

LESSON 1 HEAT

Answer briefly.

1. What are the applications of conduction in our daily life?

- We cook food in vessels made up of metals. When the vessel is heated, heat is transferred from the metal to the food.
- When we iron dresses heat is transferred from the iron to the cloth.

2. What are the effects of heat?

- Expansion
- Increase in temperature
- Change in state

3. Name three types of heat transfer.

- Conduction
- Convection
- Radiation

4. What is conduction?

- In conduction heat transfer takes place between two ends of the same solid or through two solid substances that are at different temperatures but in contact with one another.

5. Write a note on convection.

- When water in the vessel is heated, water molecules at the bottom receive heat energy and move upward.
- Then the molecules at the top comes down and get heated. This kind of heat transfer is known as convection.

6. Define specific heat capacity.

- Specific heat capacity of a substance is defined as the amount of heat energy required to raise the temperature of 1 kilogram of a substance by 1°C or 1 K.
- It is denoted by the symbol C.

OR

$$\text{Specific heat capacity} = \frac{\text{Amount of heat energy required (Q)}}{\text{Mass} \times \text{Raise in temperature } (\Delta T)}$$

7. Define one calorie.

- Calorie is defined as the amount of heat energy required by a substance to raise its temperature by 1°C or 1 K.
- It is denoted by the symbol C'

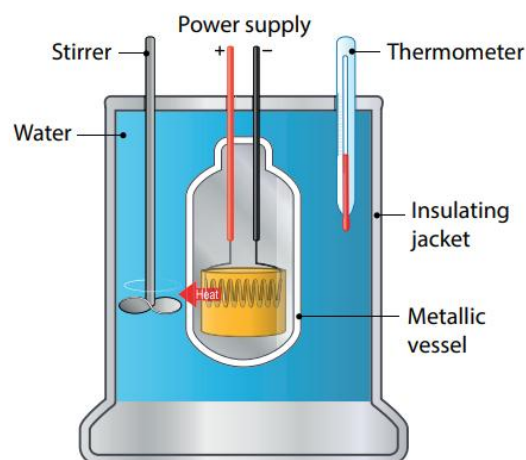
OR

$$\text{Calorie} = \frac{\text{Amount of heat energy required (Q)}}{\text{Raise in temperature } (\Delta T)}$$

VII. Answer in detail.

1. With the help of a neat diagram explain the working of a calorimeter.

- A calorimeter is a device used to measure the amount of heat gained or lost by a substance.



WORKING:

- The metallic vessel is kept in an insulating jacket to prevent heat loss.
- Through one hole a thermometer is inserted to measure the Heat temperature of the contents.
- A stirrer is inserted through another hole for stirring the content in the vessel.
- The vessel is filled with liquid which is heated by passing current through the heating element.
- Using this device we can measure the heat capacity of the liquid in the container.

2. Write a note on thermostat.

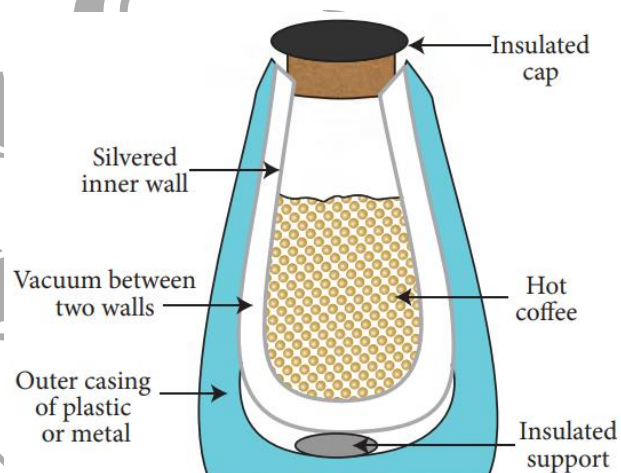
- A thermostat is a device which maintains the temperature of a place or an object constant.
- Greek word thermo means heat and static means staying the same.
- Thermostats are used in any device or system that gets heated or cools down to a pre-set temperature.
- Sometimes, a thermostat functions both as the sensor and the controller of a thermal system.
- E.g: Air conditioner, water heater.

3. Explain the working of thermos flask.

- The thermos flask (Vacuum flask) is an insulating storage vessel
- it keeps its content hotter or cooler than the surroundings for a longer time.

