SCIENCE-6

Chapter 1: Components of Food

A. 1. (a) 2. (b) 3. (b) 4. (b) 5. (a)

B. 1. F 2. T 3. F 4. T 5. F

C. 1. starch 2. Fats 3. warmth 4. Iron 5. balanced

D. 1. Fats 2. Vitamin C 3. Deficiency diseases
4. Iodine 5. Vitamin D

E. 1. The five main nutrients found in food are carbohydrates, proteins, fats, vitamins, and minerals.

2. Proteins are referred to as body-building foods because they are essential for the growth and repair of body tissues, including muscles, skin, hair, and organs.

3. The two main types of carbohydrates are simple carbohydrates (such as sugars) and complex carbohydrates (such as starches and fiber).

4. Fruits and vegetables should not be washed after peeling because water can wash away water-soluble vitamins and minerals that are exposed after peeling.

5. Symptoms of scurvy include swollen and bleeding gums, bruising, fatigue, and joint pain. This condition is caused by a vitamin C deficiency.

F. 1. To test the presence of starch in food items, you can use iodine solution, a common reagent that reacts with starch to produce a color change. Here's how you can perform the test:

Place a small sample of the food item on a plate or in a container.

Add a few drops of iodine solution to the sample.

Observe the color change. If the sample turns blue-black, it indicates the presence of starch.

This test is simple and effective because iodine interacts with the coiled structure of starch molecules, causing a significant and visible color change.

2. Proteins are crucial for growth and development, making them especially important for children. Children require more proteins than adults for several reasons:

Growth: Children are growing rapidly, and proteins are essential for building new tissues, including muscles, bones, and organs.

Cell Repair and Production: Proteins are necessary for the repair and regeneration of cells, which occurs at a higher rate in growing children.

Development: Proteins play a key role in the development of vital organs and the immune system, helping children to develop resilience against diseases.

Because of these increased demands, dietary recommendations for protein are relatively higher for children than for adults, relative to body weight.

3. A balanced diet includes the right amounts of carbohydrates, proteins, fats, vitamins, minerals, and water necessary to maintain good health. It varies according to different factors:

Age: Nutritional needs change as a person moves through different life stages.

Gender: Men and women have different nutritional requirements; for instance, women may need more iron due to menstruation.

Activity Level: Active individuals generally require more calories and proteins.

Health Conditions: People with health conditions like diabetes, heart disease, or dietary allergies may have specific dietary requirements.

Thus, a balanced diet is not one-size-fits-all but should be tailored to meet the individual needs based on the above factors.

4. Deficiency diseases occur when there is a lack of essential nutrients in the diet, which can lead to various health problems. If the diet is deficient in proteins and carbohydrates:

   Protein Deficiency: Can lead to conditions such as kwashiorkor and marasmus, characterized by muscle wasting, weakened immunity, stunted growth in children, and overall poor health.

   Carbohydrate Deficiency: Carbohydrates are the body's main energy source. Lack of carbohydrates can lead to energy depletion, weakness, fatigue, and difficulty in concentrating.

   Long-term deficiencies can cause severe health issues, impacting physical growth, mental development, and overall vitality.

5. It is not necessary to consume expensive foods to maintain a balanced diet. Affordable and locally available foods can provide all the necessary nutrients:

   Variety Over Cost: A diet that includes a variety of grains, legumes, vegetables, fruits, and proteins can meet nutritional needs without high costs.

   Local and Seasonal Foods: These are often more affordable and fresh, providing better nutritional benefits.

   Strategic Eating: Combining different foods can enhance nutrient absorption, such as pairing iron-rich foods with vitamin C for better iron absorption.

   Economic and accessible options can be just as nutritious as more costly alternatives, making a balanced diet achievable for all economic levels.

Chapter 2: Sorting Materials into Groups

A.

1. (c)	2. (c)	3. (d)	4. (c)	5. (d)

B.

1. objects	2. plastic	3. Metals	4. Animals	5. properties

C.

1. Yes	2. No	3. Cardboard	4. Glass

D. 1. Examples of wooden objects include chairs, tables, and picture frames. Wood is a versatile material commonly used in furniture making and decorative items.

2. All matter is alike in that it occupies space and has mass. These are fundamental properties that define matter, regardless of its state (solid, liquid, or gas).

3. Miscible liquids are those that can mix completely with each other to form a homogeneous solution, like alcohol and water. Immiscible liquids do not mix completely and tend to separate into layers after mixing, such as oil and water.

4. Paper can be made translucent by applying a thin layer of oil. The oil fills the small pores and spaces in the paper, allowing light to pass through while still obscuring detailed images. This is why oil-treated paper appears translucent.

5. Classification helps us organize and group objects or phenomena based on shared characteristics or properties. This organization makes it easier to study, understand, and communicate about different subjects by reducing complexity and highlighting relationships between items.

E. 1. **Transparent materials** allow light to pass through them without significant scattering, making objects on the other side clearly visible. Examples include glass and clear plastic.

Opaque materials do not allow light to pass through; they completely block the transmission of light, making it impossible to see through them. Examples include wood and metal.

Translucent materials allow some light to pass through, but it is scattered so that objects on the other side cannot be clearly seen. Examples include frosted glass and wax paper.

2. Density is a physical property defined as the mass per unit volume of a substance. It is typically expressed in grams per cubic centimeter (g/cm^3). The relationship between density and the buoyancy of objects in water (or any fluid) comes from the principle of buoyancy, also known as Archimedes' principle. According to this principle, an object will float in water if its density is less than that of water, which is approximately 1.00 g/cm^3 at 4°C. If an object's density is greater than water, it will sink. This principle helps explain why a heavy ship made of steel (which has a high density) can float — its shape and construction allow it to displace a volume of water equal to its weight before it submerges completely.
3. **Hardness:** This property determines how resistant a material is to deformation or penetration and is often measured by various scales (e.g., Mohs scale for minerals).

   Malleability: This refers to a material's ability to deform under compressive stress; it is often exhibited by metals and is a measure of how easily a material can be shaped or bent.

   Ductility: A measure of a material's capacity to be drawn out into a thin wire.

   Conductivity: This refers to the ability of a material to conduct electricity or heat. Materials can be classified as good conductors (e.g., metals like copper and aluminum) or poor conductors/insulators (e.g., rubber, wood).

