

**BIOLOGY IX-X GRADES
LIST OF PRACTICALS**

Chapter 1: Introduction to Biology	
1.	Study of different types of bacteria with the help of prepared slides and of <i>Amoeba</i> , <i>Paramecium</i> , <i>Volvox</i> from prepared slides/ fresh culture/charts
2.	Study of external morphology of mustard plant and microscopic examination of root, stem, leaf, flower, fruit and seeds.
3.	Identification of major organs and organ systems in a dissected frog (Dissection by demonstrator / teacher)
Chapter 2: Solving an Biological Problem	
	No Practical Activity
Chapter 3: Biodiversity	
4.	Observation of the apparent distinguishing taxonomic characters from fresh and preserved specimens and recognition of plants and animals on the basis of their taxonomic characters
5.	Evaluation of graphs of a population of an insect, which is endangered (due to excessive use of insecticides) and interpret the reasons for its endangered status.
Chapter 4: Cells and Tissues	
6.	Use of microscope to observe movement of water in plants and to compare sizes of various types of cells
7.	Examination under the microscope an animal cell (e.g. from frog's blood) and a plant cell (e.g. from onion epidermis), using an appropriate temporary staining technique, such as iodine or methylene blue
8.	Identify, from fresh preparations, the cell membrane, nucleus and cytoplasm in an animal cell and the cell wall, cell membrane, sap vacuole, cytoplasm, nucleus, and chloroplasts in a plant cell
9.	Preparation of the wet mounts of tissue from flowering plants and study of plant and animal tissues from charts and prepared slides
10.	Determination of the effect of tonicity on plasmolysis and deplasmolysis in plant cells or in Red Blood Cell
11.	Data collection on the number of stomata per unit area on various plant leaves that grow in areas of differing humidity, and compilation of data in a spreadsheet and graph it to determine whether there is a relationship between the variables
Chapter 5: Cell Cycle	
12.	Observation of various stages of mitosis and meiosis by slides, model and charts
13.	Preparations of root tip squashes and study stages of mitosis
Chapter 6: Enzymes	
14.	Experiment to show working of enzyme in vitro e.g., pepsin working on meat in test tube National 76 Curriculum for Biology IX-X

15.	Experiment to test enzyme action by putting diastase in a starch solution in test tube at 37°C and after fifteen minutes performing iodine test for presence of starch
Chapter 7: Bioenergetics	
16.	Demonstration of the process of photosynthesis using an aquatic plant, like <i>Hydrilla</i>
17.	Identification and labeling of the cellular and tissue structure in the CS of a leaf through observation under the microscope.
18.	Investigation of the necessity of chlorophyll, light, carbon dioxide, using appropriate controls
19.	Experiment to demonstrate the process of respiration in germinating seeds by using limewater
20.	Investigation of the release of carbon dioxide and heat during Aerobic Respiration in germinating seeds
Chapter 8: Nutrition	
21.	Food tests: Benedict's test for reducing sugar, iodine test for starch, spot test and emulsion test for fat, and Biuret test for protein in solution
22.	Microscopic examination of a transverse section of the small intestine to show the villi
Chapter 9: Transport	
23.	Measurement of differences in length/weight of raw potato strips in concentrated salt solution and water
24.	Observation of root hairs on a growing root of onion, carrot etc
25.	Microscopic observation of the structure and number of stomata in an epidermal peel of a leaf
26.	Investigation of the rate of water loss at the two surfaces of a leaf by a simple experiment using cobalt chloride paper
27.	Investigation of transpiration in potted plant under a bell jar
28.	Identification of xylem and phloem tissues in the prepared slides of stem, root and leaf
29.	Investigation of the pathway of water in a cut stem, using a suitable stain
30.	Identification of red and white blood cells under the light microscope on prepared slides and in diagrams and photomicrographs
31.	Investigation of the effect of physical activity on pulse rate
32.	Experiment to show the capillary flow in a fishtail or fin or frog's web
Chapter 10: Gaseous Exchange	
33.	Activity to compare the breathing rate at rest and after exercise
34.	Experiment to find out how much air a person can take into his lungs
35.	Demonstration through experiment of breathing out air into limewater that carbon dioxide is exhaled during respiration
36.	Demonstration of the presence of tar in cigarette smoke and also by charts showing pictures of lungs of smokers and nonsmokers
Chapter 11: Homeostasis	
37.	Examination of the structure of kidney (sheep kidney / model)
Chapter 12: Coordination in Man	

38.	Observation and recording of the difference in quickness of response of the two types of coordination (by asking a student to say a few words in front of the class and observe the change in heartbeat)
39.	Experiment to observe the contraction in the shin muscle of frog in a Petri dish filled with methylene blue and using 12 V DC current
40.	Study of bull eye
Chapter 13: Support and Movement	
41.	Investigation of the nature of bone (by putting three pieces of rib bone of lamb in water, NaOH and dilute HCl)
Chapter 14: Reproduction	
42.	Observation of binary fission of ameba using slides, photomicrographs or charts
43.	Observation of budding in yeast from prepared slides
44.	Examination of a bulb (onion), corn (<i>Edocasia</i>), rhizome (ginger) or stem tuber (potato) and its cultivation to get new plants
45.	Propagation by stem cuttings (rose or any locally available plant) and <i>Bryophyllum</i> leaf
46.	Examination of Mustard flower, Gram seed and Maize grain
47.	Investigation of the conditions for seed germination
Chapter 15: Inheritance	
48.	Recording the heights of class fellows to predict which kind of variation is it and presentation of the data of class fellows' heights in graphical form (either histogram or bar chart)
Chapter 16: Man and His Environment	
49.	Investigation of an ecosystem e.g. a balanced aquarium/pond
Chapter 17: Biotechnology	
50.	Investigation about the role of yeast and bacteria in the fermentation of flour and milk
Chapter 18: Pharmacology	
	No Practical Activity