

LESSON PLAN

REVISED CBSE SYLLABUS AND MONTHWISE DISTRIBUTION [2020-21]

SUBJECT BIOLOGY

CLASS XII

Unit-VI Reproduction

TERM 1 SYLLABUS

[MONTH:APRIL]

Chapter-2: Sexual Reproduction in Flowering Plants :- Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal

[MONTH:APRIL}

Chapter-3: Human Reproduction:- Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea).

[MONTH:MAY}

Chapter-4: Reproductive Health:- Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).

Unit-VII Genetics and Evolution [MONTH:MAY]

Chapter-5: Principles of Inheritance and Variation

Heredity and variation: Mendelian inheritance; deviations from Mendelism – incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; Sex determination - in human being, birds and honey bee; linkage and crossing over; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans -thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

[MONTH:JULY}

Chapter-6: Molecular Basis of Inheritance Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central Dogma; transcription, genetic code, translation; gene expression and regulation - lac operon; Genome, Human and rice genome projects; DNA fingerprinting

Unit-VIII Biology and Human Welfare

[MONTH:-AUGUST}

Chapter-8: Human Health and Diseases Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse

REVISION OF FIRST TERM [MONTH:-SEPTEMBER] PREBOARD IN [MONTH:-OCTOBER]

[MONTH:]January}

Chapter-10: Microbes in Human Welfare :-Microbes in food processing, industrial production, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers. Antibiotics; production and judicious use.

Unit-IX Biotechnology and its Applications[MONTH:]January]

Chapter-11: Biotechnology :- Principles and Processes Genetic Engineering (Recombinant DNA Technology).

Chapter-12: Biotechnology and its Application:- Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, biopiracy and patents. [September: revision]

Unit-X Ecology and Environment

[MONTH:February]

Chapter-13: Organisms and Populations:- Organisms and environment: Habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution. [MONTH:February]

Chapter-15: Biodiversity and its Conservation:- Biodiversity - Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

PRACTICALS

- A. A. List of Experiments TERM I:**
- 1. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.**
 - 2 .Prepare a temporary mount to observe pollen germination. TERMII :**
 - 3. Prepare a temporary mount of onion root tip to study mitosis.**
 - 4. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organism**

5. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity. Correlate with the kinds of plants found in them

Study/observation of the following (Spotting) TERM - I: .

B1 Flowers adapted to pollination by different agencies (wind, insects, birds).

B2 Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).

B.3 Meiosis in onion bud cell or grasshopper testis through permanent slides.

B.4 T.S. of blastula

through permanent slides (Mammalian).

B.5 Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colourblindness.

TERM – II:

B.6 Common disease - causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus causing ringworm through permanent slides, models or virtual images. Comment on symptoms of diseases that they cause.

B.7 Two plants and two animals (models/virtual images) found in xeric conditions. Comment upon their morphological adaptations.

B.8 Two plants and two animals (models/virtual images) found in aquatic conditions.

CHAPTER WISE LINKS OF VIDEOS

UNIT VI Reproduction

2 Sexual Reproduction in Flowering plants

<https://www.youtube.com/watch?v=6UXGobXdZGA>

3 Human Reproduction <https://www.youtube.com/watch?v=Lbv6WbjIQW0>

4 Reproductive Health <https://www.youtube.com/watch?v=NShd2e6m568>

UNIT VII Genetics and Evolution

5 Principles of Inheritance and Variation

<https://www.youtube.com/watch?v=agUgUlIQ1pk>

6 Molecular Basis of Inheritance https://www.youtube.com/watch?v=1xXeTccA-_w

<https://www.youtube.com/watch?v=XNdvpefKaYk>

Unit VIII: Biology and Human Welfare

8 Human Health and diseases [https://youtu.be/ AwlSyM1L8N4](https://youtu.be/AwlSyM1L8N4)

<https://www.youtube.com/watch?v=YA9KiI7gW5QAwlSyM1L8N4>

10 Microbes in Human Welfare https://www.youtube.com/watch?v=65sh_0kBuM8

Unit IX: Biotechnology and its Application

11 Biotechnology – Principles and Processes

<https://www.youtube.com/watch?v=TQRL9JnYkA4>

12 Biotechnology and its Application

<https://www.youtube.com/watch?v=xF7F3kAJmuQ>

Unit X: Ecology and Environment

13 Organisms and Populations <https://www.youtube.com/watch?v=L68S1t9XVgE>

15 Biodiversity and its Conservation <https://www.youtube.com/watch?v=pfPR0si>

LESSON PLAN

CLASS-XII

Subject- Biology

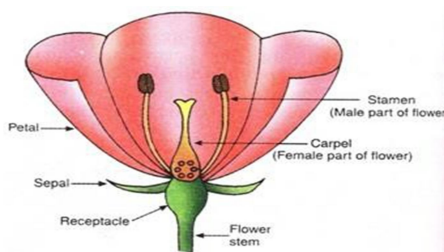
No. of Periods -8

TOPIC: SEXUAL REPRODUCTION IN FLOWERING PLANTS [month:-april]

Learning Objectives: Students will be able to

- 1) define the different terms like microsporogenesis, megasporogenesis, autogamy , geitonogamy.
- 2) differentiate between self pollination and cross pollination.
- 3) understand the development of ovule , pollen grain and seed formation.

P.K.TESTING :Teachers will ask following questions by showing China rose flower



- Name this flower.

- Name the reproductive part of plant.
- Where is pollen grain produced ?
- How is ovule formed ?

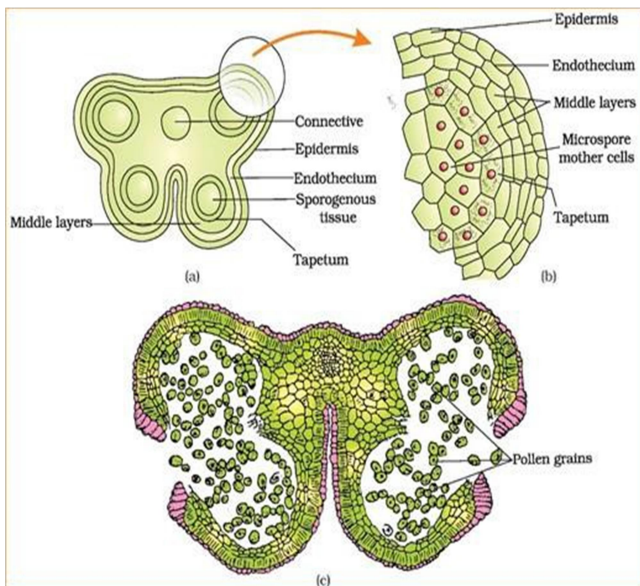
KEY WORDS / VOCABULARY :- Microsporogenesis, megasporogenesis ,synergid, antipodal cell, stomium, autogamy geitonogamy,allogamy apomictic , polyembryony etc.

Teaching aids and Innovative Pedagogic Method :-

- Online teaching through zoom app
- a. flower of china rose, pollen grain,
, different flower to study adaptation.
- b. Demonstration method, learning by doing, observation, visual clues etc
- c. Links of videos related to the topic will be shared in class group.

PROCEDURE -

- Teacher will introduce the topic by showing china rose flowers. Students will identify various parts of flower and locate male and female part of flower and its subparts like anther & filament, stigma, style and ovary.



- Teacher will demonstrate how to make T.S of anther and draw the labeled diagram of [T.S] anther on the white board by focusing camera on it during online class..

-Students will identify and observe various parts of T.S anther and relate it with the diagram.

- Teacher will discuss function of various parts of anther.

- Students will locate pollen grains from anther of available flower and observe it .

- Teacher will discuss the structure and germination of pollen grain by drawing diagrams on the board and by sharing link of video in the class group.

<https://www.youtube.com/watch?v=6UXGobXdZGA>

- Teacher will explain and demonstrate procedure of germination of pollen grain from the online lab by using simulator mode and students will also practice its simulation

<http://www.olabs.edu.in/>.

Pollination -: Teacher will show flower like china rose, wheat, bottle brush and ask certain questions to initiate discussion on the topic

a. What is the difference in the size of these flower ?

b. Which flower is more attractive?

c. Which flower is smaller in size ?

d. Why do insects and butterflies reaches flower ?

. Students will observe various adaptive features in the shown flower to identify its pollinating agents.