   Melting Point: The temperature at which a solid turns into a liquid. This property can classify materials based on their thermal stability.
4. Observing a freshly cut surface of a material is essential to accurately assess its luster because many materials can oxidize or react with air or moisture over time, leading to tarnishing or rusting. This surface alteration can obscure the material's intrinsic luster. A freshly cut surface provides a clean and uncontaminated view of the material's true appearance and reflective qualities.
5. **Round Objects:** Ball, orange, chapati, moon.

   Other Shapes: Eraser, chair, wheel, kite, notebook.

   Can be made of paper: Kite, notebook

   Can be made of wood: Chair, wheel, eraser

Chapter 3: Separation of Substances

A. 1. (c) 2. (d) 3. (a) 4. (b) 5. (a)

B. 1. F 2. F 3. F 4. F 5. F

C. 1. Sorting 2. Winnowing 3. Sieving 4. Filtration

D. 1. The principle used involves exploiting differences in physical properties such as size, density, solubility, and magnetic properties to separate components of mixtures.

2. Mixtures with distinctly different, large particles that are easily identifiable by eye can be separated by hand picking, such as picking stones from lentils or sorting different colored beads.
3. Sieving involves passing a mixture through a sieve to separate particles based on size. An example is using a sieve to separate coarse sand from fine sand in construction.
4. A saturated solution is one where no more solute can dissolve at a given temperature and pressure, with excess solute precipitating out as a solid.
5. Farmers use winnowing to separate husk from grain. This technique involves throwing the mixture into the air so the lighter husk is carried away by the wind while the heavier grain falls straight down.

E. 1. Separating a mixture into its components is essential for several reasons, including purity, recovery of valuable substances, removal of contaminants, and preparation for further processing or use. For instance, in the production of coffee, the beans are separated from other debris and impurities after harvesting to ensure that only the highest quality beans are roasted and ground for brewing. Another example is the separation of metals from ores, which is crucial in the mining industry to obtain pure metals for manufacturing and industrial use.

2. To obtain clear water from muddy water, you can use a combination of sedimentation and filtration processes. Here's how it works:

   Sedimentation: Allow the muddy water to sit undisturbed in a container. Over time, the heavier mud particles will settle at the bottom due to gravity. This process separates the solid mud from the clearer water above it.

   Filtration: Once sedimentation is complete, slowly pour the clearer water from the top into another container through a filter. This filter could be made of cloth, coffee filter paper, or a commercial water filter. The filter will trap any remaining fine particles of mud, allowing clean water to pass through.

   Optional – Disinfection: If the water is intended for drinking, it should be disinfected, typically by boiling or using chemical disinfectants to ensure it is safe for consumption.

3. A mixture of wheat grains and straw pieces can be separated using a method called threshing followed by winnowing.

   Threshing: This process involves beating the wheat stalks to separate the grains from the stalks and straws. This can be done manually with sticks or mechanically using a threshing machine.

   Winnowing: After threshing, winnowing is used to separate the grains from lighter straw pieces. The mixture is thrown into the air, usually with the help of a fan or natural wind, where the heavier wheat grains fall straight down while the lighter straw pieces are blown away.

4. To separate a mixture of sand, sugar, and pebbles, you can use a combination of sieving and dissolution followed by filtration and evaporation:

   Sieving: Start by sieving the mixture to separate pebbles from sand and sugar. Use a sieve with holes small enough to pass sand and sugar but retain the larger pebbles.

   Dissolution and Filtration: Next, dissolve the remaining sand and sugar mixture in water. Sugar will dissolve, but sand will not. Filter this mixture through a fine filter to separate the sand from the sugar solution.

   Evaporation: Finally, evaporate the water from the sugar solution to recover the sugar. This can be done by heating the solution until all water has evaporated, leaving sugar crystals behind.

5. A saturated solution is a solution that contains the maximum amount of solute that can dissolve at a given temperature. Any additional solute added to a saturated solution will not dissolve but instead will remain as a separate phase.To increase the solubility of a substance in water, you can:

   Increase the temperature: For most solids, their solubility in water increases with temperature. Heating the solution can allow more solute to dissolve.

   Stirring: Agitation or stirring can help to dissolve the solute more quickly and efficiently by bringing fresh solvent into contact with the solute.

   Use of a solvent: Changing the solvent can sometimes help, depending on the chemical nature of the solute. Some solutes may dissolve better in one type of solvent over another.

Chapter 4: Getting to Know Plants

A. 1. (a) 2. (a) and (d) 3. (c) 4. (b) 5. (c)
6. (d) 7. (d) 8. (d)

B. 1. T 2. T 3. F 4. T 5. T

C. 1. Shoot system and root system 2. Mint 3. Rose
4. Carrot and Beetroot 5. Stamen and Pistil

D. 1. **Anchorage:** Roots anchor the plant securely into the ground, providing stability.

Absorption: Roots absorb water and nutrients from the soil, which are essential for plant growth.

Storage: Some roots store food and nutrients, providing energy reserves for the plant.

2. Shoot system and Root system.
3. The midrib provides structural support to the leaf and contains the main vascular bundle (xylem and phloem), which distributes water and nutrients throughout the leaf.
4. Prop roots provide additional support to plants, helping to stabilize the stem in the soil, especially in tall plants like maize and certain tropical trees, and they can also absorb nutrients and water directly.
5. **Herbs:** Small, non-woody plants that typically have a shorter lifespan, completing their life cycle within one or two seasons.

Shrubs: Larger and woody plants that are generally perennial, lasting for several years, and have multiple branches near the ground level.

E. 1. **Support:** Provides a framework to hold leaves, flowers, and fruits up to the light and air which are necessary for photosynthesis.

Transport: Transports water and nutrients from the roots to other parts of the plant via the xylem, and distributes sugars and other products of photosynthesis from the leaves to other parts through the phloem.

Storage: Stores nutrients and water in some plants.

Reproduction: Can produce new living tissue and sometimes capable of vegetative reproduction.

2. Transpiration is the process by which water moves through a plant and evaporates from aerial parts, such as leaves, stems, and flowers. Water is absorbed by roots from the soil and transported up to the leaves by xylem vessels. In the leaves, water vapor escapes into the atmosphere through stomata, tiny openings on the leaf surface. This process helps cool the plant and enables the upward pull of water and nutrients from the roots.
3. **Tap Root:** A primary root that grows deep into the soil, with secondary roots branching off it. It is typically found in dicot plants. Examples include carrots and dandelions.

Fibrous Root: Consists of many fine roots of similar diameter that branch off near the base of the stem, forming a dense network. It is common in monocot plants. Examples include grasses and onions.

