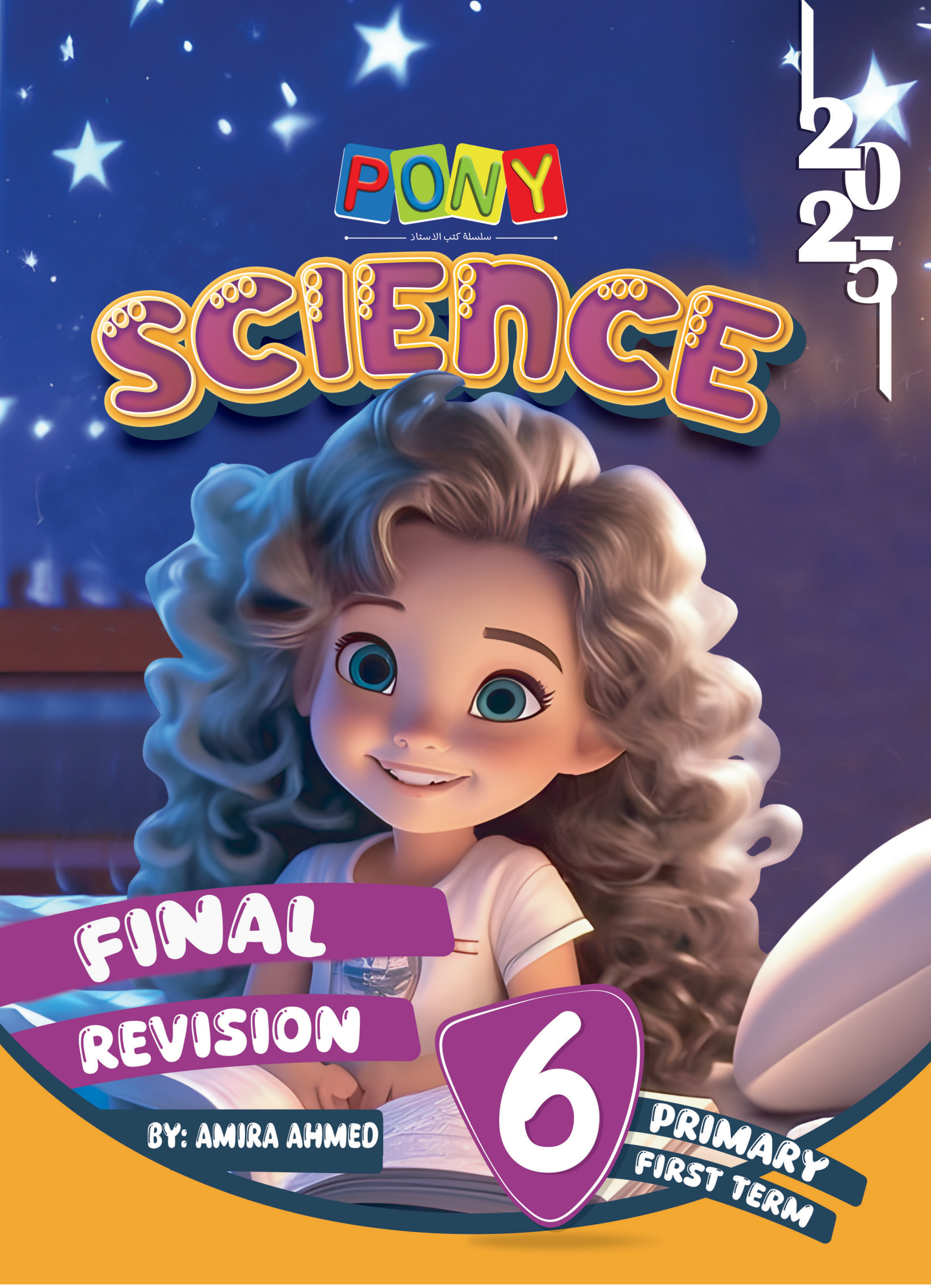
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سلسلة كتب الاستاذ

SCIENCE

2025



FINAL REVISION

6

PRIMARY

FIRST TERM

BY: AMIRA AHMED

Concept 1.1 The Cell as a System

Evaluation Weeks 1 , 2 , 3

Q1 Choose the correct answer:

1 ..... is considered the building unit of the bodies of living organisms.

a. Nucleus b. Oxygen c. Cell membrane d. The cell

2 The ..... allow water to pass to and from the cell.

a. nucleus b. cell membrane c. cytoplasm d. chloroplast

3 Which of the following cells is the smallest in size?

a. Plant cells b. Bacterial cells

c. Unfertilized bird egg d. Animal cell

4 ..... maintains the balance of water on both sides of the cell.

a. The nucleus b. Ribosomes c. Cell membrane d. Cell wall

5 The cell controls of water balance by passing it through ..... .

a. cell wall b. cell membrane c. nucleus d. Mitochondria

6 The cell takes the materials it needs and uses them to get ..... .

a. waste b. energy c. matter d. food

7 ..... contain(s) only one cell.