. Teacher will also show various types of pollination by sharing a link

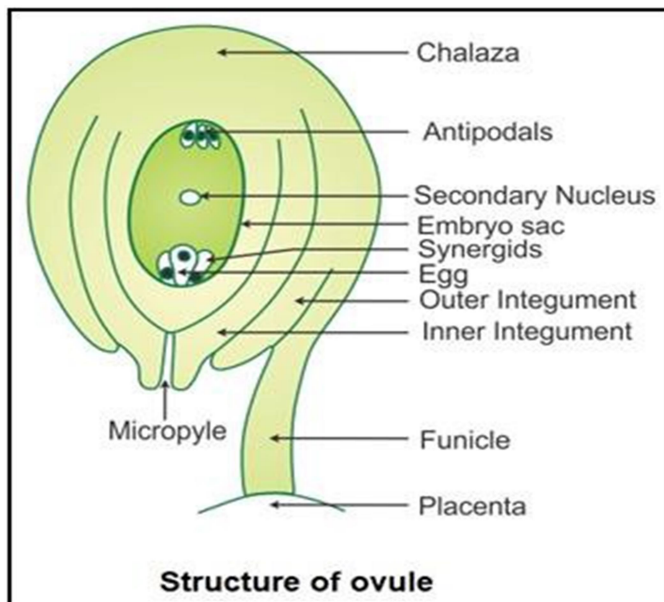
<https://youtu.be/sji9Eqi82mo>

<https://youtu.be/hCloCHwrJdQ> .

Female gametophyte

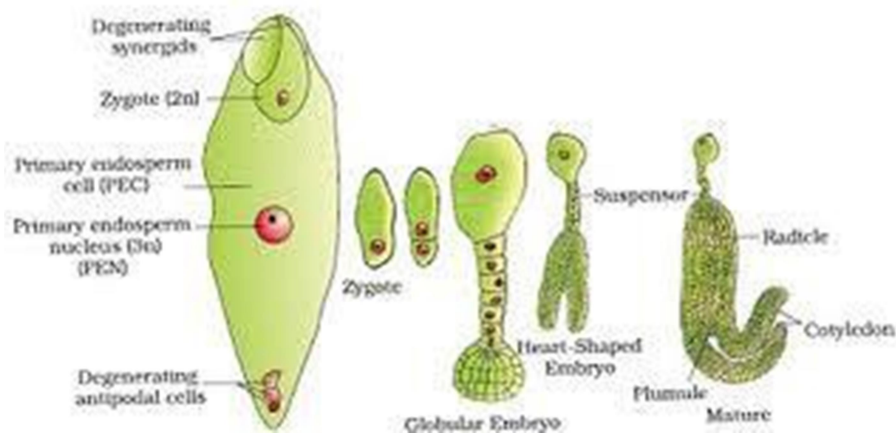
. Teacher will demonstrate and ask students to dissect flower and take out female part of the flower and display its part and name the part where ovule is formed during online class.

- Students will observe placentation and take out the ovule.
- Teacher will draw diagram of Anatropous ovule on the white board and discuss functions of various parts of ovule.
- Teacher will explain structure and development of female gametophyte by drawing diagrams .



Microsporogenesis	Megasporogenesis
1. The process of formation and differentiation of pollen grains from microspore mother cells by meiosis is known as micro-sporogenesis.	1. The process of formation and differentiation of megaspores from megaspore mother cells by meiosis is known as megasporogenesis.
2. Pollen grains are produced in the anther which is a broader knob like fertile part of the stamen.	2. Ovules (which are the future seeds) are formed in the ovary.
3. All the four pollen grains that are formed from microspore mother cell are functional.	3. Only one out of the four megaspores is functional.

- Fertilization changes, development of seed and fruit will be elaborated by sharing the picture during online class.



- Terms like apomixis, polyembryony will be defined and students will be asked to give examples. Teacher will make videos of lecture related to the topic and share in the class group on whatsapp.

PARTICIPATION OF STUDENTS:

- Students will dissect flower to identify its various parts. ----
- Students will identify, and observe the structure of anther from the available flower at home and relate it with the diagram. Student will simulate the experiment by using link of online lab--Temporary mount of pollen grain germination .

<http://www.olabs.edu.in/> link will be used to simulate this practical.

- They will draw the diagrams of anther, ovule etc
- Students will observe adaptive features in the shown flower for pollinating agents
- Students will answer various questions related to the content.

RECAPITULATION:- Teacher will ask questions for recapitulation

- What is microsporogenesis & megasporogenesis ?
- What is the function of stomium?
- Where does microsporogenesis occurs ?

ART INTEGRATION -: students

- will be able to draw diagrams.
- will be able to dissect and display various parts of flower.

Learning outcomes:- Students will be able to

- identify various parts of flower and locate male and female reproductive parts & pollen grains etc.
- analyze different adaptive features of flower for different pollinations.
- recognize the beauty of nature.

Resources:- NCERT Text book, links of khan academy and shiksha app

<https://youtu.be/6UXGobXdZGA>, <https://www.youtube.com/watch?v=6UXGobXdZGA>
<https://youtu.be/sji9Eqi82mo>

<https://youtu.be/hCloCHwrJdQ>

<http://www.olabs.edu.in/>

Co Scholastic Activities -: Students will develop skill of handling and observing flower parts.

- value the features and beauty of flowers.

Assessments -: Students will label the diagrams related to the topic and give objective test.

ASSIGNMENT

Students will practice MCQ questions from the link shared by the teacher in the class group. [www.inlearncbse](http://www.inlearncbse.com).

-Explain artificial hybridization.

-draw the diagrams of t.s anther

. Female gametophyte

.male gametophyte

. Embryo development in flowering plants

- The diagram represents the stages of dicot embryo development. Label A, B and C.

b) Which type of cell division takes place in embryogenesis? c) Endosperm development precedes embryo development. Justify. [www.inlearncbse](http://www.inlearncbse.com).

Time 30 min

Max Mark

General Instructions:

- This QP contains 12 Questions. Q1 -6 carries 1 mark each. Q 7-10 carries 2 marks each , 11 -12 carries 3 marks each
- Your answer should be brief and relevant

- 1 What is agamospermy?
- 2 Can snails pollinate the flowers? What do you call such a pollination?
- 3 In some species of Asteraceae and grasses, seeds are formed without fusion of gametes. Give the scientific term for such type of reproduction.
- 4 How are pollen stored in a pollen bank?
- 5 Hypanthodium is a special type of inflorescence. Then what is hypanthium?
- 6 In the embryos of a typical dicot and a grass, which are the true homologous structures?
- 7 State two differences between Perisperm and Pericarp
- 8 Draw I.s of anatropous ovule of an angiosperm and label a) Nucellus b) Secondary nucleus.

9



Identify the type of placentations and define them

- 10
 - a) Draw a labeled sectional view of albuminous seed.
 - b) Give two advantages of seeds to flowering plants
- 11 Continued self pollination lead to inbreeding depression. List three devices, which flowering plant have developed to discourage self pollination?

CLASS - XII

Subject-Biology

No of period=10

TOPIC - : HUMAN REPRODUCTION [month:April-May]

Learning Objectives -: Students will be able to

- explain the process of human fertilization.
- understand the changes in a women's body during and after fertilization.
- define spermatogenesis, oogenesis, spermatid etc.

P.K. TESTING -: Teacher will ask following questions

- Where is male gamete formed in plants?
- Where is female gamete formed in plants?
- What is microsporogenesis ?

VOCABULARY/ KEY WORDS -: , ovum,gametogenesis fertilization, zygote, endometrium, placenta, morula, blastula, parturition, lactation etc.

TEACHING AID AND INNOVATIVE PEDAGOGIC STRATEGIES -:

-online teaching through zoom app.

-visual clues, pictures related to content like T.S of testis, Ovary, blastula, links of videos <https://www.youtube.com/watch?v=Lbv6WbjIQW0>.

- interactive lecture method.

PROCEDURE. – Teacher will show video of male and female reproductive system by sharing link in the class group.

. Function of each part will be discussed by asking question.

-Hormonal control will be explained and students will draw flow chart of hormonal control.

-Development and fertilization will be explained by sharing the pictures on the zoom app

Teacher will make videos of lectures related to the topic and share in the class whatsapp group.



Figure 3.11a) Diagrammatic sectional view of male pelvis showing reproductive system

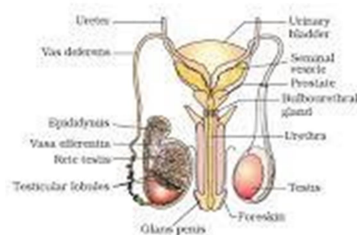


Figure 3.11b) Diagrammatic view of male reproductive system (part of testis is open to show tracer details)



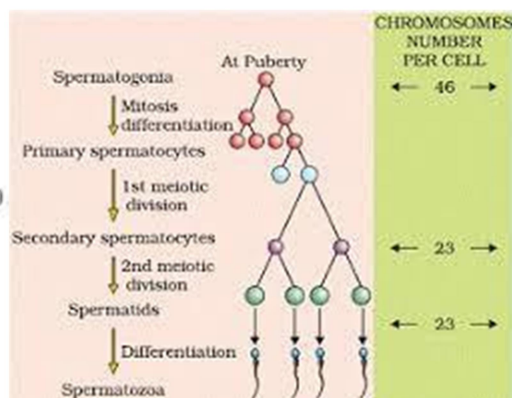
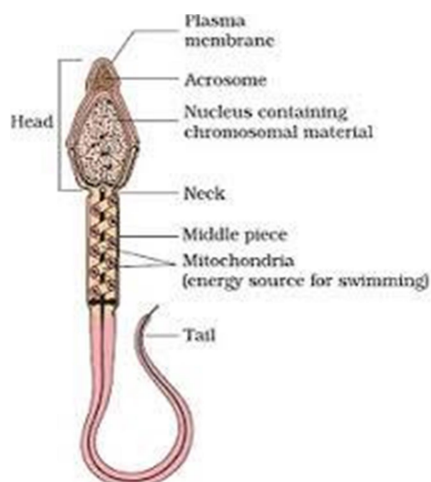
Participation of Students -: Students will study diagrams of Testes, ovary, blastula

- will trace flow chart of hormonal control of reproductive system.
- will discuss videos in group.
- draw diagrams of reproductive system.
- will practice questions from the shared link [https:// www.learncbse.in](https://www.learncbse.in)

Recapitulations -: Teacher will show unlabelled diagrams and will ask questions related to the labeling like

- label the part where fertilization occur ?
- part where male gamete is produced?

