COMPACT SCIENCE 5

(Book Solution)

1. Plant Reproduction

Checkpoint 1

1. Dicot **2.** Cotyledons **3.** Water

Checkpoint 2

1. Lotus, Coconut **2.** Cotton, Madar

3. Urea, Super phosphate **4.** Wheat, Barley

Exercises

A. 1. (d) **2.** (b) **3.** (d) **4.** (d)

B. 1. True **2.** False **3.** True **4.** False **5.** False

C. 1. Seed leaves are the structures in the seed that store food for baby plant.

2. The growing of seed into a new plant is called germination of seed.

3. Animals eat fruits and throw their seeds here and there. Some seeds get hooked to fur, skin of animals, clothes of people and are carried away to far off places. In this manner, they help in the dispersal of seeds.

4. The seeds dispersed by wind are light and hairy so that they are easily carried away by the wind.

5. Rabi crops are grown in winter from November to April, whereas Kharif crops are grown in summer from June to October.

HOTS

1. All seeds do not grow because only those seeds which get suitable conditions for growth are able to grow into new plants.

2. Life on the Earth cannot exist without plants because plants give oxygen to breathe and food to eat.

3. We get wool from sheep and silk from silkworm. Both these animals feed on plants. Without plants, they cannot live and will die.

2. Animals and Their Varying Lifestyles

Checkpoint 1

1. gills **2.** lungs **3.** legs **4.** flippers **5.** flying

Checkpoint 2

1. Small digestive system **2.** Lays eggs in river bank

3. Eats grass **4.** Hops on land

Exercises

A. 1. (a) **2.** (a) **3.** (a)

B. 1. spiracles **2.** pangolin **3.** proboscis **4.** strong

C. 1. Insects breathe through small air holes called spiracles on their body.

2. The fins of a fish help it move forwards, in maintaining balance and changing direction while swimming.

3. Herbivores have large incisors and broad molar teeth that help them cut the grass and leaves, and grind and chew well. They have long alimentary canal to digest the plant material.

4. Frogs have long, sticky tongue folded on the floor of their mouth. It is flipped at the prey. The prey gets stuck and is pulled into the mouth.

5. Camouflage is an adaptation in some animals by which they can change their body colour according to their surroundings and become unnoticeable to their enemies.

6. Octopus and cuttlefish when attacked, release a cloud of black ink-like substance in the water to confuse their predator meanwhile they get the time to escape.

7. Birds migrate to get plenty of food, water and favourable conditions of temperature and breeding.

HOTS

1. In water, breathing in cockroach will stop because all the spiracles on its body will get blocked and no exchange of gases would take place.

2. Fish breathes oxygen dissolved in water. Outside water, it cannot breathe and hence dies.

Activity Time

J	L	U	N	G	S	L	E	G	C	N
Y	T	X	K	I	P	A	D	D	L	E
U	Z	C	I	L	I	A	M	H	A	I
S	A	A	W	L	R	G	B	D	W	O
V	F	C	E	S	A	S	T	I	N	G
M	A	B	V	E	C	F	K	N	J	M
P	N	F	G	F	L	I	P	P	E	R
D	G	H	V	T	E	J	S	R	L	Q
P	R	O	B	O	S	C	I	S	J	K

3. The Skeletal System

Checkpoint 1

1. Backbone **2.** Ribs **3.** Forelimbs **4.** Hindlimbs

Checkpoint 2

1. Voluntary; Striated muscles **2.** Involuntary; Smooth muscles

3. Involuntary; Smooth muscles **4.** Involuntary; Striated muscles

Exercises

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

B. 1. True **2.** False **3.** True **4.** False

C. 1. ligament **2.** bone marrow **3.** floating

4. eight **5.** Pivot

D. 1. Skeletal system gives shape and support to the body, protects soft organs and provides movements to the body parts.

2. The joining place of two bones is called a joint. Joints are of two types:

(a) Immovable joints such as joints of bones of skull and pelvis.

(b) Movable joints such as ball and socket joints of hips and shoulders, hinge joints of knees and elbows, pivot joints between first and second vertebrae and gliding joints of wrists and ankles.