4. **Materials:** Leaf (preferably from a plant exposed to sunlight), boiling water, ethanol, hot plate, beaker, iodine solution.

Procedure:

Boil the leaf in water for a few minutes to kill the leaf and remove any waxy surface.

Transfer the leaf to a beaker of boiling ethanol to remove chlorophyll (decolorize it). Handle with care as ethanol is flammable.

Rinse the leaf in warm water to soften it.

Spread the leaf on a white dish and add a few drops of iodine solution.

Observe any color change to blue-black, indicating the presence of starch.

5. Do it yourself.

Chapter 5: Body Movements

A. 1. (c) 2. (b) 3. (d) 4. (a) 5. (d)

B. 1. F 2. F 3. F 4. T 5. F
6. F

C. 1. Heart and Lungs 2. Wrist and Ankle 3. Dorsal fins
4. Mandible (lower jaw) 5. Tortoise

D. 1. The hands and feet contain the most movable bones, as these areas have numerous joints that allow for a wide range of movements.

2. The four main parts of the skeleton system are the Axial skeleton (skull, vertebral column, rib cage), Appendicular skeleton (limbs and pelvis), Joints, and Cartilages.

3. Cartilage serves several functions, including providing flexible support for certain parts of the body (like ears and nose), reducing friction between joint surfaces, and acting as a shock absorber in joints to cushion the bones.

4. Setae, which are small bristle-like structures on the underside of an earthworm's body, help it grip the ground as it moves.

5. A joint is a connection between two or more bones or parts of the skeleton that allows for movement or mechanical support. Joints facilitate mobility and can be classified by their structure and function, such as ball-and-socket joints, hinge joints, and fixed joints.

F. 1. The ball and socket joint allows movement in all directions. It is found in the shoulders and hips, where it facilitates a wide range of motion including rotation and forward, backward, and sideways movements.

2. We are able to bend due to the presence of hinge joints such as those in our knees and elbows that allow movement in one plane, much like the way a door swings on its hinges. Additionally, the flexibility of muscles, tendons, and ligaments around these joints facilitates bending and other movements.

3. The rib cage is a structure formed by the ribs connected to the spine at the back and sternum (breastbone) at the front. It encloses and protects the thoracic cavity, which includes the heart and lungs, and provides structural support for the upper body.

4. Muscles move the bones by contracting and relaxing. Muscles are attached to bones by tendons. When a muscle contracts, it pulls on the bone it's attached to, causing the bone to move. This coordinated action between muscles often occurs in opposing pairs: as one muscle contracts to pull a bone in one direction, another muscle relaxes to allow the movement, and vice versa.

5. Birds are equipped with several features that aid in flight:

   Lightweight, hollow bones reduce body weight without sacrificing strength.

   Powerful flight muscles in the chest that provide the necessary force to flap the wings vigorously.

   Feathers provide lift and are crucial for balance and steering during flight.

   Aerodynamically shaped body that reduces air resistance.

   High metabolic rate to support the energy demands of flying.

6. Snakes move primarily by lateral undulation, a method where the snake flexes its body into lateral waves that propel it forward across the ground. The scales on the underside of its body grip the ground, and the muscles along the body make a series of coordinated contractions that push against any resistance they find, allowing the snake to move forward smoothly. Additionally, some snakes also use other methods like sidewinding, concertina, and rectilinear movement to navigate different environments.

Chapter 6: The Living Organisms and Their Surrounding

A. 1. (c) 2. (d) 3. (c) 4. (c) and (d) 5. (b)

B. 1. Ecology 2. Living 3. Water 4. Sea water 5. Hump

C. 1. Adaptation is the process through which organisms develop physical, behavioral, or physiological traits that enhance their survival and reproduction in specific environments.

2. Squirrels hibernate to conserve energy during winter when food is scarce, reducing their metabolic needs by entering a state of dormancy.

3. Terrestrial organisms live on land and are adapted to breathe air and move on solid surfaces, while aquatic organisms live in water, use gills or other structures to extract oxygen from water, and are adapted to swim.

4. The basic function of roots in aquatic plants is to anchor the plant to the substrate and help in absorption of nutrients, though many nutrients are also absorbed directly through the leaves.

5. Plants breathe through stomata, small openings on their leaves, which allow for the exchange of gases—taking in carbon dioxide and releasing oxygen as part of photosynthesis.

D. 1. **Water Conservation:** Camels can drink large amounts of water quickly and store it in their bloodstream, not in their humps as commonly thought. They also excrete very concentrated urine and dry feces to minimize water loss.

Temperature Regulation: Camels can withstand changes in body temperature and water consumption that would kill most other animals. Their body temperature can fluctuate to avoid excessive sweating.

Physical Structure: Their thick fur on the top of the body for shade, and thin fur elsewhere to allow easy heat loss. The large surface area of their limbs and the leathery pads on their feet help them withstand the hot sand.

Fat Storage: Their humps store large amounts of fat which can be converted into water and energy when sustenance is not available.

2. **Needle-like Leaves:** Pine trees have long, thin, needle-like leaves that reduce water loss due to their small surface area.

Waxy Coating: These leaves are coated with a thick waxy layer, which further reduces water loss.

Deep Root System: To access water deep in the soil and to anchor the tree on rocky slopes.

Conical Shape: Helps shed snow to prevent branch breakage.

Why Conifer: Pine trees are called conifers because they belong to the coniferous class of trees, which are cone-bearing seed plants with vascular tissue, hence the name "conifer" which means cone-bearing.

3. **Flexible Stems:** Grasses have narrow, flexible stems that bend rather than break in strong winds.

Root System: They have extensive root systems to anchor them firmly against strong winds and to absorb as much moisture as possible.

Narrow Leaves: The narrow shape of the leaves reduces water loss through evaporation.

Growth Point: Their growth point is close to the ground, which helps in rapid recovery from grazing and environmental stresses.

4. **Lions:** Having eyes in front provides binocular vision, granting depth perception which is crucial for judging distances during hunting. This positioning is typical of predators that need to focus precisely on their prey.

Deer: Eyes on the sides of their head offer a wide field of view, which is vital for early detection of predators from various angles. This panoramic vision helps prey animals to remain vigilant and ready to flee from threats.

5. **Growth:** All living organisms undergo growth by metabolism and cell division.

   Reproduction: Living things reproduce to pass on genetic information to the next generation, either sexually or asexually.

   Homeostasis: The ability to maintain a stable internal environment in response to environmental changes.