a. Human body b. Plants

c. Unfertilized bird egg d. Insect body

8 Cells need ..... and ..... to grow and live.

a. carbon dioxide - food b. water - wastes

c. oxygen – food d. sunlight - wastes

9 Which of the following is the smallest system in the human body?

a. System b. Tissue c. Cell d. Organ

10 Bacteria are considered ..... organisms.

a. multicellular b. a cellular c. unicellular d. eukaryotic

11 The..... surrounds each cell, protects it and regulates what can enter it.

a. cytoplasm b. plasma membrane

c. cell wall d. nucleus

12 Animal bodies contain a variety of cells, such as ..... .

a. muscle cells b. photosynthesis c. guard cells d. chloroplasts

13 A group of organs working together represents ..... .

a. a system b. a tissue c. a cell d. an organelle

14 The ..... is used to see cell components.

a. telescope b. microscope

c. lens d. medical glasses

15 Microorganisms are similar to plants in the ..... .

a. number of cells b. presence of cells

c. size of cells d. structure of cells

16 The organisms made up of only one cell, such as ..... .

a. bacteria b. plants c. animals d. insects

17 The organisms made up of more than one cell, such as ..... .

a. plants b. bacteria

c. unfertilized bird egg d. b and c

18 ..... is inside the membrane and supports the organelles.

a. Plasma membrane b. Cytoplasm

c. Nucleus d. Chloroplsat

19 ..... and ..... are responsible for transporting different materials in cell.

a. Plasma membrane and cytoplasm

b. Nucleus and chloroplast

c. Golgi apparatus and endoplasmic reticulum

d. Cell wall ad chloroplast

20 The ..... surrounds plant cells to give them a definite shape.

a. cell wall b. chloroplast

c. mitochondrion d. plasma membrane

21 The bodies of animals are characterized by the presence of special structures that help them keep their shape, such as ..... .

a. skin b. bones c. intestines d. exoskeleton

22 One of the components of a cell that similar to an electrical power station is ..... .

a. nucleus b. cytoplasm c. chloroplasts a. mitochondria

23 One of the components of the cell prepares and packages materials within the cell and transports them out of the cell is ..... .

a. vacuole b. Golgi apparatus

c. mitochondria d. cell wall

24 A component of the cell that is characterized by its ability to store nutrients, water, and waste is ..... .

a. vacuole b. cytoplasm c. mitochondria d. chloroplast

25 ..... contains the pigment chlorophyll, which helps it absorb the energy of sunlight to carry out the photosynthesis process.

a. Nucleus b. Chloroplast c. Mitochondria d. Cytoplasm

26 ..... is considered the main control center in the cell.

a. Nucleus b. Chloroplast

c. Golgi apparatus d. Atom

27 A type of cell that contains a cell wall and chloroplast is ..... .

a. An animal cell b. a plant cell c. bacteria d. a human cell

28 The plant cell is distinguished from the animal cell in that it contains ..... which gives it a definite shape.

a. cell membrane b. cell wall

c. vacuole d. chloroplast

Q2 Put (✓) or (✗) :

1 Humans' red blood cells contain a nucleus. (✗)

2 New cells come from existing cells. (✓)

3 All cells have a cell wall. (✗)

4 The number of cells is similar in plants and animals. (✗)

5 Each cell is surrounded by a plasma membrane that protects it and regulates what can enter. (✓)

6 Tissue is made up of a group of organs. (✗)

7 The cell nucleus is responsible for cell division. (✓)

8 The size of the vacuole differs between the plant cell and the animal cell. (✓)

9 The plant cell is distinguished from the animal cell by the presence of chloroplasts and a cell wall. (✓)

10 An animal cell is similar to a plant cell in shape and structure. (✗)

11 One of the functions of the endoplasmic reticulum is helping in assembling proteins. (✓)

12 Plant cells are similar to animal cells in the presence of a nucleus. (✓)

13 Plant cells have a cell wall and therefore do not need a cell membrane. (✗)

14 Animals can make their own food because of the presence of chloroplasts inside their cells. (✗)

Q3 Write the scientific term (Write what the following statement refers to):

1 It is a tool used to see the components of the cell. (Microscope)

2 It is the building unit of life on Earth. (cell)

3 It is the powerhouse of the cell. (Mitochondria)

4 It is a structure within the cell that has a special function. (Organelle)

5 It is the membrane that allows water to enter and leave the cell. (cell membrane)

6 It is the organelle responsible for controlling cell activities, such as making cell proteins. (Nucleus)

7 It is the gelatinous liquid inside the cells and supports the cell organelles. (Cytoplasm)

8 It is the process of using oxygen to obtain chemical energy from food so that cells can continue their function. (Cellular respiration)

9 They are living organisms with more than one cell. (Multicellular organisms)

10 It is a group of tissues jointed together and involved in performing a particular function. (Organ)

11 They are structures within the cell that have a special function. (Organelles)

12 When examining transparent, colorless cells under a microscope, we used stain. (methylene blue dye)

13 They are organelles that help in assembling and transporting proteins to build and repair the cell. (Endoplasmic reticulum)

14 Sac-like structures used for storage of nutrients, water, and waste; in plant cells. (sap vacuoles)

15 It is the organelle that packages materials within the cells and transports them out of the cell. (Golgi apparatus)

Q4 Complete the following sentences:

1 Living organisms grow and reproduce by increasing the number of their cells.

2 The cells of bacteria are smaller than plant and animal cells.

3 The Robert Hooke was the first person to use the word cell.

4 Unfertilized bird egg contains (1) cell

5 The cell wall of a plant cell is made of cellulose.

6 The specialized types of plant cells perform the photosynthesis process.

7 The insects have a hard, shell-like covering called an exoskeleton.

8 The green color in a plant cell is due to it containing chlorophyll pigment.

Q5 Give reasons for (State the scientific reason):

1 The cell membrane maintains the balance of water on both sides of the cell.

Due to the presence of a cell membrane.

2 The number of cells in the body of an adult is much greater than the number of cells in the body of the young child.

Because as we grow, the cells increase in number, not in size.

