Theme 7: Keeping Us Strong
Chapter 12: Skeletal and Muscular Systems

Main Coursebook

I am ready

shoulder   hands   legs
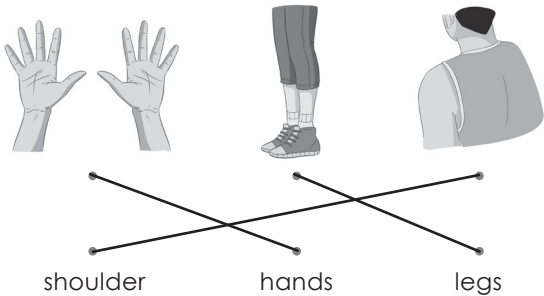
Icebreaker: Bones

In-text Question
1. No   2. No

In-text Question
1. Gliding joint   2. Hinge joint

In-text Question
1. No   2. Yes

I am a learner
A. 1. a   2. b   3. c   4. a   5. a
B. 1. False   2. True   3. False
    4. False   5. True
C. 1. Our body is made up of different organs. When these organs work together and perform a specific function, it is called an organ system.
    2. Floating ribs.
    3. A joint is the meeting point of two bones, held together by strong tissue.
D. 1. Movable joints are the type of joints that can move and perform different movements. There are four types of movable joints, these are as follows:
    • Ball and socket joints: A bone ending in a ball gets fitted into the socket of the other one. For example, hip and shoulder joints.
    • Gliding joints: In this type of joint, one bone can slide over another. For example, joints present in the wrist.
    • Hinge joint: This type of joint helps us to move our body only in a single direction. For example, joints present in the knee.

• Pivot joint: This joint helps in side-to-side movement of the head. For example, joint present at the neck.
2. Muscles are divided into three categories – skeletal, smooth and cardiac muscles.
    • Skeletal muscles are voluntary in nature and help us move our different body parts. For example, the muscles of the arms.
    • Smooth muscles are involuntary in nature and are present in our internal organs. For example, the muscles of the stomach.
    • Cardiac muscles are the involuntary muscles present in the heart.

I am a doer
Accept all relevant responses.

I am an all-rounder
A. **English:**
    1. quickly   2. carelessly
B. **Maths:** 6 hr; 360 minutes
C. **Social Studies:** Skeletal muscle

Students' Worksheets

Worksheet 1
A. 1. heart   2. heart   3. tongue
    4. respiratory   5. different
B. 1. HEART   2. BRAIN   3. LUNGS
    4. KIDNEYS   5. TONGUE
C. 1. True   2. False   3. True
    4. True   5. True

Worksheet 2
A. 1. 22
    2. bones, joints and cartilage
    3. 206   4. 12 pairs   5. 33
B. 1. SKULL   2. LIMB   3. GIRDLE
    4. RIBCAGE   5. BACKBONE
C. 1. True   2. False   3. True
    4. True   5. False

Worksheet 3
A. 1. Our body has multiple joints.
    2. A joint provides flexibility to the body.
    3. The joints present in the skull are immovable.

4. A joint is the meeting point of two bones.

5. The ball and socket joint is one of the movable joints,

B. 1. BALL   2. PIVOT   3. HINGE

    4. SOCKET   5. GLIDING

C. 1. movable joints can move

2. a joint is the meeting point of two bones

3. joints provide stability and flexibility to the body

4. hinge joint is present at the knee and elbow

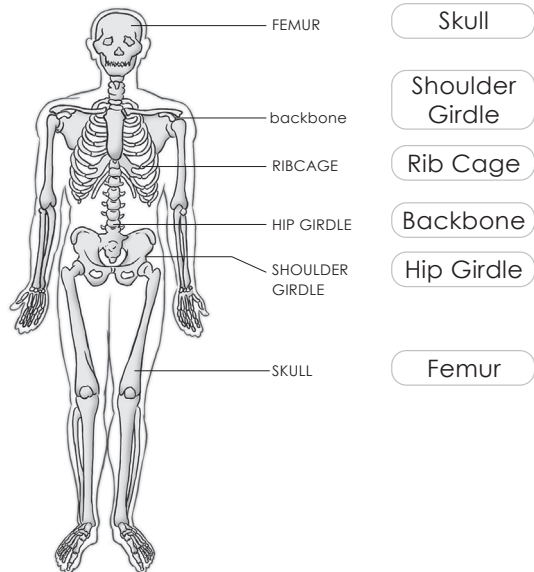5. the ball and socket joint is present at the hip and shoulder

Worksheet 4

A. 1. Muscles work by contraction and relaxation.

2. The muscular system is a system that is made up of voluntary and involuntary muscles.

3. Voluntary movements are movements that occur when we decide to move them.

4. Involuntary movements are movements that occur without our decision.

5. Skeletal, smooth and cardiac muscles.

B. 1. voluntary   2. muscle

    3. voluntary   4. involuntary

    5. muscular

C. 1. False   2. True   3. True

    4. False   5. False

Teacher's Worksheets

Worksheet 1

A. 1. an organ system

2. 22

3. vertebrae

4. 12

B. 1. Skull   2. Backbone

    3. Rib Cage   4. Rib Cage

C. 1. It is always advised to wear a helmet while driving a motorcycle. In case of accident, the helmet will protect the brain, as brain is the most important organ of the body.