3. The movable lower jaw enables us to chew and speak.
4. Voluntary muscles work under our control, e.g., muscles of arms, legs, hands, etc. Involuntary muscles do not work at our will, e.g., muscles of heart, stomach, etc.
5. The muscle fibres that are present in the heart are called cardiac muscle fibres. They work continuously without getting tired.
6. **Hint:** Refer to figure 'Types of muscle fibres'.

HOTS

1. We cannot bend our knees and allows backward because the joint found in them allows movement of bones in one direction only.
2. Heart is made of strong cardiac muscles which work continuously without getting tired.
3. If there were no bones in our body, our body would have been merely a heap of flesh.

4. The Nervous System

Checkpoint 1

1. Cerebrum **2.** Reflex action **3.** Sensory nerve
4. Motor nerve

Checkpoint 2

1. Bone **2.** Pupil **3.** Hot

Exercise

A. 1. (c) **2.** (c) **3.** (b) **4.** (c)

B. 1. False **2.** True **3.** False **4.** False

C. 1. Cerebrum **2.** Cerebellum **3.** Cell body, dendrites; axon **4.** pupil **5.** motor

D. 1. The main parts of nervous system are brain, spinal cord and nerves.

2. Brain is the control centre of our body. It controls all our life processes such as breathing, digestion, etc. and organises our voluntary actions such as walking, running, dancing, etc. It controls our ability to think, learn, feel, etc.

3. A nerve cell has a cell body which gives out many fibre-like extensions called dendrites. The longest extension from one end is called axon.

Figure: Hint: Refer to Figure 'A nerve cell'.

4. The three main parts of our ear are external ear, middle ear and internal ear.

5. We can take care of our eyes by washing them regularly, not rubbing them with dirty hands or wiping them with dirty handkerchief, not reading in dim or bright light or in moving vehicle and by not watching televising for long.

HOTS

1. On touching a hot vessel, reflex reaction takes place in our body which allows us to withdraw our hand immediately.

2. Using hair pin to clean the ears can damage the ear drum. Also, it can lead to infections.

5. Food and Health

Checkpoint 1

1. Glucose **2.** Proteins **3.** twice **4.** B; C

Checkpoint 2

1. Yes **2.** No **3.** Yes **4.** Yes

Exercises

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

B. 1. iron **2.** balanced **3.** vegetables; fruits **4.** instant

C. 1. Carbohydrates, fats **2.** Vitamins and minerals

3. A, D, E, K **4.** B, C

D. **1.** Nutrients are the substances found in food and keep our body healthy. These are carbohydrates, fats, proteins, vitamins and minerals.

2. A diet which contains all the nutrients in right amount is called balanced diet.

E. **1.** Different nutrients present in our food are carbohydrates, fats, proteins, vitamins and minerals.

2. Carbohydrates provide energy to our body.

3. Fats have twice the amount of energy as compared to carbohydrates. So they provide more energy to do lots of physical activities.

4. Proteins are called body-building foods because they help the body grow, build new cells and tissues and repair them when damaged.

5. Vitamins are classified as that dissolve in fats such as vitamin A, D, E and K and that dissolve in water such as vitamin B and C.

6. Roughage is the fibre present in plant food that cannot be digested by our digestive system. Roughage-rich foods are spinach, cabbage, oats, fruits, etc.

HOTS

1. Roughage is an essential part of our diet because it helps in bowel movement and prevents constipation.

2. Rest and sleep are important for good healthy body because during sleep our body repairs its wear and tear.

6. Health and Diseases

Checkpoint 1

1. virus **2.** Contaminated **3.** in **4.** polio

Checkpoint 2

1. non-infectious **2.** night blindness

3. Milk **4.** sodium

5. deficiency

Exercises

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

B. **1.** False **2.** True **3.** True **4.** False **5.** True

C. **1.** Disease

2. Communicable; non-communicable

3. germs

4. Infectious

5. Vaccination

D. **1.** Communicable diseases spread through direct contact, air, contaminated food and water, animal bite and insects.

2. Diseases caused due to deficiency of nutrients are called deficiency diseases such as anaemia, night blindness, etc.

3. Giving vaccine to the body is called vaccination. It enables the body to fight against diseases.

4. Obesity is having excess fat in the body. It is caused due to overeating of carbohydrates and fats.

5. Some wrong food habits are as follows:

(a) Taking excess of common salt in diet is not good for health.

