

**Let's pave the way for learning and
Move Forward**

**Standard - 10
Biology**



**State Council of Educational Research and Training (SCERT), Kerala
2022**

Dear students,

The evaluation of the answer scripts of the First Terminal Examination 2022 and the classroom experiences shared by the teachers concerned, have brought to light the fact that our children have suffered some serious learning gap due to the non-availability of proper learning experiences as a result of the unprecedented situation created by the Covid Pandemic from 2019 to 2022. An activity book has been designed to assist children internalize the concepts which they ought to have mastered in the previous classes and with the intention to facilitate further learning. Necessary explanations and activities are included in the booklet to help children bridge the gap. It is hoped that this package will facilitate the learners for self-study or for studying with the help of their teachers and I wish them success in their endeavors to move forward with confidence.

Director
SCERT, Kerala

Class 10

Chapter 1

Sensations and responses

Part 1

In this chapter we have to learn about various parts of nervous system and its functions. Don't you remember what you have learned in previous classes related to this concept? Given below are some questions based on the chapter Cell clusters in Class 8 and the concept, when carbon dioxide becomes excessive, in the chapter Breathing for Energy of Class 9. Write their answers.

Worksheet

1. Which of the following are the two stages of respiration.

- ◆ Light phase, Dark phase
- ◆ Cellular respiration, Fermentation
- ◆ Inspiration, Expiration
- ◆ Glycolysis, Krebs Cycle

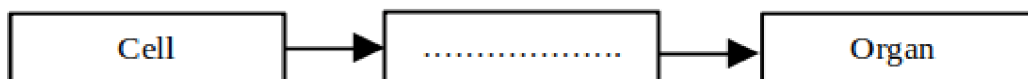
2. What are the products of cellular respiration?

- ◆ Oxygen, Hydrogen
- ◆ Glucose, Oxygen
- ◆ Water, Carbon dioxide
- ◆ Fatty acid, Glycerol

3. How carbonic acid is formed in the body?

- ◆ Carbon dioxide reacts with Water
- ◆ Carbon dioxide reacts with Oxygen
- ◆ Carbon dioxide reacts with Hydrogen
- ◆ Carbon dioxide reacts with Hydrochloric acid

4. Complete the blanks in the given flowchart



- ◆ Organ system
- ◆ Cell organell
- ◆ Tissue
- ◆ Organism

5. Find out which of the following is the function of nervous tissue. (Score 1)

- ◆ Covers and protects the body.
- ◆ Connects different tissues
- ◆ Enables the movement of the body.
- ◆ Enables to respond identifying the changes inside and outside the body.

Evaluate your responses with the help of worksheet evaluation indicators.

Complete the worksheet satisfaction

Partially complete the worksheet

Need improvement

Part 2

Let us go through the chapter once again.

Activity 1

A part of the note from the science diary of a student is given below. Analyze it based on the indicators and write the answers.

Breathing is the process of taking air in and out of the body. This is an important step in breathing. During inspiration, air enters the lungs and during expiration, air is expelled from the lungs.

Carbon dioxide resulting from cellular respiration is released through exhalation. Excess of carbon dioxide in the body is harmful to the homeostasis of the body.

Carbon dioxide combines with water present in and out of the cell to form carbonic acid. The increase in the level of carbonic acid increases the acidity in the body. This changes the internal environment.

Substances that cause change in the internal environment must be duly removed. This is also a part of maintaining the homeostasis. This is controlled by the hypothalamus, the part of brain.

Indicators

- Stages of respiration

.....
.....

- Products formed as a result of cellular respiration

.....
.....

- How does the increased level of carbon dioxide affects the body?

.....

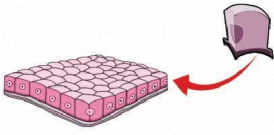
- The part of the brain that controls homeostasis

.....

Activity 2

Some slides shown in a class on various animal tissues are given below. Analyse them and answer the questions.

1




Tissues

Tissues are groups of similar cells that have a common origin and perform specific functions.

Cells -----> Tissue

2

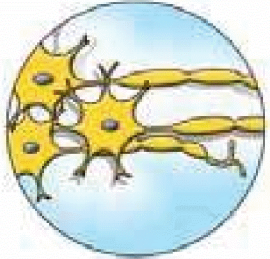
Diifferent types of animal tissues.