   Response to Stimuli: Living organisms respond to environmental changes through changes in behavior, metabolism, or directly at the cellular level.

   Metabolism: All living organisms require energy to carry out various functions such as growth, reproduction, and repair. This energy is derived from metabolic processes.

   Cellular Organization: Living things are composed of one or more cells, which are the basic units of life. Each cell carries out necessary life processes to sustain itself.

   Adaptation: Over time, living organisms evolve to adapt genetically to their environment, enhancing their survival and reproduction prospects.

Chapter 7: Motion and Measurement of Distance

A. 1. (c) 2. (b) 3. (a) 4. (c) 5. (b)

B. 1. F 2. F 3. T 4. F 5. F

C. 1. A car driving on a straight road.
   A person walking along a straight path.

2. A ball thrown in the air following a parabolic trajectory.
   A satellite orbiting the earth in an elliptical orbit.

3. A spinning wheel.
   Earth rotating on its axis.

4. A pendulum swinging back and forth.
   The moon orbiting the Earth.

5. A leaf falling randomly from a tree.
   A vehicle navigating through city traffic.

D. 1. The steam engine and the internal combustion engine brought about revolutionary changes in transport, enabling the development of railways and automobiles, respectively.

2. An object is said to be in motion when its position changes relative to a fixed point or reference over time.

3. Translatory motion is the movement of an object in which all parts of the object move through the same distance, in the same direction, and in the same straight or curved path.

4. The length of the table would be 1.25 meters (since 100 cm equals 1 meter, 125 cm equals 1.25 meters).

5. The different types of motion include rectilinear motion (motion along a straight line), curvilinear motion (motion along a curved path), rotational motion (spinning or rotating around an axis), and oscillatory motion (back and forth motion like a pendulum).

E. 1. Periodic motion is a type of motion that repeats itself at regular intervals or cycles. An example of periodic motion is the swinging of a pendulum, which moves back and forth from its resting position in a regular and continuous pattern. Another example is the rotation of the Earth around its axis, which happens every 24 hours and results in the cycle of day and night. A third example can be the vibrations of a guitar string, which when plucked, vibrates back and forth at constant intervals.

2. The International System of Units (SI) came into existence to provide a consistent, coherent, and comprehensive set of measurements based on internationally agreed standards. Before SI units, different countries and regions used their own measurement systems, leading to confusion and inefficiencies in trade, science, engineering, and technology. The introduction of SI units facilitated global cooperation and standardization, making it easier to compare measurements, share scientific data, and synchronize technological developments worldwide.

3. When measuring a pencil with a scale, several precautions should be taken to ensure accuracy:

   Start at Zero: Ensure the zero mark on the scale aligns with one end of the pencil. Misalignment can lead to incorrect measurements.

   Use a Flat Surface: Place both the scale and the pencil on a flat surface to avoid any bending or angle, which might distort the measurement.

   Measure Straight: Make sure the pencil is completely straight when you measure it.

   Eye Level: Look directly down at the scale to avoid parallax error, which occurs when you view the scale from an angle.

   Use Appropriate Units: If precision is needed, use a scale with finer divisions.

4. **Earth:** It exhibits both rotational motion as it spins on its axis and translational motion as it orbits around the Sun.

   A basketball thrown in a match: It experiences translatory motion as it moves through the air, and rotational motion as it spins.

   A drill: The drill bit has rotational motion as it turns and also may move translationally along its length into the material being drilled.

5. To measure the length of a branch of a tree, you can use a flexible measuring tape, which allows you to follow the curve and contours of the branch accurately. Here's how:

   Start at the Base: Begin at the point where the branch meets the trunk or from the very start of the branch.

   Follow the Branch: Lay the measuring tape along the branch from the starting point to the tip, bending the tape to follow any curves or twists in the branch.

   Read the Measurement: Make sure the tape is snug against the branch but not so tight that it bends the branch. Read the measurement where the branch ends.

   Record the Measurement: It's helpful to note down the measurement, especially if you are measuring multiple branches.

   Use an Assistant: If the branch is high or difficult to reach, using a ladder safely or having an assistant can help ensure accuracy and safety in your measurement.

Chapter 8: Light, Shadows and Reflections

A. 1. (c) 2. (a) 3. (a) 4. (c) 5. (d)

B. 1. F 2. T 3. F 4. T 5. F
6. F

C. 1. Non-luminous 2. No 3. Translucent 4. No 5. Transparent
6. No 7. Black 8. Reflection 9. Yes 10. Non-luminous

D. 1. Translucent objects allow light to pass through them but diffuse it enough to prevent clear images from being seen. Examples include frosted glass and wax paper.

2. A shadow is formed when an opaque object blocks the path of light, casting an area where the light is obstructed.

3. Rectilinear propagation of light refers to the concept that light travels in straight lines. This principle explains how shadows form and how light behaves when passing through small apertures or when obstructed by objects.

4. The pinhole camera is based on the principle of rectilinear propagation of light. Light from an object passes through a small hole to project an inverted image on the opposite side of the camera.

5. Non-luminous objects can be divided into transparent objects (like clear glass, which allows light to pass through clearly), translucent objects (like frosted glass, which scatters light), and opaque objects (like wood or metal, which do not allow light to pass through).

E. 1. A natural example of a pinhole camera is the phenomenon observed inside a dark room or a shaded area under a tree during a solar eclipse, where tiny gaps between leaves act as multiple pinholes. These gaps project the image of the eclipsed sun onto the ground or other surfaces. This occurs because light from the sun travels through each small, round hole, casting an inverted image of the sun on surfaces opposite the holes, mimicking the basic principle of a pinhole camera.

2. **Experiment: Shadow Play**

Materials: A flashlight, a small spherical object (like a ball), and a screen or a wall.

Procedure:

Darken the room to ensure that the effects of the experiment are visible.

Place the ball in the path between the flashlight and the wall.

Turn on the flashlight and direct its beam towards the ball.

Observe the shadow formed on the wall.

Observation: The shadow of the ball will be clearly defined on the wall, indicating that the light from the flashlight traveled in a straight line from its source to the wall but was obstructed by the ball, forming a shadow.

Conclusion: This experiment demonstrates that light travels in straight lines as the shadow's sharp edges reflect the direct path of the light blocked by the ball.

3. **Formation:** An image is formed by the reflection or refraction of light rays from an object, which can be captured on a surface like a mirror or lens. A shadow is formed when an object blocks light rays, causing a dark area on another surface.