Working of Thermos flask:

- A thermos flask has double walls, It is silvered on the inside.
- The vacuum between the two walls prevents heat being transferred from the inside to the outside by conduction and convection.
- The silvered walls reflect radiated heat back to the liquid in the bottle.



LESSON 02 - ELECTRICITY

Answer briefly.

1. How charges are produced by friction?

- Comb rubbed with hair becomes negatively charged.
- Positive and negative charges are present at the edges of the paper.
- Negative charges in the comb attract positive charges in the bits

2. What is earthing?

- A safety measure devised to prevent people from getting shocked if the insulation inside electrical devices fails is called Earthing.

3. What is electric circuit?

- The path through which electrons flow from one terminal to another terminal of the source, is called electric circuit.

4. What is electroplating?

- The process of depositing a layer of one metal over the surface of another metal by passing electric current in called electroplating.

5. Give some uses of electroplating.

- Car parts,
- Bath taps,
- Bicycle handlebars,
- Wheel rims

VIII. Answer in detail.

1. Explain three ways of charge transfer.

- Transfer of charges takes place in the following three ways.

Transfer by Friction

- In this type transfer of charges by friction. E.g: paper bits and comb

Transfer by Conduction

- In this type transfer of charges by conduction. E.g: ebonite rod and woolen cloth.

Transfer by Induction

- In this type transfer of charges by induction. E.g: we can charge an uncharged object

2. What is electroscope? Explain how it works?

- An electroscope is a scientific instrument used to detect the presence of electric charge on a body
- In the year 1600, British physician William Gilbert invented the first electroscope.
- There are two types of electroscope: pith-ball electroscope and goldleaf electroscope.

Working of Electroscope

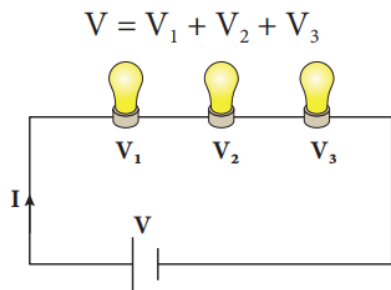
- When the brass disc of the electroscope is touched by a charged object, electric charge gets transferred to the gold leaf through the rod.
- This results in the gold leaves moving away from each other.

- This happens because both the leaves have similar charges.

3. Explain series and parallel circuit.

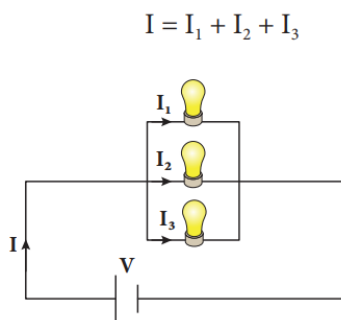
Series Circuit

A series circuit is one that has more than one resistor (bulb) but only one path through which the electrons can travel.



Parallel Circuit

In a parallel circuit, there is more than one resistor (bulb) and they are arranged on many paths.



4. How lightning takes place?

- Lightning is produced by discharge of electricity from cloud to cloud or from cloud to ground.
- During thunderstorm air is moving upward rapidly. This air which moves rapidly, carries small ice crystals upward.
- The upper part of the cloud is positively charged and the lower part of the cloud is negatively charged.

- When they come into contact, electricity is generated and lightning is seen.
- Sometimes lightning may be seen before the thunder is heard. This is because the distance between the clouds and the surface.

5. What is electroplating? Explain how it is done.

- The process of depositing a layer of one metal over the surface of another metal by passing electric current is called electroplating.
- When electric current is passed through the copper sulphate solution, you will find that a thin layer of copper metal is deposited on the iron spoon and an equivalent amount of copper is lost by the copper plate.

LESSON 03 AIR

I. Answer briefly.

1. What are the sources of oxygen?

- Atmospheric air
- Water

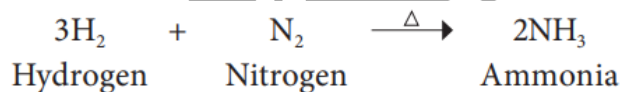
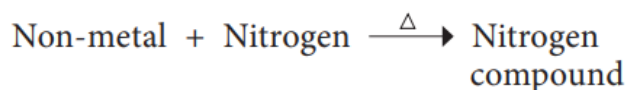
2. Mention the physical properties of oxygen.

