Oxford INSPIRE

Science

MIDDLE LEVEL

Class 6

OXFORD
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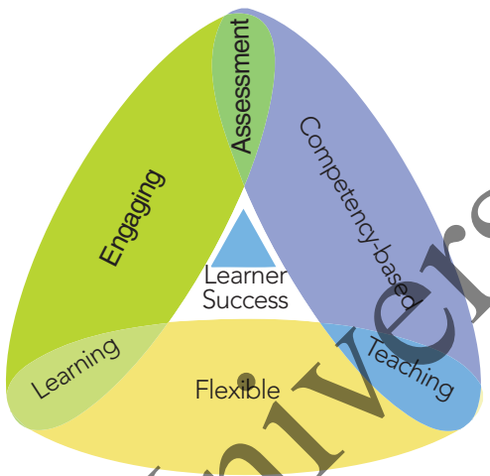
Oxford INSPIRE

Welcome to Oxford Inspire, an NEP-aligned, blended, competency-based programme with learner success at its heart

Key Pillars

High learner engagement using game-based concepts like rewards, competition, and visible achievement through leaderboards



Progress is determined by demonstration of mastery or competence (knowledge, abilities, and skills)

Focus on outcomes and real-world application, and meaningful data on learner progress for all stakeholders

Easily move back and forth between the textbook and MyInspire
Continue learning at home with anytime, anywhere access

NEP Focus

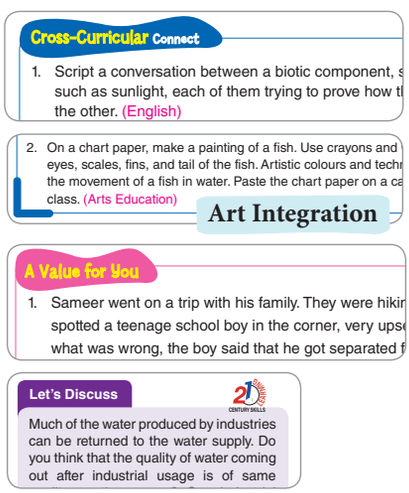
LITERACY SKILLS
- Information Literacy
- Media Literacy
- Technology Literacy

LEARNING SKILLS
- Critical Thinking
- Collaboration
- Communication
- Creativity and Innovation

LIFE SKILLS
- Flexibility and Adaptability
- Leadership and Responsibility
- Initiative and Self-Direction
- Social and Cross-Cultural Interaction

21st CENTURY SKILLS: LEARNING | LITERACY | SKILLS

KNOWLEDGE OF INDIA | VALUES



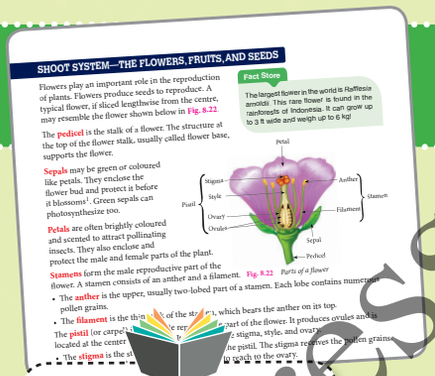
Unique Learn Journey

I am the Lion-Tailed Macaque, and I will be your Learn Buddy in this journey.

My Inspire

Tune In Go through introductory or recap content and attempt practice questions

1



Go through concept explanation

2

3

My Inspire

Go through learning and practice content in the form of concept videos, concept animations, simulations, interactivities, and tactivities

My Inspire

- Concept videos
- Interactivities
- Concept animations
- Tactivities
- Bloom's Revised Taxonomy: REMEMBERING, UNDERSTANDING, APPLYING, EVALUATING, ANALYSING, CREATING
- PDFs
- Chapter-end quizzes

MyInspire

Climb the class leaderboard and unlock exciting achievements!

