A body must move for _____ to be done.

Answer: Work

5. Work is done when force produces _____.

Answer: Displacement

6. One joule is the SI unit of _____.

Answer: Work

7. Food contains _____ energy.

Answer: Chemical

8. Energy and work are measured in the same _____.

Answer: Unit

C. Define the Following (8)

1. Energy

Answer:

Energy is the **capacity or ability to do work**. Every activity requires energy.

SI Unit: Joule (J)

2. Work**Answer:**

Work is said to be done when a **force applied on an object causes it to move in the direction of the force**.

$$W = Fd \cos(\theta) \quad W = Fd \cos(\theta) \quad W = Fd \cos(\theta)$$

$$W = (6)(4) \cos(35^\circ) = 19.7 \text{ J} \quad W = (\text{6})(\text{4}) \cos(\text{35}^\circ) = \text{19.7} \text{ J} \quad W = (6)(4) \cos(35^\circ) = 19.7 \text{ J}$$

Only the part of F along d contributes to work.

FFF

6.

N

FFF

ddd

4.

m

ddd

θ

35

deg

θ

$$d = 4 \text{ m} \quad F \cos \theta = 35^\circ F \parallel = 4.9 \text{ N} \quad W = 19.7 \text{ J}$$

SI Unit: Joule (J)

3. Joule**Answer:**

A **joule (J)** is the SI unit of work and energy. One joule of work is done when a force of **1 newton** moves an object through a distance of **1 metre** in the direction of the force.

4. Force**Answer:**

Force is a **push or pull** that can move or change the shape of an object.

SI Unit: Newton (N)

5. Mechanical Energy

Answer:

Mechanical energy is the energy possessed by an object due to its **motion or position**. It includes **kinetic energy** and **potential energy**.

6. Chemical Energy

Answer:

Chemical energy is the energy stored in substances such as **food, fuels, and batteries**.

7. Kinetic Energy

Answer:

Kinetic energy is the energy possessed by an object due to its **motion**.

8. Potential Energy

Answer:

Potential energy is the energy possessed by an object due to its **position or shape**.

D. Differentiate Between (8)

1. Work and Energy

Work

Work is done when force causes displacement.
Measured in joules.

Energy

Energy is the ability to do work.
Also measured in joules.

2. Kinetic Energy and Potential Energy

Kinetic Energy

Energy due to motion.

Potential Energy

Energy due to position.

Example: Moving bicycle. Example: Water stored in a dam.

3. Force and Work

Force	Work
A push or pull. Result of force causing displacement.	
Unit: Newton.	Unit: Joule.

4. Joule and Newton

Joule	Newton
Unit of work and energy.	Unit of force.
Symbol: J	Symbol: N

5. Work and Power

Work	Power
Amount of work done.	Rate of doing work.
Unit: Joule	Unit: Watt

6. Living and Non-living Sources of Energy

Living	Non-living
Human beings, animals.	Sun, wind, water.

7. Heat Energy and Light Energy

Heat Energy	Light Energy
Produces warmth.	Enables us to see objects.

8. Renewable and Non-renewable Energy Sources

Renewable	Non-renewable
Can be replenished naturally.	Cannot be replenished quickly.
Example: Solar energy.	Example: Coal.

E. Numericals (8)

1. A force of 10 N moves an object through a distance of 5 m. Find the work done.

Answer:

Given:

- Force = 10 N
- Distance = 5 m

Formula:

$$\text{Work} = \text{Force} \times \text{Distance}$$

Calculation:

$$\text{Work} = 10 \times 5 = 50$$

Answer: 50 J

2. A force of 20 N moves a box through 4 m. Find the work done.

Answer:

Given:

- Force = 20 N
- Distance = 4 m

Formula:

$$\text{Work} = \text{Force} \times \text{Distance}$$

Calculation:

$$\text{Work} = 20 \times 4 = 80$$

Answer: 80 J

3. A force of 15 N moves an object through 3 m. Calculate the work done.

Answer:

Given:

- Force = 15 N
- Distance = 3 m

Formula:

$$\text{Work} = \text{Force} \times \text{Distance}$$

Calculation:

$$\text{Work} = 15 \times 3 = 45$$

Answer: 45 J

4. A boy pushes a trolley with a force of 25 N through 2 m. Find the work done.

Answer:

Given:

- Force = 25 N
- Distance = 2 m

Formula:

Work = Force $\times$ Distance

Calculation:

Work = $25 \times 2 = 50$

Answer: 50 J

5. A force of 8 N moves an object by 6 m. Find the work done.

Answer:

Given:

- Force = 8 N
- Distance = 6 m

Formula:

Work = Force $\times$ Distance

Calculation:

Work = $8 \times 6 = 48$

Answer: 48 J

6. A force of 30 N acts on an object and moves it 5 m. Find the work done.

Answer:

Given:

- Force = 30 N
- Distance = 5 m

Formula:

$$\text{Work} = \text{Force} \times \text{Distance}$$

Calculation:

$$\text{Work} = 30 \times 5 = 150$$

Answer: 150 J

7. A force of 12 N acts on an object. The work done is 60 J. Find the distance moved.

Answer:

Given:

- Force = 12 N
- Work = 60 J

Formula:

$$\text{Distance} = \text{Work} \div \text{Force}$$

Calculation:

$$\text{Distance} = 60 \div 12 = 5$$

Answer: 5 m

8. Work done is 100 J when a force of 20 N is applied. Find the distance.

Answer:

Given:

- Work = 100 J
- Force = 20 N

Formula:

$$\text{Distance} = \text{Work} \div \text{Force}$$

Calculation:

$$\text{Distance} = 100 \div 20 = 5$$

Answer: 5 m

F. Give Reasons (8)

1. Why is energy called the capacity to do work?

Answer:

Energy is called the capacity to do work because **without energy, no work can be performed**. Every activity, such as walking, lifting objects, or running machines, requires energy.

2. Why is work done only when an object moves?

Answer:

Work is done only when a **force causes displacement**. If there is no movement, no work is done, even if force is applied.

3. Why are work and energy measured in the same unit?

Answer:

Energy is the **capacity to do work**, and work is the **use of energy**. Therefore, both are measured in the **same unit, the joule (J)**.

4. Why is no work done when pushing a wall that does not move?

Answer:

Although force is applied, the wall does **not move**, so there is **no displacement**. Therefore, no work is done.

5. Why does a moving object possess kinetic energy?

Answer:

A moving object possesses **kinetic energy** because energy is associated with its **motion**. Faster-moving objects generally have more kinetic energy.

6. Why does a raised object possess potential energy?

Answer:

A raised object possesses **potential energy** because of its **position above the ground**. It can do work when allowed to fall.

7. Why is food called a source of energy?

Answer:

Food contains **chemical energy**, which is released in our body to perform activities such as walking, running, studying, and playing.

8. Why is the joule called the SI unit of work?

Answer:

The joule is the SI unit of work because **one joule of work is done when a force of one newton moves an object through one metre in the direction of the force**.

G. Answer the Following (8)

1. What is energy?

Answer:

Energy is the **capacity or ability to do work**. Every living and non-living thing needs energy to perform different activities.

Examples: Running, lifting objects, operating machines, and lighting a bulb.

SI Unit: Joule (J)

2. What is work?

Answer:

Work is said to be done when a **force applied on an object causes it to move in the direction of the force**.

Formula:

Work = Force × Distance

SI Unit: Joule (J)

3. Explain the relation between work and energy.

Answer:

Work and energy are closely related. **Energy is the ability to do work**, while **work is done when energy is used to move an object**. Whenever work is done, energy is transferred from one object to another. Therefore, work and energy are measured in the **same unit, the joule (J)**.

4. State the SI unit of work and define it.

Answer:

The **SI unit of work is the joule (J)**.

Definition:

One joule of work is done when a **force of one newton moves an object through a distance of one metre in the direction of the applied force**.

5. State the SI unit of energy.

Answer:

The **SI unit of energy is the joule (J)**.

Energy is measured in joules because it represents the capacity to do work. Larger amounts of energy may also be measured in **kilojoules (kJ)**, where **1 kJ = 1000 J**.

6. What are the conditions necessary for work to be done?

Answer:

The following conditions are necessary for work to be done:

1. A **force** must act on the object.
2. The object must **move (displacement)**.
3. The movement should be **in the direction of the applied force**.

If any one of these conditions is not satisfied, no work is done.

7. Name any four forms of energy with examples.

Answer:

Form of Energy	Example
Heat Energy	Boiling water
Light Energy	Sunlight
Chemical Energy	Food, petrol, batteries
Electrical Energy	Electric fan, television

8. Differentiate between kinetic energy and potential energy with examples.

Answer:

Kinetic Energy	Potential Energy
Energy possessed due to motion.	Energy possessed due to position.
Exists only when the object is moving.	Exists even when the object is at rest at a height.
Example: Moving car, running person.	Example: Water stored in a dam, stretched rubber band.

Theme 3 (Unit 2): VARIOUS FORMS OF ENERGY AND THEIR INTERCONVERSION

A. MCQ (8)

1. Energy is the ability to:

- a) Move only
- b) Do work
- c) Produce sound only
- d) Increase weight

Answer: b) Do work

2. Which is the ultimate source of energy on Earth?

- a) Moon
- b) Wind
- c) Sun
- d) Water

Answer: c) Sun

3. Energy stored in food is:

- a) Heat energy
- b) Chemical energy
- c) Light energy
- d) Sound energy

Answer: b) Chemical energy

4. Which form of energy is possessed by a moving object?

- a) Potential energy
- b) Kinetic energy
- c) Chemical energy
- d) Heat energy

Answer: b) Kinetic energy

5. Which form of energy is possessed by water stored in a dam?

- a) Kinetic energy
- b) Potential energy
- c) Sound energy
- d) Electrical energy