3 A microscope is used to see cells.

Because it can magnify the cells to see their structures, as cells can't be seen by the naked eye.

4 The cell needs energy in the form of food and oxygen.

To carry out all its life activities to survive and get rid of waste materials.

5 The mitochondria are the powerhouses of the cell.

Because mitochondria provide the cell with the needed energy.

6 It is possible to distinguish between plant cells and animal cells by a microscope.

Due to the presence of a cell wall and chloroplast in plant cells only.

7 The cell membrane has the property of being selectively permeable.

To control the substances that can enter or leave the cell.

8 The cell membrane plays a main role in maintaining the cell.

Because it controls what can enter and leave the cell and keeps water balance.

9 Plants can make their own food.

Because it contains chloroplasts that help in making the photosynthesis process.

10 The plant cell has a definite shape, while the animal cell does not.

Due to the presence of a cell wall in plant cells only.

11 Animals cannot make their own food.

Due to the absence of chloroplasts in the animal cell.

Q6 What happens if:

1 Too much water enters the cell?

The cell will swell until it bursts.

2 The microscope was not invented (discovered)?

Scientists could not discover more information about the tiny particles of cells.

3 There is no nucleus inside the cell?

The cell cannot form protein or be divided.

4 There is no cell membrane?

The cell cannot control the substances that enter or leave it.

5 There is no chloroplast in the plant cell?

It cannot make its food as it cannot make the photosynthesis process.

6 There is no vacuole in the plant cell?

It cannot store nutrients, water and waste materials inside the plant cell.

7 There are no mitochondria inside the cell?

The cell cannot get its needed energy.

8 There is no cytoplasm inside the cell?

Organelles cannot float inside the cell and cannot transfer materials inside it.

9 There is no endoplasmic reticulum in the plant cell?

The protein can't build and repair the damaged cells.

Q7 Explain what is meant by cellular respiration.

It is the process that takes place inside the mitochondria, where oxygen is used to obtain the chemical energy stored in food to help the cells make their functions.

Q8 Explain the difference between unicellular and multicellular organisms.

Unicellular organisms: They are living organisms that their bodies consist of one cell only.

Multicellular organisms: They are living organisms that their bodies consist of many cells.

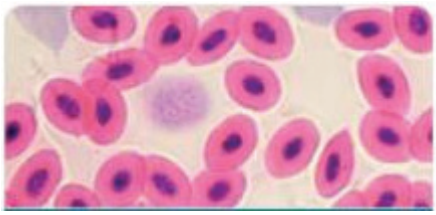
Q9 What does the picture in front of you indicate?

Plant cells



Q10 **What does the picture in front of you indicate?**

An animal cell



Q11 **Explain what is meant by selectively permeable.**

It is a feature that the cell membrane allows some substances to enter or leave according to its needs.

Concept 1.2 The Body as a System

Evaluation Weeks 4,5,6

Q1 Choose the correct answer:

1 Muscle cells need to be shaped like ..... fibers.
a. short b. long c. fatty d. soft

2 The ..... coordinates the needed movements to muscles.
a. blood b. lung c. brain d. heart

3 The ..... system receives signals from the body's organs, such as the eye.
a. nervous b. muscular c. respiratory d. digestive

4 The heart is one of the organs of the ..... system.
a. nervous b. circulatory c. digestive d. respiratory

5 When feeling nervous or exposed to a dangerous situation, ...
a. each system works separately
b. the systems work together in an integrated system
c. the systems do not interact with each other
d. the nervous system only work

6 The process of muscle contraction leads to ..... its length.
a. decrease b. increase
c. no change in d. no correct answer

7 The ..... sends instructions to muscles.
a. heart b. brain c. arm d. lung

8 Performing simple movements such as picking up a glass of water over the table. What systems in the human body work together to perform this task?
a. The nervous and circulatory systems
b. The nervous and musculoskeletal systems
c. The nervous, circulatory, and musculoskeletal systems
d. The digestive and circulatory systems

9 The group of similar cells work together to form ..... .
a. organ b. tissue c. system d. organelle

10 ..... secretes enzymes to increase the chemical breakdown of food.

a. Lungs b. Stomach c. Large intestine d. Kidney

11 The liver stores sugar and converts it into ..... .

a. protein b. fat c. starch d. glycogen

12 The endocrine glands secrete ..... to help the body perform its function.

a. hormones b. salts c. proteins d. sugars

Q2 Put (✓) or (✗) :

1 The brain pumps more blood to muscles during danger. (✓)

2 The two arms move due to the contraction and relaxation of muscles. (✓)

3 Undigested food is stored in the small intestine until it is expelled. (✗)

4 Involuntary muscles move automatically; their movement can`t be controlled. (✓)

5 When the diaphragm muscle contracts, the air is expelled out from the lungs. (✓)

6 The circulatory system transports only hormones to all body parts. (✗)

7 The heartbeat slows down when exposed to danger or stress. (✗)

8 When the arm is bent, the front muscle relaxes and the back muscle contracts. (✗)

Q3 Write the scientific term (Write what the following statement refers to):

1 It is the organ that pumps more blood to feed the muscles required for movement. (Heart)

2 It is the organ that sends instructions to the muscle. (Brain)

3 It is a system consisting of bones, muscles, ligaments, tendons, and cartilage. (Musculoskeletal system)

4 They are cells are shaped like long fibers, which allows movement. (Muscle cell)

5 It is a system that is made up of bones, ligaments, tendons, and cartilage. (Musculoskeletal system)

6 It is the cell which able to store and use energy quickly. (Muscle cell)

7 It is a fluid secreted in the mouth that helps digest food. (Saliva)

8 It is a system of organs and tissues that helps the body breathe. (Respiratory system)

9 It is a muscle that pumps oxygenated blood to every cell. (Heart)

10 It is a muscular opening at the end of the rectum through which food waste is expelled. (Anus)

11 It is the main organ of the respiratory system. (Lung)

12 It is a system that converts complex nutrients into simple substances in the human body. (Digestive system)

Q4 Complete the following sentences:

1 The heart pumps more blood to feed the muscles required for movement.

2 The brain sends instructions to the muscles.

3 To pick up a glass of water, the eye first sees the location of the book.

4 Hormones are transmitted to all parts of the body by the circulatory system.

5 During inhalation the diaphragm muscle contracts.

6 Glucose sugar is stored by the liver and muscle in the form of animal starch.

Q5 Give reasons for (State the scientific reason):

1 The human body is considered a system.
Because all systems in the human body work together to do specific functions.

2 No system in the body can work alone to do a simple task.
Because all systems depend on each other to do their functions.

3 Muscle cells need to be shaped like long fibers.
To allow the movement.

4 Cells must vary in shape and size.

Because each type of cell must be specialized to perform a specific function.

5 The endocrine system plays an important role in the fight-or-flight response.

Because the endocrine system secretes hormones that control this response and affect other body systems to face that danger or to run away from it, such as:

- Contraction of muscles.
- Increasing the breathing rate.
- Increasing the heartbeats.

6 Heart muscle relaxes and contracts.

To allow the heart to pump the blood carrying oxygen to all the body cells.

7 Chewing and breaking down food facilitates the digestion process.

To convert the complex food into simpler substances that the body can use for energy and growth.

Q6 What happens if:

1 Muscle contracts and relaxes?

It causes body to move.

2 Diaphragm muscle contracts?

The lungs take in the air rich in oxygen gas

3 The heart muscle contracts and relaxes?

To allow the heart pumps the blood carrying oxygen to all the body cells.

4 You face threat or danger according to your heart beats?

Heartbeats increase to pump more blood

5 The front muscle in the upper arm contracts and the back muscle relaxes?

The elbow will be bend.

Q7 Write the function of each:

1 Small intestine

- It continues its chemical breakdown of food with the help of enzymes secreted into it from the pancreas and gallbladder.

-The wall of the small intestine absorbs nutrients through blood vessels to carry them to all the body parts.

2 The respiratory system

- It provides the body with oxygen gas and gets rid of carbon dioxide gas.

3 The endocrine system

It controls the body temperature and the blood pressure.

4 The gallbladder

- It secretes enzymes in the small intestine to break down food.

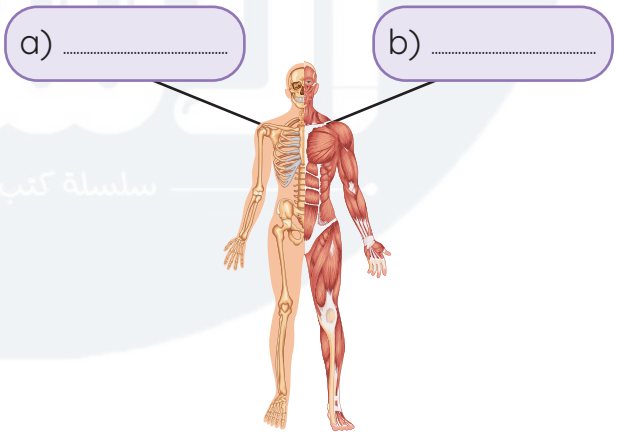
Q8 Identify four body systems that work together when playing a football game:

Nervous system - Circulatory system - Musculoskeletal system

Q9 Determine the two systems in the picture in front of you:

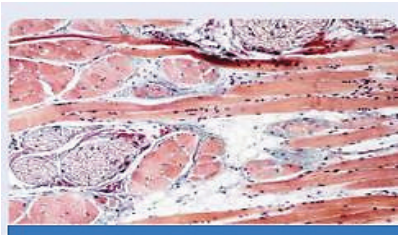
a. Skeletal system.

b. Muscular system.

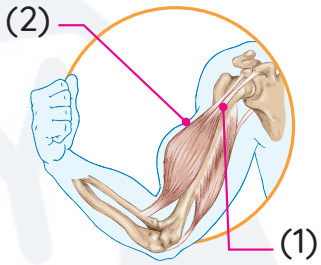


Q10 Determine the name of tissue in the picture in front of you:

Muscular tissue



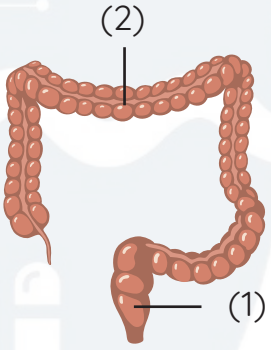
Q11 Notice the picture, then complete:



1 Muscle number (1) is a relaxed muscle.

2 Muscle number (2) is a contracted muscle.

Q12 Notice the picture, then complete:



1 The number (1) indicates rectum.

2 The number (2) indicates large intestine.

3 Write function of number (2).

It absorbs most of water from the undigested food.

Q13 Notice the picture, then complete:



1 The heart is from the circulatory system.

2 What happens to the heart when the human body is faced with danger?

Heartbeats increase to pump more blood.