Complete Let's Review

MyInspire

Attempt objective-type Exercise questions

Solve Exercise questions

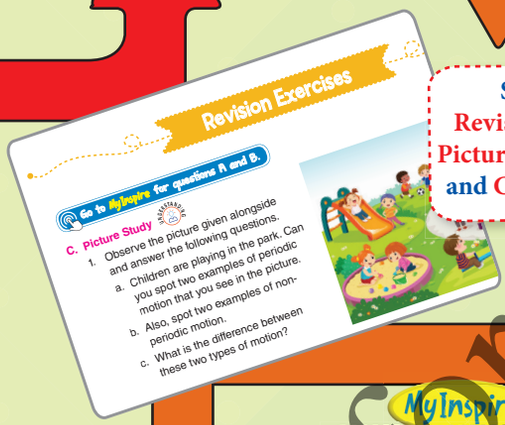
6

MyInspire

View Chapter Summary, Keywords, and Activities

4

5



Solve end-of-chapter Revision Exercises, including Picture Study, HOTS Questions, and Cross-Curricular Connect

8

7

MyInspire

Attempt end-of-chapter quizzes

9

10

MyInspire

Competencies Achieved

Proceed to learn new concepts

11

MyInspire

Competencies Not Achieved

Review learning content and re-attempt quizzes

MyInspire

View detailed reports

1 Food: Where Does It Come From?

Tune In Go to MyInspire and view . Also, answer the following:

1. Give three reasons why food is essential for us.
2. Name three plant-eating animals.

IN THIS CHAPTER

- Sources of Food
- What Do Animals Eat?

Food is essential for all living beings. To perform various tasks, our body needs energy, which is obtained from the food we eat.

Food provides essential materials for growth, movement, and repair. Food also protects the body from various diseases.

You may have observed that people from different states eat different types of food items. Food items are prepared using different ingredients[1]. For example, milk, rice, and sugar are three main ingredients of kheer. Similarly, rice and vegetables are the main ingredients of vegetable biryani.

In this chapter, we will learn about the sources of various food items and ingredients.

SOURCES OF FOOD

Plants and animals are our two main sources of food items.

Go to MyInspire and view .

Food From Plants

Green plants, called producers, manufacture their own food by the process of photosynthesis. A plant takes in carbon dioxide (from air) and water (from soil) to prepare its food using chlorophyll (the green pigment present in the leaves) in the presence of sunlight. Plants usually make more food than they require. This extra food is stored in plants in different parts such as roots, stems, leaves, flowers, flower buds, fruits, bark, and seeds.

[1]ingredients (in this chapter): foods or substances that are combined to make a particular dish

Plant Parts as Food

Plants are the sources of various food ingredients such as vegetables, fruits, cereals, pulses, and spices. These food ingredients are obtained from the different parts of the plants.

Roots We eat the roots of plants such as the beetroot, radish, carrot, and turnip **(Fig. 1.1)**.

Leaves We eat the leaves of plants such as the spinach, lettuce, cabbage, mint, and coriander **(Fig. 1.2)**.

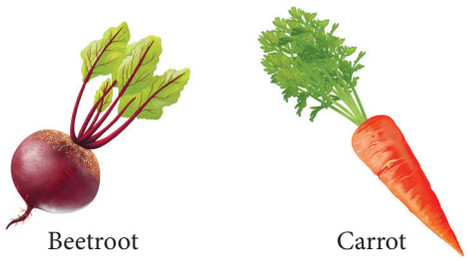


Fig. 1.1 *Roots of plants that we eat*

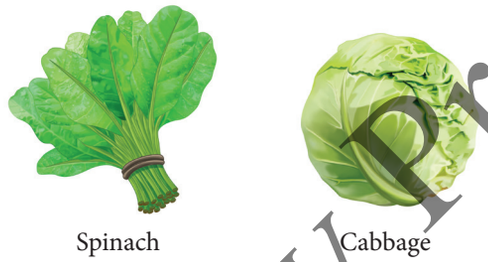


Fig. 1.2 *Leaves of plants that we eat*

Stems We eat the stems of plants such as the sugar cane, potato, and ginger **(Fig. 1.3)**. The stem of the sugar cane plant is also the primary raw material for producing sugar. The potato and ginger that we eat are the underground stems of plants.

Flowers We eat the flowers of plants such as cauliflower and broccoli **(Fig. 1.4)**. The flowers of banana are also eaten in some parts of India.

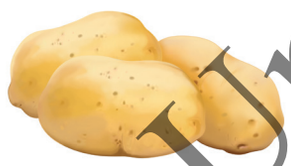


Fig. 1.3 *Stems of plants that we eat*

Fig. 1.4 *Flowers of plants that we eat*

Seeds We eat seeds of some plants as cereals or pulses. Cereals and pulses are called food grains. Small, hard seeds of plants such as rice, wheat, maize, and barley **[Fig. 1.5(a)]** are called **cereals**. Cereals such as wheat and maize are ground to make flour, which is then used to make different food items. Cereals such as oats are typically eaten with milk as a breakfast meal.