Epithelial tissue Nervous tissue Muscular tissue Connective tissue

3

Nervous tissue

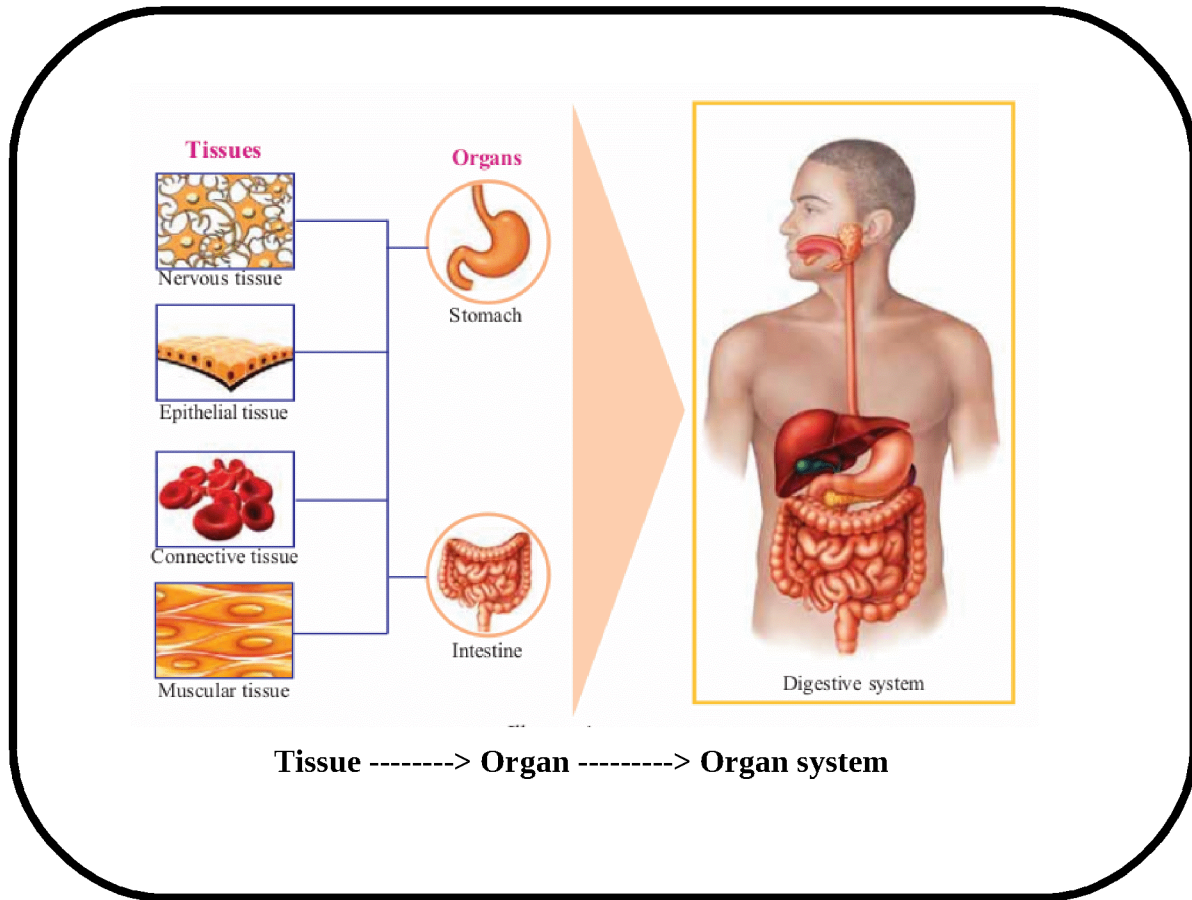


Nerve tissue is tissue made up of nerve cells

FUNCTIONS

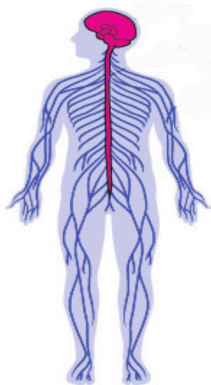
- + Controls and coordinates physiological functions.
- + enables to respond identifying the changes inside and outside the body.

- 4 Tissues combined together to form organ and several organs combined together to form organ system.