Answer: b) Potential energy

6. Solar panels convert solar energy into:

- a) Sound energy
- b) Electrical energy
- c) Chemical energy
- d) Heat energy only

Answer: b) Electrical energy

7. According to the law of conservation of energy, energy can be:

- a) Created
- b) Destroyed
- c) Created and destroyed
- d) Converted from one form to another

Answer: d) Converted from one form to another

8. Which form of energy is produced in an electric bulb?

- a) Light and heat energy
- b) Chemical energy
- c) Potential energy
- d) Nuclear energy

Answer: a) Light and heat energy

B. Fill in the Blanks (8)

1. The Sun is the _____ source of energy.

Answer: Ultimate

2. A moving object possesses _____ energy.

Answer: Kinetic

3. Water stored in a dam has _____ energy.

Answer: Potential

4. Food contains _____ energy.

Answer: Chemical

5. Electrical energy can be converted into _____ and heat energy in an electric bulb.

Answer: Light

6. Energy can neither be created nor _____.

Answer: Destroyed

7. Wind energy is produced due to the heat of the _____.

Answer: Sun

8. The SI unit of energy is _____.

Answer: Joule

C. Define the Following (8)

1. Energy

Answer:

Energy is the **capacity or ability to do work**.

SI Unit: Joule (J)

2. Kinetic Energy

Answer:

Kinetic energy is the **energy possessed by an object due to its motion**.

Examples: Moving car, rolling ball, flying bird.

3. Potential Energy

Answer:

Potential energy is the **energy possessed by an object due to its position or shape**.

Examples: Water stored in a dam, stretched rubber band.

4. Chemical Energy

Answer:

Chemical energy is the **energy stored in food, fuels and batteries**. It is released during chemical reactions.

5. Heat Energy

Answer:

Heat energy is the energy that **makes an object hot**. It flows from a hotter object to a colder object.

6. Light Energy

Answer:

Light energy is the energy that **enables us to see objects**. The Sun is the main natural source of light energy.

7. Electrical Energy

Answer:

Electrical energy is the energy produced by the **flow of electric current**. It is used to operate electrical appliances.

8. Law of Conservation of Energy

Answer:

The law of conservation of energy states that:

"Energy can neither be created nor destroyed. It can only be converted from one form into another."

D. Differentiate Between (8)

1. Kinetic Energy and Potential Energy

Kinetic Energy

Due to motion.

Potential Energy

Due to position or shape.

Kinetic Energy

Exists only when the object moves. Can exist even when the object is at rest.

Example: Moving bicycle.

Potential Energy

Example: Water in a dam.

2. Heat Energy and Light Energy**Heat Energy**

Produces warmth. Enables vision.

Example: Fire.

Light Energy

Example: Sunlight.

3. Chemical Energy and Electrical Energy**Chemical Energy**

Stored in food and fuels. Produced by electric current.

Example: Battery.

Electrical Energy

Example: Electricity.

4. Renewable and Non-renewable Sources of Energy**Renewable**

Can be replenished naturally.

Example: Solar energy.

Non-renewable

Cannot be replenished quickly.

Example: Coal.

5. Sun and Battery as Sources of Energy**Sun**

Natural source of energy.

Gives solar energy.

Battery

Artificial source of energy.

Gives electrical energy.

6. Mechanical Energy and Electrical Energy**Mechanical Energy**

Due to motion or position.

Example: Windmill.

Electrical Energy

Due to electric current.

Example: Electric fan.

7. Light Energy and Sound Energy**Light Energy**

Helps us to see.

Sound Energy

Helps us to hear.

Light Energy**Sound Energy**

Travels as light waves. Travels as sound waves.

8. Energy and Work**Energy**

Ability to do work. Done when force causes displacement.

Work

Measured in joules. Measured in joules.

E. Numericals (8)

1. A force of 10 N moves an object through 5 m. Find the work done.

Answer:

Given:

- Force = 10 N
- Distance = 5 m

Formula:

Work = Force $\times$ Distance

Calculation:

Work = $10 \times 5 = 50 \text{ J}$

Answer: 50 J

2. A force of 20 N moves a box through 3 m. Find the work done.

Answer:

Given:

- Force = 20 N
- Distance = 3 m

Formula:

Work = Force $\times$ Distance

Calculation:

Work = $20 \times 3 = 60 \text{ J}$

Answer: 60 J

3. A force of 15 N moves an object through 4 m. Calculate the work done.

Answer:

Calculation:

$$\text{Work} = 15 \times 4 = 60 \text{ J}$$

Answer: 60 J

4. A boy pushes a trolley with a force of 25 N through 2 m. Find the work done.

Answer:

$$\text{Work} = 25 \times 2 = 50 \text{ J}$$

Answer: 50 J

5. A force of 12 N acts on an object. If the work done is 60 J, find the distance moved.

Answer:

Formula:

$$\text{Distance} = \text{Work} \div \text{Force}$$

Calculation:

$$\text{Distance} = 60 \div 12 = 5 \text{ m}$$

Answer: 5 m

6. Work done is 120 J. If the distance moved is 6 m, find the force applied.

Answer:

Formula:

$$\text{Force} = \text{Work} \div \text{Distance}$$

Calculation:

$$\text{Force} = 120 \div 6 = 20 \text{ N}$$

Answer: 20 N

7. A force of 40 N moves an object through 5 m. Calculate the work done.

Answer:

$$\text{Work} = 40 \times 5 = 200 \text{ J}$$

Answer: 200 J

8. A force of 50 N moves an object through 4 m. Find the work done.

Answer:

$$\text{Work} = 50 \times 4 = 200 \text{ J}$$

Answer: 200 J

F. Give Reasons (8)

1. Why is the Sun called the ultimate source of energy?

Answer:

The Sun is called the **ultimate source of energy** because most forms of energy on Earth, such as wind energy, water energy, and the chemical energy stored in plants and food, are obtained directly or indirectly from the Sun.

2. Why does a moving object possess kinetic energy?

Answer:

A moving object possesses **kinetic energy** because energy is associated with its **motion**. The faster the object moves, the greater its kinetic energy.

3. Why does water stored in a dam possess potential energy?

Answer:

Water stored at a height has **potential energy** because of its **position**. When released, this energy is converted into kinetic energy and can be used to generate electricity.

4. Why is energy said to be convertible from one form to another?

Answer:

Energy can change from one form into another without being lost. For example, in an electric bulb, **electrical energy is converted into light energy and heat energy**.

5. Why are work and energy measured in joules?

Answer:

Energy is the **capacity to do work**, and work is done by using energy. Therefore, both are measured in the **same SI unit, the joule (J)**.

6. Why is no energy destroyed during energy conversion?

Answer:

According to the **law of conservation of energy**, energy can neither be created nor destroyed. It only changes from one form to another.

7. Why is food considered a source of energy?

Answer:

Food contains **chemical energy**, which our body converts into **mechanical energy and heat energy** to perform various activities.

8. Why is electrical energy widely used?

Answer:

Electrical energy is widely used because it can be **easily converted into light, heat, sound, and mechanical energy**, making it useful for operating different appliances.

G. Answer the Following (8)

1. What is energy? Name any four forms of energy.

Answer:

Energy is the **capacity or ability to do work**.

Four forms of energy are:

1. Heat Energy
2. Light Energy
3. Electrical Energy
4. Chemical Energy

Other forms include kinetic energy, potential energy, sound energy, and solar energy.

2. Explain the interconversion of energy with one example.

Answer:

Interconversion of energy is the **process by which one form of energy changes into another.**

Example:

In an electric bulb:

- Electrical energy $\rightarrow$ Light energy + Heat energy.

Another example is a hydroelectric power station:

- Potential energy of stored water $\rightarrow$ Kinetic energy $\rightarrow$ Electrical energy.
-

3. Why is the Sun called the ultimate source of energy?

Answer:

The Sun provides **light and heat energy** to the Earth. Plants prepare food using sunlight, and animals depend on plants for food. Wind and water energy are also produced due to the Sun's heat. Therefore, the Sun is known as the **ultimate source of energy.**

4. State the law of conservation of energy.

Answer:

The **law of conservation of energy** states:

"Energy can neither be created nor destroyed. It can only be converted from one form into another."

The total amount of energy always remains constant.

5. Explain the law of conservation of energy with an example.

Answer:

When a ball is dropped from a height:

- At the top, it has **potential energy**.
- As it falls, potential energy changes into **kinetic energy**.
- Just before reaching the ground, most of the energy is kinetic energy.

Thus, energy changes its form but is **not lost or created**.

6. Explain any four forms of energy with examples.

Answer:

Form of Energy	Example
Heat Energy	Fire, heater
Light Energy	Sun, electric bulb
Chemical Energy	Food, petrol, batteries
Electrical Energy	Electric fan, television

7. Give three examples of energy conversion in daily life.

Answer:

1. **Electric bulb:** Electrical energy → Light energy + Heat energy.
 2. **Electric fan:** Electrical energy → Mechanical energy.
 3. **Car engine:** Chemical energy of fuel → Heat energy → Mechanical energy.
-

8. Why is energy important in our daily life?

Answer:

Energy is essential because **every activity requires energy**. We need energy for walking, running, cooking, lighting homes, operating machines, transporting goods, and performing all daily activities. Without energy, no work can be done.