2. In that case, we will not be able to touch our knees as the backbone is made up of one single bone.

Worksheet 2

FEMUR — Skull

backbone — Shoulder Girdle

RIBCAGE — Rib Cage

HIP GIRDLE — Backbone

SHOULDER GIRDLE — Hip Girdle

SKULL — Femur

Theme 7: Keeping Us Strong
Chapter 13: Our Nervous System

Main Coursebook

I am ready: NOSE; EYES; SKIN; EARS

Icebreaker: NOSE

In-text Question

1. True   2. False

In-text Question

1. No   2. No

I am a learner

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

B. 1. Cerebrum   2. Medulla

    3. spinal cord   4. optic nerves

    5. skin

C. 1. Nerves are thread-like structures that act as a messenger between the brain and the body.

2. Cerebrum is responsible for the working of the nose, eyes, tongue and ears. The cerebrum also helps us think, learn, remember, recall, speak and emote. In the absence of cerebrum thinking, learning, remembering, recalling and speaking will be affected.

3. Reflex action is the quick response of the body.

D. 1. The brain consists of three parts namely, the cerebrum, cerebellum and medulla oblongata. The cerebrum is responsible for the working of the nose, eyes, tongue and ears. The cerebellum helps in coordinating muscle actions and balancing the body in proper posture. The medulla oblongata forms a connection between the brain and the spinal cord and regulates the involuntary activities of the body.

2. Accept all relevant responses.

I am a thinker

If a person lacks reflex action, then the body would be unable to respond timely to injury or shock.

I am an all-rounder

A. **English:**
1. smells
2. smoke

B. **Maths:** 33.5 degrees Celsius; 36.88 degrees Celsius

C. **Social Studies:** Sunderlal Bahuguna

Students' Worksheets

Worksheet 1

A. 1. control   2. information
3. three   4. largest
5. 80%

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

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

Worksheet 2

A. 1. skull   2. Cerebrum
3. jerky   4. Medulla oblongata
5. Spinal cord

B. 1. INFORMATION   2. SKULL
3. CEREBRUM   4. CEREBELLUM
5. MEDULLA

C. 1. C   2. I   3. C   4. C   5. C

Worksheet 3

A. 1. medulla   2. thread-like
3. Nerves   4. three
5. sensory

B. 1. MESSENGER   2. NETWORK
3. SENSORY   4. MOTOR
5. MIXED

C. 1. True   2. True   3. False
4. False   5. False

Worksheet 4

A. 1. Brain   2. Skull   3. Cerebrum
4. Cerebellum 5. Medulla

B. spinal cord, medulla, thread-like, Sensory, Motor

C. 1. CORNEA   2. IRIS   3. PUPIL
4. RETINA   5. OPTIC NERVES

Teacher's Worksheets

Worksheet 1

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

B. 1. cerebrum   2. motor nerves
3. sounds   4. thread-like
5. Reflex action

C. 1. signal   2. heart   3. think

Worksheet 2

A. 1. To protect ourselves from shocks and injuries, the body needs to respond rapidly. Such types of quick responses are processed by the spinal cord. These actions are called reflex actions. The brain is not usually involved in reflex actions.

2. A clear fluid is present within the space between the brain and the skull and also within the inside of the brain. This fluid acts as a cushion against various injuries and jerks.

3. The nervous system consists of:
a. Brain
b. Spinal cord
c. Nerves and
d. Sense organs

4. Nerves are thread-like structures that act as a messenger between the brain and the body. They form a wide network that extends throughout the body. Some of them are directly connected to the brain and others are connected to the spinal cord.

5. The three types of nerves are sensory nerves, motor nerves and mixed nerves.

6. The brain is made up of three parts — the cerebrum, the cerebellum and the medulla oblongata.

Cerebrum: It is the largest part of our brain and constitutes around 80 percent of the weight of the brain. It is responsible for the working of our nose, eyes, tongue and ears. The cerebrum also helps us think, learn, remember, recall, speak and emote.

Cerebellum: This part of the brain lies below the cerebrum. It helps in coordinating the muscle actions and balancing the body in proper posture. If the cerebellum does not work properly, our body makes jerky movements.