Seeds of plants such as beans, kidney beans, chickpeas, and peas **[Fig. 1.5(b)]** are called **pulses**. These plants bear seeds in pods. Seeds such as mung or chickpeas are also eaten as sprouts. The process of soaking seeds for some time, after which they are drained and kept undisturbed till shoots emerge from them is

(a) Cereals

(b) Pulses

Fig. 1.5 *Seeds of plants that we eat as cereals and pulses*

called **sprouting**. Sprouted seeds are highly nutritious. The process of sprouting completes the development of a young shoot from the seed.

Activity

Germination of seeds such as mung and chickpeas

What you need: A cup of whole green mung seeds and black chickpeas, water, and a muslin cloth

What you do:

1. Wash the seeds and soak them in water overnight.
2. Drain the water in the morning.
3. Wrap the seeds in a wet muslin cloth **(Fig. A)**.
4. Occasionally sprinkle water on them.
5. Keep aside for a day or two.

Fig. A

What you find: Seed covers break and give way to tiny white structures, which are the roots of the young plants.

What is the science? The seeds germinate under favourable conditions. If these sprouted seeds are planted in soil, new plants will grow from them.

Fruits Mangoes, oranges, apples, bananas, and grapes are some common fruits. We should eat a lot of seasonal fruits[1] as they keep us strong and healthy.

Vegetables Different parts of plants are eaten as vegetables. For example, we eat the fruits of tomato and brinjal plants, leaves of spinach and cabbage plants, roots of beetroot and turnip plants, and stems of potato and ginger plants as vegetables.

Try This!

Identify the food items that are technically called the 'stem' based on their function of storing food but grow underground as root. Find out more about them. Draw sketches and list down their unique features in your scrapbook.

Fact Store

Some plants may have more than one edible part. For example, both seeds as well as the leaves of the coriander and mustard plants are edible. Similarly, the stem and flowers of the banana plant are edible. Can you think of more such plants?

Some Other Food Items

Tea leaves and coffee beans We get tea **[Fig. 1.6(a)]** from the leaves of the tea plant. We get coffee from the roasted coffee beans **[Fig. 1.6(b)]**. The coffee beans are actually the seeds of the coffee plant. These seeds are present inside the red or purple fruit called **berry**.

(a) Tea leaves (b) Coffee beans

Fig. 1.6 *Tea leaves and coffee beans*

[1]seasonal fruits: fruits available in a particular season and not stored or preserved for the next season

Oil Some seeds are used for making oil. These seeds are called oilseeds **(Fig. 1.7)**. Seeds of sunflower, mustard, and coconut plants are used to make oils. Oil is also obtained from fruits of plants such as olive.

Get It Right

Walnut is a seed whose hard outer covering or shell is broken and thrown away. The seed kernel is eaten.

Dry fruits Seeds of some plants are eaten as dry fruits. Cashew nuts, groundnuts, and walnuts **(Fig. 1.8)** are some common dry fruits that we eat.

Olive oil


Sunflower oil

Fig. 1.7 *Oilseeds*


Cashew nuts


Groundnuts


Walnuts

Fig. 1.8 *Dry fruits*

Spices The spices we use in our food are obtained from different parts of plants. Spices are added to the food to enhance its flavour and taste. Cinnamon, cardamom, clove, and pepper are examples of spices **(Fig. 1.9)**. Cinnamon is obtained from the bark. Cardamom and black pepper are fruits. Cloves are dried flower buds.


Cinnamon


Cardamom


Black pepper


Cloves

Fig. 1.9 *Spices*

Food From Animals

Animal products are another important source of food. Various animal products are consumed as food.

Meat We obtain meat from chicken, fish, sheep, and goat **(Fig. 1.10)**. In some places, meat products are obtained from animals such as turkeys, ducks, and geese.

Eggs We obtain eggs from birds such as hens, ducks, and geese **(Fig. 1.11)**. Such birds are called **poultry birds**. Eggs are a rich source of proteins and vitamins.

Fact Store

The eggs of a fish are called roe. They are eaten raw or after pasteurization.