Theme 4 (Unit 1): LIGHT AND GENERAL TERMS USED IN UNDERSTANDING LIGHT

A. MCQ (8)

1. Light is a form of:

- a) Matter
- b) Energy
- c) Force
- d) Sound

Answer: b) Energy

2. The natural source of light is:

- a) Electric bulb
- b) Candle
- c) Sun
- d) Torch

Answer: c) Sun

3. Which of the following is a luminous object?

- a) Moon
- b) Book
- c) Sun
- d) Chair

Answer: c) Sun

4. Objects that do not produce their own light are called:

- a) Luminous objects
- b) Non-luminous objects
- c) Transparent objects
- d) Translucent objects

Answer: b) Non-luminous objects

5. Light travels in:

- a) Curved lines
- b) Zig-zag lines

- c) Straight lines
- d) Circular paths

Answer: c) Straight lines

6. A thin path of light is called:

- a) Beam
- b) Ray
- c) Shadow
- d) Reflection

Answer: b) Ray

7. Which of the following is an artificial source of light?

- a) Sun
- b) Stars
- c) Electric bulb
- d) Firefly

Answer: c) Electric bulb

8. A shadow is formed when light is blocked by:

- a) A transparent object
- b) An opaque object
- c) Air
- d) Water

Answer: b) An opaque object

B. Fill in the Blanks (8)

1. Light is a form of _____.

Answer: Energy

2. The Sun is a _____ source of light.

Answer: Natural

3. A bulb is an _____ source of light.

Answer: Artificial

4. Light travels in _____ lines.

Answer: Straight

5. A thin path of light is called a _____.

Answer: Ray

6. A group of light rays is called a _____.

Answer: Beam

7. Shadows are formed by _____ objects.

Answer: Opaque

8. The Moon is a _____ object.

Answer: Non-luminous

C. Define the Following (8)

1. Light

Answer:

Light is a **form of energy that enables us to see objects**. Without light, objects cannot be seen.

2. Luminous Object

Answer:

A **luminous object** is an object that **produces its own light**.

Examples: Sun, stars, candle flame, electric bulb.

3. Non-luminous Object

Answer:

A **non-luminous object** is an object that **does not produce its own light**. It can be seen only when light from another source falls on it.

Examples: Moon, book, table, chair.

4. Ray of Light

Answer:

A **ray of light** is the **thin, straight path along which light travels**. It is represented by a straight line with an arrow.

5. Beam of Light

Answer:

A **beam of light** is a **group of light rays travelling together**.

Types of beams:

- Parallel beam
 - Convergent beam
 - Divergent beam
-

6. Propagation of Light

Answer:

The **propagation of light** is the movement or travel of light from one place to another. Light always travels in **straight lines** in a uniform medium.

7. Shadow

Answer:

A **shadow** is the **dark region formed behind an opaque object when it blocks the path of light**.

8. Opaque Object

Answer:

An **opaque object** is an object that **does not allow light to pass through it**.

Examples: Wood, brick, metal.

D. Differentiate Between (8)

1. Luminous and Non-luminous Objects

Luminous Objects	Non-luminous Objects
Produce their own light.	Do not produce their own light.
Can be seen without another light source.	Seen only when light falls on them.
Example: Sun.	Example: Moon.

2. Natural and Artificial Sources of Light

Natural Sources	Artificial Sources
Found in nature.	Made by humans.
Example: Sun.	Example: Electric bulb.

3. Ray and Beam of Light

Ray	Beam
Single path of light.	Group of light rays.
Represented by one line.	Consists of many rays.

4. Transparent and Opaque Objects

Transparent

Allow light to pass completely. Do not allow light to pass.

Example: Glass.

Opaque

Example: Wood.

5. Transparent and Translucent Objects

Transparent

Allow almost all light to pass. Allow only some light to pass.

Objects are seen clearly.

Translucent

Objects appear blurred.

6. Shadow and Image

Shadow

Formed when light is blocked. Formed by reflection or refraction of light.

Usually dark.

Image

Shows the appearance of the object.

7. Ray and Shadow

Ray

Path along which light travels. Dark region formed when light is blocked.

Shadow

8. Sun and Moon

Sun

Luminous object.

Produces its own light.

Moon

Non-luminous object.

Reflects sunlight.

E. Numericals / Application-Based Questions (8)

1. A candle is placed in front of an opaque object. What is formed behind the object?

Answer:

A **shadow** is formed behind the opaque object because it blocks the path of light.

2. A student stands in sunlight. Why is a shadow formed on the ground?

Answer:

The student's body is **opaque** and blocks the sunlight. Therefore, a **shadow** is formed on the ground behind the student.

3. Is the Moon a luminous object? Give a reason.

Answer:

No. The Moon is a **non-luminous object** because it does **not produce its own light**. It reflects the light received from the Sun.

4. Why can we see a book only in the presence of light?

Answer:

A book is a **non-luminous object**. It can be seen only when light from a source falls on it and is reflected into our eyes.

5. Name the type of beam produced by a laser.

Answer:

A laser produces a **parallel beam of light** because its rays travel parallel to each other.

6. A torch is switched on in a dark room. Which form of energy is converted into light?

Answer:

The torch converts **chemical energy** stored in the battery into **electrical energy**, which is then converted into **light energy**.

