

** Enhanced Edition
NEP 2020 Guidelines*

FACTS

of

SCIENCE

Teacher Manual



4



Chapter - 1 — Plants Make Food

Page 11

A. Tick (✓) the correct option:

1. Leaf 2. Leaf blade 3. Glucose 4. Midrib 5. Blue

B. Match the following:

1. c 2. d 3. a 4. b

C. Answer the following questions (Page 12)

1. It is the green pigment present in leaf that helps to capture sunlight.
2. It is the process by which green plants prepare their own food.
3. Animals are dependent on plants for food and oxygen. Plants are dependent on animals as after the death, the decomposed animal organic matter mixes in soil and is used by plant.
4. Because it prepare food for the plant.
5. Parts— Leaf blade, Mid rib, Side veins, Stomata (Refer Pg-8 of the book for detail)
6. Plants which are non-green cannot make their own food.

Critical Thinking

1. They cannot do photosynthesis
2. Animals will not survive as we are dependent on plants for food and oxygen.

Picture Based Activity

1. Leaf margin 2. Leaf stalk 3. Midrib
4. Leaf blade 5. Side vein

Things To Do

Do with parental guidance.

Life Skills

Do with teacher guidance.

Subject link

Do with parental guidance.

Chapter - 2 — Plants living and Surviving

Page 19

A. Tick (✓) the correct option:

- | | | |
|---------------|-----------|------------------|
| 1. Mango tree | 2. Banyan | 3. Both of these |
| 4. Mushroom | 5. Banyan | |

B. Answer the following questions

1. Ability to adjust to one's surroundings is called adaptation. The place or surroundings where plants and animals live and grow is called their habitat.
2. (i) Roots spread far into the soil
(ii) Have small leaves
(iii) Leaves are like spines
(iv) Thick stem
3. Plants that grow in water is called aquatic plants:
(i) Floating plants
(ii) Fixed plants
(iii) Underwater plants
4. Living beings like mushrooms, moulds etc. which do not have chlorophyll and cannot make their own food.
5. They give us cereals, help to make chains, mats, medicines, paper, packing material, etc.
6. Plants that grow in poor mineral soil and eat insect are insectivorous plants. eg. Venus flytrap, Pitcher plant.

Critical Thinking

1. No, because it is not adapted to the low temperature environment there.
2. The plant will not be able to respire and thus die.

Picture Based Activity

- | | | |
|-------------|-------------|-----------|
| 1. Sheesham | 2. Datepalm | 3. Sundew |
| 4. Maple | 5. Lotus | |

Things To Do

To be done with parents and teacher's guidance

Life Skills

Subject link

To be done with teacher's assistance.

Unit II : ANIMAL WORLD

Chapter - 3 — Reproduction in Animals

A. Tick (✓) the correct option:

- | | | |
|----------------|----------|-----------|
| 1. Laying eggs | 2. Yolk | 3. Spawns |
| 4. Caterpillar | 5. Three | |

B. Fill in the blanks

- | | | |
|-------------|----------------|-------------|
| 1. Female | 2. Embryo | 3. Tadpoles |
| 4. Moulting | 5. Caterpillar | |

C. Answer the following questions

1. Outer shell, Shell membranes, Yolk, Albumen, Air cell, Chalazae
2. A change from young animal to adult animal.
3. Egg— Caterpillar— Chrysalis—Adult
4. Mammals are the one that give birth to young ones and produce their own milk.
5. Egg— Nymph— Cockroach (Detail in Page-23 of your text book)

Critical Thinking

1. Embryo will not obtain the warmth needed for complete development.
2. Because they do not have gills but have lungs to breathe and to take air they come to the surface of water.

Picture Based Activity

- | | | |
|-------------|------------|---------|
| 1. Shell | 2. Embryo | 3. Yolk |
| 4. Air cell | 5. Albumen | |

Things To Do

Do with parental guidance.

Life Skills

Do with parental guidance.