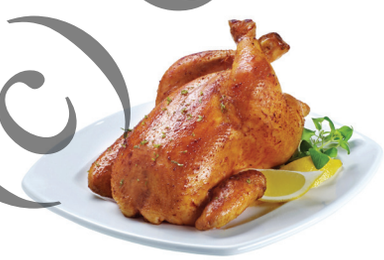


Fig. 1.10 *Meat from animals*

Fig. 1.11 *Eggs from poultry birds*

Milk We obtain milk from animals such as cows, buffaloes, and goats. Milk is rich in calcium and is very nutritious[1]. Calcium is essential for building strong teeth and bones.

Milk-giving animals are also called **milch animals**. Milk is also used to produce several other products such as cheese, cottage cheese, curd, butter, ghee, and cream **(Fig. 1.12)**. Such products are called dairy or milk products.

Milk Cheese Curd Butter

Fig. 1.12 *Milk and milk products*

Table 1.1 lists some common milk products and the methods of their preparation.

Table 1.1 *Common milk products and methods of their preparation*

Dairy products	Ingredients	Methods of preparation
Paneer/Cottage cheese	Milk and a sour ingredient such as lemon juice or vinegar	1. A sour ingredient is added to warm milk. 2. Milk separates into liquid and solid parts. This process is called curdling. The solid part is pressed to drain off the liquid. 3. The solid part forms the paneer.
Cheese	Milk	Cheese is usually prepared by curdling of milk by adding a substance called rennet. (Paneer and cheese are both made from curdled milk but the different ways of curdling make them appear and taste different.)
Curd	Milk and a teaspoonful of curd	1. Milk is warmed. 2. A teaspoonful of curd is added to the warmed milk. 3. The milk is now kept undisturbed for a few hours. 4. Bacteria present in the curd convert the milk into curd.
Cream	Milk	1. Milk is cooled. 2. After some time, a thick layer of cream forms at the surface of the milk.
Butter	Cream	Fresh cream is churned, which separates into a solid (butter) and a liquid (buttermilk).
Ghee	Butter or cream	1. Butter or cream is heated. 2. The fat content separates from the solid matter. 3. The liquid part is consumed as ghee.

[1]nutritious: containing things that help us live healthy and grow

Honey Honey **(Fig. 1.13)** is a natural sweetener. It is obtained from beehives where honeybees produce honey from the nectar collected from flowers. Honeybees also help in crop production by carrying out pollination and, thus, play a vital role in the food we eat. We will learn more about pollination later in this book.

Fig. 1.13 *Honey*

Try This!

Gather information on some more animals from which we obtain meat and milk.

Go to MyInspire and view .

Exercise I

Go to MyInspire for questions A and B.

C. Short Answer Questions

REMEMBERING UNDERSTANDING

1. State the ingredients of paneer or cottage cheese.
2. What is the other name given to milk-giving animals?
3. What are poultry birds? Give two examples.
4. What are oilseeds? Give two examples.
5. What is the source of tea and coffee?

D. Long Answer Questions

REMEMBERING UNDERSTANDING

1. What is honey? How is it obtained?
2. What are spices? From which parts of the plant are they obtained?
3. List various food items obtained from different animals.

WHAT DO ANIMALS EAT?

All animals, irrespective of their size and habitat, need food in order to obtain nutrients and energy. Plants can prepare their own food and are called **producers** or **autotrophs**. Unlike plants, animals cannot prepare their own food. They depend on plants or other animals for food and hence, are called **consumers** or **heterotrophs**. Animals eat a variety of foods such as plants, seeds, nuts, insects, and the flesh of other animals.

Classification of Animals Based on Their Feeding Habits

Based on their eating habits, animals can be classified broadly into five categories—herbivores, carnivores, omnivores, scavengers, and decomposers.

Herbivores *Animals that eat only plants or plant parts are called **herbivores**.* The term herbivore is derived from the Latin words *herba* meaning 'plant' and *vora* meaning 'to eat'. Cow, camel, rabbit, elephant, horse, and hippopotamus are some herbivores.

Special Features of Herbivores

- The dentition[1] in herbivores **(Fig. 1.14)** is adapted for ripping and grinding the food. They have premolars and molars, which break down the plant material into fine particles. The premolars and molars have flat, broad surfaces with many folds (ridges) to grind the plant material. They also have sharp incisors to bite off plants. They have small or non-existent canine teeth.

Fact Store

Some herbivores such as hippopotamus have large canine teeth. They use these teeth to defend themselves.