Concept 1.3 Energy a System

Evaluation Weeks 7,8,9

Q1 Choose the correct answer:

1 The electric circuit contains ..... , which is responsible for opening and closing the electric circuit.

a. a battery b. a switch c. a lamp d. a resistor

2 Scientists use a ..... to detect the flow of an electric current.

a. generator b. galvanometer c. battery d. switch

3 A turbine uses the power of wind or water to generate ..... energy to operate electrical generators.

a. electrical b. mechanical c. solar d. chemical

4 ..... is used to slow the flow of an electric current in the electric circuit.

a. A battery b. A switch c. A resistor d. A lamp

5 Electrical wires are coated with a layer of ..... .

a. iron b. aluminum c. plastic d. nickel

6 All the following are electric insulators, except ..... .

a. wood b. plastic c. rubber d. copper

7 ..... is an example of electrical insulators.

a. Iron b. Aluminum c. Wood d. Copper

8 Magnets can be made from ..... .

a. copper b. glass c. iron d. plastic

9 The area around the magnet in which magnetic force appears is a ..... .

a. magnet b. magnetic force

c. magnetism d. magnetic field

10 A magnetic field can be formed when an electric current flows around a ..... .

a. plastic core b. battery

c. metal core d. rubber core

11 The factors on which gravitational force depends are ..... .

a. mass and shape b. size and shape

c. mass and volume d. distance and mass

12 The artificial pacemaker is inserted into the ..... of the human body.

a. legs b. chest c. neck d. brain

13 The artificial pacemaker helps patients who suffer from ..... .

a. kidney failure b. diabetes

c. headaches d. irregular heartbeats

Q2 Put (✓) or (✗):

1 In series circuits, the electric current can flow in different branches. (✗)

2 The electric devices in houses are connected in series circuits. (✗)

3 When a light bulb connected in a series burns out, all the other light bulbs are turned off. (✓)

4 Electricity is considered a form of energy. (✓)

5 Water in dams is used to operate wind turbines. (✗)

6 The switch is the source of electricity in an electric circuit. (✗)

7 When placing an insulator in the electric circuit, electricity flows. (✗)

8 Electrical resistors are found in some devices, such as electric stoves. (✓)

9 Copper, aluminum, and rubber are electric conductors. (✗)

10 An electric shock happens when touching a non-insulated wire that an electric current flows through. (✓)

11 A metallic spoon is an electric conductor. (✓)

12 Electricity and magnetism are related to each other. (✓)

13 An electric current is generated when a static magnet is placed inside a coil. (✗)

14 A magnet attracts all materials. (✗)

15 The natural pacemaker inside our heart produces electrical currents to make it contract. (✓)

Q3 Correct the underlined words:

1 Gravity is the force by which a magnet attracts some materials.

(Magnetism)

2 Magnetism is a pulling or pushing force, while gravity is a pushing force only. (pulling)

3 Non-metals allow electric current to flow through them. (Metals)

4 Water in dams is used to operate wind turbines. (water turbines)

5 Electricity can flow through electric insulators. (electric conductors)

6 Scientists use a generator to detect the flow of small electric currents. (galvanometer)

7 Electric wires are made of plastic and conduct electricity. (copper)

Q4 Write the scientific term:

1 It is a tool that is used to open and close the electric circuit. (Switch)

2 They are the components of an electric circuit that are used to limit the flow of electricity through the circuit. (Resistors)

3 It is a device for generating electricity by using magnets. (Generator)

4 They are materials that are attracted to the magnet. (Magnetic materials)

5 They are materials that are not attracted to the magnet. (Non-magnetic materials)

6 It is the area around the magnet in which its magnetic force appears. (Magnetic field)

7 It is the pattern formed by iron filings near the magnet. (Magnetic field)

8 It is the flow of electric charges along a closed path. (Electric current)

9 It is the force of Earth which attracts all objects on its surface to its center. (Gravity)

10 They are materials that allow the electric charges to flow through. (Electric conductors)

11 They are two factors that affect the force of gravity. (Mass and distance)

12 It is a battery-operated device that is inserted into the chest to regulate heartbeat. (Artificial pacemaker)

13 It is a type of electric circuits that are found in houses and help in operating many devices at the same time. (Parallel circuit)

14 They are materials that don't allow electrons to flow through them easily. (Electric insulators)

15 They are materials that allow electrons to flow through them easily. (Electric conductors)

16 They are small electric charges moving in the wires in a closed electrical circuit. (Electrons)

17 It is a device inserted into the chest that stimulates the heart to beat regularly. (Artificial pacemaker)

Q5 Complete the following sentences:

1 Electric circuits in houses are connected in a parallel way.

2 An electric circuit contains a switch, which is responsible for opening and closing the circuit.

3 Electric wires are coated by plastic as it is an electric insulator.

4 Rubber is an electric insulator, while copper is an electric conductor.

5 Generators change kinetic (mechanical) energy into electrical energy.

6 Wind turbines need the kinetic energy of wind to produce electricity.

7 Electric energy transfers to the devices that are powered by electricity through wires.

8 A moving magnet inside a coiled wire can generate an electric current.

9 By increasing the number of loops in the coil, and moving a magnet inside it, the amount of generated electric current will increase.