Subject link

- | | | |
|------------------|----------|----------|
| 1. Black panther | 2. Horse | 3. Whale |
|------------------|----------|----------|

Chapter - 4 — Animals Living and Surviving

A. Tick (✓) the correct option:

- | | | |
|-----------------------|--------------------|----------|
| 1. Terrestrial animal | 2. Arboreal animal | 3. Gills |
| 4. Grass | 5. Chameleon | |

B. Fill in the blanks:

- | | | |
|-------------|---------------|----------|
| 1. Bear | 2. Vertebrate | 3. Horns |
| 4. Reptiles | | |

C. Name the category to which each group of animals belongs:

- | | | |
|---------------|--------------|---------------|
| 1. Carnivores | 2. Omnivores | 3. Herbivores |
|---------------|--------------|---------------|

D. Answer the following questions

- (a) A place where plants and animals live and which provide them food and shelter is called habitat.
(b) The ability to adjust to one's habitat is called adaptation.
- To insulate the body
- (a) Fins or limbs to swim
(b) Webbed feet
(c) Breathe through gills
(d) Presence of blubber in whale
- Some animals survive in winter by going into a long period of sleep. This winter sleep is called hibernation.
- Animals like chameleon which as a defence mechanism blend with surroundings to escape from enemies. This is called camouflaging.
- Animals having backbone are called vertebrates and animals who do not have backbone is called invertebrates.
- Carnivores eat the flesh of animals only but omnivores eat both plants and animals.

Critical Thinking

- To climb trees.
- No, because humans are social animals who through their thinking have developed clothes and many machines to protect themselves from harsh climate conditions.

Picture Based Activity

- | | | |
|-------------|------------|---------|
| 1. Tiger | 2. Penguin | 3. Frog |
| 4. Mosquito | 5. Fish | |

Things To Do

Do with parental and teacher's guidance.

Life Skills

Reference points to be followed

Subject link

To be done with parental guidance.

Unit III : (HUMAN BODY)

Chapter - 5 — Our Food

A. Tick (✓) the correct option:

1. Nutrients
2. Carbohydrates
3. Pulses, peas, eggs
4. Roughage
5. Body-building

B. Fill in the blanks

1. Protein
2. Carbohydrates
3. Protein
4. Illness

C. Answer the following questions

1. Carbohydrate, proteins, fats, minerals, vitamins, roughage.
2. (a) By freezing (b) Adding salt, sugar and oil (c) Can be tinned
3. Proteins are body building that help in growth. Carbohydrates give us energy to work.
4. Roughage are fibre that are present in food like raw vegetables and fruits. They should be included in a diet because it is important for proper digestion of food.
5. No, carbohydrate are energy giving food but fats provide more heat and energy than carbohydrates.

Critical Thinking

1. Paneer, Curd, Lassi intake can be suggested.
2. To preserve them.

Picture Based Activity

Food Item	Carb.	Fats	Proteins	Vit./minerals	Water	Roughage
Burger	✓	✓	✓	✗	✗	✗
Kheer	✓	✓	✓	✓	✓	✗
Vegetable	✓	✗	✗	✓	✗	✓
Sandwich	✓	✓	✓	✗	✗	✗
Omelette	✗	✓	✓	✗	✗	✗
Pizza	✓	✓	✓	✗	✗	✗

Things To Do

To be done with teacher assistance.

Life Skills

To be done with teacher guidance as an oral discussion activity.

Subject link

To be done with parental guidance

Chapter - 6 — Teeth and Digestion

A. Tick (✓) the correct option:

1. Temporary 2. Canines 3. Enamel 4. Anus 5. Four

B. Write 'Yes' or 'No':

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

C. Answers the following questions

- Teeth are used to bite, cut, tear, grind the food we eat.
- Two
- Refer to "Key words" section, Page-48.
- (i) Crown (ii) Root (iii) Enamel (iv) Dentine (v) Pulp.
For detail diagram refer Page-45
- Small bits of food that get stuck between our teeth if not removed harbours germs that give out acid causing damage to enamel of teeth forming cavity. If cavities grow bigger, they reach the pulp and cause tooth decay.
- Break down of big complex food particles to simpler nutrients by enzymes so that they can be absorbed by body is called digestion.
- (a) Rinse your mouth after every meal.
(b) Avoid eating chocolates, sweets and candies.
(c) Brush your teeth twice a day.