Properties: An image can show colors and details depending on the quality of the reflective or refractive surface, and can be either upright or inverted. A shadow is always black, lacking any detail or color of the object, and does not invert.

4. Reflection of light is the process where light rays bounce off a surface back into the medium from which they originated. This phenomenon occurs according to the law of reflection, which states that the angle of incidence (the angle at which incoming light rays hit the surface) is equal to the angle of reflection (the angle at which they bounce off). Reflection is responsible for the ability to see most objects around us because light reflects from those objects into our eyes.

5. **Umbra and Penumbra:** A shadow consists of two parts; the darker part where all the light is blocked is called the umbra, and the lighter, partial shadow is the penumbra.

Color: Shadows are inherently colorless or black, as they are formed due to the absence of light.

Size and Shape: The size and shape of a shadow can change depending on the light source's distance and angle relative to the object creating the shadow.

Edges: The edges of a shadow may be sharp or blurred, depending on the light source's size and distance. A point light source creates a sharp-edged shadow, while an extended light source creates a shadow with a more blurred edge.

Chapter 9: Electricity and Circuits

A. 1. (c) 2. (c) 3. (a) 4. (a) 5. (d)

B. 1. electricity 2. torch 3. source 4. glow 5. broken

C. 1. No 2. filament 3. No 4. chemical 5. switch
6. non-metal 7. insulator

D. 1. An electric circuit is a pathway made of wires and other components like resistors, capacitors, and switches through which electric current flows.

2. A closed circuit is a complete electrical connection around which current flows or circulates. When the circuit is complete, it allows electricity to move from the power source through the connected components and back to the source.

3. A switch is a device in an electric circuit that can interrupt the flow of electricity or divert it from one conductor to another. Essentially, it can make or break an electrical circuit, controlling the flow of electricity.

4. The key elements necessary for an electric current include a voltage source (like a battery or generator), conductors (such as wires), and a load (any device that consumes electricity, like a light bulb or motor).

5. In a torch, the cell (or battery) acts as the source of electric power. It converts chemical energy into electrical energy which is used to power the light bulb or LED, thus producing light.

E. 1. A bulb is said to be fused when its filament breaks or burns out, usually due to the thinning of the filament from prolonged use or a surge in electrical current. When the filament breaks, it interrupts the flow of electricity, causing the bulb to stop producing light.

2. Draw electric circuit (do it yourself)

Explanation of a Simple Electric Circuit:

Imagine a circuit that includes a battery, a light bulb, a switch, and connecting wires.

The battery has two terminals (positive and negative). The positive terminal is connected through a wire to one terminal of the switch.

The other terminal of the switch is connected to one of the terminals of the light bulb.

The other terminal of the light bulb is connected back to the negative terminal of the battery.

When the switch is in the "closed" position, it completes the circuit, allowing current to flow from the battery through the light bulb and back to the battery.

The light bulb illuminates because the electrical energy from the battery is converted into light and heat energy by the filament in the bulb.

3. Conductors are materials that allow electric charges to flow freely due to their free electrons. Examples include:

Copper: Used in electrical wiring due to its excellent conductivity.

Aluminum: Used in high-voltage transmission wires.

Silver: The best conductor but not widely used due to its cost.

Insulators are materials that resist the flow of electric charges and are used to protect us from electric currents. Examples include:

Rubber: Commonly used to coat wires and electrical components.

Glass: Used in insulators for power poles.

Plastic: Widely used to insulate cables and electrical devices.

4. **Basic Difference:**

   A cell is a single electrical energy source that converts chemical energy into electrical energy.

   A battery consists of one or more cells connected together to provide more power than a single cell.

   Symbols:

   Cell Symbol: A long line (representing the positive terminal) and a shorter line parallel to it (representing the negative terminal).

   Battery Symbol: Several pairs of long and short lines alternated and connected to indicate multiple cells.

5. Batteries need to be changed after long use because they undergo chemical reactions that deplete the reactive materials required to produce electricity. Over time, these materials are used up, and the battery's ability to generate electric current diminishes, leading to a reduction in power output and eventually the inability to function.

Chapter 10: Magnets

A. 1. (a) 2. (d) 3. (d) 4. (b) 5. (a)
6. (c)

B. 1. magnets 2. Loadstone 3. magnetic 4. two 5. Repulsion

C. 1. Greece 2. Magnetic 3. No 4. Two 5. poles
6. Iron 7. No 8. Keepers 9. Yes 10. Yes

D. 1. A magnet is a material or object that produces a magnetic field, which enables it to attract ferromagnetic materials like iron, nickel, and cobalt, as well as other magnets.

2. If you break a magnet into two pieces, each piece will become a new magnet, with its own north and south poles. Essentially, breaking a magnet does not eliminate its magnetic properties but rather divides its magnetic domain into smaller complete magnets.

3. The poles of a magnet are located at its extremities; these are the points where the magnetic force exerted by the magnet is strongest, typically referred to as the north and south poles.

4. **Attractive Property:** A magnet attracts ferromagnetic materials like iron, nickel, and cobalt.

   Directive Property: A freely suspended magnet always aligns itself in the north-south direction, with the north pole pointing towards the geographical north and the south pole pointing towards the geographical south.

5. Self-demagnetisation is a phenomenon that occurs in magnets where the magnetic domains within the magnet interact in such a way that they reduce the overall magnetic field strength of the magnet. This can happen due to thermal agitation, mechanical stress, or improper storage, leading to a reduction in the magnet's magnetic effectiveness over time.

E. 1. The instrument that uses a magnet to find direction is called a compass. A typical compass consists of a small, lightweight magnet balanced on a nearly frictionless pivot point. The magnet is usually marked

as a needle. Due to the Earth's magnetic field, the needle will rotate until it aligns with the Earth's north and south poles, with the marked end pointing towards magnetic north, providing a reliable indication of direction.

2. **Electronic Devices:** Magnets are crucial in the functioning of many electronic devices, including speakers, hard drives, and electric motors where they facilitate the conversion of electrical energy to mechanical energy (and vice versa).

   Medical Equipment: Magnets are used in medical devices such as MRI machines, which use strong magnetic fields to generate images of organs and tissues within the body.

   Industrial and Home Applications: Magnets are used in various industrial processes for sorting ferrous materials from non-ferrous materials, and at home, they are commonly found in refrigerator doors to keep them sealed, as well as in various latches and closures.

3. Materials Needed: Two bar magnets, a flat surface, small pieces of paper or iron filings.

   Procedure:

   Place one bar magnet on the flat surface.