- In cow, buffalo, goat, and sheep, a thick gum pad **(Fig. 1.15)** replaces the incisors in the upper jaw. They wrap their tongues around the grass and use their gum pads along with the teeth in the lower jaws to bite the grass.

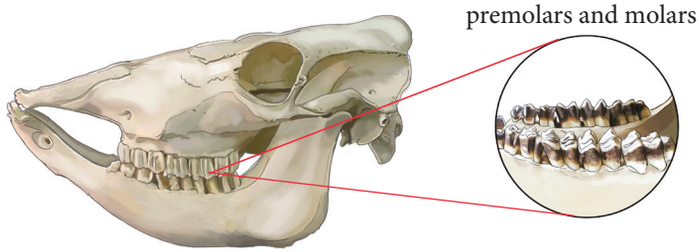


Fig. 1.14 *Dentition in herbivores*

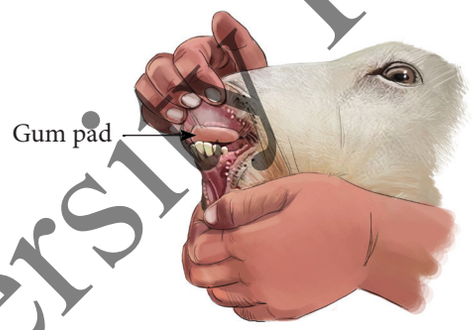


Fig. 1.15 *Gum pad in a goat*

- Cattle chew their food twice in order to break it down completely. They chew their food partly and swallow it. This partly digested food, called cud, is brought back into the mouth from the stomach to be chewed again. This act, called chewing the cud, softens and helps break down the plant fibres.

Carnivores *Animals that eat only the flesh of other animals are called* ***carnivores***. The term carnivore is derived from the Latin words *carni* meaning 'meat' and *vora* meaning 'to eat'. Snake, lizard, eagle, lion, tiger, cheetah, and wolf are some carnivores.

Special Features of Carnivores

- Dentition in carnivores **(Fig. 1.16)** is adapted for shearing the flesh. They have sharp and pointed canines to tear off large pieces of flesh. They have sharp premolars and molars, called **carnassial teeth**, with jagged (sharp and uneven) edges. These teeth are well-suited to slice the flesh and bones of the prey.
- Jaguars are quick runners. This helps them to catch their prey easily. They have big and strong claws to hold their prey.
- Eagle **(Fig. 1.17)** and owl have sharp eyesight to spot the prey. They have sharp, pointed, and curved claws to catch their prey. They also have sharp and curved beaks to tear flesh.

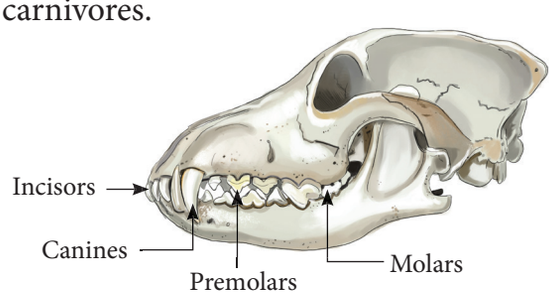


Fig. 1.16 *Dentition in carnivores*

Fig. 1.17 *Eagle has a sharp beak and claws.*

[1]dentition: the arrangement or condition of the teeth in a particular species or an individual

- Chameleon and frog **(Fig. 1.18)** have long and sticky tongue to catch insects.

Fig. 1.18 *Frog has a long, sticky tongue.*

Omnivores *Animals that eat plants as well as the flesh of other animals are called* ***omnivores***. The term omnivore is derived from the Latin words *omnis* meaning 'all' and *vora* meaning 'to eat'. Cat, squirrel, dog, monkey, rat, bear, and human being are some omnivores.

Special Features of Omnivores

- Dentition in omnivores **(Fig. 1.19)** is adapted for eating both plants as well as the flesh of other animals.
- Human beings have blade-like incisors to bite, sharp canines to tear, and flatter and broader molars and premolars to chew the food.
- Squirrels have sharp-edged front teeth, called incisors, to facilitate gnawing[1].