Critical Thinking

- It is because, without treatment, germs will enter the pulp and this exposes the nerves and blood vessels to germs that cause pain.
- Carbohydrate will not be digested and also food will not be moistened to pass through the digestive system.

Picture Based Activity

1. Enamel 2. Dentine 3. Gums 4. Pulp

Things To Do

To be done by parental assistance.

Life Skills

To be done by parental assistance.

Subject link

Incisors	=	8
Canines	=	4
Premolars	=	8
Molars	=	12
Total	=	<u>32</u>

Chapter - 7 — Safety and First Aid

A. Tick (✓) the correct option:

- | | | |
|--------------------------|------------------|-------------|
| 1. Play with matchsticks | 2. Both of these | 3. Footpath |
| 4. Both of these | 5. Dry | |

B. Write 'Yes' or 'No'

- | | | | |
|-------|--------|-------|--------|
| 1. No | 2. Yes | 3. No | 4. Yes |
|-------|--------|-------|--------|

C. Answer the following questions

1. Our carelessness to follow rules causes accidents.
2. Refer Pg-52
3. Because they are prone to catch fire and on catching fire they melt and stick to skin causing injury.
4. Because it can cause accidents and injury.
5. Refer Pg-53
6. First aid is the immediate medical help given to a person who is injured or suddenly falls sick.
7. Refer to Pg-54.

Critical Thinking

1. Correct, wearing helmet
2. Incorrect, not wearing helmet

Picture Based Activity

Do it with parents assistance.

Things To Do

For Reference only

Life Skills

Do it with parents guidance.

Subject link

Do it with teacher guidance as an oral activity.

Chapter - 8 — Clothes We Wear

A. Tick (✓) the correct option:

- | | | |
|---------------------|------------------|--------------|
| 1. Protect Our body | 2. Cotton plants | 3. Silk worm |
| 4. Nylon | 5. Wool | |

B. Fill in the blanks

- | | | |
|-----------|------------|---------|
| 1. Fibres | 2. Natural | 3. Wool |
| 4. Cotton | 5. Winter | |

C. Write two examples of each

- | | | |
|----------------------------------|---------------|-----------------|
| 1. Cotton, Jute | 2. Silk, Wool | 3. Nylon, Rayon |
| 4. Pilot Uniform, Police Uniform | | |

D. Answer the following questions

- To protect our body.
- Long, thin strands or threads which when woven to make fabric and clothes are called fibres.
- Natural fibres are obtained from nature from plant and animal product. Synthetic fibres are made artificially by humans.
- It is so because they absorb less heat.
- Summer season—Loose fitting, cotton light coloured clothes.
Winter season— Dark coloured woollen clothes.
Rainy season— Waterproof fabric
- Doctors, lawyer, pilot, soldier, policemen, factory worker.

Critical Thinking

- To reduce socioeconomic disparities, ensuring students not to distract themselves and focus on discipline and study.
- Synthetic fibres catches-fire easily and melts and stick to skin on heating.

Picture Based Activity

- | | | | |
|-----------|----------------|---------|---------|
| 1. Rubber | 2. Cotton/Silk | 3. Wool | 4. Wool |
|-----------|----------------|---------|---------|

Things To Do

Do with parental guidance.

Life Skills

Do with teacher's guidance.

Subject link

Do with parental guidance.

Unit IV : (SPACE AND ENVIRONMENT)

Chapter - 9 — Weather, Air and Water

A. Tick (✓) the correct option:

1. Wind 2. Weather 3. Sun 4. Both of these
5. Three 6. 70

B. Write 'Yes' or 'No'

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

C. Answer the following questions

1. It is the condition of air at a particular time and place.
2. Rotation of earth is when earth moves on its axis. Revolution of earth is when earth moves around Sun.
3. The differential heating of land and air above it by sun causes pressure difference that causes wind to blow.
4. Movement of cool air from sea towards land during day is called sea breeze. Movement of warm air from land to sea in night is called land breeze.
5. The repeated inter conversion of water states from ocean to clouds to land etc in nature is called water cycle.
6. The process of change of water vapour into water on cooling is called condensation.

