CHOITHRAM SCHOOL, MANIK BAGH, INDORE

ANNUAL CURRICULUM PLAN SESSION 2017 – 2018

CLASS: XII_Term-

SUBJECT:BIOLOGY

Month & Working Days	Theme/ Sub-theme	Learning Objectives		Activities & Resources	Expected Learning Outcomes	Assessment
		Subject Specific (Content Based)	Behavioural (Application based)			
June	**Principles of Inheritance and variation** • Mendel's Laws of Inheritance • Inheritance of one gene theory • Inheritance of two gene theory • Sex determination • Mutation • Genetic disorder	**Specific objectives :** Students will be able to 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	learn to appreciate the leadership quality by studying law of dominance proposed by Mendel students will learn to be independent by studying law of independent assortment and segregation. To explore the critical thinking of the society that females are not responsible for the sex of offspring as	To Study the pedigree chart on the genetic traits like widow's peak, Rolling tongue, Blood group, color blindness 2.To prepare a pedigree chart on any of the genetic disease. 3.Study of Mendelian inheritance using pea seeds of different colours and Size.	The students learnt to Illustrate the monohybrid and dihybrid crosses and evaluate phenotypic and genotypic ratio in different generation They learnt to analyze and infer the blood group present in them by the parental crosses The students understood the difference between mendelian cross and chromosomal inheritance The learners learnt how change in chromosomal number or point mutation can cause different type of	To prepare a pedigree chart on any of the genetic disease Unit test

		limitions of Mendel's experiment. Describe Chromosomal theory of inheritance and will understand how it modified Mendel's limitations. Understand ABO- blood group and the concept of dominance, co-dominance and muliple allelism. Understand the concept of sex determination and the mutations which leads to variation.	man is heterogametic and woman is homogametic. Sensitize that genetic disorders occurs due to change in chromosomal number, chromosomal abbrebations and mutations. Appreciate a new change (evolution) can be due to mutation which develops adaptability according to the environment. Infer the responsibility of genes for various traits.		genetic disease.	

July	**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 **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	Understand the location and chemical composition of DNA. Explain the process of protein synthesis Understand the Human Genomic project which provide information for various genetic diseases and its treatments. Understand and express the different pattern of sequencing of DNA by the process of DNA finger printing. Understand different	Appreciate the role of DNA to initiate and guide the process of protein synthesis. To explore the use of DNA finger print technique to find out variation in polulation, genetic disorders. They will be able to evaluate the importance Human genome project in preventing inherited disease. The learners could apply the knowledge of evolution of human beings by the molecular study of analogous and homologus organ in animals	1.Isolate DNA from Plant material. 2.Classifying the sequences into DNA, RNA and Protein. 3.Motif analysis of the given sample. 4.To make complementary sequence of the given nucleotide. . Study of analogous and homologus organ in various plants and animals	Relate the chromosomal abbrebations with real life situation. 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	**Assignment** **Unit test**

	man	theories on evolution.	and their anatomical evidences. .			
August	• **Biology & Human Welfare** • Human health and diseases • Common human diseases its causative agents and mode of transmission **Strategies for enhancement in food production** • Animal Husbandry • Management of Farm and farm animals • Animal Breeding and Plant Breeding • Plant breeding for developing resistance to insects • Single cell protein • Tissue culture	Understand and classify the disease into congenital- since birth (gene mutation, chromosomal aberrations, environmental factors- first two are transmitted to children where as environmentally are not) or acquired (after birth- communicable or non communicable) . communicable –infectious spread through pathogens and non-communicable- non infectious	Learn to imbibe awareness, concern, cleanliness to prevent themselves from different pathogenic diseases. Sensitize that genetic disorders occurs due to change in chromosomal number, chromosomal aberrations and mutations. Inculcate self control, determination to keep away from social diseases like, smoking, drinking, drugs etc.	To observe the permanent slides of disease causing organisms like Acaris, Ent amoeba, Plasmodium, Round worm and write the symptoms of the disease. 2. To visit sewage treatment plant to observe and understand about the primary and secondary treatment using microbes. To visit a Dairy Farm to observe and understand more on dairy farming Video on tissue culture to save exotic plants	The students learnt to draw the life cycle of malarial parasite showing different stages at 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 that chromosomal abbrebation can lead to genetic disease. Learnt the way to conserve the exotic plants by tissue culture.	Draw the life cycle of malarial parasite showing the stages at in different host