Art integration -: students will draw diagrams of T.s testis,T.s ovary,spermatozoa,development upto implantation etc



Learning outcomes -: Students will be able to

- differentiate between spermatogenesis and oogenesis.
- answer reasoning facts on various concept related to human reproduction .
- draw labeled diagram of male and female reproductive system, sperm, ovum etc.
- trace schematic representation of spermatogenesis and oogenesis.

Resources -: NCERT text Book, [http my cbse guide. com](http://mycbseguide.com/blog)> blog

[http://cbsebiology4u.wordpress. com](http://cbsebiology4u.wordpress.com) , <https://www.youtube.com/watch?v=Lbv6WbjIQW0>.

For simulated practical <http://www.olabs.edu.in/>

Co Scholastic activities -: students will be able to express themselves while discussing.

-critically analyze menstrual cycle and able to understand importance of reproduction.

Assesment:-MCQ,oral test,class test

ASSIGNMENT

Your answer should be brief and relevant

- 1 Where fertilization does takes place in human female? 1
- 2 Which cells of embryo have potency to give rise to all tissues and organs? 1
- 3 Write two major functions of ovary. 1

- 4 How many eggs are released by human female in a month? 15
- Which hormone is involved in induction of parturition? 1
- 6 What is colostrum? 1
- 7 Why testes are situated outside the abdominal cavity within a pouch called scrotum? 2
- 8 Identify major differences between spermatogenesis and oogenesis? 2
- 9 Draw schematic representation of oogenesis.2
- 10 Write the function of each one of the following: 1. Seminal vesicle 2. Luteinising hormone in males 2
- 11 Draw a labeled diagram of the microscopic structure of sperm 2

CLASS -XII

Subject:-Biology

No of periods-6

Topic -: Reproduction Health [month:MAY]

Previous knowledge testing-: Teacher will ask following questions

- What is the site of fertilization in humans?
- Name two sexually transmitted viral diseases
- Name some birth control methods ?

Learning objectives -: Students will be able

- to explain viral and bacterial STD.
- to understand various type of ART.
- to explain various type of birth control methods.

KEY WORDS/Vocabulary -: condoms, intrauterine devices, amniocentesis ,implantation, vasectomy, tubectomy,ZIFT,GIFTetc.

Teacher aids and innovative pedagogic strategies -:

- visual clues,links of videos <https://www.youtube.com/watch?v=NShd2e6m568>

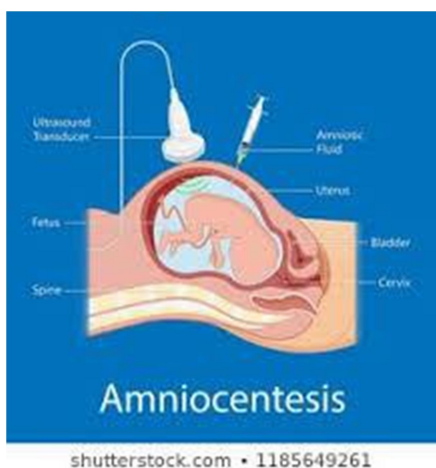
<https://youtu.be/KyU880oHSxM>

-pictures of amniocenteses

Peer to peer learning, interactive lecture, group learning.

Procedures -: Teacher will explain various STDs, birth control method, ART, ZIFT, GIFT etc with the help of links of video. Topic will be explained by writing Important key words on the white screen of zoom app.

-Amniocenteses and its significance will be discussed by sharing the picture.



Highlighter will be used to explain labeling of its diagram

-students will be divided into groups to discuss and answer list of questions related to topic. Group leaders will clear their queries from the teacher and explain it to the group members by using whatsapp group.

Participation of students -:

- will discuss content and share the information.
- observe the shared picture and videos.
- draw the diagrams and note down the important key words.

Recapitulation -: Teacher will show unlabelled diagram and will ask question related to the labeling.

Art integration -:- will draw diagrams of amniocentesis.

Learning Outcomes -: Students will be able to answer reasoning facts related to the reproductive health

- develop awareness of STDs.
- List the factors that causes infertility.

Resources :- NCERT text Book ,elementary biology , <http://cbsebiology4u.wordpress.com>

[/www.youtu https://be.com/watch?v=NShd2e6m568](https://www.youtube.com/watch?v=NShd2e6m568)

<https://youtu.be/KyU880oHSxM>

Co-scholastic activities:- Students will develop

- character & Citizenship by understanding importance of reproductive health
- value of sharing information
- Analytical skill to identify reason of infertility .

Assesment:-MCQ,oral test

ASSIGNMENT

This QP contains 12 Questions. Q1-6 carries 1 mark each. Q 7-10 carries 2 marks each and Q

•General Instructions:

Your answer should be brief and relevant•

- 1 Name the drug developed by CDRI, Lucknow. 1
- 2 Increasing female foeticide is the result of amniocentesis. How? 1
- 3 Cutting and tying of vas deferens is termed as ----- --. 1
- 4 At how many cell stage embryo will transfer in ZIFT? 1
- 5 Lactational amenorrhea is a contraceptive method. How? 1
- 6 Give two examples of copper releasing IUDs. 1
- 7 Write type of surgical methods of contraception. 2
- 8 Oral contraceptives are considered safer than other methods.Justify 2
- 9 Write the full form of ART. List any two techniques. 2
- 10 When does GIFT and ZIFT applied? 2
- 11 What are the objectives of sex education in schools? 3
- 12 Write the aims and objectives of RCH programmes. 3[Link; www.learncbse.in] for practice of MCQ

CLASS -XII

Subject:-Biology

No of periods-10.

TOPIC:- PRINCIPLES OF INHERITANCE [month:MAY]

LEARNING OBJECTIVES :- Students will be able

- to understand the rules of inheritance, phenomena of genetics and phenotypic expression of traits.
- to explain Co dominance, multiple allelism, incomplete dominance.
- critically analyze the genetic disorders.

P.K. TESTING - Teacher will ask following question (pointing toward the students)

- What is the Similarities and differences between these students?
- What is the unit of inheritance ?
- Where is it present ?
- Explain the laws of inheritance.

VOCABULARY / KEY WORDS :- Genetics,Co dominance,

incomplete dominance, multiple allelism, pleiotropy, Turner Syndrome etc

TEACHING AIDS AND INNOVATIVE PEDAGOGIC STRATEGIES

-Online teaching through zoom app.

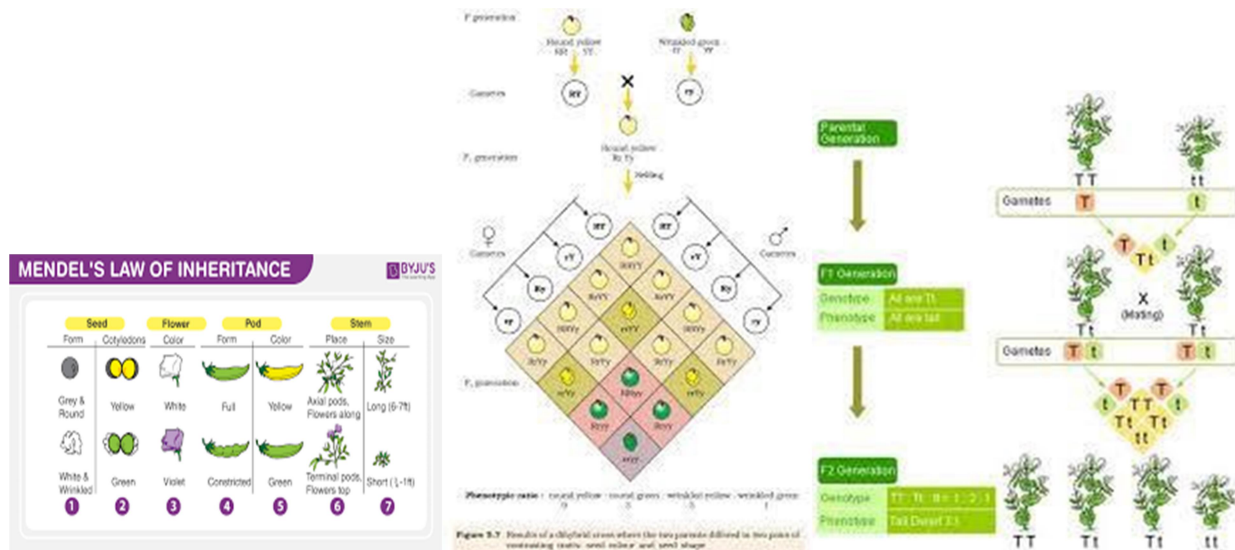
- a. Pea seeds of round and wrinkled shaped, visual clues, links of videos.
- b. Brainstorming,Interactive lecture,Problem solving method, group learning

PROCEDURE :- - Teacher with introduce the topic by discussing

the reason for similarity and differences of parents and offspring. Mendel's work,his law, law of segregation and law of independent assortment will be explained by sharing the link of video <https://www.youtube.com/watch?v=agUgUlQ1pk>

<http://youtu.be/x0ksaQhAI-g>. Teacher will draw crosses on the white board with coloured marker during online class.