Critical Thinking

1. Exhaust fans are used to pull excess moisture and unwanted odors out of particular room.
2. Because it helps in the repeated interconversion of forms of water in nature.

Picture Based Activity

Do it with parents assistance

Things To Do

Do it with parents assistance

Life Skills

1. ✗ 2. ✗ 4. ✗

Subject link

Do it with teachers assistance

Chapter - 10 — Our Earth's Neighbours

A. Tick (✓) the correct option:

- | | | |
|----------|------------|------------------|
| 1. Venus | 2. Mars | 3. Constellation |
| 4. Sun | 5. Jupiter | 6. Saturn |

B. Fill in the blanks

- | | | |
|----------|-----------|------------|
| 1. Eight | 2. Uranus | 3. Jupiter |
| 4. 5000 | 5. Pluto | |

C. Answer the following questions

1. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.
2. Group of stars with a definite pattern is called constellation.
3. They are scientific instruments made and sent by scientists to orbit around celestial body.
4. Earth is the only planet where life sustains.
5. The fixed path that a planet takes to move around the sun is called its orbit. (Refer Pg-75)

Critical Thinking

1. If earth's axis had not been tilted to the plane of orbit, then there would be no seasons and humanity would have suffered.
2. No, because it is very close to sun due to solar radiation and extreme temperature it faces.

Picture Based Activity

- | | | | |
|---------|--------|--------------------|-------------|
| 1. Holi | 2. Eid | 3. Vasant Panchami | 4. Vaisakhi |
|---------|--------|--------------------|-------------|

Things To Do

Do it with teachers guidance.

Subject link

Do it with teacher guidance as an oral discussion activity.

Chapter - 11 — Environment

A. Tick (✓) the correct option:

- | | | |
|------------------|--------------|-----------|
| 1. Air pollution | 2. Diarrhoea | 3. Leaves |
| 4. Metal | 5. Asthma | |

B. Write 'Yes' or 'No'

- | | | |
|-------|--------|--------|
| 1. No | 2. Yes | 3. Yes |
| 4. No | 5. No | |

C. Answers the following questions

1. Addition of undesirable pollutants to land, air, water is called pollution.
2. Refer Pg-80, 81
3. Pollutants like oxides of sulphur, carbon and nitrogen when given up by burning fuels in industries when combined with water forming acid when falls down is called acid rain.
4. CNG produces significantly less pollution, reduces maintenance cost and is cheaper.
5. It consists of material that are no longer needed and its accumulation is toxic for nature.
6. Biodegradable waste rots easily and mixes with soil. Non biodegradable waste do not rot.

Critical Thinking

Growing trees as they provide us food and oxygen to live.

Picture Based Activity

- | | |
|------|------|
| 1. ✗ | 2. ✗ |
|------|------|

Things To Do

Do it with parental guidance

Life Skills

Do it individually with teacher's assistance

Subject link

As it cause air and noise pollution

Chapter - 12 — Soil

A. Tick (✓) the correct option:

1. Top soil 2. Bedrock 3. Sandy soil 4. Loamy soil

B. Write 'Yes' or 'No'

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

C. Answer the following questions

1. Soil is the topmost layer on earth's surface that sustain life.
2. Breakdown of rocks due to action of air, water to form soil is called weathering.
3. (i) Top soil (ii) Sub soil (iii) Bedrock
4. (i) Sandy soil (ii) Clayey soil (iii) Loamy soil
5. It is caused by deforestation, strong wind, heavy rainfall, faulty agricultural methods.
6. Removal of the top fertile layer of soil by the action of wind and water is called soil erosion.
7. Refer Pg-88

Critical Thinking

1. It is not suitable to grow crops because it is devoid of humus and do not hold water.
2. Plants do not get nutrients and are unable to survive.