- Oxygen is a colourless, odourless and tasteless gas.
- It supports combustion.
- It is a poor conductor of heat and electricity

3. List out the uses of nitrogen.

- Liquid nitrogen is used as a refrigerant
- It is used for the preservation of fresh foods
- It is used for inflating tyres of vehicles.

4. Write about the reaction of nitrogen with non metals.



5. What is global warming?

- The green house gases are CO₂, N₂O, CH₄, CFC increases the temperature of earth's surface.
- This is called global warming.

6. What is dry ice? What are its uses?

- Solid carbon dioxide, called as dry ice is used as a refrigerant.

- CO₂ can be used in the preservation of food grains, fruits etc.

II. Answer in detail.

1. What happens when carbon dioxide is passed through lime water? Write the equation for this reaction.

- Reaction with Lime water (Calcium hydroxide) When a limited amount of CO₂ is passed through lime water, it turns milky due to the formation of insoluble calcium carbonate.



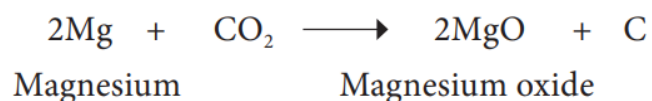
2. Name the compounds produced when the following substances burn in oxygen.

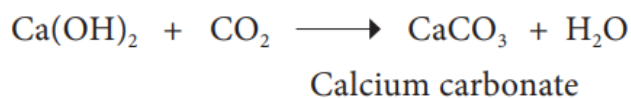
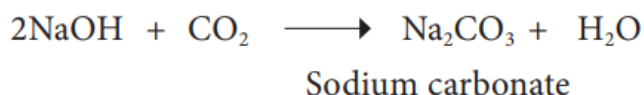
- a) Carbon b) Sulphur c) Phosphorous
d) Magnesium e) Iron f) Sodium

Metal	Product
Carbon	Carbon di oxide
Sulphur	Sulphur di oxide
Phosphorous	Phosphorus trioxide
Magnesium	Magnesium oxide
Iron	Iron oxide
Sodium	Sodium oxide

3. How does carbon dioxide react with the following? a) Magnesium b) Lime water c) Sodium hydroxide

a) Magnesium



b) Lime water**c) Sodium hydroxide****4. What are the effects of acid rain? How can we prevent them?****Effects of acid rain:**

- It irritates eyes and skin of human beings.
- It changes the fertility of the soil.
- It inhibits germination and growth of seedlings.

Prevention:

- Minimizing the usage of fossil fuel such as petrol, diesel etc.,
- Using CNG (Compressed Natural Gas),
- Using non-conventional source of energy.
- Proper disposal of the industrial wastes.

LESSON 04 ATOMIC

STRUCTURE

Answer briefly.

1. State the law of conservation of mass.

- The law of conservation of mass states that during any chemical change, the total mass of the products is equal to the total mass of the reactants.

2. State the law of constant proportions.

- It states that in a pure chemical compound the elements are always present in definite proportions by mass.

3. Write the properties of anode rays.

- Anode rays travel in straight lines.
- Anode rays are made up of material particles.

4. Define valency of an element with respect to hydrogen.

- Valencies of the other elements are expressed in terms of hydrogen.
- valency of an element can also be defined as the number of hydrogen atoms which combine with one atom of it

5. Define the term ions or radicals.

- Atoms which carry positive or negative charges are called ions.
- An atom or a group of atoms when they either lose or gain electrons, get converted into ions or radicals

6. What is a chemical equation?

- A chemical equation is a short hand representation of a chemical reaction with

the help of chemical symbols and formulae.

7. Write the names of the following compounds.

a) CO b) N₂O c) NO₂ d) PCl₅

- a) CO - Carbon monoxide
 b) N₂O - Nitrogen oxide
 c) NO₂ - Nitrogen di oxide
 d) PCl₅ - Phosphorus penta chloride

V. Answer the following.

1. Find the valency of the element which is underlined in the following formula.

a) NaCl b) CO₂ c) Al (PO₄) d) Ba (NO₃)₂ e) CaCl₂

Answer:

- a) NaCl - 1
 b) CO₂ - 2
 c) Al (PO₄) - 1
 d) Ba (NO₃)₂ - 2
 e) CaCl₂ - 2

2. Write the chemical formula for the following compounds a) Aluminium sulphate b) Silver nitrate c) Magnesium oxide d) Barium chloride