- Students will be involved in completing the monohybrid cross.

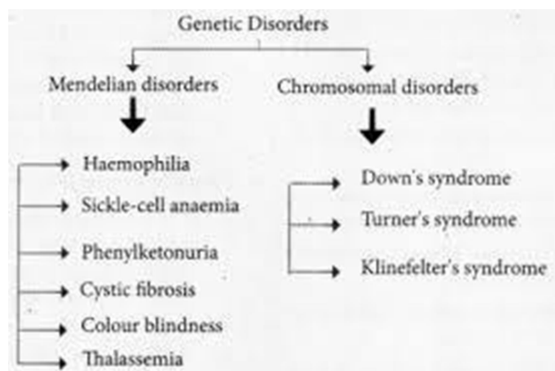


- Deviation from mendelism like multiple allelism,

Co-dominance, incomplete dominance, chromosomal theory of inheritance, sex determination in birds, human and insect, linkage and crossing over, genetic disorder will be explained by drawing crosses on the white board. Videos related to these topic will be shared in the class group on whatsapp .

Incomplete Dominance		Co-Dominance	
1.	Effect of one of the two alleles is more conspicuous.	1.	Effect of both the alleles are equally conspicuous.
2.	It produces a mixture of the expression of two alleles.	2.	There is no mixing of the effect of the two alleles.
3.	The F_1 does not resemble either of the parents.	3.	The F_1 resembles both the parents.
	E.g.: Flower colour in dog flower.		E.g.: ABO blood grouping in humans.

-Students will be divided into group to discuss and understand various disorders, solve problems based on the crosses. Each group will speak on one genetic disorder during online class.



-Teacher will give instructions about how to count the pea seeds with different shapes and find out monohybrid ratio for the given sample.

<http://www.olabs.edu.in/>

Participation of Students:- Students will solve different questions based on the crosses of various genetic phenomenon .

- Students will read information related to genetic disorders and speak on it.

-will perform activity of counting pea seeds with round & wrinkled shape to study law of segregation .

RECAPITULATION -:

-Students will solve various genetic problems based on the crosses.

-Why did Mendel selected pea plant ?

-Why his work was not successful?

-Differentiate between mendelian and chromosomal disorders.

ART INTEGRATION. Students will

- select and count the number of round and wrinkled pea seeds
- draw Pedigree for the inheritance of blood group in their family.

LEARNING OUTCOMES -: students will

- develop critical thinking about the expression of traits.
- differentiate between Mendelian and chromosomal disorders.
- recognize various genetic phenomena.
- find out the possible genotype for the given phenotype in the pedigree of given family.

Resources -: NCERT text Book , [http:// mycbseguide. com](http://mycbseguide.com) > blog
<https://www.youtube.com/watch?v=agUgUIJQ1pk>

<http://youtu.be/x0ksaQhAI-g> , . <http://www.olabs.edu.in/>

Co-Scholastic activities: Students will develop

- problem solving skill related to genetics concept.
- co-operation while solving questions in the group .

ASSESSMENT -: oral questions, MCQ, written test.

ASSIGNMENT

This QP contains 12 Questions. Q1-6 carries 1 mark each. Q 7-10 carries 2 marks each and
•General Instructions: 11-12 carries 3 marks each

Your answer should be brief and relevant•

1 What type of allele produces its effects only in homozygous individual . a) dominant, b) recessive, c) incomplete dominant , d) incomplete recessive. 1

2 Write the phenotypic ratio of di hybrid cross. 1

3 Name two organisms where males are heterogametic. 1

4 Scientific name of garden pea is _____1

5 Tendency of gene to link together in a same locus is called _____ 1

- 6 Name two Mendelian disorder that are sex- linked 1
- 7 Distinguish between monohybrid and dihybrid cross. 2
- 8 What is trisomy, Give an example. 2 9 What is co-dominance, give an example. 2
- 10 Write four symptoms of Turner's syndroms. 2
- 11 Mentions the advantages of selecting pea plant for experiment. 3
- 12 What is Pedigree analysis? Write advantages.

CLASS –XII

Subject:-Biology

No. of periods-14

Topic - Molecular basis of inheritance [month:july]

LEARNING OBJECTIVES-: Students will be able to

- understand structure of DNA .
- explain the process of replication, description and translation.
- comprehend human genome project, DNA fingerprinting etc.

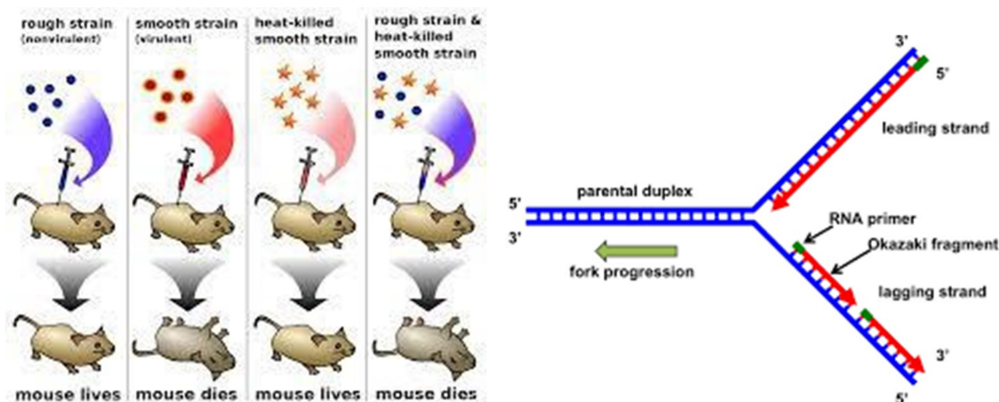
Previous Knowledge Testing -: Teacher will ask following questions

1. Name the genetic material present in the human.
2. What is responsible for similarities of offspring with the parents ?
3. Explain the structure of DNA.

IMPORTANT KEYWORDS & VOCABULARY -: Replication, transcription, promoter, terminator, repressor, semi conservative DNA etc.

TEACHING AID AND INNOVATIVE PEDAGOGIC STRATEGIES -:

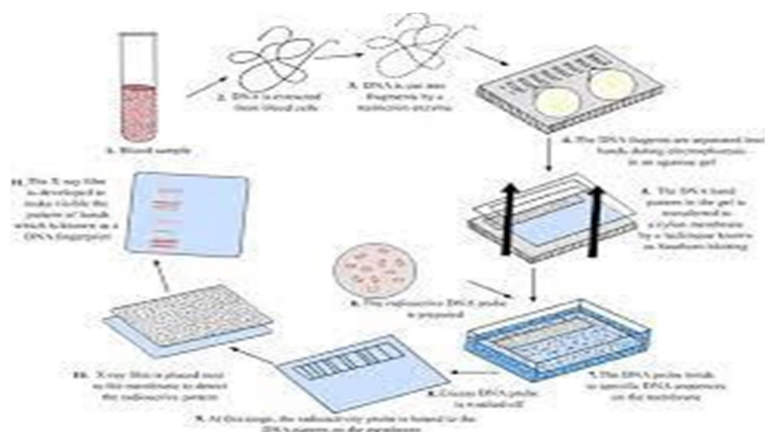
- Student will make model of DNA using blocks or with straws. Video of making DNA model will be shared ,various pictures arranged in sequence related to the topic.
- Project method, interactive lecture



PROCEDURE -: Teacher will explain structure of DNA, experiment to show that DNA is the genetic material, transcription, translation, replication will be explained by using white board during online class..

- Students will make model to show various bond present in the structure of DNA.
- Students will read and understand the topic of human genome project, DNA fingerprinting and give presentation in the class.
- lac operon, model of gene expression will be explained by sharing related pictures on zoom app.

Teacher will share the lecture by making videos related to the content and sharing in the class group.



STUDENTS PARTICIPATION:- Students will observe and write key words, construct model of DNA, will read and discuss the content, draw the diagrams, give presentation on human genome project.

RECAPITULATION:-Teacher will ask related questions to recapitulate the content.