Medulla Oblongata: Below the cerebellum, lies the medulla oblongata or medulla. It forms a connection between the brain and the spinal cord.

It regulates the involuntary activities of the body, such as respiration and heartbeat. The medulla remains active even when we are sleeping.

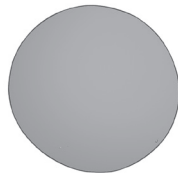## Theme 8: From Satellite to Satellite
Chapter 14: The Earth's Satellite

Main Coursebook

I am ready
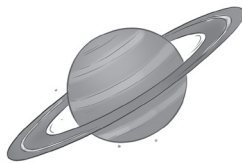
Name of the planet:
Saturn

Number of Moons:
62

Name of the planet:
Uranus

Number of Moons:
27

Icebreaker: Moon

In-text Question

1. Yes
2. No

In-text Question

1. true
2. false

I am a learner

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

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

C. 1. The surface of the Moon is rough due to huge mountains, and some round and hollow structures called craters.

   2. There is no air and water on the Moon. So, no life exists there.

   3. Rakesh Sharma

D. 1. **Lunar eclipse:** In lunar eclipse, the Earth casts a shadow on the Moon, as the Earth comes in between the Sun and the Moon.

In partial lunar eclipse, the Moon is only partly hidden by the dark shadow of the Earth.

In total lunar eclipse, the Moon is completely in the dark shadow of the Earth.

A lunar eclipse occurs at night.

Solar eclipse: In solar eclipse, the Moon casts a shadow on the Earth as the Moon comes between the Sun and the Earth.

In partial solar eclipse, the Sun is only partly hidden by the dark shadow of the Moon.

In total solar eclipse, the Sun is completely in the dark shadow of the Moon.

A solar eclipse occurs during the day.

2. Artificial satellites are man-made satellites. The names of some satellites are APPLE, INSAT-1B, INSAT-2A, INSAT-2B, Oceansat and IRNSS-1A.

Uses of artificial satellites: Artificial satellites were designed for scientific research. They are also used for sending messages from one country to another. Satellites are also used for communication (communication satellites), weather forecasts (weather satellites) and so on.

I am a doer

Accept all relevant responses.

I am an all-rounder

A. **English**
   1. Rahul has some chocolates in his bag,
   2. Ritika has kept her shoes under the table.

B. **Maths:** 3,84,400 x 1000 = 38,44,00,000 m.

C. **Social Studies:**
   Satellite data help forecast the weather or climate by images and numerical data.

Students' Worksheets

Worksheet 1

A. 1. Moon   2. 3,84,400   3. Earth's
   4. satellite   5. smaller

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

C. 1. SUN   2. MOON   3. EARTH
   4. PLANET   5. SATELLITE

Worksheet 2

A. 1. water   2. Moon   3. gravity
   4. Sun   5. cold

B. **1.** NEW MOON

  2. FULL MOON

  3. WAXING GIBBOUS

  4. WANING GIBBOUS

  5. WAXING CRESCENT

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

  4. True   **5.** True

Worksheet 3

A. **1.** The surface of the Moon is rough due to huge mountains, and some round and hollow structures called craters.

  2. When the sunlight falls on the surface of the Earth and the Moon, their shadows form. These shadows are called eclipses.

  3. A satellite is an object that revolves around a planet.

  4. 4,500 million years old

  5. 3,84,400 km

B. one-sixth; heavy; atmosphere; Sun; sound

C. **1.** yes   **2.** yes   **3.** yes

  4. yes   **5.** no

Worksheet 4

A. Rakesh Sharma; in space; spacecrafts; spacesuit; atmosphere

B. **1.** LUNAR   **2.** SOLAR   **3.** ECLIPSE

  4. APOLLO   **5.** CRATERS

C. **1.** no   **2.** yes   **3.** yes

  4. no   **5.** yes

Teacher's Worksheets

Worksheet 1

A. **1.** F   **2.** F   **3.** T

  4. F   **5.** F

B. **1.** Sputnik

  2. communication

  3. 1975

  4. Major Yuri Gagarin

C. Accept all relevant answers.

Worksheet 2

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

B. Accept all relevant answers.

Theme 9: From/Signs to Signals
Chapter 15: Artificial Intelligence

Main Coursebook

I am ready

☑

Cannot eat
Cannot feel

Can eat
Can feel

Icebreaker

Accept all relevant responses.

In-text Question

1. No   **2.** Yes

I am a learner

A. **1.** c   **2.** a   **3.** c   **4.** c   **5.** c

B. **1.** True   **2.** True   **3.** True

  4. False   **5.** True

C. **1.** Self-driving cars are the vehicles that uses AI to sense their surroundings and move safely with little or no human input.

