

SCIENCE

BIOLOGY (CLASS XI-XII)

Biology (Class-XI)

Learning Outcomes	Sources/ Resources	Suggested Activities (to be guided by teachers)
<p>The learner</p> <ul style="list-style-type: none"> – differentiates organisms, phenomena and processes based on certain characteristics and salient features such as living and nonliving, acellular, unicellular and multicellular; different groups of organisms, etc. – identifies and classifies organisms based on certain characteristics / salient features systematically in more scientific and organised manner; such as five kingdom classification, several levels of organisation of classification of Plant and Animal Kingdom, taxonomic categories, etc. – efficiently explains systems, relationships, processes and phenomena, such as, systematic binomial nomenclature of organisms; basis and systems of biological classification and their characteristics; life cycles of various plants and animals; importance of 	<p>NCERT/State Textbook</p> <p>All flip textbooks of NCERT are available on the following website https://epathshala.nic.in/process.php?id=students&type=eTextbooks&ln=en</p> <p>QR codes on the <i>Textbook of Biology, Class XI</i> for e-resources</p> <p>E-resource available on NROER National Repository of Open Educational Resources (NROER) https://nroer.gov.in/home/e-library/</p> <p><i>Exemplar Problem – Biology, Class XI</i> http://ncert.nic.in/ncerts/1/Keep401.pdf</p> <p>http://ncert.nic.in/ncerts/1/Keep402.pdf</p>	<p>WEEK 1</p> <p>Unit I Diversity in Living World</p> <p>Chapter 1: Living World</p> <ol style="list-style-type: none"> 1. Learners in biology class may be involved using the available resources, such as, textbooks available on e-pathshala, e-resources available on QR codes etc., in making a survey of literature and explore their surroundings and differentiate life forms on the basis of their defining features, such as, growth, reproduction, metabolism, consciousness, etc. 2. Learners may explore videos on YouTube to find out various life forms on the earth to understand diversity in life forms; the biodiversity. 3. Learners may be involved to enlist organisms in their surroundings and may be allowed to surf internet to find out the generic and specific names of the organisms enlisted by them. Later they may be assessed for the importance of naming the plants and how to write the generic and specific names of an organism. 4. Learners may be involved in an activity such as collecting data about any common plants having two species under the same genus, two genera under the same family, and other taxonomic categories and so on to understand the hierarchical arrangement of these taxonomic categories and submit a report. 5. Learners may be involved in an investigatory project on the topic “Taxonomical Aids and their importance” using various resources and make a presentation for five minutes on Zoom or any video conferencing platform.

<p>taxonomical aids, Biodiversity, etc.</p> <ul style="list-style-type: none"> - draws labelled diagrams, flow charts, concept maps, and graphs, such as, structure of various organisms; life cycles of various plants and animals, systematic classification, etc. - plans and conducts investigations and experiments to arrive at and verify the facts, principles, phenomena, or to seek answers to queries on their own, with organisms in nature to verify their lifecycle and seek answer to the queries on their own, such as, bryophytes and pteridophytes follow haplo-diplontic life cycle, etc. - applies scientific concepts in daily life and solving problems, such as, conserving and using medicinal plants or products for maintaining health and wellbeing, etc. - handles laboratory and agricultural tools, and apparatuses, instruments and devices properly for performing activities/ experiments/ investigations, such as, developing a kitchen garden/ vertical garden, etc. - draws conclusion from activities/experiments and investigatory projects they perform, 	<p>http://ncert.nic.in/ncerts/1/Keep403.pdf</p> <p>http://ncert.nic.in/ncerts/1/Keep404.pdf</p> <p><i>Laboratory Manual of Biology, Class XI</i> http://ncert.nic.in/ncerts/1/kelm301.pdf</p> <p>http://ncert.nic.in/ncerts/1/kelm302.pdf http://ncert.nic.in/ncerts/1/kelm303.pdf</p> <p>NCERT Official – YouTube https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA</p> <p>Live telecast on Swayam Prabha Channel for various concepts of Biology</p> <p>MOOCs at Swayam</p> <p>ITPD package on Biology developed for teachers at Higher Secondary Stage</p>	<h2 style="color: purple;">WEEK 2</h2> <h3 style="color: purple;">Chapter 2</h3> <p>Classification of Living Organisms</p> <ol style="list-style-type: none"> 1. Learners may be encouraged to watch YouTube video on five kingdom classification and draw a concept map in the form of a tree showing all five kingdoms with their characteristic features. 2. Learners may be encouraged to work on computer and using paint and brush they may be encouraged for making colored drawing and painting of different organisms with proper labelling with important features and organise them under five kingdom classification and make an e-book and pdf version of the e-book may be shared with peers. The e-book may later be compiled by all learners of Class XI and kept for reference for all school learners. 3. The learner may be facilitated with the YouTube video links and to surf the internet to collect the information about the acellular and may be encouraged to self-assess with the interactive assessment items. <h2 style="color: purple;">WEEK 3 AND 4</h2> <h3 style="color: purple;">Chapter 3: Plant Kingdom</h3> <ol style="list-style-type: none"> 1. Learners may be encouraged for surfing internet on given topics related to Plant Kingdom, '<i>Plantae</i>' in groups and develop a power-point presentation and share with all on google group. After an incubation period of one day teacher may initiate discussion on the given investigatory projects on WhatsApp group where learners will find the opportunity to argue, discuss, share and assess their own thoughts. 2. The learner may be facilitated to make a herbarium of 10 common weed plants in their area. Using herbarium sheets, write their systemic positions and share with peers. 3. Learners must be facilitated to collect five cereals, five pulses, five spices and condiments, three oil yielding and two beverages from their kitchen. With the help of internet, write their
--	---	---