(b) Taking excess of fat soluble vitamins in diet affects liver and kidneys badly.

(c) Having excessive fried and fatty food leads to obesity.

HOTS

1. This is because rickets is caused due to deficiency of vitamin D. Our body prepares vitamin D in the presence of sunlight.

2. Flu is an infectious disease. Sharing handkerchief and towel with a flu patient would also make us ill.

3. We should change the water of desert cooler every three or four days to prevent the breeding of mosquitoes.

7. Staying Safe

Checkpoint 1

1. jerks **2.** sand **3.** roll on the floor

Checkpoint 2

1. First aid **2.** Blisters **3.** Splint

Exercises

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

B. 1. accident **2.** antiseptic **3.** first aid **4.** traffic

C. 1. First aid **2.** Sprain **3.** Poison **4.** Splint **5.** Blisters

D. 1. An accident is a sudden, unexpected and harmful incident. Accidents can be prevented by avoiding carelessness and following safety rules.

2. Fire caused by petrol can be put out by throwing sand over it.

3. In case of sprain, apply an ice pack followed by pain relieving cream on sprained area and tie a crepe bandage or clean cloth giving complete rest to the affected part.

In case of animal bite, wash the wound with soap and water, apply an antiseptic cream and tie a bandage or clean clothes over the wound.

4. Poisonous substances should be kept out of the reach of children in tightly closed bottles with labels on them.

5. In case of snake bite, tie a tight bandage a little above the bitten area, do not allow the victim to sleep and take him to the doctor immediately.

HOTS

1. Sand should be used in case of fire caused by petrol because petrol being lighter, floats on water and continues to burn.

2. Talking on mobile phones while driving can distract us from driving and lead to an accident.

3. Petrol is a highly inflammable substance. A single drop of petrol can catch fire easily and become hazardous.

8. Wonders of Air

Checkpoint 1

1. 800 **2.** Oxygen **3.** soil **4.** pressure

Checkpoint 2

1. CNG **2.** Bronchitis **3.** Tree **4.** Ozone

Exercises

A. 1. (b) **2.** (d) **3.** (c) **4.** (c)

B. 1. 800 **2.** Oxygen **3.** soil **4.** pressure **5.** barometer

C. 1. False **2.** False **3.** False **4.** True

D. 1. Air is a mixture of 78 per cent nitrogen, 21 per cent oxygen, 0.03 per cent carbon dioxide, some water vapour and other gases.

2. Pitchkari, doctor's syringe and fountain pen work due to air pressure. Liquids flow from one container to other using siphon are also due to air pressure.

3. The presence of unwanted and harmful materials in air is called air pollution. Its main causes are smoke and harmful gases evolved due to burning of fossil fuels in automobiles and industries.

4. Main effect of air pollution are as follows:

(a) Air pollution causes respiratory diseases and irritation of eyes.

(b) Polluted air kills plants and trees.

(c) The excess of carbon dioxide in air has resulted in global warming.

Air pollution can be reduced by planting more and more trees; using nonpolluting fuels like CNG, ecofriendly sprays and renewable forms of energy and getting checked automobiles regularly.

HOTS

1. We should prefer using CNG vehicles because CNG is a non-polluting fuel. It burns without giving smoke.

2. Regular check of automobiles gives good milage, hence, less consumption of fuel that reduces air pollution.
3. Factories and industries are not allowed to establish in residential areas because harmful gases and other wastes released by them would cause ill-effects on the health of people living there.

9. Matter

Checkpoint 1

1. matter **2.** matter **3.** solids **4.** shape; volume

Checkpoint 2

1. Carbon dioxide **2.** Nitrogen

3. Mixing salt into water **4.** Burning petrol

Exercises

A. 1. (b) **2.** (c) **3.** (b)

B. 1. False **2.** True **3.** True **4.** True

C. 1. Solids: Solids have definite shape and definite volume. Their molecules lie very close to each other with strong forces of attraction. They cannot flow.

Liquids: Liquids have no definite shape but have a definite volume. Their molecules do not lie close to each other. They do not have strong forces of attraction between their molecules. Liquids can flow.

Gases: Gases neither have a definite shape nor a definite volume. Their molecules have very weak forces of attraction between them. They are far apart. Gases can flow in all directions.