7. Why does an opaque object cast a shadow but a transparent object does not?

Answer:

An opaque object blocks light completely, so it forms a shadow. A transparent object allows almost all the light to pass through it, so it does not form a distinct shadow.

8. A person stands between the Sun and a wall. Where will the shadow be formed?

Answer:

The shadow will be formed **on the wall opposite the Sun**, because light travels in straight lines and is blocked by the person's body.

F. Give Reasons (8)

1. Why is the Sun called a luminous object?

Answer:

The Sun is called a **luminous object** because it **produces and emits its own light**.

2. Why is the Moon called a non-luminous object?

Answer:

The Moon is called a **non-luminous object** because it **does not produce its own light**. It reflects the light of the Sun.

3. Why does light travel in a straight line?

Answer:

Light travels in a **straight line** in a uniform transparent medium. This property is called the **rectilinear propagation of light**.

4. Why is an opaque object necessary for the formation of a shadow?

Answer:

An opaque object is necessary because it **blocks the path of light completely**, resulting in the formation of a shadow.

5. Why is a shadow always dark?

Answer:

A shadow is dark because **light cannot pass through the opaque object**, leaving the region behind it without light.

6. Why do transparent objects not form clear shadows?

Answer:

Transparent objects allow **almost all the light** to pass through them, so very little light is blocked. Therefore, they do not produce clear shadows.

7. Why can we not see objects in complete darkness?

Answer:

We cannot see objects in complete darkness because **no light is available to reflect from the objects into our eyes.**

8. Why is the propagation of light important?

Answer:

The propagation of light is important because it enables us to **see objects, form shadows, and understand many optical phenomena.**

G. Answer the Following (8)

1. What is light?

Answer:

Light is a **form of energy that enables us to see objects.** It travels in straight lines and is essential for vision. Without light, objects cannot be seen.

2. What are the sources of light? Give examples.

Answer:

Sources of light are objects that emit light.

They are of two types:

1. Natural Sources: Found in nature.

- Sun
- Stars
- Fireflies

2. Artificial Sources: Made by humans.

- Electric bulb

- Candle
 - Torch
 - LED lamp
-

3. What are luminous and non-luminous objects?

Answer:

Luminous objects are objects that **produce their own light**.

Examples: Sun, stars, electric bulb.

Non-luminous objects do **not produce their own light**. They are visible because they reflect light falling on them.

Examples: Moon, table, book, chair.

4. What is a ray of light? What is a beam of light?

Answer:

A **ray of light** is the **single straight path** along which light travels.

A **beam of light** is a **group of light rays travelling together**.

Types of beams:

- Parallel beam
 - Divergent beam
 - Convergent beam
-

5. Explain the propagation of light.

Answer:

Propagation of light means the **travel of light from one place to another**.

Light always travels in **straight lines** in a **uniform transparent medium**. This property is called the **rectilinear propagation of light**.

This property helps explain the formation of shadows and eclipses.

6. What is a shadow? State the conditions necessary for the formation of a shadow.

Answer:

A **shadow** is the **dark region** formed behind an opaque object when it blocks the path of light.

Conditions necessary for the formation of a shadow:

1. A source of light.
 2. An opaque object.
 3. A screen or surface on which the shadow is formed.
-

7. Explain the formation of a shadow.

Answer:

A shadow is formed when an **opaque object comes in the path of light**. Since light travels in straight lines and cannot pass through the opaque object, a **dark region** is formed behind it. This dark region is called the **shadow**.

The **size and shape of the shadow** depend on the **position of the light source, the object, and the screen**.

8. State the properties of light.

Answer:

The important properties of light are:

1. Light is a **form of energy**.
2. Light travels in **straight lines**.
3. Light enables us to **see objects**.
4. Light forms **shadows** when blocked by opaque objects.
5. Light can be **reflected** from surfaces.
6. Light can pass through **transparent materials**.

Theme 3 (Unit 2): REFLECTION OF LIGHT ON PLANE SURFACES

A. MCQ (10)

1. The bouncing back of light into the same medium is called:

- a) Refraction
- b) Reflection
- c) Dispersion
- d) Absorption

Answer: b) Reflection

2. A plane mirror forms an image which is:

- a) Real
- b) Virtual
- c) Inverted
- d) Magnified

Answer: b) Virtual

3. The angle of incidence is always _____ the angle of reflection.

- a) Greater than
- b) Less than
- c) Equal to
- d) Double

Answer: c) Equal to

4. Which instrument uses plane mirrors?

- a) Microscope
- b) Periscope
- c) Telescope
- d) Thermometer

Answer: b) Periscope

5. Lateral inversion means:

- a) Upside down image
- b) Left and right sides are interchanged
- c) Bigger image
- d) Smaller image

Answer: b) Left and right sides are interchanged

6. A plane mirror produces:

- a) Real image
- b) Virtual image
- c) Diminished image
- d) Coloured image

Answer: b) Virtual image

7. The primary colours of light are:

- a) Red, Green, Blue
- b) Red, Yellow, Blue
- c) Green, Yellow, Blue
- d) Red, Orange, Blue