10 A magnet can be made of iron and other materials.

11 Gold and copper are considered non-magnetic materials as they are not attracted to the magnet.

Q6 Cross out the odd word:

1 Iron – Nickel – Aluminum – Cobalt (Aluminum)

2 Battery – Magnet – Wire – Light bulb (Magnet)

Q7 Classify the following materials in the table below:

(Wooden clip – Metallic paperclip – Plastic spoon – Piece of glass – Copper wire – Iron nail)

Magnetic Materials	Non-magnetic Materials
Metallic paperclip - Iron nail	Wooden clip – Plastic spoon – Piece of glass – Copper wire

Q8 Answer the following questions

1 The figure that represents the way of connecting devices in houses is figure A.

2 Mention the components of the electric circuit.

A metal wire, a battery, a switch, and an electric device

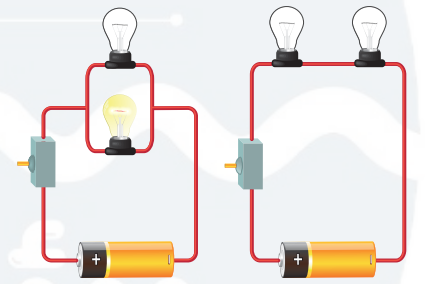


Figure A Figure B

3 Define electric conductors.

They are materials that allow an electric current to flow easily through them.

Q9 Give reasons for:

1 The electric circuit is considered a system.

Because the electric circuit consists of many components that work together to make an electric current flow.

2 Wood and copper are not attracted to the magnet.

Because wood and copper are non-magnetic materials.

3 Cobalt and nickel are considered magnetic materials.

Because cobalt and nickel are attracted to the magnet.

4 Most electric wires are covered with rubber or plastic.

To stop the flow of electricity and protect us from the electric shock.

5 The electric circuit must contain a battery.

Because the battery is the source of electricity in the electric circuit.

6 Electric generators have a great importance in our lives.

Because generators convert kinetic energy into electrical energy, which is used in lighting houses and operating electrical devices.

7 When a ball is thrown into the air, it will stop moving upward and then fall down.

Due to gravity, which pulls objects down toward the Earth's center.

8 Gravity and magnetism are different from the other forces.

Because magnetism is a pulling or pushing force, while gravity is a pulling force only.

9 The heart has a natural pacemaker.

The heart has a natural pacemaker that creates electrical currents, causing the heart to contract.

10 Many devices, such as toasters, microwaves, and electric stoves, contain resistors.

To limit the flow of the electric current in the electric circuit and prevent the damage of devices.

11 Some electric circuits contain electric resistors.

Because resistors are used to slow the flow of electrons through an electric circuit to avoid damaging its other components.

12 In the parallel circuit, we can turn off or remove one light bulb while the other light bulbs remain lit.

Because in a parallel circuit, all light bulbs are connected in different paths (branches); if one bulb is turned off, the other devices continue to work.

13 Some electric circuits contain electric resistors.

To limit the flow of the electric current in the electric circuit and prevent the damage of devices.

14 The human body is considered an electric conductor.
Because the human body contains a lot of water, which is a good conductor of electricity.

15 All metals are considered electric conductors.
Because metals allow electricity to flow through them.

Q10 What happens if:

1 Large magnets spin at a high speed around coiled wires?
An amount of electricity is produced and flows through the wires.

2 The switch is turned on in the electric circuit?
The electric circuit becomes closed, so the electric current flows through the circuit and the light bulb is turned on.

3 The switch is turned off in the electric circuit?
The electric circuit becomes opened, so the electric current doesn't flow through the circuit and the light bulb is turned off.

4 An electric circuit doesn't contain a switch?
We can't open or close the electric circuit easily.

5 The mass of an object increases?
Gravity (gravitational force) increases.

6 The distance between an object and the Earth's center increases?
Gravity (gravitational force) decreases.

7 The distance between objects and the center of the Earth decreases?
Gravity (gravitational force) increases.

8 A magnet is approached close to some iron nails mixed with small pieces of paper?
The magnet attracts the iron nails, but it does not attract the small pieces of paper.

9 A magnet is moved inside a coil of wire in a circuit containing a galvanometer?
The needle of the galvanometer moves and this indicates there is an electric current flow.

10 Aluminum foil is used to wrap electric wires?

The electric current will flow through it which causes an electric shock when touching the wires.

11 Electric circuits in houses are connected in series?

If one light bulb is disconnected, the other light bulbs do not work.

12 When a piece of wood is replaced by a piece of aluminum in an electrical circuit?

The electric current will flow through the closed electric circuit.

13 A person touches a non-insulated electric wire through which an electric current passes?

The electric current flows through his body and he will be shocked by electricity.

14 A patient has slow or irregular heartbeats?

The patient needs an artificial pacemaker to keep the heart beating correctly.

سلسلة كتب الأستاذ

Concept 2.1 Thermal Energy and States of Matter

Evaluation Weeks 10,11

Q1 Choose the correct answer:

1 Changing from a gaseous state to a liquid state is called ..... .

a. melting b. evaporation c. condensation d. freezing

2 When wax melts, its particles ..... .

a. gain thermal energy and speed up

b. gain thermal energy and slow down

c. lose thermal energy and speed up

d. lose thermal energy and slow down

3 In which state(s) of matter do the molecules move away from each other?

a. Solid b. Gas

c. Solid and liquid d. Solid and gas

4 A molecule is composed of very small particles called ..... .

a. cells b. atoms c. mixtures d. compounds

5 All these substances are solids, except ..... .

a. pens b. balloons c. soup d. ice

6 As a result of heat flow through metals, they ..... .

a. expand b. contract

c. get smaller d. are not affected

7 When a thermometer is placed in a cup of iced water, the liquid inside the thermometer ..... due to its ..... .

a. goes down – expansion b. rises up – expansion

c. goes down – contraction d. rises up – contraction

8 The spaces between molecules ..... during the melting of solids.

a. decrease b. increase

c. do change d. may increase or decrease

9 If a metallic rod of 40 meters length is heated at a high temperature, its length can reach ..... meters after heating.