   Slowly bring the north pole of the second magnet close to the north pole of the first magnet. Observe the reaction.

   Now bring the north pole of the second magnet close to the south pole of the first magnet.

   Optionally, sprinkle iron filings or lay small pieces of paper around the magnets to visualize the magnetic field lines and see the interaction more clearly.

   Observations:

   When like poles (north-north or south-south) are brought close to each other, the magnets will repel each other.

   When unlike poles (north-south or south-north) are near each other, the magnets will attract each other.

   Conclusion: This experiment demonstrates that magnetic forces operate such that like poles repel each other, while unlike poles attract each other.

4. To magnetize an iron piece, you can use a simple method called stroking:

   Obtain a strong permanent magnet.

   Align the iron piece on a stable surface.

   Place one pole of the magnet at one end of the iron piece.

   Stroke the magnet along the length of the iron piece from one end to the other in one direction only.

   Lift the magnet and return to the starting position without dragging it back along the iron.

   Repeat this stroking motion several times.

   Test the iron piece with some small metal objects like paper clips to see if it has become magnetized.

5. **Keep Poles Apart:** Store magnets in such a way that the north pole of one magnet is near the south pole of another to avoid them demagnetizing each other.

   Use Keepers: Iron bars known as keepers can be placed across the poles of a set of magnets to help maintain their strength by providing a path for the magnetic lines of force.

   Avoid Physical Shock and Heat: Store magnets in a stable, cool environment away from physical shocks and high temperatures, which can demagnetize them.

   Separated Storage: For stronger magnets, ensure they are stored individually in padded containers to prevent them from snapping together and breaking.

Chapter 11: Air Around Us

A. 1. (a) 2. (d) 3. (d) 4. (b) 5. (c)

B. 1. (e) 2. (c) 3. (a) 4. (b) 5. (d)

C. 1. Oxygen 2. Nitrogen 3. Pollution 4. Atmosphere 5. Gills

D. 1. Plants are called producers of oxygen because they release oxygen as a byproduct of photosynthesis. During this process, they absorb carbon dioxide from the air and use sunlight to convert it into glucose and oxygen, thereby enriching the atmosphere with oxygen that all aerobic organisms need to survive.

2. Air is a mixture of gases, primarily made up of nitrogen (about 78%), oxygen (about 21%), and small amounts of other gases such as carbon dioxide, argon, and trace amounts of other gases, along with variable amounts of water vapor.

3. Smoke in the air comes from the burning of materials, such as wood, fossil fuels, and other organic matter. Common sources include vehicle exhausts, industrial emissions, agricultural burning, wildfires, and the burning of garbage or other materials.

4. Humidity is the amount of water vapor present in the air. It is a measure of the atmospheric moisture content and can significantly affect weather patterns and human comfort.

5. The atmosphere refers to the layer of gases surrounding Earth, held in place by gravity. It protects life by absorbing ultraviolet solar radiation, warming the surface through heat retention (greenhouse effect), and reducing temperature extremes between day and night.

6. The main gases present in air are nitrogen (approximately 78%) and oxygen (approximately 21%). Other significant components include argon (about 0.93%), carbon dioxide (about 0.04%), and trace amounts of other gases such as neon, helium, methane, krypton, and hydrogen, along with water vapor.

E. 1. To demonstrate that air is dissolved in water, perform an experiment involving a glass of water:

Materials: A glass, water, and a heat source.

Procedure:

Fill the glass with water.

Allow it to stand at room temperature or chill it in a refrigerator.

Gradually heat the glass of water. You can do this by placing it in a warm area or using a controlled heat source like a hot plate.

Observe small bubbles forming along the inside surface of the glass as the water heats.

Explanation: These bubbles are air that was dissolved in the water and is being released as the temperature rises. This happens because the solubility of gases (including air) in water decreases as the temperature increases.

2. To demonstrate the presence of water vapor in the air, you can use a simple condensation experiment:

Materials: A cold metal can or glass and a warm, humid environment.

Procedure:

Place the cold can or glass in a warm room or outside on a warm day.

Observe the outside of the can or glass after a few minutes.

Explanation: The cold surface of the can causes the water vapor in the warm air to condense, forming droplets on the outside. This shows that water vapor is a component of the air around us.

3. Earthworms come to the surface during the rainy season primarily for two reasons:

Moisture: Earthworms need a moist environment to breathe; they breathe through their skin, which must be wet to allow oxygen to pass through effectively.

Survival: When the soil is saturated with water during heavy rains, the oxygen levels in the soil decrease. Coming to the surface allows earthworms to avoid drowning and suffocation.

4. Policemen wear masks while regulating traffic to protect themselves from inhaling pollutants, dust, and vehicle exhaust fumes. These pollutants can be harmful to health, causing respiratory problems and other illnesses over time. Masks help filter out these harmful particles and reduce the risk of health issues.
5. The oxygen cycle is a series of natural processes by which oxygen is exchanged between the atmosphere, biosphere, and lithosphere. Key processes include:

   Photosynthesis: Plants, algae, and some bacteria take in carbon dioxide and water to produce glucose and oxygen in the presence of sunlight.

   Respiration: Animals and plants consume oxygen for energy production and emit carbon dioxide as a waste product.

   Decomposition: Decomposers break down dead organic matter, releasing carbon dioxide back into the atmosphere.

   Weathering: Oxygen is also involved in the chemical breakdown of rocks and minerals on Earth's surface.

   This cycle is crucial for maintaining the balance of oxygen in the atmosphere, which is essential for life on Earth.
6. **Breathing:** Air is essential for respiration in almost all living organisms, providing the oxygen necessary for cellular processes.

   Combustion: Air supplies oxygen which is necessary for burning fuels in various applications, from vehicle engines to industrial furnaces.

   Weather Systems: Air plays a crucial role in the formation of weather patterns and climate through its movement in the atmosphere.

   Wind Energy: Air movement, or wind, is harnessed as a renewable energy source to generate electricity using wind turbines.

   Pollination: Air assists in the pollination of many plants by carrying pollen grains from one flower to another, facilitating reproduction.

Revision Test Paper-1

A.	1.	(b)	2.	(a)	3.	(b)	4.	(d)	5. (c)
B.	1.	T	2.	T	3.	F	4.	F	5. T
C.	1.	Tuber	2.	Omnivore	3.	Vitamin C	4.	Spindle	5. Wood

Revision Test Paper-2

A.	1.	(b)	2.	(b)	3.	(c)	4.	(b)	5. (c)
B.	1.	F	2.	F	3.	T	4.	T	5. F
C.	1.	Sorting	2.	Mint	3.	Rose	4.	Evaporation	5. Mandible

Model Test Paper-1

A. 1. Food provides energy for daily activities, nutrients for growth and repair, and substances to regulate the body's processes.