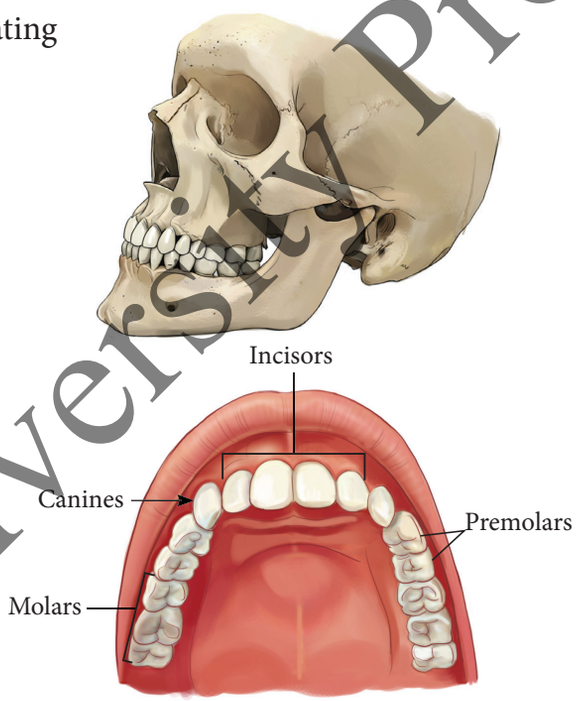


Fig. 1.19 *Dentition in human beings*

Scavengers *Organisms that feed mainly on dead and decaying animal and plant matter are called* ***scavengers***.

- Unlike carnivores, scavengers do not hunt or kill other animals for food. Instead, they feed on the already dead animal material.

Let's Discuss

Teeth of an organism suggest the kind of food it eats. What does the teeth structure of human beings tell us about the type of food they can eat?

- Scavengers keep the ecosystem free of dead animals. Vultures **(Fig. 1.20)**, jackals, hyenas, termites, and earthworms are some scavengers.

Fig. 1.20 *Vultures are scavengers.*

Decomposers *Organisms that obtain nutrients by breaking down the remains of dead organic matter are called* ***decomposers***. Decomposers break down the dead or decaying organic matter into nutrients such as nitrogen and carbon, which in turn can be used by the living plants and animals.

Fig. 1.21 *Fungi are decomposers.*

Fungi **(Fig. 1.21)** and microorganisms such as bacteria, are examples of decomposers. Organisms that are too small to be seen with the naked eye are called **microorganisms**.

Go to MyInspire and view

[1]gnawing: to bite or nibble at something again and again

Try This!

Research on the following animals and give information on their feeding habits. Find out what they eat and what are their special characteristics. Prepare a chart based on your information. Share your information with others.

Rabbit **Shark** **Gorilla** **Giant panda** **Turtle** **Raccoon** **Elephant** **Eagle**

Exercise II

Go to MyInspire for questions A and B.

C. Short Answer Questions

REMEMBERING UNDERSTANDING

1. Which teeth help the herbivores to break down the plant material into fine particles?
2. Why do eagles and owls have sharp eyesight?
3. Why do squirrels have sharp-edged front teeth?
4. Do microorganisms, like bacteria, play the role of a scavenger or of a decomposer? Justify.

D. Long Answer Questions

REMEMBERING UNDERSTANDING

1. What is meant by chewing of the cud?
2. Differentiate between scavengers and decomposers.
3. How are scavengers different from carnivores?

Revision Exercises

Go to MyInspire for questions A and B.

C. Picture Study

UNDERSTANDING

1. Observe the food items (A–D) and answer the questions that follow.

A

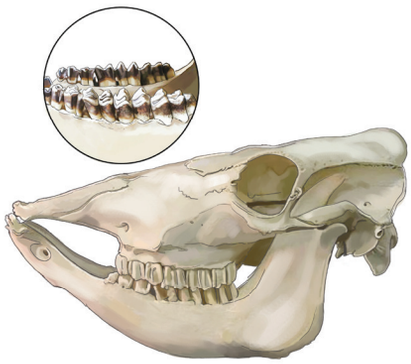
B

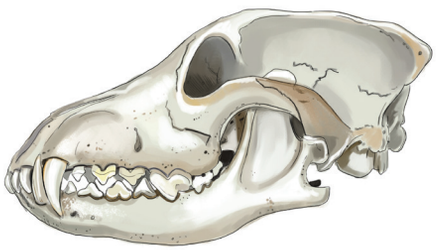
C

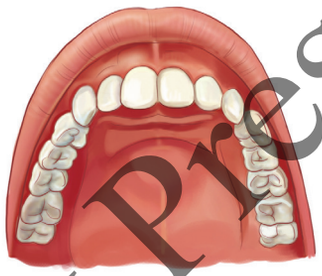
D

a. Identify the source from where these food items are obtained. In case the item is obtained from a plant, also identify the plant part it is obtained from.
b. What type of product is food item C called as, and why?