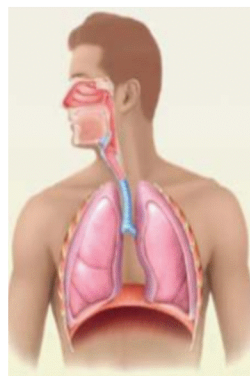


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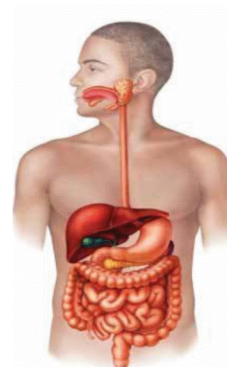
Different organ systems



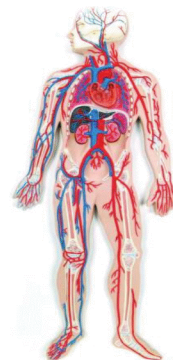
Nervous system



Respiratory system



Digestive system



Circulatory system

Indicators

1. What are tissues?

.....
.....

2. List the different types of animal tissues

.....
.....

3. What are the functions of nervous tissue ?

.....
.....
.....

4. Complete the following table by finding out the systems to which the organs listed in the table belong to:

Organs	Organ system
Heart, blood vessels	
Nose, trachea, lungs	
Kidney, ureter, urinary bladder	
Brain, nerves	

Worksheet evaluation indicators

(1) Inspiration, Expiration

(2) Water, Carbon dioxide

(3) Carbon dioxide reacts with Water

(4) Tissue

(5) Enables to respond identifying the changes inside and outside the body.

This is a self learning material

NB: If you have any doubts, seek the help of your teacher. Completed worksheet should be submitted to the teacher after self assessment.

Chapter 3

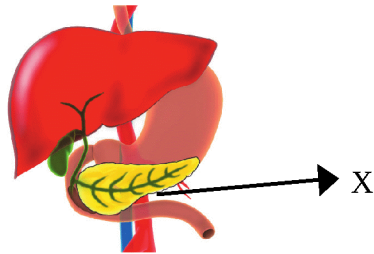
Chemical messages for Homoeostasis

Part-1

In this chapter we will learn about Endocrine system and hormones. Some questions based on what you have learned in class 8 and 9 related to this concepts. (Pancreas -Chapter 2 in class 9, Sex hormone -chapter 6 in class 8). Try to find out the answers to the following questions for yourself .

Worksheet

1. Analyze the picture given below and answer the questions.



(i) Identify the gland marked as X in the figure.

- ◆ Liver
- ◆ Pancreas
- ◆ *Duodenum*
- ◆ Stomach

(ii) Select the digestive juice produced by this gland.

- ◆ Pancreatic juice
- ◆ Bile
- ◆ Intestinal juice
- ◆ Gastric juice

(iii) Select the function of the digestive juices produced by this gland.

- ◆ Converts protein to Peptones
- ◆ Converts protein to Peptide
- ◆ Breaking down of fat into smaller particles
- ◆ Fat is converted to Fatty acid and Glycerol

2. Find the correct statement related to collecting duct from the following. (1 Score)

- ◆ The part that carries blood to the nephron
- ◆ The part where ultrafiltration takes place

- ◆ The part where absorption of water takes place
- ◆ The part where reabsorption of essential components takes place

3. Which of the following is a male sex hormone? (1 Score)

- ◆ Testosterone
- ◆ Estrogen
- ◆ Progesterone
- ◆ Insulin

Evaluate your responses with the help of worksheet evaluation indicators.

Complete the worksheet satisfaction

Partially complete the worksheet

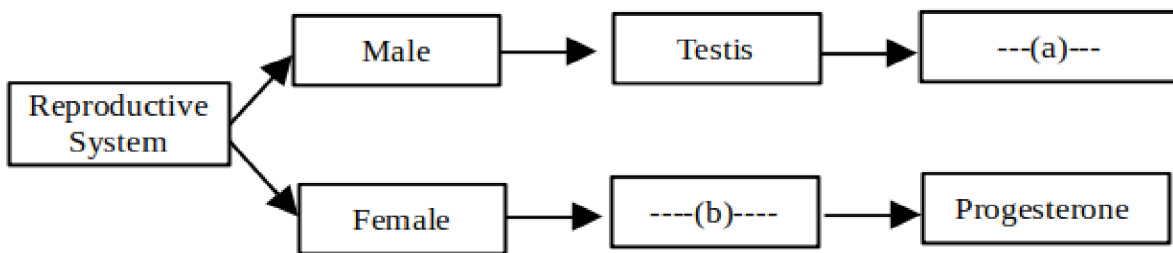
Need improvement

Part -2

Activity-1

Below is a portion of a booklet prepared for sex education. Analyze it and complete the illustration given below.

in humans, a special organ system has been developed for the production of gamates. The sperms develop in a pair of testes that are found in the scrotum outside the abdomen.The testiss also produce the male sex hormone testosterone. In the female reproductive system, a pair of ovaries in the abdomen produce eggs and the female hormones estrogen and progesterone.

