Bhartiya Vidya Mandir Sen. Sec. School,Sector 39, Chandigarh Road, Ludhiana

XII Biology Syllabus

OOK: NCERT

Month	Unit/Chapter/Topic	Learning Objective	Resources/Art-Integrated Pedagogy Tools Used /E-Resources		Learning Outcomes /Skills Learnt
APRIL	Sexual reproduction in flowering Plants Pollination Fertilization Development of seeds parthenocarpy ,Apomixis, polyembryony Human Reproduction – Male and female reproductive system, Gametogenesis Fertilization Parturition Reproductive health – prevention of STD Birth control methods Medical termination of Pregnancy Amniocentesis Infertility and assisted reproductive technologies	Specific objectives To make the learners understand about the asexual and sexual reproduction in flowering plants To acquire knowledge of Pre fertilization , fertilization and post fertilization events To make them learn and understand about the of Male and Female reproductive System Learn and understand on the hormonal changes during puberty.	*Discussion *Brainstorming *Questioning *Contextual teaching and learning ***Lab Activity** 1 Prepare a temporary mount to observe pollen germination. 2 Prepare a temporary mount of onion root tip to study mitosis. 3Flowers adapted to pollination by different agencies (wind, insects, birds). 4. Pollen germination on stigma through a permanent slide or scanning electron micrograph. 5 Identification of stages of gamete development, i.e., T.S. of testis and 6 T.S. of ovary throughpermanent slides (from grasshopper/mice). 7. Meiosis in onion bud cell or grasshopper testis through permanent slides. 8 T.S. of blastula through permanent slides (Mammalian).	**Reproduction in flowering plants**. https://youtu.be/qJMhi2AeV3k?si=UvMYkIkV9GuKAJgW **Human Reproduction** https://youtu.be/Yiqp3_Ilh_c?si=Zy2VEj85BvWg9Kxj	Understood the various ways of asexual and sexual reproduction in plants Analyse and interpret the role of different hormones in the life span of the organism. Understand about clones, identical and non identical twins Consider the evolutionary advantages of the genetic variation that comes from sexual reproduction. Students will develop decision making and logical thinking. SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion
MAY	Reproductive health – prevention of STD Birth control methods Medical termination of Pregnancy Amniocentesis Infertility and assisted reproductive technologies	Disorders of the reproductive system Create awareness regarding various sexually transmitted diseases Educate and make them aware of Amniocentesis To make aware of different Assisted reproductive technologies	*Discussion. *Brainstormi ng. *Questioning *Contextual teaching and learning	https://youtu.be/dwoqbEdPrg0?si=oDS3PaSPtl9yJani	Students will inculcate the applications of Assisted Reproduction Technologies which assist infertile couples to have children. Students will be educated regarding developments to overcome population explosion. SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion
	Principles of Inheritance and variation Mendel's Laws of Inheritance Inheritance of one gene theory Inheritance of two gene theory Sex determination Mutation Genetic disorderPrinciples of Inheritance and variation Mutation Genetic disorder	Specific objectives : Explain and understand Mendel's monohybrid and dihybrid experiment and draw the different laws like law of dominance, independent assortment, law of segregation. Understand and express the limitations of Mendel's experiment Describe Chromosomal theory of inheritance and will understand how it modified Mendel'slimitations. Understand ABO- blood group and the concept of dominance, co-dominance and muliple allelism	Contextual teaching and learning. *Chalk and Board ***Lab activities** 1 Mendelian inheritance using seeds of different colour/sizes of any plant. 2. Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colour blindness	principal of inheritance https://youtu.be/ZJ2RniQzUw?si=ZMnGludt_kgdN5AV	Students have learnt to Illustrate the monohybrid and dihybrid crosses Analyze and infer the cause of blood groups and its importance during blood transfusion. Understand the importance of blood donation, use of blood bank separation of various blood components. Apply quantitative problem solving skills to genetics problems and issues Relate the chromosomal abbrebations with real life situation SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion

	Molecular basis of Inheritance □ The DNA □ The search of Genetic Material □ RNA World □ Replication □ Transcription □ Genetic code □ Regulation of gene expression □ Human Genome Project DNA Fingerprinting	□Understand the location and chemical composition of DNA. □Explain the process of protein synthesis . □Understand the Human Genomic project which provide information for	**Tools** : Contextual teaching and learning *Chalk and Board *Concept Mapping **Lab Activity**- Study the model of DNA	https://youtu.be/IJvzFiXiCAA?si=kLsbDEEe2Y3s_tzq	□The students will understand the importance of DNA in all activities □The students learnt how DNA finger printing helps in Forensic sciences □The learners learnt about the human genomic project which helped in identifying and preventing many hereditary disease SKILLS: *Scientific attitude and temper *Observation *Analysis *Conclusion
June	**SUMMER VACATIONS**				
July	Evolution □ Origin of life □ Evolution of Life Forms □ Evidences of evolution □ Adaptive radiation □ Biological Evolution □ Mechanism of Evolution □ Hardy Weinberg Principle □ Brief Account of evolution Origin and evolution of man	.□ Understand different theories on evolution.	**Tools** : Contextual teaching and learning *Chalk and Board *Concept Mapping **Lab Activity**-Flash cards models showing examples of homologous and analogous organs.	https://youtu.be/nNNWK6rthjQ?si=9hP0-mRDjLAYfMSK	□The students learnt about the life cycle of malarial parasite and the different stages of life cycle it completes in different host □Students learnt to prevent themselves from different diseases by observing signs and symptoms. SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion
	Human health and Diseases □ Disease, Types of disease: Congenital and acquired, common diseases(pneumonia, common cold, malaria, ascariasis) □ Immunity, □Development of immunity, types of immunity □ vaccination, kinds of defence mechanism,external defence, internal defence – cellular and cytokine barrier, □Addiction (tobacco, alcohol, drugs	□Understand and explain about different diseases its cause, causative agents, symptoms, life cycle, preventive measures. □Explain about immunity its type : inborn or acquired. Inborn is accomplished by providing different types of barriers – physical, physiological, cellular and cytokine. Acquired- Active and passive. □Understand the concept of Addiction and explain different social disease like, smoking, drinking, drugs.	**Tools** :Contextual teach and learning *Chalk and Board *Concept Mapping. **Lab Activity**-Common disease causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus causing ringworm through permanent slides,		The students learnt about the life cycle of malarial parasite and the different stages of life cycle it completes in different host Students learnt to prevent themselves from different diseases by observing signs and symptoms. Analysed different strategies in the improvement in food production. Synthesize some genetic disorders can be cured by genetic transformations. The learners understood thatchromosomal abbrebation can lead to genetic disease. SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion

	Microbes in Human Welfare Microbes in human welfare □ house hold □ industrial □ antibiotics □ sewage □treatment	□Understand and express the benefits of bacteria in probiotics, antibiotics, industrial and sewage treatment.	**Tools** Contextual teaching and learning *Chalk and Board *Concept Mapping * Brainstorming. **Activity**-List the microbes used in houses,industries and in medical field		□Learnt the way to conserve the exotic plants by tissue culture □The learners understood the role of microbes in sewage treatment,biogas production, preparation of antibiotics, biofertilizers enzymes etc. SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion
August	Principles of Biotechnology Tools for recombinant DNA Technology Process of Recombinant DNA technology Biotechnology and its Application □ Principles and process of Biotechnology □ Genetic engineering □ Biotechnological application in Agriculture □ Biotechnological Application in Medicines □ Transgenic Animals & Ethical Issues	□Understand Basic concept of genetic engineering □Learn basic tools of rDNA technology □Describe restriction enzymes, cloning vecto □Understand procedures, to transfer rDNA into host cell, □Apply procedures to identify recombinants, Acquire knowledge of DNA sequencing, □Enumerate the applications of PCR. □Understand techniques of isolating, purifying and manipulating the DNA. □Learn methods of gene sequencing and DNA fingerprinting	Tools :Contextual teaching and learning *Chalk and Board *Concept Mapping * Brainstorming. **Lab Activity**-. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.	https://youtu.be/kFitbn-cwN4?si=bxL-ByDTLGqemYuk	□The students learnt the process of r-DNA technology □The learners understood how the technology is used in the large scale production of antibiotics, enzymes etc in industries □The students learnt about the different techniques which could be applied to transfer the genes. □The students learnt about the gene therapy which enabled the medical scientist to replace the defective gene responsible for hereditary disease □Demonstrate their ability to reason both inductively and deductively with experimental information and data. SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion
September	**Term -I Exam**				
October	ECOLOGY Organisms and Populations Organisms and environment: □ Habitat and niche, population and ecological adaptations; □populationinteractions - □ mutualism, □competition, □predation, □parasitism; □population □Attributes-growth, birth rate and death rate, age distribution	Specific objectives □Students will be familiarized with various hierarchial levels of organization likeOrganism, Population, Community, Biosphere Ecosystem. □To explore their critical thinking by studying population growth and growth models □To make them share their opinion in population interactions	**Tools** : Contextual teaching and learning *Chalk and Board *Concept Mapping **Lab Activity**-. Models specimen showing symbtic association in root modules of leguminous plants, Cuscuta on host, lichens		□The learners can distinguish between density dependent and density independent birth and death rates. □They will be well versed with the analysis of population data using statistics, graphs, life tables, survivor curves. □Understand how interaction among species such as competition predation, parasitism and mutualism organize a community. SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion

November	Ecosystem □ Patterns, components; □ ecological . productivity and decomposition; □ energy flow; pyramids of number, biomass, energy;	□Describe various biotic components in ecosystem like producers, consumers decomposers and certain abiotic components □Understand different types of food chains, grazing and detritus food chain □Acquire knowledge of different types of ecological pyramids □Understand ten percent law in energy flow models □Evaluate the mechanism of decomposition in ecosystem	Tools: Contextual teaching and learning *Chalk and Board *Concept Mapping **Activity** -Study the pyramid of number ,oraganic mass and energy in their place and area	https://youtu.be/j7VLLM6sMwE?si=nL6kNws8SBvHd6fI	□Interpret energy flow among population through food web and ecological pyramids □Learn to describe the major forces structuring community and explain how community structure can be represented by food webs. □Describe how energy from sunlight is transformed through an environment. □Analyze the importance of decomposition in ecosystem SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion
December	_x0002_Biodiversity and its Conservation Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation;hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks, sanctuaries and Ramsar sites.	□To evaluate and characterize different levels of Biodiversity □To analyse critically the factors contributing threat to extinction of biodiversity □To enumerate different methods of conservation of biodiversity, in situ and ex situ conservation. □Students will develop scientific temperament and inquisitiveness. □Students will analyze various methods of conservation of biodiversity	Tools : Contextual teaching and learning *Chalk and Board *Concept Mapping **Lab Activity**-1. Study the plant population density by quadrat method. 2 Study the plant population frequency by quadrat method.	https://youtu.be/LaMwoPB2frI?si=veMcv1M0apM94x99	□Describe the cultural uses of plants for food, fiber, medicine, biotechnology, etc. □Describe methods of how resources are valued. Critically analyze the factors involved in the historical evolution of conservation. □Analyze the general scientific bases of conservation. □Analyze conservation management as a land use strategy. SKILLS: *Scientific attitude and temper *Observation *Experimentation *Analysis *Conclusion
January	**Board Practical**				
February	**Board Examination**				