ART INTEGRATION -: - Students will create 3D model of DNA by using straws

- draw diagram of transcription, translation, replication, lac operon etc

LEARNING OUTCOMES -: Student will be able to apply information for the construction of DNA model.

-develop team spirit while making videos in group.

-able to recognize concept and process of replication, transcription and translation.

-able to construct model of DNA.

RESOURCES -: NCERT text book [https:// mycbse guide.com](https://mycbseguide.com) 2 blog [https://cbse biology 4u wordpress.com](https://cbsebiology4u.wordpress.com) <https://www.youtube.com/watch?v=XNdvpefKaYk>

CO-SCHOLASTIC ACTIVITIES-:

- will develop scientific attitude.

- will develop interpersonal relationship and creative thinking while constructing model

Assessment -: Teacher will take objective test, Short question tes,oral test,MCQ.

ASSIGNMENT

This QP contains 12 Questions. Q1-6 carries 1 mark each. Q 7-10 carries 2 marks each and

•General Instructions: 11-12 carries 3 marks each
Your answer should be brief and relevant

• 1 What are the components of a nucleoside ?

2 Who experimentally proved the semiconservative nature of DNA replication? 1

3 How is the nitrogenous base linked to the pentose sugar ? 1

4 Which enzyme is used in the Transcription process ? 1

5 Write the dual function of AUG. 1 6 Expand VNTR . 1

7 State two reasons that favour DNA to be the genetic material than that of RNA . 2

8 How are the exons different from introns? Give two points of difference . 2

9 Which strand of DNA is transcribed and Why ? 2

10 Stat two functions of DNA polymerase . 2

11 Who postulated an adapter molecule to link the genetic code and the amino acids? State its two functions. 3

12 (i)What are the four levels at which gene expression is regulated in eukaryotic cell ? (ii)Name the regulatory gene of Lac –operon .

CLASS - XII

Subject:-Biology

No. of periods-06

Topic -: Human Health and diseases. [MONTH:July-August]

Objectives -: Students will be able to define health, pathogen, vector, immunity, antigen, antitoxic.

- will be able to explain and understand causative agents mode of transmission, symptoms of various diseases.

- will have knowledge of various types of drugs and drug abuse.

PREVIOUS KNOWLEDGE TESTING-: Teacher will ask by pointing toward the student

- When was you last effected by the disease?

- Name it, what were it symptoms?

- Name the diseases that spread by mosquito.

- Name some viral and bacterial diseases.

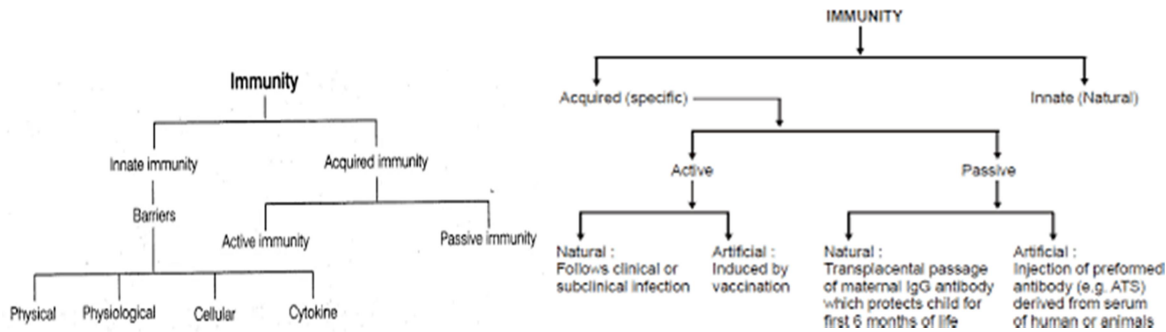
IMPORTANT KEYWORDS AND VOCABULARY -: Pathogen, vector, symptoms, antibody, antigen Immunity, acquired and inherited etc.

TEACHING AIDS AND INNOVATIVE PEDAGOGIC METHOD-:

-online teaching through zoom app ,sharing videos of lecture

- pictures of diseases ,links of videos related to content.

- flipped classroom approach will be used to learn various diseases and drug abuse,role play, interactive lecture approach.



PROCEDURE: - Important definitions will be discussed by asking questions

- Students will watch videos and see content in the whatsapp class group.
- Teacher will discuss diseases like typhoid, pneumonia common cold and malaria and relate it to the content read by the students at home.
- Students will be divided into groups to present different diseases in the form of shot play and present it during online class.
- Teacher will write key words of symptoms for various diseases on the whiteboard of zoom app.
- student with plan and show play on drug abuse, its causes and effects .
- Teachers with discuss various types, sources and effects of drug.
- Diagram of antibody will be drawn on the black screen by using highlighter..
- Students will be directed to learn and complete table of diseases and its causative

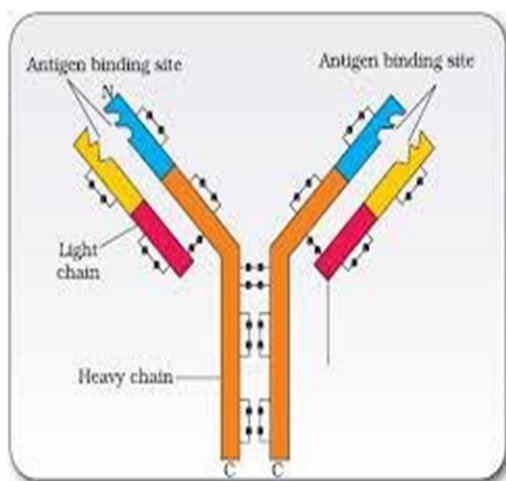


Figure 8.4 Structure of an antibody molecule

Agent.

normal vital activities resulting in morphological and functional damage.

Name of disease /test	Causal organisms	Symptoms	Effects
Typhoid / Widal test	Salmonella typhi	Sustained high fever, weakness, stomach pain,	
Pneumonia	Streptococcus pneumoniae and Haemophilus influenzae	Fever, chills, cough and headache.	Alveoli get filled with fluid leading to severe problems in respiration.
Common cold	Rhino viruses	Nasal congestion and discharge, sore throat, cough and headache.	Infect the nose and respiratory passage.
Malaria	Plasmodium (P. vivax, P. malaria and P. falciparum)	The chill and high fever recurring 3 to 4 days.	Parasite multiply within liver cells and then attack the RBCs.
Amoebiasis or Amoebic dysentery	Entamoeba histolytica	Constipation, abdominal pain, cramps, stool with mucous and blood clot.	Infect the large intestine.
Ascariasis	Ascaris (Helminthes)	Internal bleeding, muscular pain, fever, anemia etc.	Healthy person get infected through water, vegetable etc.
Elephantiasis or filariasis	Wuchereria (W. bancrofti and W.	Inflammation in the lower limb and genital organs.	Lymphatic vessels of lower limbs get blocked.

PARTICIPATION OF STUDENTS:-Students will study the content related to the various diseases.

-Student will plan and act in the play to show drug abuse & its effect

-will write the key words of various disease.

- will write causative agents, symptoms & diagnostic test for various disease in tabular form.

-will observe and discuss the shared videos

RECAPITULATION :- Teacher will give list of causative

TYPHOID PNEUMONIA MALARIA AIDS List of words

Streptococcus pneumonia

Salmonella typhi

HIV

Plasmodium vivax

agents to the students and they will write it under heading of various diseases .

ART INTEGRATION -: Students will prepare play on drug abuse and its effect.

- will draw the diagram of antibody.

LEARNING OUTCOME -: Students will be able to distinguish between acute and chronic diseases.

- will be able to find and understand information related to the diseases .

- will develop team spirit.

- will be able to correlate symptoms with the causative agent and organ it attacks.

- will be sensitized toward the drug abuse issue

- will understand the need of adopting hygienic ways to prevent diseases

- will be able to critically understand issues related to corona virus.

REOURCES -: NCERT Text book <http://mycbseguide.com> >blog <https://Cbsebiology4u.wordpress.com> ,. diseases <https://youtu.be/AwISyM1L8N4>
<https://www.youtube.com/watch?v=YA9KiI7gW5QAwISyM1L8>

Co-SCHOLASTIC ACTIVITIES -: Reading and Listening skill

- Students will be able to express themselves while discussing drug abuse.

- will be able to make right choice for healthy life .

- will develop critical thinking while comparing various diseases

- will develop creative skill while planning and acting in the play.

Assessment -: Teacher will take oral quiz on the topic of diseases

- written test of short question will be taken, MCQ

ASSIGNMENT

This QP contains 12 Questions. Q1-6 carries 1 mark each. Q 7-10 carries 2 marks each and Q 11-12 carries 3 marks each
•General Instructions:
Your answer should be brief and relevant•

- 1 Write the scientific name of the causative organism of elephantiasis. 1
- 2 What do you mean by malignant tumor ? 1 3 What are interferons ? 1
- 4 How does saliva act in body defence ? 1 5 What is the test used to confirm typhoid ? 1
- 6 Smack is common drug which is consumed by many person. Name the plant from which it is obtained. 1
- 7 What is contact inhibition? How does this phenomenon operate in cancer cells? 2
- 8 Write the full form of ELISA. Give an example of the clinical application of ELISA test. 2
- 9 Due to undue peer pressure a group of adolescents started using opioids intravenously. What are the serious problems they might face in future? 2
- 10 Write the specific symptoms of pneumonia .Name the causative organism. 2
- 11 In which way has the study of biology helps us to control infectious diseases? 3
- 12 Do you think that friends can influence one to take alcohol/ drugs? If yes, how one may protect himself from such an influence?3

-

Class XII Subject:- Biology

No. of period-05

TOPIC - MICROBES IN HUMAN WELFARE [MONTH:January]

Learning Objectives -:Students will be able to

- understand the process of Sewage treatment.