2. Simple carbohydrates (sugars) and complex carbohydrates (starches and fibers).

3. Spinning is the process of turning raw fibers like cotton or wool into yarn or thread.

4. Weaving and knitting are two primary methods for converting yarn into fabric.

5. Paper can be made translucent by treating it with oils or resins that fill the pores of the paper, allowing light to pass through without detailed images.

6. Classification helps organize information, simplifies the study of objects and concepts, and improves communication by creating a common understanding of terms.

7. A saturated solution is a solution in which the maximum amount of solute has been dissolved at a given temperature, beyond which no more solute can dissolve.

8. The midrib provides structural support, helps in transporting water and nutrients, and is the main vein from which other smaller veins branch out.

9. A reversible change is a change that can be undone, where substances can return to their original state without changing their chemical composition, such as melting ice to water and refreezing it.

10. Cartilage provides support and flexibility to various parts of the body, acts as a cushion between joints, and helps in the formation of the skeletal structure.

B.

1. used	2. warmth	3. balanced	4. largest	5. objects
6. plastic	7. grains	8. taproot	9. diameter	10. two

C.

1. (c)	2. (a)	3. (d)	4. (e)	5. (b)

D. 1. Food sources primarily encompass both plants and animals. From plants, we derive a wide array of food items including fruits, vegetables, grains, nuts, seeds, and spices which are essential for various nutrients like vitamins, minerals, and carbohydrates. Legumes and pulses sourced from plants are vital for their protein content. From animals, we obtain meat, poultry, fish, dairy products like milk, cheese, and yogurt, as well as eggs. These animal-based foods are crucial for high-quality protein, fats, and minerals like iron and calcium. Additionally, some fungi, such as mushrooms, are also consumed as food. The diversity in plant and animal-based foods ensures a balanced diet rich in all necessary nutrients.

2. Honey production is a fascinating process carried out by honeybees. Bees collect nectar, a sugary juice, from flower blossoms using their long, tube-shaped tongues and store it in their extra stomach, or "honey stomach". The nectar mixes with enzymes in the bees' saliva, a process that begins its transformation into honey. Back in the hive, they regurgitate the nectar into the beeswax cells of the hive. Bees then fan the nectar with their wings to evaporate excess water, gradually thickening the substance into honey. Once the honey is sufficiently concentrated, the bees seal off the beeswax cell with more wax, preserving the honey for later consumption. This process not only produces a food source for humans but also serves as the bees' primary source of energy.

3. Testing for the presence of starch in food items can be efficiently done using iodine solution, a simple and effective method. To perform this test:

   Place a small sample of the food item on a white plate or a non-reactive surface.

   Drop a few drops of iodine solution onto the food sample.

   Observe the color change; iodine reacts with starch and changes color to a blue-black or purple shade.

A positive result (blue-black or purple coloration) indicates the presence of starch in the food sample, while a negative result (no color change) means there is no starch.

This test is widely used in both educational settings for teaching purposes and in culinary fields for ingredient analysis.

4. Jute, known as the 'golden fiber', thrives under specific climatic conditions:

   Climate: Jute requires a warm and humid climate with temperatures ranging from 24°C to 37°C. It is highly sensitive to frost.

   Rainfall: Jute plants need a lot of water, and thus areas with a rainfall of 1500 mm to 3000 mm per year are ideal.

   Soil: Jute grows best in alluvial soil which is often found in river basins. The soil should be fertile and well-drained to prevent water stagnation which could damage the roots.

   These conditions are predominantly found in the Ganges delta, which is why regions such as West Bengal in India and Bangladesh are leading producers of jute.

5. Materials can be classified based on various physical and chemical properties:

   Electrical Conductivity: Materials can be conductors, insulators, or semiconductors based on their ability to conduct electricity.

   Thermal Conductivity: This refers to the ability of a material to conduct heat.

   Malleability: The ability of a material to be hammered into thin sheets is called malleability.

   Ductility: The capacity of a material to be drawn into thin wires.

   Density: The mass per unit volume of a material. It helps in identifying how compact or porous a material is.

   These properties are critical for determining the uses of materials in various industrial, technological, and everyday applications.

6. To obtain clear water from muddy water, a process called sedimentation and decantation is typically used:

   Sedimentation: Allow the muddy water to sit undisturbed in a container for a period. Over time, the heavier sediment will settle at the bottom of the container.

   Decantation: Carefully pour off the clear water into another container, making sure not to disturb the sediment at the bottom.

   This method is simple and effective for separating solid impurities from water without the need for complex equipment.

7. Separating wheat grain from straw pieces is commonly done using a combination of threshing and winnowing:

   Threshing: This involves beating the wheat stalks to loosen the edible grains from the chaff (straw pieces).

   Winnowing: After threshing, the mixture of wheat grains and straw is tossed into the air, usually with a fan or natural breeze. The lighter straw blows away, while the heavier grains fall back down to the ground.

   These traditional agricultural techniques are still widely used today to efficiently separate grains from straw.

8. Transpiration is the process by which moisture is carried through plants from roots to small pores on the underside of leaves, where it changes to vapor and is released to the atmosphere. Essentially, it is the evaporation of water from plant leaves and stems. Transpiration serves several functions:

Regulating Temperature: It helps to cool the plant, much like sweating does in humans.

Water Movement: It aids in the upward movement of water from the roots to the rest of the plant, facilitating the transport of essential nutrients.

Internal Water Pressure: Maintains water pressure within the plant cells which aids in keeping the plant rigid and upright.

This biological process is vital for plant health and growth, influencing both ecological and agricultural dynamics.

9. A chemical change involves the formation of new substances with different properties from the original materials through the reorganization of atoms. Chemical changes are generally irreversible without further chemical reactions. An example of a chemical change is the rusting of iron, where iron reacts with oxygen in the presence of water to form iron oxide (rust). This process changes the chemical structure of iron, resulting in a new substance with different properties, including color, strength, and composition.
10. Snakes move by contracting their muscles against the ground and curving their bodies in sequences of waves known as lateral undulation. This primary movement involves the snake bending its body into a series of S-shaped curves and pushing off objects and rough surfaces to propel itself forward. The scales on the belly of the snake grip the ground, providing the necessary friction for movement. Some snakes also use other methods, such as sidewinding in sandy environments, to minimize contact with the hot ground and conserve energy. This unique locomotion allows snakes to navigate various terrains effectively.