a. 37 b. 38 c. 39 d. 41

10 Metallic parts of a bridge ..... in different temperatures.

a. expand only
b. expand and contract
c. don't change
d. contract only

Q2 Put (✓) or (✗) :

1 We can change the shape of glass by heating only. (✗)
2 When ice cubes are heated, they melt. (✓)
3 Gases have variable shape and volume. (✓)
4 By decreasing the temperature, the motion speed of molecules of matter decreases. (✓)
5 Hot water molecules have more kinetic energy than cold water. (✓)
6 The decrease in the volume of matter that occurs when matter is cooled is called expansion. (✗)
7 Expansion joints allow bridges to expand safely. (✓)
8 The spaces between molecules of a substance increase by decreasing the temperature of this substance. (✗)
9 Expansion and contraction of matter occur due to changes in the temperature. (✓)
10 Most bridges are made of steel and concrete. (✓)

Q3 Write the scientific term (Write what the following statements refer to):

1 It is the change of matter from a solid state to a liquid state. (Melting process)
2 It is the total sum of the kinetic energy of its molecules and its atoms. (Thermal energy)
3 It is the change of matter from a gaseous state to a liquid state. (Condensation)
4 It is the smallest building unit of matter. (Atom)
5 It is the state of matter that has a fixed volume and shape. (Solid state)
6 It is the increase in the volume of a material as its temperature increases. (Expansion)

7 They are joints between parts of a bridge that allow its expansion without being damaged. (Expansion joints)

8 It is the decrease in the size of a substance due to decreasing its temperature. (Contraction)

Q4 Complete the following sentences:

1 The boiling point of a substance is the temperature at which a substance changes from liquid into gas.

2 The state of matter that has a fixed volume and shape is the solid state.

3 The kinetic energy is related to the motion of particles of a matter.

4 Changing ice into water followed by changing water into steam shows two different processes, which are melting and evaporation.

5 The boiling point of water is less than the boiling point of mercury.

6 The temperature at which solid changes to liquid is the melting point.

7 The melting and boiling points are physical properties of matter.

8 Temperature is a measure of the kinetic energy of the molecules of a substance.

9 When the thermal energy of a matter increases, the kinetic energy of its molecules increases and moves faster.

10 The spaces between molecules increase during the melting of solids.

11 When a substance contracts, its volume decreases, while its volume increases when it expands.

12 Heat flows from a hot object to a cool one.

13 Heat is one of the forms of energy.

14 Examples of thermal conductors materials are iron and aluminum.

15 Hot food continues to lose heat until its temperature becomes equal to the temperature of the air surrounding it.

16 Examples of insulators materials are plastic and wood.

Q5 Cross out the odd word:

1 Melting – Freezing – Condensation – Conduction (Conduction)

2 Steam – Ice – Rocks – Glass (Steam)

3 Water – Milk – Glass – Oil (Glass)

Q6 Give reasons for:

1 Ice melts when it is put in a hot cooking pan.

Because ice particles gain thermal energy, so they move faster and spread out, and the state of ice changes into water.

2 Matter may change from one state to another.

Because matter gains or loses thermal energy during heating or cooling.

3 All matter contains thermal energy.

Because any matter consists of particles which are in continuous motion.

4 Small spaces are left between the railroad tracks.

To allow the iron to expand in hot weather without being bent to avoid train accidents.

Q7 What happens if:

1 You touch a hot cup of tea (according to the transfer of heat)?

Heat flows from the hotter substance (hot cup) to the cooler substance (your hand).

2 You touch a piece ice (according to the transfer of heat)?

Heat flows from the hotter substance (your hand) to the cooler substance (ice).

3 You heat a piece of butter (according to the change of state)?

It changes from a solid state to a liquid state.

4 Expansion joints are not included in the design of bridges?

Buckling of bridges occurs due to the expansion of steel when exposed to high temperatures.

Concept 2.2 Heat Transfer

Evaluation Weeks 12, 13, & 14

Q1 Choose the correct answer:

1 If you mix water at two different temperatures, the resulting temperature of the mixture will be ..... .

a. 60°C b. 20°C c. 10°C d. 38°C

2 The measuring unit of heat is ..... .

a. °C b. meters c. grams d. calories

3 Heat is transferred through solids by ..... .

a. radiation only b. conduction and convection

c. conduction only d. radiation and convection

4 ..... is the transfer of heat through liquids and gases.

a. Radiation b. Conduction c. Freezing d. Convection

5 Heat is transferred through copper and iron by ..... .

a. radiation only b. conduction only

c. conduction and convection d. convection only

6 The heat of the Sun reaches the Earth by ..... .

a. conduction b. convection c. radiation d. condensation

7 When an object stops on the top of a ramp, it stores ..... energy.

a. kinetic b. light c. potential d. sound

8 When a car goes down on a ramp, its ..... energy changes to ..... energy.

a. kinetic – potential b. sound – potential

c. potential – kinetic d. light – potential

9 Due to the friction between a moving object and a flat road, the moving object changes some ..... energy into ..... energy.

a. kinetic – thermal b. potential – thermal

c. thermal – kinetic d. kinetic – potential

Q2 Put (✓) or (✗) :

1. Cool objects do not contain any energy inside. (✗)
2. We feel the heat, but we cannot see it. (✓)
3. Heat cannot be lost, only transferred. (✓)
4. The transfer of heat due to the movement of a liquid or gas is called radiation. (✗)
5. Some materials, such as wood, resist the transfer of thermal energy. (✓)
6. Holding your hands in front of a fire to warm them is an example of radiation. (✓)
7. When a substance changes its state, the mass of the substance does not change. (✓)
8. When an object is placed at a high place, it has potential energy. (✓)
9. Studying the chemical structure of any material helps us know its properties. (✓)
10. Steel is made of rocks, sand, and water. (✓)
11. Flexible fabrics are used in making cloth. (✓)