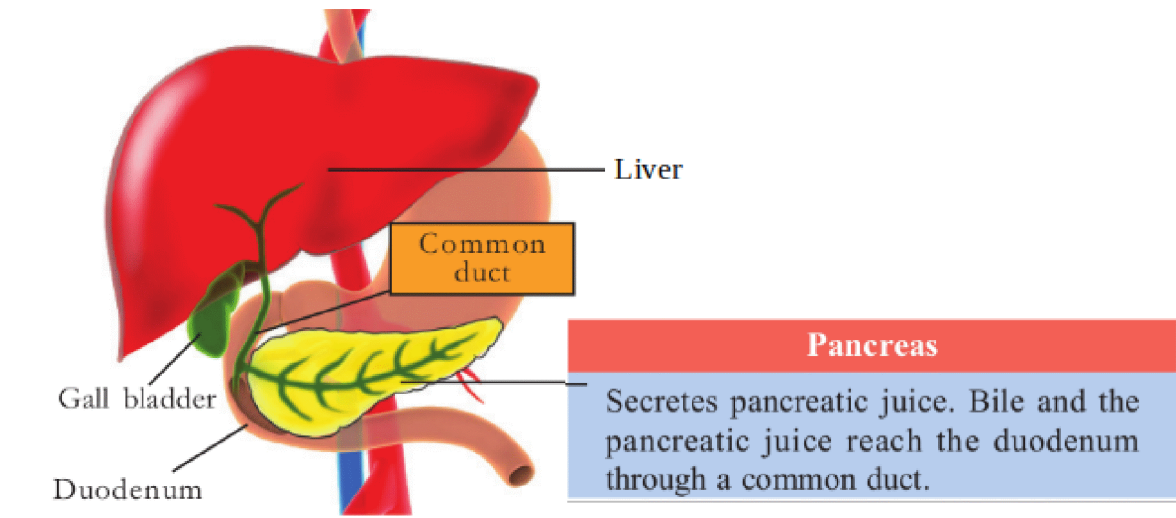


(a).....

(b).....

Activity-2

Given below is a portion of the science diary of a student studying in class 9. Analyze it and answer the questions.



Pancreas is a digestive gland found in association with the liver. The digestive juices secreted by the pancreas act upon the partially digested food and enhance the process of digestion. Pancreatic amylase converts starch into maltose, trypsin converts protein to peptide and pancreatic lipase converts fat into fatty acid and glycerol.

Fill in the blanks in the table given below.

Enzyme	Nutrients	Simple components
Pancreatic lipase(a).....(b).....
.....(c).....(d).....	Maltose
.....(e).....	Protein(f).....

(a).....

(d).....

(b).....

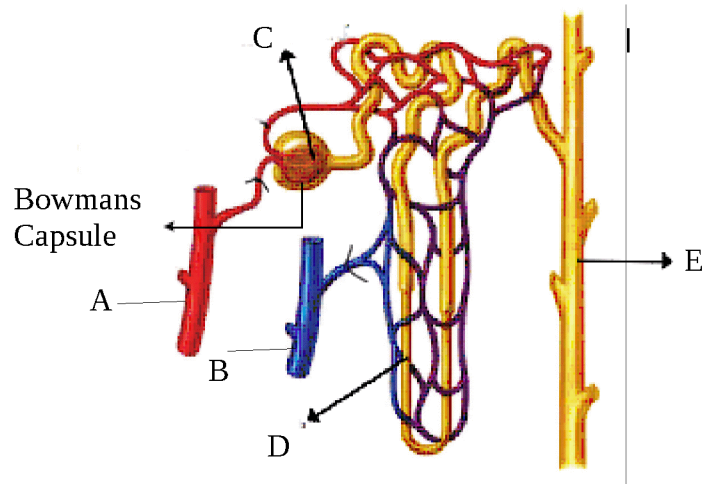
(e).....

(c).....

(f).....

Activity-3

The description of the formation of urine and an illustration of the nephron, the basic structural and biological component of the kidney are given below. Analyze them and answer the questions.