- recognize the role of microbes in household products, industries, Biogas etc.
- explain Biogas plant and bio fertilizers.

P.K. Testing :- Teacher will ask questions by showing food material like curd cheese, etc

- (1) Name some microbes.
- 2) Which microorganism is present in the curd?
- 3) Name the product formed that is responsible for curdling of milk.
- 4) What is biogas plant?

KEY WORDS / VOCABULARY:-Microbes,primary effluent,secondary treatment,sludge,methanogens etc.

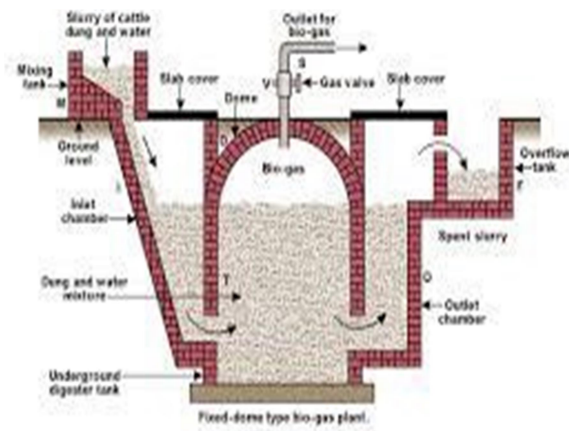
PROCEDURE -: Teacher will discuss examples of various microbes used for household production by showing various items like curd, cheese, bread etc.

- Pictures of related microbes will be shown by sharing screen on zoom app.
- Students will note down names of microbes and its use in tabular form.
- Microbes in industrial products will be shown by sharing link of videos

<http://youtu.be/949R9zSKibM> .

- Sewage treatment will be explained by writing key words on white board and sharing video.

- Video will be shared to observe structure and process of biogas plant in the class



group .

<https://youtu.be/NZRItS6xopc>

- Examples of microbes as biocontrol agents, biofertilizers will be discussed by writing key words on the board.

Participation of students :-

- Students will observe pictures of microbes, make table of microbes and their uses in household and Industries.
- will observe the shared video to study structure and working of bio gas plant.

Recapitulations -: Teacher will ask student to complete the table of microbes used in Industries, household and agriculture.

Art integration –will make model of biogas plant,draw diagram of biogas plant and sewage treatment.

Learning outcome -: Students will be able to

- list various microbes and its uses.
- recognize microbes, bio control agent, bio fertilizer etc.
- comprehend the biogas plant and Sewage treatment.

Resources -: NCERT TEXT BOOK. <http://youtu.be/949R9zSKibM> .

<http://mycbseguide.com>blog>

https://www.youtube.com/watch?v=65sh_0kBuM8

<http://cbsebiology4u.wordpress.com>

Co-scholastic activities -: Students will

- develop skill of using microbes for producing products of human welfare.
- scientific attitude while studying sewage treatment and biogas plant.
- sensitized toward the need of Sewage treatment and importance of bio control agent.

ASSESSMENT:-class oral test, objective test, short question test,MCQ.

ASSIGNMENT

Your answer should be brief and relevant•

1 The vitamin whose content increases following the conversion of milk into curd by lactic acid bacteria is: a. vitamin C b. vitamin D c. vitamin B12 d. vitamin E 1

2 Match the following list of bacteria and their commercially important products:

- (i) Aspergillus niger (a) Lactic acid
- (ii) Acetobacter aceti (b) Butyric acid
- (iii) Clostridium butylicum (c) Acetic acid
- (iv) Lactobacillus (d) Citric acid 1

3 _____causes large holes in swiss cheese? 1

4 If a given water sample have more BOD, what does it indicate? 1

5 Give any two microbes that are useful in biotechnology. 1

6 How are alcoholic drink wine and beer different from whisky and rum?

7 One farmer of your locality is suffered as soil of his paddy field became less fertile due to excessive use of chemical fertiliser. What would you suggest him? 2

8 What are flocs? What is their role in WWTP?

10 Why are Nucleopoly hedroviruses considered as excellent bioinsecticides? 2

11 Name any two bioactive molecules, their source microbes and their uses. 3

12 Write any three benefits of having mycorrhizal association in plants.

Class XII

Subject:- Biology

No. of period-12

TOPIC :- BIOTECHNOLOGY [MONTH:January]

1. Principles and Process

2. Applications of biotechnology

LEARNING OBJECTIVES - Students will be able to define biotechnology, restriction endonuclease , palindromic nucleotide sequence.

- have knowledge of tools and process of biotechnology with special emphasis on PCR, gel electrophoreses.

- Understand applications of biotechnology in agriculture, human health care, forensic sciences etc.

- become aware about world scenario of biotechnology and issue related to it.

P.K Testing:- Teacher will ask following questions

- Name the microbes used for converting milk into curd.

- Name the test used for diagnose of AIDS.

- Which technique form the basis of the test.

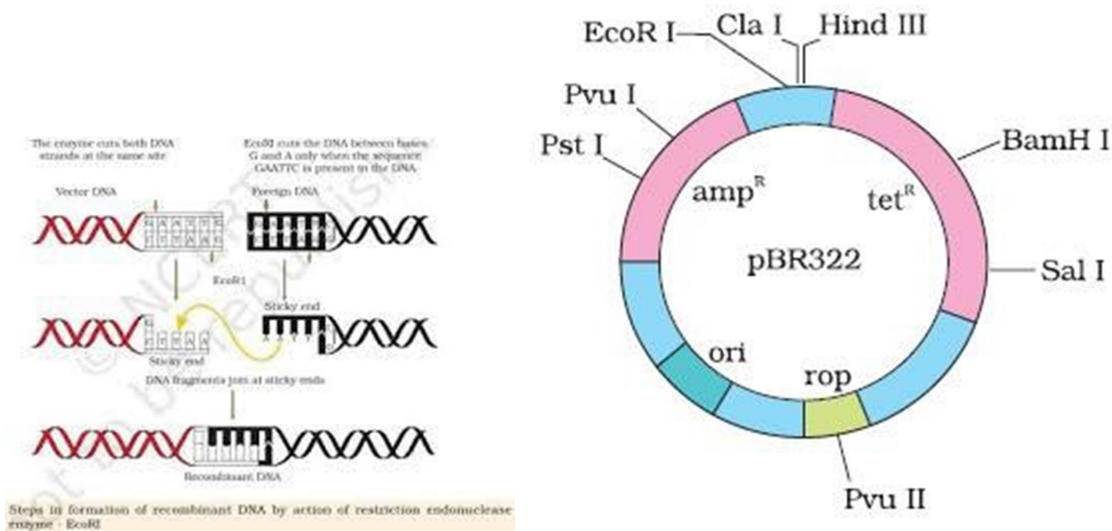
VOCABULARY / KEY WORDS -: Biotechnology, Palindromic nucleotide sequence, Restriction endonuclease, Polymerase chain reaction, RNA interference, gene cloning, gene therapy etc.

TEACHING AID AND INNOVATIVE PEDAGOGIC STRATEGIES:-

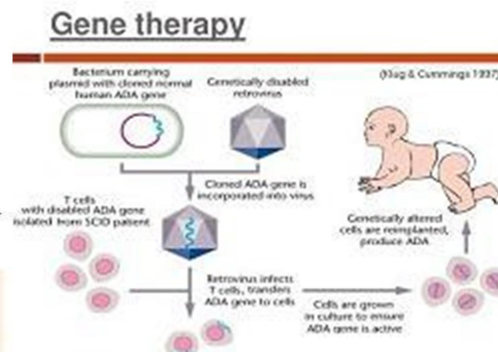
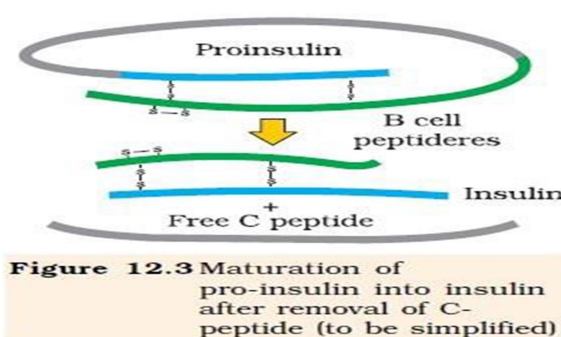
- visual clues, links of related videos , sample of some biotechnological product like milk, bread etc, picture of plasmid,PCR etc

- Reflective discussion, random questioning,

PROCEDURE :- Teacher will discuss definition, principles of biotechnology by writing key words on the black screen and by using highlighter.