Q3 Write the scientific term (Write what the following statements refer to):

1. It is the energy transferred from a hot object to a cold object. (Thermal energy)
2. They are materials that resist the transfer of heat energy. (Thermal insulators)
3. They are materials that allow heat to flow through them. (Thermal conductors)
4. It is a condition in which the object temperature is equal to the surrounding environment. (Thermal equilibrium)
5. It is the transfer of heat due to the movement of a liquid or gas. (Convection)
6. It is heat that travels through space. (Radiation)
7. It is the transfer of heat when objects are touching. (Conduction)
8. When a substance changes state, the mass of the substance does not change. (Law of Conservation of Mass)

9 It is the energy that kinetic energy changes into when a moving object is affected by friction. (Thermal energy)

10 It is a form of energy stored in an object when it is placed on the top of a ramp. (Potential Energy)

11 It is a material made of a mixture of iron and other elements. (Steel)

12 It is a material that consists of sand, limestone, and soda ash. (Glass)

13 It is a mixture of rocks, sand, and water, which becomes hard after it dries. (Concrete)

Q4 Complete the following sentences:

1 Heat flows from a hot object to a cool one.

2 Heat is one of the forms of energy.

3 Thermal conductors materials include iron and aluminum.

4 Hot food continues to lose heat until its temperature becomes equal to the temperature of the air surrounding it.

5 Examples of insulators materials are plastic and wood.

6 The handles of cooking ware are made of plastic because it is a thermal insulator.

7 Heat flows from the hotter object to the surrounding objects.

8 Molecules of matter are always in continuous motion.

9 When a substance is heated, the kinetic energy of its molecules increases.

10 Temperature is a measurement of the average kinetic energy of the molecules of matter.

11 Thermal energy transfers from one place to another by conduction, convection, and radiation.

12 When the difference in temperature between objects and time of contact between objects increases, this affects the rate at which heat is transferred.

13 Examples of insulators are wood, plastic, and glass.

14 Conduction occurs with objects that are solid.

15 Metals, such as iron and aluminum, are good conductors.

16 A metal doorknob feels cooler than the wooden door it is on.

17 When a substance changes in state, the mass of the substance does not change.

18 Some materials prevent heat from being transferred, such as plastic.

19 Friction between a moving car and a road changes its kinetic energy into thermal energy.

20 Smart clothes can light in the dark and keep themselves clean.

21 Plastic is made by chemically changing some compounds of petroleum.

22 Glass is a mixture of sand, limestone, and sodium carbonate.

23 Concrete is used as the base of buildings as it is very strong.

24 When a toy car is at the top of a slide, it stores potential energy.

25 When a toy car goes down on the slide, its potential energy changes into kinetic energy.

Q5 Give reasons for:

1 Cookware is made of aluminum.

Because aluminum is a thermal conductor that allow heat to transfer through it.

2 We do not feel the thermal energy in cold objects.

Because our hands have more thermal energy than the ice, so energy transfers from our hands to cold objects.

3 Meteorologists must understand convection and radiation.

To help them predict the weather.

4 A metal doorknob feels cooler than the wooden door it is on.

Because heat transfers from your hand to the metal doorknob.

5 A metal doorknob feels cooler than the wooden door, even though they are both the same temperature.

Because thermal energy transfers fast from your hand to the metal doorknob, which is a thermal conductor.

6 Scientists should study the structure of molecules of different materials.

To understand their chemical structures, which helps in understanding their properties and their suitable uses.

7 Due to friction force, the tires of a moving car become hot.

Because some of the kinetic energy changes into thermal energy.

8 Smart clothes have many benefits.

Because smart clothes can control body temperature, light up in the dark, and keep themselves clean.

Q6 What happens if:

1 A lizard stands on a hot rock?

The skin of the lizard absorbs thermal energy from the rock, so the particles inside the rock lose energy and move slower.

2 The temperature of a body increases?

The kinetic energy of the molecules of the body increases.

3 You lift your face to the Sun?

You feel warm, as heat transfers to your face through radiation.

4 The iron handle is made of metal?

Heat transfers into the handle, so our hands will be burnt.

5 We pick up a hot pot with a metal handle?

Heat transfers to our hands, so it will burn.

6 We weigh an ice cube then heat it (according to the mass off ice cube)?

The mass does not change.

7 Concrete is left to dry?

It becomes hard.

8 We make a chemical change to some compounds of petroleum?

Plastic, a new matter that has different properties from petroleum, is formed.

9 We mix sand, limestone, and soda ash at a high temperature?

Glass is formed.

Q7 Explain how are the following materials created?

1. Steel: By mixing iron and other materials.
2. Shrink-wrap: By adding heat to plastic to make it shrink.
3. Plastic: By making chemical changes on petroleum.

Q8 Explain what is meant by:

1. Thermal equilibrium:
   It's the condition where heat stops transferring between two objects in contact when they reach the same temperature.
2. Thermal conductors:
   They are materials that allow thermal energy to transfer though
3. Convection:
   It is the transfer of heat due to the movement of particles of a liquid or gas.
4. Radiation:
   It is the transfer of heat through space or gases.
5. Law of Conservation of Mass:
   The mass of a substance doesn't change when the substance changes from one state to another.