F. Do it yourself.

Revision Test Paper-3

A.	1.	(d)	2.	(a)	3.	(b)	4.	(d)	5. (c)
B.	1.	T	2.	F	3.	T	4.	T	5. T
C.	1.	Hump	2.	Water	3.	No	4.	Translucent	5. No

Revision Test Paper-4

A.	1.	(b)	2.	(c)	3.	(d)	4.	(d)	5. (d)
B.	1.	T	2.	T	3.	F	4.	F	5. F
C.	1.	No	2.	Yes	3.	Rainwater	4.	Oxygen	5. Scavenger

Model Test Paper-2

A. 1. Adaptation is the process by which a species becomes better suited to its environment through changes in its physical structure, behavior, or physiological processes over generations.

2. Plants breathe through a process called transpiration, where they exchange gases with the environment through tiny openings in their leaves called stomata. They absorb carbon dioxide and release oxygen during photosynthesis.
3. Translatory motion refers to the movement of an object from one point to another along a straight or curved path, where all parts of the object move the same distance in the same direction.

4. Types of motion include translatory motion, rotational motion (movement around an axis), oscillatory motion (back-and-forth movement), and random motion (erratic changes in direction).
5. A shadow is formed when an opaque object blocks the path of light, casting a silhouette on the surface behind it where the light is obstructed.
6. A magnet is an object or material that produces a magnetic field, which exerts a force on other ferromagnetic materials like iron, attracting or repelling them.
7. Higher temperatures increase the rate of evaporation as more water molecules gain enough kinetic energy to break free from the liquid surface and become vapor.
8. The atmosphere is the layer of gases surrounding Earth, held in place by gravity. It protects life by absorbing ultraviolet solar radiation, warming the surface through heat retention, and reducing temperature extremes between day and night.
9. Humidity is the amount of water vapor present in the air. It is an important aspect of the atmosphere that affects weather conditions and human comfort.
10. A landfill is a site for the disposal of waste materials by burial and is the oldest form of waste treatment. It involves the dumping of waste into the ground, which is then covered to prevent odors and vermin.

B.

1. forests	2. pendulum	3. daily lives	4. Shiny	5. two
6. transportation	7. 71%	8. pollutants	9. 0.04%	10. Compost

C. 1. (e) 2. (c) 3. (a) 4. (b) 5. (d)

D.

1. Camels are highly adapted for desert life. They can drink up to 40 gallons of water at once and their oval-shaped red blood cells enable blood flow even when dehydrated. Their thick fur and undercoat insulate them from desert heat and cold, while wide, flat feet prevent sinking in the sand. Additionally, camels' nostrils and eyelashes can close to block sand and dust.
2. Living things share several key characteristics: they grow and develop, reproduce, respond to stimuli, maintain homeostasis, and have metabolism. Growth involves cell division and differentiation, while reproduction can be sexual or asexual. Organisms respond to their environment to survive, regulate internal conditions (homeostasis), and convert nutrients into energy (metabolism).
3. Periodic motion occurs when an object moves in a repetitive pattern. A classic example is a pendulum that swings back and forth in a fixed arc. Another example is the Earth revolving around the Sun, completing one orbit annually. Both examples show regular, repeating movements typical of periodic motion.
4. The International System of Units (SI) was established to provide a consistent, global framework for scientific measurements. This system simplifies communication and collaboration across different countries and scientific disciplines by ensuring that measurements are universally understood and reproducible.
5. Reflection of light occurs when light rays bounce off a surface. It is governed by the law of reflection, which states that the angle of incidence (where the light hits the surface) equals the angle of reflection (where it reflects away). This phenomenon allows us to see objects that do not emit their own light by reflecting light into our eyes.
6. Magnets are used in various applications including electronics, where they form essential components of motors and hard drives. In medicine, magnets are crucial in imaging technologies like MRI scans. Everyday uses include magnetic closures in bags, refrigerator magnets for holding items, and magnetic tools for securing objects.
7. Droughts occur when a region experiences a significant lack of precipitation over an extended period, leading to insufficient water supply. Factors contributing to drought include high temperatures, high winds, and low humidity, which can increase evaporation and transpiration rates, further reducing available moisture.

8. The oxygen cycle is the biogeochemical cycle that describes the movement of oxygen within and between its three main reservoirs: the atmosphere, the biosphere, and the lithosphere. Processes such as photosynthesis, respiration, and decomposition are crucial in maintaining the levels of oxygen in the earth's atmosphere.
9. Air, a vital resource for life on Earth, serves many essential functions across various domains of life and industry. Here are five significant uses of air:

   Breathing and Respiration: Air's primary and most critical use is for breathing. Oxygen from the air is essential for the respiration process in humans, animals, and other organisms, allowing cells to produce energy from food. Carbon dioxide, a byproduct of respiration, is expelled back into the atmosphere.

   Photosynthesis: Air is also crucial for photosynthesis, the process by which plants, algae, and some bacteria convert carbon dioxide from the air into organic matter using the energy from sunlight. This process not only sustains plant life but also produces the oxygen necessary for most life forms on Earth.

   Weather and Climate Regulation: Air plays a key role in the Earth's climate system. Movements of air in the atmosphere, driven by the heat from the sun and the rotation of the Earth, form various weather patterns and climate zones. These air movements, known as wind, help regulate temperatures and distribute moisture globally, influencing weather systems and seasonal changes.

   Combustion: Air is essential for combustion processes, which are fundamental to various industrial applications, including energy production and transportation. Oxygen from the air reacts with fuels such as coal, oil, gas, or wood to release energy in the form of heat and light, a process pivotal to generating electricity, powering vehicles, and heating homes.

   Aerodynamics and Flight: Air is indispensable in the field of aerodynamics, where it supports the flight of birds, insects, and man-made vehicles like airplanes and drones. The principles of air pressure and flow around objects are utilized to design aircraft that can lift off, stay aloft, and navigate through the atmosphere efficiently.
10. Plastic pollution is considered a global menace due to its non-biodegradable nature, leading to long-lasting environmental impact. Plastic accumulates in natural habitats, harming wildlife and ecosystems. It breaks down into microplastics that contaminate water and food sources, posing health risks to animals and humans.

F. Do it yourself.