2. Observe the pictures (A–C) given below and answer the questions that follow.
   a. Under each picture, write whether it belongs to a herbivore, carnivore, or omnivore.
   b. State one basic difference in food habits between these three types of animals.







A. _____ B. _____ C. _____

D. Short Answer Questions

1. Where does a plant store the extra food prepared by it?
2. What are pulses? Give two examples.
3. What do you understand by dairy products? Give two examples.
4. Explain the process of preparing curd from milk.
5. List a few characteristics of an eagle which help in catching its prey.

E. Long Answer Questions

1. What is sprouting? State its significance.
2. Differentiate between herbivores, carnivores, and omnivores on the basis of the food they consume. Give two examples of each.
3. Write a note on dentition of herbivores.
4. Differentiate between carnivores and omnivores on the basis of their dentition.

HOTS Questions

APPLY

1. Pritha and her elder sister love to eat curd after meals. Their mother has fallen sick and there is no curd left for lunch. Both, Pritha and her elder sister don't know how to prepare curd. Can you tell them the names of all the ingredients required and how to prepare it?
2. Maya feeds her pet dog with milk, rice, and rotis. Do you think it will be correct to call Maya's dog a herbivore? Justify your answer.

ANALYSE

1. Will the health of a person be affected if he/she consumes only one type of food, for example, only the leaves, stem, or root of plants or only cereals or pulses or only dry fruits? Justify your answer.

2. Vegetarian people eat plant products. Do you think that the teeth of those adults who have been vegetarians throughout their lives, get adapted to their food habits and are modified with time? Why or why not? Give reasons to support your answer.

EVALUATE

1. Although honey is a by-product of the nectar of flowers, it is considered as a food item obtained from animal source. Justify this statement with reasons.
2. As compared to herbivores and carnivores, omnivores face less challenges in finding the food that suits their diet. Do you agree with this statement? Give reasons to support your answer.

CREATE

1. In your scrapbook, paste pictures and create a collage showing various fruits, vegetables, spices, cereal, pulses, and dry fruits which are consumed by you and your family.
2. Create a working model of dentition for herbivores, carnivores, and omnivores to show the positioning of premolars, molars, incisors, and canines.

Cross-Curricular Connect

1. Frame a conversation between a grandson and a grandmother discussing the importance of consuming each part of a plant including roots, stems, leaves, flowers, fruits, and seeds for a healthy body. (English)
2. Locate places in India where the herbivores, carnivores, and omnivores are mostly found. Find out if they are region specific or scattered all across the country. (Geography)

A Value for You

1. Rani came across a cat, badly hurt by a bicycle, in front of her house. The passersby ignored it and moved ahead. She immediately called the animal welfare organization and, in the meantime, brought milk from inside her house to feed the cat.
   a. What value is exhibited by Rani?
   b. Is cat a herbivore, carnivore, or omnivore?
   c. Mention any two special features of this type of animal.
   d. What else could Rani have offered it to eat?
2. Vivek observed that a vegetable vendor in his area was discarding the leaves of radishes and the outer layer of cabbages and cauliflowers and throwing them into the dustbin. He immediately gathered those and offered it to the cows, tied in a nearby house, and it served as fodder for them.
   a. What made Vivek perform this action?
   b. Apart from leaves, can cows eat other parts of the plant like roots, stem, fruit, or seeds?
   c. Is there any specific type of dentition observed in cows? How is it different from other herbivores?

Go to MyInspire and attempt .

Let's Review

Come here after you have completed the chapter. Score a topic from 1 to 5 to indicate how well you understand it. (*5 = Very well*; *1 = Not at all*)

State the sources of various food items and ingredients.	
Identify whether an ingredient is obtained from plants or animals.	
Identify food obtained from plants.	
Describe how we can sprout seeds to eat as food.	
Identify the different edible parts of plants.	
Describe food obtained from animals.	
Identify different animal products used as ingredients in common food items.	
Briefly describe how we get honey.	
Compare herbivores, carnivores, and omnivores.	