	Microbes in Human Welfare • Microbes in Household products • Industrial, Sewage Treatment, • In biogas production, In bio control Agents and Bio fertilizer Household, industrial, sewage treatment, energy generation	(organ ic disease, deficiency disease, hypo or hyper secretion of hormones, allergies and cancer, AIDS) 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	Analyze that productivity in farm animals are due to care and safety, personal hygiene. Apply knowledge of tissue culture in saving the exotic plants . Appreciate the useful use of microbes in day to day life. To explore the critical thinking of the society that microbes are not always bane but act as boon in our daily life.		The learners understood the role of microbes in sewage treatment,biogas production, preparation of antibiotics, biofertilizers enzymes etc.	

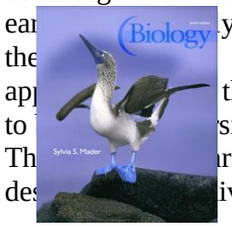
		passive. Understand the concept of Addiction and explain different social disease like, smoking, drinking, drugs Describe the ways by which productivity can be increased through plant breeding and Animal husbandry Understand and express the benefits of bacteria in probiotics, antibiotics, industrial and sewage treatment. The students will understand the use of organisms for the production	Appreciate the role of microbes to initiate and guide the process r-DNA To explore the critical thinking of the society that transgenic organism benefits	To Prepare vinegar from fruit peels by the process of fermentation To determine the action of salivary amylase in carbohydrates/starch at different pH and temperature		

	Biotechnology Principles and Process Principles of Biotechnology Tools for recombinant DNA Technology Process of Recombinant DNA technology	of materials ans services of benefit to human kind Students will understand gene manipulation by r-DNA Technology The students will learn about different methods to introduce DNA in host. They will understand large scale production using bioreacters	human kind Analyze the productivity of antibiotics, protein, enzymes etc are all due the R-DNA technology	. .		
September	**Biotechnology and its Application** • Principles and process of Biotechnology • Genetic engineering	Students will understand about the different techniques for the process of	Apply the knowledge of r-DNA in producing antibiotics, enzymes etc. .	. 1.Study the effect of antibiotics on microorganism 2.Study of drug resistance in bacteria	The students learnt the process of r-DNA technology The learners understood how the technology is used	To determine salivary amylase at different pH and temperature

	• Biotechnological application in Agriculture • Biotechnological Application in Medicines • Transgenic Animals & Ethical Issues	gene manipulation Students will understand the production of insulin by r-DNA technology Students will understand about genetically modified plants Like improvement in photosynthesis, herbicide resistance	Appreciate the useful use of genetic engineering in producing transgenic animals and plants To explore the critical thinking of the society that microbes are not always bane but act as boon in our daily life. Learn to appreciate the technology which had made our life more easy and comfortable rather creating ethical issues.	using antibiotics.	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.	

October	**Ecology and Environment Organisms and Populations** Organisms and environment: Habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism;	**Specific objectives** Students will be familiarized with various hierarchial levels of organization like-Organism,Population-Community,	To emphasized on development of skills like observational, experimental and inculcating values like Awareness, Responsibility	To determine population density and frequency by quadrate method. Adaptation of xerophytic and aquatic plants and animals	The students learnt how adaptation allows organism to survive and reproduce in natural environment The students have learnt to explain how single species population grow and regulate.	Half yearly Assignment

	population attributes - growth, birth rate and death rate, age distribution	Biosphere,Ecosystem. Students will learn about plant adaptation to different medium like light, salinity etc. To enhance their ability to learn and understand biotic community. To explore their critical thinking by studying population growth and growth models To make them share their opinion in population interactions	Students will exhibit critical thinking and problem solving slikk by determining population density. They will describe and practice scientific methods of observation, experimentation by finding population frequency. They will be able to evaluate that increase or decrease in population attribute is due to birth and death rates.		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. They learnt how community change in both space(biome and gradient)and time(succession) Students will be able to assess survival needs and interaction between organism and environment. Understand how interaction among species such as competition predation, parasitism and mutualism organize a community	
November	**Ecosystem** Ecosystems: Patterns, components; productivity and	Characterize a biological community and	Students will be able to	Analysis of Soil Texture, pH, Water holding capacity, Moisture content	The students will be able to analyse the roles of organism as a part of	Documentation of files Role play on ecological