Answer:

- a) Aluminium sulphate - Al₂SO₄
 b) Silver nitrate - AgNO₃
 c) Magnesium oxide - MgO₂
 d) Barium chloride - BaCl₂

3. Write the skeleton equation for the following word equation and then balance them

- a) Carbon + Oxygen → Carbon dioxide
 b) Phosphorus + Chlorine → Phosphorus pentachloride.
 c) Sulphur + Oxygen → Sulphur dioxide
 d) Magnesium + hydrogen → Magnesium + Hydrogen chloride chloride

ANSWER:

- a) C + O₂ → CO₂
 b) P + Cl₅ → PCl₅
 c) S + O₂ → SO₂
 d) Mg + HCl₂ → MgCl₂ + H

4. Balance the following chemical equation.

- a) Na + O₂ → Na₂O
 b) Ca + N₂ → Ca₃N₂
 c) N₂ + H₂ → NH₃
 d) CaCO₃ + HCl → CaCl₂ + CO₂ + H₂O
 e) Pb(NO₃)₂ → PbO + NO₂ + O₂

ANSWER:

- a) Na + O₂ → Na₂O
 b) 3Ca + N₂ → Ca₃N₂
 c) N₂ + 3H₂ → 2NH₃
 d) CaCO₃ + 2HCl → CaCl₂ + CO₂ + H₂O
 e) Pb(NO₃)₂ → PbO + 2NO₂ + O₂

LESSON 05 MOVEMENTS

I. Answer very briefly.

1. What is skeleton?

- It is composed of connective tissues like bones, cartilage, tendons and ligaments.

2. What is cranium?

- The top portion of brain which protects brain called cranium.

3. Why our backbone is slightly moveable?

- The discs of cartilage allow the vertebrae to move slightly to forward and downward.

4. Differentiate axial and appendicular skeleton.

- The axial skeleton consists of the skull, facial bones, sternum, ribs, and vertebral column.
- The appendicular skeleton comprises the shoulder girdle; the arm, wrist, and hand bones; the pelvic girdle; and the leg, ankle, and foot bones.

5. What is ligament?

- Bands of tough, elastic connective tissue that surround a joint to give support and limit the joint's movement.

6. Define Muscle.

- The muscles in the body provide the means of all movements.
- They cover the skeletal framework and also give shape to the body

7. Differentiate tendons and ligament.

Tendons	Ligament
fibrous cords of tissue that attach muscle to bone	fibrous cords of tissue that attach bone to bone.

II. Answer briefly.

1. Differentiate between the following.

a) Movement and Locomotion.

Movement	Locomotion
Movement is the act of changing the place or position by one or more parts of the body	The movement of an organism from one place to another is known as locomotion.

b) Endoskeleton and Exoskeleton

Endoskeleton	Exoskeleton
It is found in the inside of the human body	It is found in the exterior part of the body

c) Pectoral and Pelvic girdle

Pectoral girdle	Pelvic girdle
Attachment of arms. This forms a ball and socket joint.	Attachment of legs. This forms a ball and socket joint.

d) Ball and socket Joint and Hinge Joint

Ball and socket Joint	Hinge Joint
A ball shaped head of one bone articulates with a cup like socket of an adjacent bone.	A cylindrical protrusion of one bone articulates with a trough-shaped depression of an adjacent bone.

e) Voluntary and Involuntary muscle

Voluntary muscle	Involuntary muscle
Attached to bones. Found in arms, legs, neck.	Attached to soft parts of the body like blood vessels, iris, bronchi and the skin

2. What are antagonistic muscles? Give one example.

- Muscles often work in pairs which work against each other. These are called antagonistic pairs.
- The two muscles, the biceps and triceps are working against each other.
- When the biceps contracts the lower arm is raised and the arm bends. In this position the triceps muscle is relaxed.

3. How is the skeleton of a bird well-suited for flying?

- A bird has streamlined body. Its bones are light and strong.
- They are hollow and have air spaces between them.
- The breast bones are modified to hold massive flight muscles which help in moving wings up and down.
- Birds have special flight muscles and the forelimbs are modified as wings.
- The wings and tail have long feathers, which help in flying

4. What are the functions of skeleton in human body?

- It provides structure and shape to the body.
- It supports and surrounds the internal organs of the body.
- Calcium and phosphorus, the two minerals that the body needs for important regulatory functions, are stored inside the bones.
- Red blood cells are produced in the bone marrow.
- The bones of the skeletal system act as levers for muscular action.