- Tools of biotechnology, and process will explained by focusing front camera on white board during online class..
- Model of plasmid will be made by using clay to explain its diagram.
- activity of isolating DNA from spinach or onion extract will be shown by sharing link. <https://youtu.be/f9hC8ipPNTg>
- content and vedio of application of biotechnology will be explained and related question will be asked. Gene cloning and RNA interference will be explained by writing on white board.
- Teacher will make video of lecture and share in the class group.



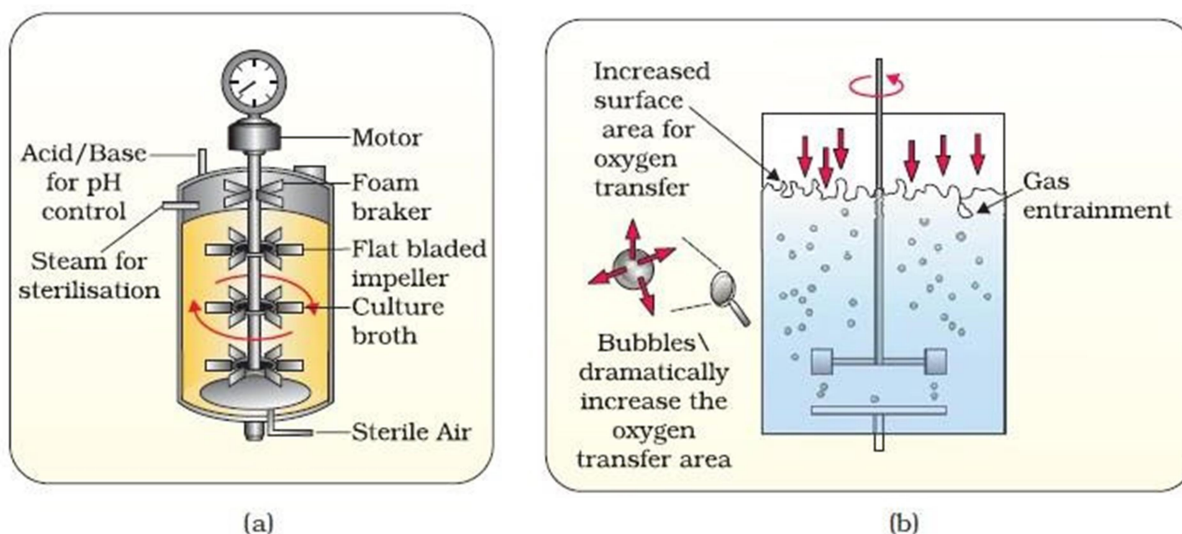


Figure 11.7 (a) Simple stirred-tank bioreactor; (b) Sparged stirred-tank bioreactor through which sterile air bubbles are sparged

Participation of students -: will observe and isolate DNA from spinach extract.

- observe and discuss the video and concept seen in the class group.
- make model of plasmid, structure of insulin
- participate in answering the questions.

Recapitulations -:Teacher will ask questions like

- Define biotechnology .
- List the features a plasmid should have.
- How can we make cell competent ? etc

Art integration -: students will make

- model of Plasmid by using clay.
- draw diagram of gene cloning, PCR etc,
- model of insulin to discuss its production by biotechnology

Learning Outcomes -: Students will be able to develop scientific communication related to the field of biotechnology.

- think critically and solve problems related to the content.

- get insight into the applications of rDNA technology in agriculture, medicines and diagnosis.

- comprehend the process and application of biotechnology

Resources -: NCERT text book [https // www kukhagaria.ac.in](https://www.kukhagaria.ac.in)

[https// schools aglasem.com](https://schools.aglasem.com) <https://www.youtube.com/watch?v=TQRL9JnYkA4>
<https://www.youtube.com/watch?v=xF7F3kAJmuQ>

. <https://youtu.be/f9hC8ipPNTg>

Co scholastic activities :-Student will

- develop skill to extract DNA from given material.

-scientific attitude while studying the process of biotechnology
& its application.

ASSESSMENT:-MCQ,objective test,oralclass test

ASSIGNMENT

• Your answer should be brief and relevant

1 What is the role of restriction endonuclease in biotechnology? 1

2 Restriction endonuclease usually isolated from bacteria and bacteria use it for its self protection. How? 1

3 ----- and -----are two main processes used in downstream processing. 1

4 Name the enzyme that is used to dissolve cell wall of bacteria and plant. 1

5 A rDNA is inserted in the coding sequence of an enzyme and which inactivates the gene. Give the term for that. 1

6 Name two natural genetic engineer used in biotechnology process 1

7 Complete the table given below Processes Enzyme involved • Cutting of DNA fragments at specific site • Joining of foreign DNA fragments with plasmid • Amplification of DNA fragments • Dissolve fungal cell wall 2

8 Give diagrammatic representation of rDNA technology 2

9 DNA being hydrophilic cannot pass through the cell membrane of a cell. Explain how recombinant DNA get introduced into the cell to transform the latter. In bacterial culture some of the colonies produce blue colour in the presence of a chromogenic substrate and some did not due to the presence or absence of an insert (rDNA) in the coding sequence of the beta- galactosidase.

a) Mention the mechanism and steps involved in the above experiments

b) How is it better than the technique of plating on two plates having different antibiotics

CLASS XII

Subject:-Biology

NO. OF PERIODS -06

unit -: Ecology and Environment

TOPIC:- organism and Population[MONTH:February]

LEARNING OBJECTIVES -: Students will be able to

- define terms like stenohaline euryhaline stenothermal, conformers, regulators, population density.
- explain features of adaptation in organisms like Kangaroo rat, desert plants, lizards etc.
- give reason for more RBCs in the body of higher altitude persons.
- list the factors influencing the population density.
- understand the various types of population interactions like competition, commensalism, mutualism etc with examples.

P.K TESTING -: Teacher will ask following questions

- List some living and non living things
- What are lichens ?
- Which type of association is shown by them?
- Name and explain any other type of associations.

KEY WORDS/ VOCABULARY -: Population density, natality, mortality, immigration, emigration, parasitism ,commensalism, mutualism, sexual decoiet etc.

TEACHING AID INNOVATIVE PEDAGOGIC STRATEGIES -:

- smart board, slide and specimens
- material to find out population density in the school garden .
- outdoor learning, Inductive / Deductive approach for population interactions, flipped learning

PROCEDURE-: various abiotic and biotic factors will be discussed by flipped learning method.

- key words like euryhaline, stenohaline etc will be written on the board .
- content and videos of adaptation in plants and animals will be shown and discussed from the smart board.Specimens and slides will be used as visual clues.
- Teacher will explain population growth, population density and type of population growth curve with the help of board

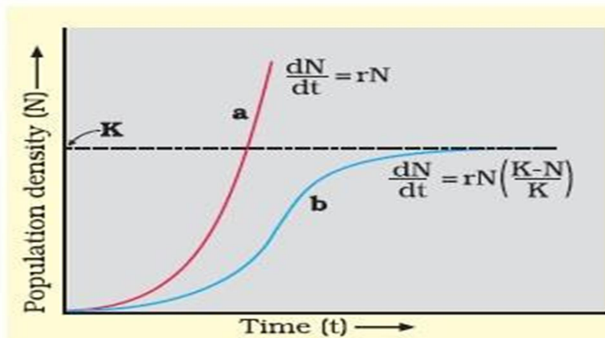
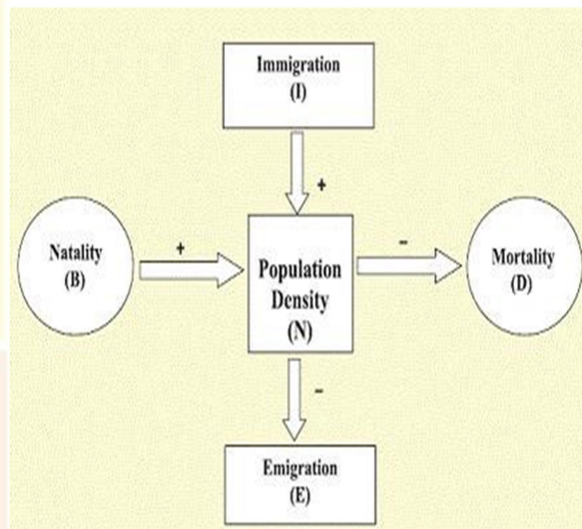


Figure 13.5 Population growth curve
a when responses are not limiting the growth, plot is exponential.
b when responses are limiting the growth, plot is logistic.
K is carrying capacity



- Topic of various type of population interaction will be taught from general to specific or from specific to general (inductive/deductive method]

MUTUALISM

- Mutualism is a type of symbiosis in which populations interact to the benefit of both species.
- Mutualism may be obligate (necessary for survival of one or both species) or facultative (one species may survive in the absence of other).