Formation of urine

Blood contains urea is carried by venal artery to the kidneys. Glomerulus a bunch of capillaries locate at the Bowmans capsuls. When blood flows through the glomerulus, ultrafiltration takes place through its small pores. This process is supported by the high pressure developed in the glomerulus. The glomerular filtrate formed as a result of this is collected in the capsular space. When glomerular filtrate flows through renal tubules to the collecting duct, essential components are reabsorbed to the peritubular capillaries. The absorption of excess water from the glomerular filtrate takes place in the collecting duct. What is left behind is urine.

(i) Name the blood vessels A and B

(A).....

(B).....

(ii) Write the functions of the parts labelled as C,D,E

(C).....

(D).....

(E).....

Worksheet Evaluation indicators

- (1) Pancreas
- (2) Pancreatic juice
- (3) Converts protein to Peptide
- (4) The part where absorption of water takes place
- (5) Testosterone

This is a self learning material

NB: If you have any doubts, seek the help of your teacher. Completed worksheet should be submitted to the teacher after sel assesment.

Chapter -4

Keeping diseases away

Based on what you have studied in Class IX related to this chapter, try to answer the following questions.

Part 1

Worksheet

Analyze the given in the box and answer the questions given below.

Bronchitis, Hypertension, Athirosclerosis, Emphysema, Lung cancer.

01. Select the diseases affecting the lungs from those given in the box.

- -----
- -----
- -----

02. The condition occurs due to the accumulation of fat in the arterial walls.

.....

03. What is the common term used for the diseases / diseased conditions given in the box?

- Hereditary diseases
- Occupational diseases
- Lifestyle diseases
- Deficiency diseases

Evaluate your responses with the help of worksheet evaluation indicators.

Complete the worksheet satisfaction

Partially complete the worksheet

Need improvement

Part 2

Activity 1

Given below is a pamphlet prepared by health department on World Heart Day. Analyse it and answer the questions.

September 28 - World Heart Day

Changing Food habits and lack of exercise are factors that affect the health of heart. A diet high in fat or a habit of eating such a diet can lead to accumulation of fat in the arteries. Atherosclerosis is such a condition in which fat accumulates in the artery walls. As a result of this, the inner diameter of the artery reduces. Moreover arterial walls lose elasticity and may rupture. Inner wall becomes rough. Hence RBCs may clump together to form blood clot in the coronary vessels which may cause heart attack.

1. How does a excess fatty diet affect the arteries? (Tick the appropriate boxes)

- The inner diameter of the artery reduces due to the accumulation of fat.
- Artery dilates.
- Arterial walls lose its elasticity
- inner diameter of the artery increases
- The inner wall of the artery is smooth.
- The inner wall of the artery is rough.

2. Write three sentences related to heart health to be included in a poster to be prepared for World Heart Day.

- (i)
- (ii)
- (iii)

3. Analyze the statement and answer the question given below.

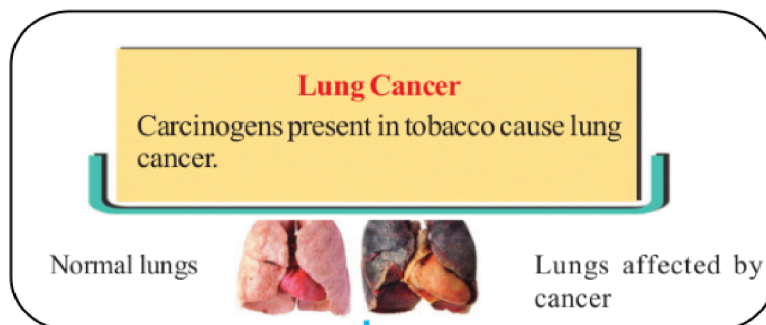
"Blood clots in the blood vessels that carry blood to the heart can cause heart attack."

1.What is the reason for the formation of blood clot as mentioned in the statement?

.....
.....
.....

Activity. 2

Analyze the slides prepared by the children for a seminar on lung diseases and their causes due to tobacco use and answer the questions.



Emphysema

Alveoli rupture due to the loss of elasticity, by the deposition of toxic substances contained in tobacco. This reduces the respiratory surface and reduces vital capacity.

Normal alveoli
Alveoli affected by emphysema

Bronchitis

The tar, carbon monoxide, etc., in tobacco leads to the deposition of mucus and the swelling of lungs due to the proliferation of germs in the alveoli.

Normal bronchioles
Affected bronchioles

(i) Name the diseases that affect lungs due to smoking

.....

(ii) How does smoking reduce vital capacity?

.....

(iii) How does smoking cause inflammation of the lung ?

.....