  2. Humanoids are robots that look and act like humans. However, these robots cannot feel, eat, move on its own and grow like the human beings.

  3. Smart-speaker is a voice-activated speaker that uses AI to do everyday tasks.

D. **1.** When machines think, learn and act as humans, it is called Artificial intelligence. With the help of this some fascinating technologies are possible, namely, humanoids, futuristic space travel, self-driving cars and smart speakers.

  2. Some of the technologies that uses AI are as follows:

  • **Humanoids:** Humanoids are robots that look and act like humans. They are the most exciting innovation of AI. Some of the popular humanoids are Atlas, Asimo, Rashmi and Pepper.

  • **Futuristic space travel:** Futuristic space travel involves physical exploration of the space by human spaceflights or by robotic spacecrafts.

  • **Self-driving cars:** A self-driving car is a vehicle that uses AI to sense its

surroundings and move safely with little or no human input.

- **Smart speakers:** A smart speaker is a voice-activated speaker that uses AI to perform everyday tasks. For example, Alexa (a virtual-assistant system developed by an e-commerce company).

I am a thinker
Accept all relevant responses.

I am an all-rounder

A. **English**
1. future
2. feature

B. **Maths:** AI analyse the data which makes data handling easier.

C. **Social Studies**
AI analyse the data and change the way to make the speeches, content and various other modes of communication easier.

Students' Worksheets

Worksheet 1

A. 1. Artificial intelligence
2. robots
3. space
4. humanoids
5. cheaper

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

C. 1. →d
2. →a
3. →e
4. →c
5. →b

Worksheet 2

A. 1. humanoid
2. Futuristic space travel
3. self-driving car
4. voice-activated
5. Alexa

B. 1. DATA
2. SCIENTIFIC RESEARCH
3. SPACE EXPLORATION
4. GAMING
5. TECHNOLOGY

C. 1. C
2. I
3. I
4. C
5. I

Worksheet 3

A. understand, repetitive, rest, doctors, gaming

B. 1. ROBOT
2. ATLAS
3. ASIMO
4. RASHMI
5. PEPPER

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

Teacher's Worksheets

Worksheet 1

A. **Humanoids**
They dont have family
They look and act like humans
They don't have muscles and nervous system
They cannot reproduce
They are made in laboratories
They cannot feel

Humans
They have family
Humans do not act like humanoids.
They have muscles and nervous system
They can reproduce
A human child grows in a mother's womb
They feel through their sense organs

B. 1. v
2. iii
3. iv
4. ii
5. i

C. Artificial intelligence is used in our day to day life. It is used in giving on-line shopping recommendations, playing music and also giving the routes having less traffic.

Worksheet 1

A. 1. The ability to think and learn is called intelligence. When machines think, learn and act as humans, it is called Artificial Intelligence (AI).

2. Humanoids are robots that look and act like humans. They are the most exciting innovation of AI. Countries from all over the world have come up with different humanoid models. Some of the popular humanoids are Atlas, Asimo, Rashmi and Pepper.

3. The arrival of the concept of space tourism has made big companies use AI and work towards making space travel cheaper and safer even for common people.

Futuristic space travel involves physical exploration of the space by human spaceflights or by robotic spacecrafts. There are also attempts to find new planets which can be used for human settlement.

4. A self-driving car is a vehicle that uses AI to sense its surroundings and move safely with little or no human input

5. A smart speaker is a voice-activated speaker that uses AI to perform everyday tasks. For example, Alexa (a virtual-assistant system developed

by an e-commerce company) and Siri (a voice-assistant powered by an multinational corporation that specialises in gadgets).

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

B. 1. earth
   2. pinna or the outer ear
   3. cartilage
   4. tube-like
   5. touch

C. 1. True   2. True   3. False
   4. True   5. Fasle

D. 1. Yuri Gagarin
   2. Optic Nerves
   3. Skeletal Muscles
   4. Eclipses
   5. Humanoids

E. 1. The ability to think and learn is called intelligence. When machines think, learn and act as humans, it is called Artificial Intelligence (AI). It is different from human intelligence.

2. The skeleton is the framework of bones that supports our body. The bones also protect our internal body organs (such as stomach, heart orbrain) from any injury.

3. The vertebral column helps to perform different body Movements like forward bending, backward bending, yoga, dance.

4. This light travels from the pupil to the retina, where the image is formed.

5. A phase is a term that is used for different shapes of the Moon that are visible from the Earth. The different phases of the Moon are – full moon, waxing gibbous, first quarter, waxing crescent, new moon, waning crescent, third quarter and waning gibbous.

F.

iris, cornea, pupil, retina, optic nerve