<p>such as, there are a variety of life forms on the earth; a group of organisms like those under <i>plantae</i> or <i>animalia</i> may have many similar characteristics; etc.</p> <ul style="list-style-type: none"> - communicates the findings and conclusions effectively, such as, takes part in the discussion over ZOOM platforms or WhatsApp media about characteristics of different phyla under animal kingdom; or methanogens are present in guts of ruminants and they play an important role in biogas production, etc. - exhibits creativity in designing models using eco-friendly resources/preparing charts/paintings/sketching, etc., on different topics, such as, role of plants or animals in environmental conservation or structure of an insect, etc. - exhibits values of honesty, objectivity, rational thinking and freedom from myth and superstitious beliefs while taking decisions, such as, reports and records experimental data accurately, reveals respect for life by 		<p>levels of organisation of classification and prepare a poster under the topic "Plants Products in Daily Life". Discuss and share it with peers.</p> <ol style="list-style-type: none"> 4. Each Learner may be assigned to draw/trace life cycle of any one plant from any of the five groups under <i>plantae</i> and be allowed to discuss the type of alternation of generation of each of the plants. Later all learners relate the presence of the type of alternation of generation in algae, bryophytes, pteridophytes, gymnosperms and angiosperms. 5. Learners may be allowed to plant five indoor plants and conserve them. Take their pictures and make a poster on power point and write their classification using internet. They may be allowed to share their work with peers. <p>WEEK 4</p> <p>Chapter 4: Animal Kingdom</p> <ol style="list-style-type: none"> 1. Learners may be divided in 11 groups and each group is allowed to work on 11 different <i>phyla</i> of <i>animalia</i>. They may be encouraged to record their salient features such as, level of organisation, symmetry, <i>coelom</i>, etc., and member animals belonging to that particular <i>phylum</i> and put colored pictures from internet with their classification. The report of each group may be presented by the group members using Zoom/Google platform and circulated for review among all 11 groups for comparison with other phyla and comments. Later the learners may be encouraged to draw a concept map of different phyla and share with peers for discussion and improvement. 2. The learner may be called upon at ZOOM/Google platform to debate upon the topic 'Role and Importance of Animals in Biodiversity Conservation', or 'Role of methanogens in biogas production', where all learners are encouraged to share their views. Learners were allowed to work as reporters in each others' sessions and they may be encouraged to make a brief report.
---	--	--

<p>conserving plants and animals, etc.</p> <ul style="list-style-type: none"> - makes efforts to conserve environment realising the inter-dependency and inter-relationship in the biotic and abiotic factors of environment, such as, by appreciating conservation of medicinal plants and rearing of pets etc - applies scientific concepts in daily life and solving problems, such as, by maintaining aquarium, conserving medicinal plants, etc. 		<p>The report may be kept in the school library as reading material.</p>
---	--	--