COMPETITION

- Mutual use of a limited resource by populations of two or more species.
- Each individual adversely affect another in the quest for food (nutrients), living space, or other common needs.
- Individuals harm one another is attempting to gain a resource.

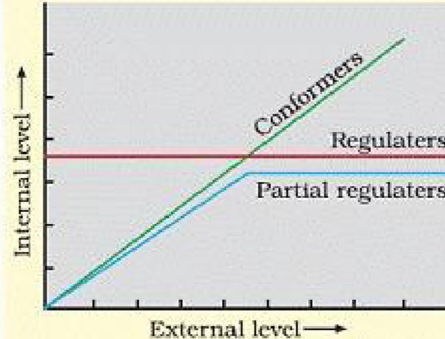


POPULATION INTERACTIONS INFLUENCE ABUNDANCE

- When populations of different species interact, the effects on one on the other may be positive (+), negative (-) or neutral (o).

Table 1. : Population Interactions

Species A	Species B	Name of Interaction
+	+	Mutualism
-	-	Competition
+	-	Predation
+	-	Parasitism
+	o	Commensalism
-	o	Amensalism



Student Participation -: Students will

- observe the videos and answer the related questions asked by the teacher.
- record and find out reading of population density.
- draw the graph of population growth.

RECAPITULATION -: Teacher will ask the type of population interaction in the various examples .

- tell students to draw graphs of population growth.

ART INTEGRATION -:

- Construct a frame to find out population density by quadrant method.
- draw graph of population growth.

Learning outcomes: Students will be able to

- identify the level of organization and major biomes.
- List various types of abiotic and biotic factors.
- Identify various types of adaptations shown by the plants and animals.
- list various attribute of population and population growth.
- analyze the significance of population interaction and classify it.
- evaluate co-evolution with examples.

RESOURCES -: NCERT Text book, <https://www.youtube.com/watch?v=L68S1t9XVgE>

My cbseguide .com ,diksha app,shiksha house

CO-SCHOLASTIC ACTIVITIES -: Students will develop

- value of interacting and associating with each other while studying population interaction.
- skill of finding out population density and growth.

ASSESSMENT: oral test, class test, MCQ

ASSIGNMENT

Your answer should be brief and relevant•

1 Ecology consists of organisms, populations _____ and _____. 1

2 In recent years, there has been a growing concern about the gradually increasing average global temperatures. If this trend continues, would you expect the distributional range of some species to be affected? 1

3 $N_1 = N_0 + (B + I) - (D + E)$.In the given equation what will happen if a change is seen in B. 1

4 If in a pond there are 20 lotus plants in the last year and it becomes 28 in the next year due to reproduction. Calculate the birth rate. 1 32

5 Archaeobacteria live in hot springs and deep sea hydrothermal vents that exceeds 100 °C. How is this possible? 1

6 If resources are available in plenty ,which type of growth curve is seen? 1

7 Label 'a', 'b', 'c' and 'd' from the diagram. 2

8 a. Why is temperature considered to be the most relevant abiotic factor that influences life of organisms? b. During global warming which type of organism can cope up better – eurythermal or stenothermal? Why? 2

9 a Regulators Internal level b External level a. Label 'a' and 'b' in the given diagram. b. Which one of the animal group shows more adaptability. 2

10 Why are small birds like Humming birds not found in polar regions? Explain. 2

11 Biomass is a more meaningful measure of population size. Explain with an example 3

12 Starfish is an important predator. When we remove starfish from an enclosed intertidal area. A. What will be the effect of it? Why ? 3

LINK:-www.ncert.guru/biology

www.learncbse.in/extra for questions practice

CLASS XII

SUBJECT BIOLOGY

NO OF PERIODS:04

Topic :- Biodiversity and Conservation [MONTH-February] Learning

objectives -: Students will be able to

- explain how disappearance of one species affects other species.
- define biodiversity, and its types-genetic diversity, species diversity and ecological diversity.
- understand species area relationship.

- analysis causes of biodiversity loss.
- comprehend conservation of diversity in situ and ex situ.

P.K Testing -: Teacher will ask following questions

- What is biodiversity ?
- Define species & its diversity.
- List the causes of biodiversity.

KEY WORDS / VOCABULARY -: Biodiversity species and genetic biodiversity, hot spot, in situ and ex situ conservations, Red data book, exploitation etc

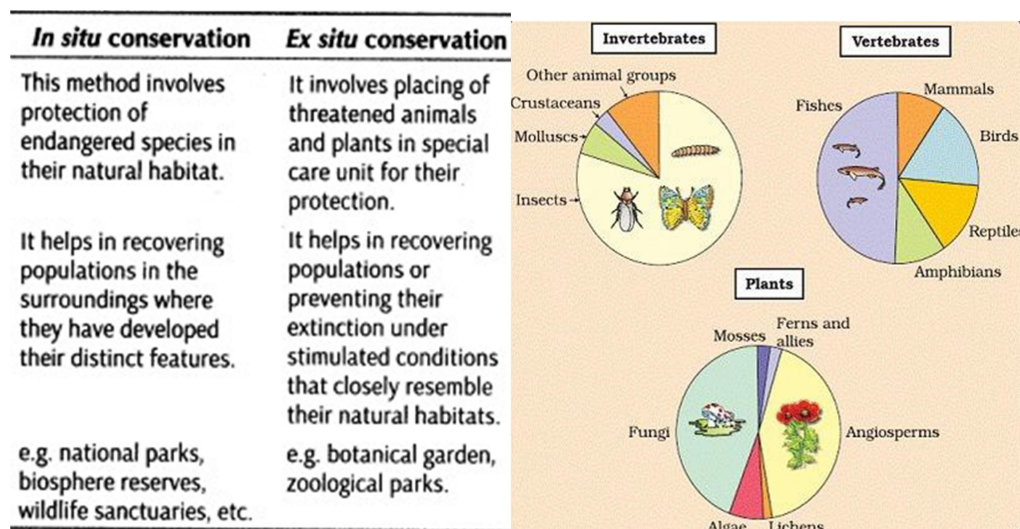
TEACHING AIDS AND INNOVATIVE PEDAGOGIC STRATEGIES -:

- Smart class, picture of extinct and endangered species.
- visual clues, peer to peer learning, interactive lecture, game.

PROCEDURE -: Meaning of biodiversity, genetic diversity, species and ecological diversity

-Will be explained by writing keywords on the board. General to specific method will be used.

-Importance of species diversity, causes of biodiversity losses, reasons of biodiversity conservation , in situ and ex situ conservation will be read by the students individually & discussed.



-Musical chair activity -: Students will play in this activity by holding the picture of different extinct or endangered animals to understand how loss of species is going to effect diversity.

Students Participation -: Students will

- observe the smart class.
- read & discuss the content.
- participate in musical chair activity.
- note down the key wonder.

Recapitulation -: Teacher will ask following questions

- differentiate between in situ and ex situ conservation.
- What is red data book and hot spot ? etc

Art Integration -: musical chair activity

- Draw graph of species area relationship

Learning outcomes -: Students will be able to

- list the causes of biodiversity losses.
- find out ways of conserving biodiversity
- recall the definition of biodiversity
- Compare ex situ and in situ conservation.

Resources -: NCERT textbook, <http://ncert.nic.in> >2014/11

<http://www.learncbse.in> , <https://www.youtube.com/watch?v=pfPR0si>

<http://youtu.be/rwDfRCbYwZc>

Co-scholastic Activities -: Students will develop

- value of conserving biodiversity
- skill of identifying factors that leads to biodiversity losses.

- scientific attitude of conserving biodiversity.

ASSESSMENT:- MCQ, oral test, class test

ASSIGNMENT

1 Which of the following is not a major characteristic feature of biodiversity hot spots?

- a. Large number of species
- b. Abundance of endemic species
- c. Large number of exotic species
- d. Destruction of habitat

2 Two hot spots of India are _____ and _____. 1

3 The Amazon rainforest is referred to as “lungs of the planet”. Mention any one human activity which causes loss of biodiversity in this region. 1

4 Match the animals given in column A with their location in column B: Column A Column B (i) Dodo (a) Africa (ii) Quagga (b) Russia (iii) Thylacine (c) Mauritius (iv) Stellar's sea cow (d) Australia 1

5 Why is genetic variation important in the plant *Rauwolfia vomitoria*? 1

6 How conservation of species in wildlife sanctuaries is different from in zoological parks? 1

7 Evil Quartet are the four main reasons of biodiversity loss. Name these. 2

8 Water logging and soil salinity are some of the problems that have come in the wake of the Green Revolution. Discuss their causes and adverse effects to the environment. 2

9 List any two features that make a stable biological community. 2

10 What is the association between the bumble bee and its favorite orchid, *Ophrys*? How extinction of one would affect the other? 2

11 There is greater biodiversity in tropical /subtropical regions than in temperate region. Explain why? 3

12 Alien species are highly invasive and are a threat to indigenous species. Substantiate this statement with any two examples.

--Link for various question practice www.learnbse.in