2. Compounds are the substances formed by the combination of different elements in a fixed ratio. Water and salt are two examples of compounds.

3. The substances made of only one kind of atoms are called elements such as gold, silver, iron, etc. The substances that are formed by the combination of different elements in

fixed ratio are called compounds such as sugar, salt, water, etc., whereas mixtures are the substances that contain different elements or compounds or both in uncombined state and varying amount such as air, sea water, etc.

4. Cooking of rice is a chemical change because it is irreversible as we cannot get back raw rice.
5. Carbon dioxide, water vapour and water.
6. Physical changes are reversible changes without forming new products, whereas chemical changes are irreversible changes that form new products.

D. Elements: Iron, carbon, gold, hydrogen

Compounds: Sugar, water, salt, baking soda

Mixtures: Air, soil, soda water, sea water

HOTS

1. Chemical changes are permanent changes because the composition and properties of the substance do not remain same and the new substances formed are completely different from the original one.
2. Solids have fixed volume and fixed shape because molecules in solids lie very close and strongly attracted towards each other.
3. Air is considered matter because it has weight and occupies space.

10. Rocks and Minerals

Checkpoint 1

1. Geology **2.** crust **3.** fire rocks

Checkpoint 2

1. Coal **2.** metallic minerals **3.** Natural gas **4.** Gemstones

Exercises

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

B. 1. False **2.** True **3.** False **4.** True

C. 1. The rocks formed by cooling of hot, molten magma are called igneous rocks.

These rocks are formed by cooling of either underground magma or its volcanic eruption as lava on the ground.

2. Metamorphic rocks are formed by the transformation of igneous and sedimentary rocks by intense heat and pressure developed due to overlying layers.

3. (a) **Sandstone:** It is formed from grains of quartz and feldspar.

(b) **Limestone:** It is formed from calcite.

(c) **Conglomerate:** It is made of sand, pebbles, silica and calcium carbonate.

(d) **Gypsum:** It is made of sulphate minerals.

(e) **Shale:** It is made of clay.

4. The elements or compounds found in the earth's crust are called minerals. For example, gold, silver, etc.

5. Coal was formed by the decomposition of dead remains of plants that lived 400 million years ago and got buried in swamps.

D. Igneous rocks: Pumice, Obsidian, Granite

Sedimentary rocks: Limestone, Sandstone, Shale, Conglomerate, Gypsum

Metamorphic rocks: Gneiss, Marble, Slate

HOTS

1. Granite is used for making long-lasting buildings and statues because it is hard and does not wear out easily.

2. Pumice stone is porous and has air in the holes. This makes it very light and it floats on water.

11. Soil Erosion and Conservation

Checkpoint 1

1. rocks **2.** soil erosion **3.** deforestation

Checkpoint 2

1. Afforestation **2.** Terrace farming

3. Soil conservation **4.** Soil pollution

Exercises

A. 1. (a) **2.** (b) **3.** (b)

B. 1. rocks **2.** soil erosion **3.** vegetation

4. terrace farming **5.** pesticides; fertilisers

C. 1. Weathering of rocks is a process of breaking of rocks into fine particles by wind and water.

2. Soil is formed by weathering of rocks in which rocks are broken into fine particles by wind and water.

3. The removal of topsoil is called soil erosion. It is caused by strong winds, heavy rain and some human activities such as deforestation, overgrazing by farm animals, excessive ploughing of farmland and leaving land bare after harvesting.

4. Protection of soil against its erosion is called soil conservation. It is important to save the land from losing its fertility.

5. Felling down trees on a large scale for human use is called deforestation, whereas growing plants on a large scale to prevent soil erosion is called afforestation.

6. The major sources of soil pollution are dumping wastes on open land and excessive use of fertilisers and other chemicals by farmers.

HOTS

1. Solid non-biodegradable wastes should not be dumped on land because they are not broken down by microorganisms of soil and remain unaffected. They cause soil pollution and make the land barren.

2. Cattle should not be made to graze at the same place regularly because this would make the land loose and bare causing soil erosion.