Answer key - part 1

- (1) Bronchitis, Emphysema, Lung cancer.
- (2) Atherosclerosis
- (3) Lifestyle diseases

This is a self learning material

NB: If you have any doubts, seek the help of your teacher. Completed worksheet should be submitted to the teacher after self assessment.

Chapter 5

Soldiers of defense

Part 1

In this chapter we have to learn about the importance of blood and lymph in the immune system. You have learned about the structure of blood and lymph in lower classes. Try to find the answers to the following questions for yourself based on what you have learned. Evaluate your learning level by comparing it with the answer key.

Worksheet

(1) Identify the tissue from the following in which blood is included.

- ◆ Epithelial tissue
- ◆ Muscular tissue
- ◆ Nervous tissue
- ◆ Connective tissue

(2) Which of the following is not included in tissue fluid?

- ◆ Monocyte
- ◆ Platelet
- ◆ Fat
- ◆ Lymphocyte

(3) Plasma protein that helps regulate blood pressure.

- ◆ Albumin
- ◆ Globulin
- ◆ Fibrinogen
- ◆ Prothrombin

(4) Choose only the correct ones from the following statements

- ◆ 90-92% of blood plasma contains proteins.
- ◆ Lymph is the tissue fluid inside the lymph capillaries.
- ◆ The simpler molecules formed as a result of digestion, reach cells through the blood cells.
- ◆ Globulin is a plasma protein that helps in the clotting of blood.

(5) Which of the following is included in lymphatic system.

- ◆ Heart
- ◆ Blood vessel
- ◆ Spleen
- ◆ Kidney

Evaluate your responses with the help of worksheet evaluation indicators.

Complete the worksheet satisfaction

Partially complete the worksheet

Need improvement

Part 2

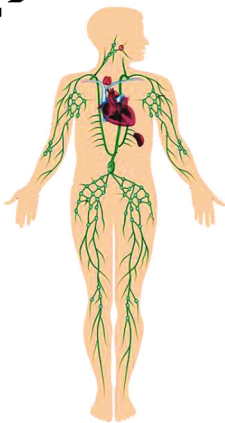
Activity 1

Slides prepared to conduct a seminar on body fluids is given below. Analyse them and complete the activities.

Slide 1

Blood is a fluid connective tissue that performs functions such as transport and immunity. Plasma is a pale yellow liquid that makes up 55% of blood. Blood cells that includes 45% of blood are found in the plasma. The simpler molecules formed as a result of digestion, reach cells through the plasma. Plasma consists of 90-92% water, 7-8% proteins, fats, salts, urea, sugars, hormones and other components. Albumin, which regulates blood pressure, globulin, which helps immunity, and fibrinogen, which clots blood, are plasma proteins. The blood cells are red blood cells, white blood cells and platelets.

Slide 2



When blood flows through capillaries, the fluid part of blood oozes into intercellular spaces through minute pores of the capillary wall. This fluid, formed in the intercellular space, is the tissue fluid. It does not contain RBCs, large protein molecules and platelets. Exchange of materials takes place between the tissue fluid and cells. Tissue fluid is absorbed into the blood and lymph capillaries. Lymph is the tissue fluid inside the lymph capillaries. The lymph formed from blood passes through lymph ducts and returns to blood near the heart. In addition to lymph, the lymphatic system consists of lymph capillaries, lymph ducts, lymph nodes and Spleen. This plays a major role in defending disease causing germs.

(i) Find the odd one and write the common feature of others

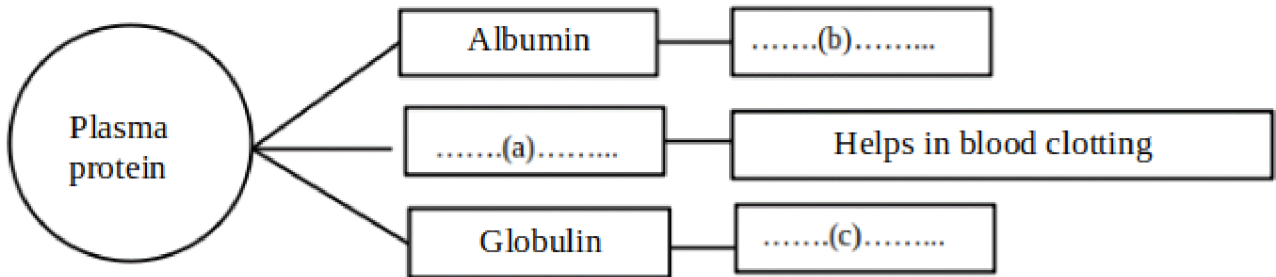
Red blood cells, White blood cells, Albumin, Platelet

.....