Picture Based Activity

1. Top soil 2. Sub soil 3. Parent material 4. Bedrock

Things To Do

Do it with teacher's assistance.

Life Skills

Do it with teacher's assistance as an oral brainstorming session in the class.

Subject link

Do it with teacher's assistance.

Chapter - 13 — Solid, Liquid and Gas

A. Tick (✓) the correct option:

- | | | |
|---------------|-------------|-----------------|
| 1. Very close | 2. Liquid | 3. Both A and B |
| 4. Melting | 5. Freezing | |

B. Writ 'Yes' or 'No'

- | | | | |
|--------|--------|-------|--------|
| 1. Yes | 2. Yes | 3. No | 4. Yes |
|--------|--------|-------|--------|

C. Answer the following questions

1. Anything that occupy space and has mass is called matter.

2. Solid	Liquid	Gas
(i) Fixed shape	(i) No fixed shape	(i) No fixed shape
(ii) Fixed volume	(ii) Fixed volume	(ii) No fixed Volume
(iii) Molecules are tightly packed	(iii) Molecules are loosely packed	(iii) Molecules are loosely packed

3. Solid— Sugar, salt, pebble, dice.

4. The conversion of water into water vapour when heated is called evaporation.

5. Freezing	Melting
Process of conversion of liquid to solid by cooling.	Process of conversion of solid to liquid by increasing temperature.

6. Solution— It is a homogeneous mixture of solute and solvent.

Solute— A substance that dissolve in a liquid.

Solvent— A liquid that dissolve the solute.

7. Soluble— Substances which dissolve completely in water. e.g. salt, sugar, etc.

Insoluble— Substance which do not dissolve in water are called insoluble substance e.g., sand, chalk powder etc.

Critical Thinking

1. They are solid. They can be changed into different shapes because thermoplastics are elastic and can be moulded when heat is applied.
2. Moth balls are sublime substance that directly change into vapour. So, gradually they disappear.

Picture Based Activity

Do with parental guidance.

Things To Do

- | | | |
|----------------|---|--------------|
| 1. Wheat flour | – | Not dissolve |
| 2. Turmeric | – | Not dissolve |
| 3. Honey | – | Not dissolve |
| 4. Rice | – | Not dissolve |
| 5. Nuts | – | Not dissolve |

Life Skills

Do with parental guidance.

Subject link

Do with parental guidance.

Chapter - 14 — Force, Work and Energy

A. Tick (✓) the correct option:

1. Force 2. Both of these 3. Energy 4. Sun

B. Fill in the blanks

1. Friction 2. Energy 3. Sun 4. Green plants
5. Pollutes

C. Answer the following questions

1. Force can push, pull, stop an object and can also change the shape of an object.
2. Due to Earth's gravitational force.
3. The force that acts when one object tends to move on another object.
4. Work is said to be done when force displaces an object.
5. Heat, light and electrical energy.

Uses—

Heat energy : Used to cook food.

Light energy : Plants use sunlight to make food.

Electrical energy : Use for running electrical gadgets.

6. Sun is the ultimate source of energy because we are dependent on it for all our energy needs.

Critical Thinking

1. Due to less friction due to mucus in peel of banana.

Picture Based Activity

1. ✓ 2. ✓ 3. ✓ 4. ✓

Things To Do

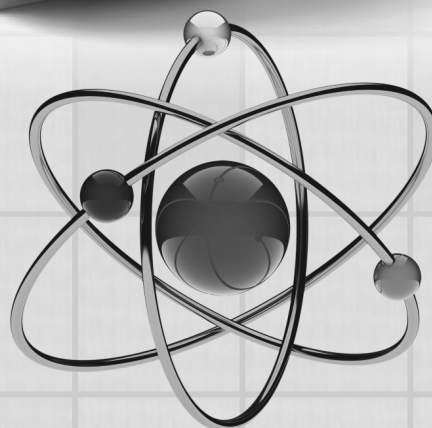
Do the activity with parental assistance.

Life Skills

Done

Subject link

Do with teacher's guidance.



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