Answer: a) Red, Green, Blue

8. Red + Green light produces:

- a) Blue
- b) Yellow
- c) White
- d) Magenta

Answer: b) Yellow

9. All three primary colours of light combine to form:

- a) Black
- b) White
- c) Brown
- d) Grey

Answer: b) White

10. Colour subtraction occurs when:

- a) Colours are emitted
- b) Colours are absorbed by objects
- c) Light is reflected
- d) Sound is produced

Answer: b) Colours are absorbed by objects

B. Fill in the Blanks (10)

1. Reflection is the _____ back of light.

Answer: Bouncing

2. A plane mirror forms a _____ image.

Answer: Virtual

3. The angle of incidence is _____ to the angle of reflection.

Answer: Equal

4. The incident ray, reflected ray and normal lie in the same _____.

Answer: Plane

5. A plane mirror produces _____ inversion.

Answer: Lateral

6. A periscope uses _____ mirrors.

Answer: Plane

7. The primary colours of light are Red, Green and _____.

Answer: Blue

8. Red and Blue light produce _____ colour.

Answer: Magenta

9. Green and Blue light produce _____ colour.

Answer: Cyan

10. All primary colours together produce _____ light.

Answer: White

C. Define the Following (10)

1. Reflection of Light

Answer:

Reflection of light is the **bouncing back of light into the same medium after striking a surface.**

2. Incident Ray

Answer:

The **incident ray** is the ray of light that **falls on the reflecting surface.**

3. Reflected Ray

Answer:

The **reflected ray** is the ray of light that **bounces back from the reflecting surface**.

4. Normal

Answer:

The **normal** is an imaginary line drawn **perpendicular to the reflecting surface at the point of incidence**.

5. Angle of Incidence

Answer:

The **angle of incidence** is the angle between the **incident ray and the normal**.

6. Angle of Reflection

Answer:

The **angle of reflection** is the angle between the **reflected ray and the normal**.

7. Lateral Inversion

Answer:

Lateral inversion is the **sidewise reversal of an image**, where the **left side appears as the right side and vice versa**.

8. Plane Mirror

Answer:

A **plane mirror** is a mirror with a **flat, smooth reflecting surface** that forms a **virtual, erect image of the same size** as the object.

9. Primary Colours of Light

Answer:

The **primary colours of light** are **Red, Green and Blue (RGB)**. These colours can be combined to produce all other colours of light.

10. Secondary Colours of Light

Answer:

The colours formed by mixing two primary colours of light are called **secondary colours**.

- Red + Green = Yellow
 - Green + Blue = Cyan
 - Blue + Red = Magenta
-

D. Differentiate Between (8)

1. Incident Ray and Reflected Ray

Incident Ray

Reflected Ray

Falls on the mirror. Bounces back from the mirror.

2. Angle of Incidence and Angle of Reflection

Angle of Incidence

Angle of Reflection

Between incident ray and normal. Between reflected ray and normal.

Represented by $\angle i$.

Represented by $\angle r$.

3. Real Image and Virtual Image

Real Image

Virtual Image

Can be obtained on a screen. Cannot be obtained on a screen.

Usually inverted.

Erect.

4. Plane Mirror and Curved Mirror

Plane Mirror

Curved Mirror

Flat reflecting surface. Curved reflecting surface.

Forms same-sized image. May magnify or diminish the image.

5. Reflection and Refraction

Reflection

Light bounces back.

Refraction

Light bends while passing into another medium.

6. Primary Colours and Secondary Colours

Primary Colours Secondary Colours

Red, Green, Blue. Yellow, Cyan, Magenta.

7. Lateral Inversion and Upside-down Image

Lateral Inversion

Left and right are interchanged.

Produced by a plane mirror.

Upside-down Image

Top and bottom are reversed.

Produced by some lenses or curved mirrors.

8. Opaque and Transparent Objects

Opaque

Do not allow light to pass.

Transparent

Allow almost all light to pass.

E. Numericals / Application-Based Questions (8)

1. A ray of light strikes a plane mirror at an angle of incidence of 40° . Find the angle of reflection.

Answer:

Given:

- Angle of incidence ($\angle i$) = 40°

Law of Reflection:

Angle of incidence = Angle of reflection

Calculation:

$$\angle r = 40^\circ$$

Answer: 40°

2. The angle of incidence is 65° . Calculate the angle of reflection.

Answer:

Given:

- $\angle i = 65^\circ$

According to the law of reflection,

$$\angle r = \angle i$$

Therefore,

Answer: 65°

3. A person stands 2 m in front of a plane mirror. How far is the image behind the mirror?

Answer:

In a plane mirror, the image is formed **at the same distance behind the mirror as the object is in front of it.**

Object distance = **2 m**

Image distance = **2 m behind the mirror**

Answer: 2 m

4. A boy is 3 m away from a plane mirror. What is the distance between the boy and his image?

Answer:

Distance of image behind mirror = **3 m**

Distance between object and image

$$= 3 + 3$$

$$= \mathbf{6\ m}$$

Answer: 6 m

5. A girl moves 1 m towards a plane mirror. How much does the distance between her and her image decrease?

Answer:

When the object moves **1 m** towards the mirror, the image also moves **1 m** towards the mirror.