	decomposition; energy flow; pyramids of number, biomass, energy; nutrient cycles (carbon and phosphorous); ecological succession; ecological services - carbon fixation, pollinat**ion**, seed dispersal, oxygen release (in brief). **Chapter-** **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.	species richness. Describe the factors that define an organism's ecological niche within its community. Understand how the interactions among species such as competition, predation, parasitism, and mutualism organize a community. Explain how ecological succession changes community structure and organization ovetime. Discuss the interactions of organisms with their environment that comprise an ecosystem.	analyze the roles of organisms as part of interconnected food webs, populations, communities, and ecosystems. Students will be able to assess survival needs and interactions between organisms and the environment. Students will be able to assess the requirements for sustaining healthy local ecosystems.	Role play on ecological pyramids of number, biomass and energy	interconnected webs, population, communities and ecosystem**.** They will learn to describe energy flow among population through food web and ecological pyramids The learns will learn to describe the major forces structuring community and explain how community structure can be represented by food webs. They will be able to describe how energy from sunlight is transformed through an environment. Explain how the abundance and distribution of organisms relate to resources availanle with environment. The students will be able to understand vast range of biological diversity on ear 

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		Identify the ways autotrophs, photoautotrophs, and heterotrophs obtain nutrients. Contrast the energy flow and chemical cycling within and among ecosystems. Describe the energy flow among populations through food webs and ecological pyramids. Diagram the water, carbon, nitrogen, and phosphorus biogeochemical cycles.	Identify the role of conservation biology with regard to biodiversity. Understand that conservation biology is an applied, goal-oriented, multidisciplinary field. Recall the increase in extinction rates throughout history. Know that biodiversity encompasses diversity of species, genetics, community, and landscape in marine, freshwater, and terrestrial habitats.		is measured and predict the consequences of continued species loss.	

			Discuss the direct and indirect value of biodiversity. Assess the factors responsible for the loss of biodiversity: introduction of exotic species, pollution, overexploitation, and disease. Explain how many species can be saved from extinction through the identification and conservation of biodiversity hotspots and/or keystone species. Justify the importance of conserving populations that have been subdivided due to habitat fragmentation. Describe how computer analyses can select areas for preservation and determine the minimal population size needed for survival. Recognize that the restoration of habitats is often involved in landscape preservation.			
December	**Environmental Issues** Air pollution and its control; water pollution and its control; agrochemicals and their effects; solid waste management; radioactive waste management; greenhouse effect and climate change; ozone layer depletion; deforestation; any one case study as success story	Understand the natural environment and its relationships with human activities which leads to pollution. Characterize and analyze human impacts on the environment which has caused climatic change,	The students will use critical and creative thinking to understand, formulate, or apply ethical responses to contemporary issues and challenges associated with global change	To study the suspended particulate matter in air at two different sites. To study pH, clarity and presence of living organism in water	The students will be able to Define and explain important concepts in the field of solid waste management, such as waste hierarchy, waste prevention, recirculation, municipal solid waste etc. understand the current evidence for global	Preboard

	addressing environmental issue(s). **Revision**	ozone layer depletion. Integrate facts, concepts, and methods from multiple disciplines and apply to environmental problems.	and life on a dynamic Earth. Expand awareness of self in a global society and effectively engage diverse perspectives, values, and cultures, ranging from local to global, in dealing with environmental and social issues..		warming understand the current warming in relation to climate changes throughout the Earth's history explain factors forcing climate change, and the extent of anthropogenic influence use scientific methods, quantitative and symbolic reasoning, and explore complex environmental issues and analyze the problems . Locate, interpret, synthesize, and apply relevant scientific information sources to address information needs for problem analysis and reporting. Use technical media as needed and communicate clearly in verbal and written modes as appropriate for public or professional science	

					audiences.	