.....

.....

(ii) Complete the following illustration suitably



(a).....

(b).....

(c).....

Activity 2

Make notes on the following

(i) Formation of tissue fluid

.....
.....
.....

(ii) Structural peculiarity of tissue fluid

.....
.....
.....

(iii) Lymphatic system

.....
.....
.....

Worksheet evaluating indicators

- (1) Connective tissue
- (2) Platelet
- (3) Albumin
- (4) Lymph is the tissue fluid inside the lymph capillaries.
- (5) Spleen

This is a self learning material

NB: If you have any doubts, seek the help of your teacher. Completed worksheet should be submitted to the teacher after self assessment.

Chapter 6

Unravelling Genetic Mysteries

Part 1

In the chapter, **Unravelling Genetic Mysteries**, we will learn about the heredity and variation. Genes that carry Hereditary traits and their functions are discussed in this chapter. Based on what you have learned in classes 8 and 9 regarding this lesson, try to find out the answers to the following questions for yourself.

Worksheet

(1) Find out the regulatory centre of the cell from the following.

- ◆ Ribosome
- ◆ Nucleus
- ◆ Mitochondrion
- ◆ Vacuole

(2) Karyokinesis means.

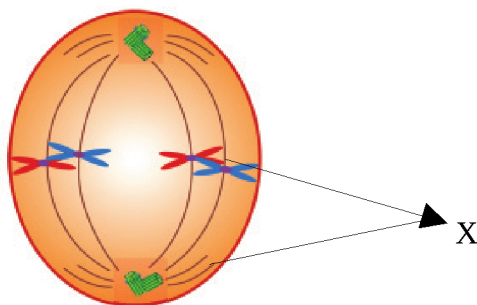
- ◆ Division of Cytoplasm
- ◆ Another name of Mitosis
- ◆ Another name of Meiosis
- ◆ Division of Nucleus

(3) Analyze the hints given in the box and find out which part of the nucleus it refers to.

- Seen as a network in the nucleoplasm.
 - Consists of genes.

- ◆ Chromatin reticulum
- ◆ Nuclear pore
- ◆ Nucleolus
- ◆ Nuclear membrane

(4) Name the part labeled as X in the figure.



- ◆ Centromere
- ◆ Chromatid
- ◆ Spindle fibres
- ◆ Chromatin reticulum

(5) Identify the word relation and fill in the blank.

(Score 1)

- Telophase : Formation of daughter nuclei.
..... : Chromosomes are arranged at the centre of the cell.
- ◆ Beginning of the Prophase
 - ◆ Metaphase
 - ◆ Anaphase
 - ◆ Ending of the Prophase

Evaluate your responses with the help of worksheet evaluation indicators.