Total decrease = **2 m**

Answer: 2 m

6. Name the colour produced when Red and Green light are mixed.

Answer:

Red + Green = **Yellow**

7. Name the colour produced when Green and Blue light are mixed.

Answer:

Green + Blue = **Cyan**

8. Name the colour produced when Red, Green, and Blue lights are mixed together.

Answer:

Red + Green + Blue = **White Light**

F. Give Reasons (8)

1. Why is the angle of incidence always equal to the angle of reflection?

Answer:

According to the **First Law of Reflection**, whenever light strikes a smooth reflecting surface, the **angle of incidence is always equal to the angle of reflection**. This ensures regular and predictable reflection of light.

2. Why does a plane mirror form a virtual image?

Answer:

A plane mirror forms a **virtual image** because the reflected rays **do not actually meet**. They only appear to come from a point behind the mirror.

3. Why is the image in a plane mirror laterally inverted?

Answer:

A plane mirror reverses the **left and right sides** of an object while keeping the top and bottom unchanged. This sidewise reversal is called **lateral inversion**.

4. Why can a virtual image not be obtained on a screen?

Answer:

A virtual image cannot be obtained on a screen because the **reflected rays do not actually meet**. They only appear to meet behind the mirror.

5. Why are plane mirrors used in periscopes?

Answer:

Plane mirrors are used in periscopes because they **reflect light without changing the size or shape of the image**, allowing us to see objects over obstacles.

6. Why is the Sun considered the primary source of light?

Answer:

The Sun is considered the **primary natural source of light** because it emits its own light and provides light to the Earth.

7. Why does white light appear when all primary colours of light are mixed?

Answer:

White light is produced because the three primary colours of light—**Red, Green, and Blue**—combine completely through **additive colour mixing**.

8. Why do coloured objects appear coloured?

Answer:

Coloured objects appear coloured because they **reflect their own colour and absorb the other colours** of the incident white light.

G. Answer the Following (8)

1. What is reflection of light?

Answer:

Reflection of light is the **bouncing back of light into the same medium after striking a reflecting surface**.

Examples:

- Seeing your image in a mirror.
 - Reflection of sunlight from calm water.
-

2. State the two laws of reflection.

Answer:

The **laws of reflection** are:

1. **The angle of incidence is equal to the angle of reflection.**
 2. **The incident ray, the reflected ray, and the normal at the point of incidence all lie in the same plane.**
-

3. What is lateral inversion?

Answer:

Lateral inversion is the **sidewise reversal of an image** formed by a plane mirror. In this case, the **left side of the object appears as the right side in the image and vice versa**, while the top and bottom remain unchanged.

Example: The word "AMBULANCE" is written in reverse on the front of an ambulance so that it appears correctly in a driver's rear-view mirror.

4. State the characteristics of the image formed by a plane mirror.

Answer:

The image formed by a plane mirror is:

1. **Virtual**
 2. **Erect (upright)**
 3. **Same size as the object**
 4. **Laterally inverted**
 5. **Formed at the same distance behind the mirror as the object is in front of it**
-

5. What is a reflecting periscope? State its uses.

Answer:

A **reflecting periscope** is an optical instrument that uses **two plane mirrors placed at an angle of 45°** to reflect light. It allows a person to see objects that are **not directly visible**.

Uses:

- In submarines to observe objects above the water surface.
 - By soldiers to observe the enemy from behind walls or trenches.
 - To look over obstacles.
-

6. What are the uses of a plane mirror?

Answer:

Plane mirrors are used:

1. As **dressing mirrors**.
 2. In **periscopes**.
 3. In **kaleidoscopes**.
 4. In **interior decoration** to make rooms appear larger.
 5. In optical instruments.
-

7. What are the primary and secondary colours of light?

Answer:

Primary Colours of Light:

- Red
- Green
- Blue (RGB)

Secondary Colours of Light:

Primary Colours Mixed Secondary Colour Formed

Red + Green	Yellow
Green + Blue	Cyan
Blue + Red	Magenta

When **Red + Green + Blue** are mixed together, they produce **White Light**.

8. Explain colour addition and colour subtraction.

Answer:

Colour Addition

Colour addition is the process of **mixing coloured lights**.

- Red + Green = Yellow
- Green + Blue = Cyan
- Blue + Red = Magenta
- Red + Green + Blue = White

Colour Subtraction

Colour subtraction occurs when an object **absorbs certain colours of white light and reflects the remaining colour**.

Example: A red apple appears red because it **reflects red light and absorbs the other colours**.