12. Force and Simple Machines

Checkpoint

1. force **2.** three **3.** changing **4.** wedge

Exercises

A. 1. (b) **2.** (d) **3.** (b) **4.** (a)

B. 1. False **2.** True **3.** False **4.** True

C. 1. A force is a pull or push applied on an object. A force can make an object move, stop a moving object, change the direction and slow down or speed up a moving object, and change the shape and size of an object.

2. An upward force in water that resists an object from going down and keeps it afloat is called buoyant force.

The force which acts between the two surfaces and opposes the motion of a moving object is called frictional force.

3. A sloping surface that reduces the effort required to lift a load is called an inclined plane. It is used as ramp in hospitals, hotels, airports, etc. to drive the vehicles up, for loading and unloading heavy goods from trucks and on mountains, as sloppy roads for vehicles to climb up easily.

4. Lever, pulley and inclined plane are major groups of simple machines.

5. The wheel and axle arrangement such as steering wheel in cars, handles of bicycles, door knob, an egg beater help us turn or move something across a surface more easily.

HOTS

1. Lifting a bucket of water out of a well with the help of a pulley becomes easier because pulley changes the direction of applied force.

2. The rolling ball stops itself because the force of friction acts between the ball and ground which opposes the motion of ball.

3. Swimming rings save from drowning by increasing the buoyant force.

13. The Universe

Checkpoint 1

1. Venus

2. Moon

3. Great Dark Spot

4. Jupiter

Checkpoint 2

1. Yes **2.** Yes **3.** No **4.** Yes

Exercises

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

B. 1. True **2.** False **3.** False 4. True

C. 1. The different shapes of moon seen on different nights are called phases of moon.

2. An eclipse occurs when the light of the sun is blocked by the moon or the earth.

3. Tides are regular rise and fall of ocean water due to gravitational pull by moon on the earth. Low tides are formed when the ocean water on the side of the earth facing away from the moon rushes towards moon-facing side of the earth. High tides occur when ocean water on the moon-facing side of the earth is attracted upwards.

4. The main function of artificial satellites is to collect information related to atmosphere, planets, stars and other distant objects.

The first artificial satellite launched by India was 'Aryabhata'.

5. In lunar eclipse, the earth comes between the sun and the moon such that the shadow of the earth falls on the moon, whereas in solar eclipse, the moon comes between the sun and the earth and casts its shadow on the earth.

6. Hint: Refer to figure under the head 'Solar Eclipse'.

HOTS

1. The earth has life on it because of the following reasons:
   (a) It is at the appropriate distance from the sun.
   (b) Its atmosphere contains oxygen which is necessary for life.
   (c) It has water on it.
2. It becomes completely dark during total solar eclipse because the moon covers the sun completely.
3. Sound waves need air (medium) to travel and there is no air on the moon.

14. Natural Disasters

Checkpoint

1. No **2.** Yes **3.** Yes **4.** Yes

Exercises

A. 1. (b) **2.** (b) **3.** (c) **4.** (d)

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

C. 1. An earthquake is the sudden shaking of ground due to vibrations deep inside the earth. It causes great damage to life and property.

2. A volcano is an opening on the earth's surface through which hot and molten rocks, ash and gases erupt from inside the earth.

Mount Vesuvius, Mount Etna, Mount Erebus, Mount Fuji and Barren Island are some active volcanoes.

3. Tsunami causes a great loss of life and property in the coastal areas.

4. The condition of continuous heavy rains for many days making rivers overflowing and submerging nearby areas is called flood.

Deforestation and overgrazing are the main causes of floods.

5. A flood damages the crop fields, submerges many areas causing great loss to life and property as well as soil erosion.
6. A condition of less or no rains over a long period of time is called drought.

HOTS

1. Floods wash away the upper fertile layer of soil causing soil erosion.
2. Trees give out water vapour during transpiration and help in bringing rains.

Activity Time

B	U	M	A	D	R	O	U	G	H	T
V	O	R	N	S	T	X	M	W	F	S
E	A	R	T	H	Q	U	A	K	E	U
N	T	Q	C	N	O	R	G	L	G	N
T	D	Y	Y	P	E	J	M	X	P	A
L	Q	M	L	B	S	L	A	V	A	M
N	F	L	O	O	D	S	V	B	R	I
K	Z	U	J	I	T	A	H	W	A	Q
C	Y	C	L	O	N	E	R	A	P	H