Complete the worksheet satisfaction

Partially complete the worksheet

Need improvement

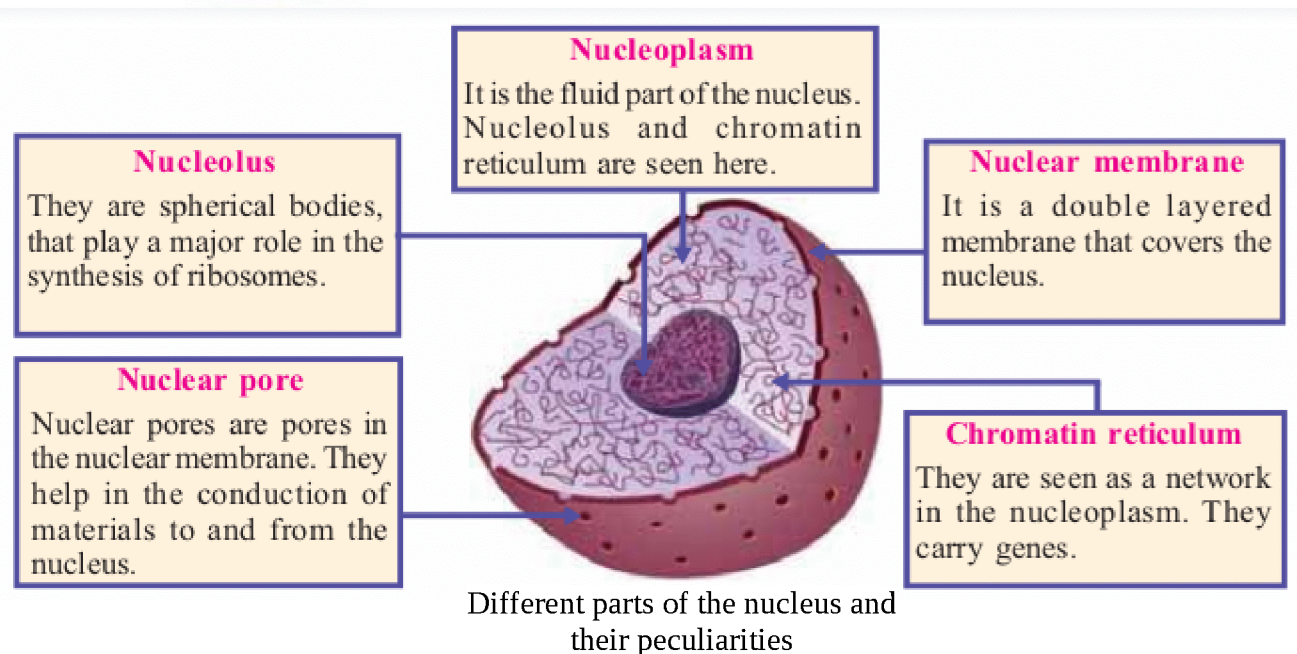
Part 2

Analyze Sneha's science diary and illustration and complete the given activities.



Nucleus - the regulatory centre of the cell

The various proteins produced in the cell play a major role in regulating various activities in the cell. The synthesis of proteins is under the control of genes in the chromatin reticulum in the nucleus



Activity 1

Why the nucleus is considered as the regulatory centre of the cell?

.....

.....

.....

Activity 2

Complete the given table suitably.

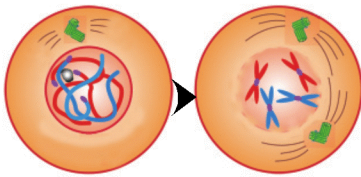
Part	Peculiarity / Function
Nuclear membrane	
	Conduction of materials to and from the nucleus
	The fluid part of the nucleus.
Nucleolus	

Given below are presentation slides prepared by a teacher for using in a class on growth of the body. Analyze them and complete the given activities.

Mitosis

Mitosis is the type of cell division that helps in the growth of the body. During mitosis, division of nucleus takes place first. This phase is known as karyokinesis. The second phase of cell division is the division of Cytoplasm. This is known as cytokinesis. Cytokinesis completes through the following 4 phases.

Prophase
Metaphase
Anaphase
Telophase



Beginning

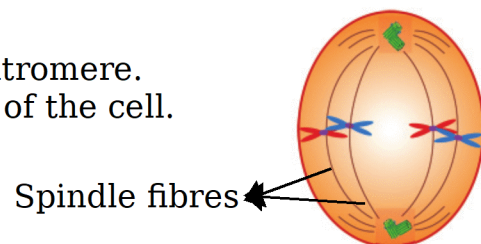
End

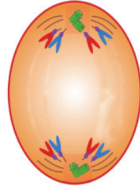
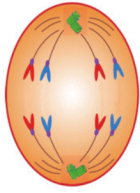
Prophase

Chromatin reticulum condenses to form chromosomes and get duplicated. Spindle fibres are formed from the centrioles.

Metaphase

Spindle fibres are connected to the centromere. Chromosomes are arranged at the centre of the cell.



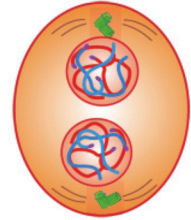


Anaphase

Centromere divides and chromatids are separated. Separated chromatids move to opposite poles of the cell. Daughter chromosomes are formed.

Telophase

Chromosomes are converted to chromatin reticulum. Nuclear membrane is formed around the chromatin reticulum and two daughter nuclei are formed. The daughter nucleus has the same number of chromosomes as the mother cell.



Activity 3

Fill in the blank.

Division of Cytoplasm : Cytokinesis
Division of Nucleus :

Activity 4

Complete the given table suitably.

Division of the nucleus	
Stages	Changes

Worksheet evaluating indicators

- (1) Nucleus
- (2) Division of the nucleus
- (3) Chromatin fibres
- (4) Spindle fibres
- (5) Metaphase

This is a self learning material

NB : Seek the help of your teacher if you have any doubts. Completed worksheet should be submitted to the teacher after self-assessment.