LESSON 06 REACHING THE AGE OF ADOLESCENCE

I. Answer briefly.

1. What is adolescence?

- The term adolescence is derived from the Latin word 'adolescere' meaning 'to grow' or 'grow to maturity'

2. List out the changes which occur during puberty.

- Changes in body size
- Changes in body proportion
- Development of primary sex characteristics
- Development of secondary sex characteristics

3. What is secondary sex characteristics?

- Hair
- Skin
- Glands
- Muscles
- Voice

4. What is fertilization?

- The action of fertilizing an egg or a female animal or plant, involving the fusion of male and female gametes to form a zygote.

5. Explain Menarche.

- The first menstrual flow begins at puberty and is termed menarche.
- The ova begin to mature with the onset of puberty.

6. Explain the process of pregnancy.

- After ovulation the ovum reaches the fallopian tube and fertilization takes place.
- The fertilized egg undergoes development and it is implanted in the uterus.
- The corpus luteum continues to grow and produces large amount of progesterone. This results in pregnancy

7. Explain the importance of cleanliness during the time of menstrual cycle in girls.

- Have a bath once or twice a day.
- Change the underwear daily.

8. How is adolescence differ from childhood?

- During childhood, legs grow proportionately more than the trunk.
- At the time of puberty trunk also lengthens. Also, trunk broadens at the hip and shoulder thus giving the adult proportion to the body

II. Answer in detail.**1. What are the physical changes that occur in boys and girls during adolescence?**

Girls	Boys
Height and weight increase.	Height and weight increase.
Hip broadens.	Shoulder broadens.
Hair grows in arm pits and pubic area.	Hair grows in the arm pits and pubic area, and facial hair also appears.
Voice becomes shrill.	Voice break takes place due to lengthening of vocal cord and enlarging of larynx.

2. Explain the role of hormones in reproduction.**Follicle Stimulating Hormone (FSH):**

- In the male it is necessary for the development of seminiferous tubules, and for spermatogenesis.

Luteinizing Hormone (LH):

- In the female, it is the hormone necessary for ovulation.

Prolactin (PRL) or Lactogenic Hormone:

- The main function of this hormone is milk secretion during lactation.

Oxytocin Hormone:

- It is involved in the contraction of smooth muscles of uterus during child birth.

3. Briefly describe the menstrual cycle.

- Usually one mature ovum (or egg) is released from one of the ovaries into the oviduct once in every 28 days. This is called ovulation.
- Before ovulation (or release of ovum), the inner wall of uterus becomes thick and spongy, and full of tiny blood vessels (or blood capillaries). It prepares itself to receive the fertilized ovum.
- If the ovum does not get fertilized then the thick and soft inner lining of uterus is no longer needed and hence it breaks. So, the thick and soft inner lining of uterus along with the blood vessels and the dead ovum comes out of the vagina in the form of a bleeding called menstruation.

- Menstruation usually occurs 14 days after ovulation and usually lasts for about 3 to 5 days.
- After menstruation is over, the inner lining of the uterus starts building up again so that it may become ready to receive the next ovum.

4. Briefly explain the nutritional needs of adolescence.

Minerals

- Since there is an increase in skeletal mass and blood volume during adolescence, the body needs calcium, phosphorus and iron.

Calcium

- Calcium intake needs to be increased to prevent osteoporosis in later life. It is present in milk and milk products or other equivalents.

Iodine

- It helps to prevent thyroid gland related diseases.

Iron

- Iron builds blood and iron-rich foods such as green leafy vegetables, jaggery, meat, dates, fish, chicken, citrus, etc.

LESSON 07 DIGITAL PAINTING

I. Answer briefly.

1. What is Tux Paint ?

- Tux Paint is a free drawing program designed for young children.

2. What is the use of Text Tool ?

- This tool is used to type texts.

3. What is the shortcut key for Save option?

- Ctrl + S

4. What is Tux Math?

- Tux Math is an open source arcade – style video game for learning arithmetic. The main goal is to make learning effective and fun.

5. What is the use of Ranger ?

- Ranger - addition, subtraction, multiplication and division to ten.