مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

# ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

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| **Subject** | **Biology** |
| **Class/ Section** | **Yr 9** |
| **Week** | **Week 5 : 26th September to 30th September** |
| **Work send to students by** | **Google classroom** |
| **Total number of lessons per week** | **3** |
| **Unit/Topic** | **SB1- Key biological concepts:**<br>**SB 1e: Enzymes and Nutrition, SB1g Enzyme action, SB1h Enzyme activity** |
| **Key Vocabulary** | **Catalyst, substrate, active site, denature, rate of enzyme reaction** |
| **Live Zoom lesson along with face to face instruction for students present on a particular day**<br><br>**Work will be assigned in google classroom which will be matched to the students ability.** | **Lesson 1: SB 1e: Enzymes and Nutrition**<br>**Specific Learning objectives**: Explain the importance of enzymes as biological catalysts in the synthesis of carbohydrates, proteins and lipids and their breakdown into sugars, amino acids and fatty acids and glycerol.<br><br>**Specific Intended Learning Outcomes:**<br><br>• Give examples of enzymes and where they are found in the human body and in other species.<br><br>• Recall the subunits from which carbohydrates, proteins and lipids are formed (sugars, amino acids, fatty acids and glycerol).<br><br>• Explain why catalysis by enzymes is important for life processes<br>**Tasks:**<br><br>Ask students the meaning of the term 'metabolism', and to write down as many processes and reactions as they can remember that happen in living organisms. Then ask them to try to identify those processes or reactions where smaller units are joined to make something large, and those that show where something large is broken down into smaller units to help students realise that there are many processes taking place in an organism at any one time.<br><br>Students must watch the video link given below on https://www.youtube.com/watch?v=VLK2wANjQm0&t=202s<br><br>Teacher discusses the action of enzymes as biological catalyst.<br><br>Students to complete the Textbook questions related to Enzymes and Nutrition on pgs 12-13. |

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| | When students have completed the questions, check which students have difficulty with which questions and use the level of problem to identify any areas for revisiting.<br><br>**Assessment Criteria/ Essential questions:**<br><br>**Support:** Name few products formed by digestion of food.<br><br>**Stretch:** Explain the role of amylase, pepsin and lipase in digesting food.<br><br>**Extend:** Amylase is produced in the mouth and small intestine. Amylase breaks bonds between pairs of glucose molecules in starch. Many foods contain a lot of carbohydrate. Suggest why amylase is produced by the pancreas as well as in the mouth.<br><br>**Resources**: PowerPoint /Board work, Textbook &Video link |
| | **Lesson 2: Topic SB1g Enzyme action**<br>**Specific Learning objectives**: Explain the mechanism of enzyme action including the active site and enzyme specificity and how enzymes can be denatured due to changes in the shape of the active site.<br><br>**Specific Intended Learning Outcomes:**<br><br>• Describe the role of the active site in enzyme function (including specificity).<br>• Use the lock-and-key model to develop explanations for enzyme activity.<br><br>**Tasks:**<br><br>Elicit from students the role of enzymes in digestion and enlisting different enzymes and the substrate they act on linking to the specificity of enzyme action.<br><br>The **ALDS** animation *SB1g Enzymes and temperature* helps students to visualise how an enzyme works and how the shape of the active site is key to the action of the enzyme.<br><br>Teacher discusses the lock and key model using the video link.<br>https://www.youtube.com/watch?v=VNX9UQ08fZ4<br><br>Students complete Textbook questions on Enzyme Action and turn in their work in GC.<br><br>**Assessment Criteria/ Essential questions:**<br><br>**Support:** What is the function of the active site of an enzyme?<br>**Stretch:** Why do enzymes only work on specific substrates?<br>How are enzymes denatured?<br>Explain the lock and key model for enzyme activity.<br>**Extend:** Students research the use of enzymes in biological laundry detergents, and the most common biological stains, to help explain which |

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| | enzymes are used in the detergents.<br><br>**Resources:** PowerPoint /Board work, Textbook, Worksheet &Video link |
| | **Lesson 3: SB1h Enzyme activity**<br>**Specific Learning objectives**: Explain the effects of temperature, substrate concentration and pH on enzyme activity.<br>Demonstrate an understanding of rate calculations for enzyme activity.<br><br>**Specific Intended Learning Outcomes:**<br><br>• Explain why temperature, substrate concentration and pH affect enzyme activity.<br>• Calculate the rate of enzyme activity from experimental data.<br>**Tasks:**<br><br>Introduce the terms rate of enzyme activity and its unit. Students answer on what they think it is and how it could be calculated.<br><br>Students must watch the video link given below on https://www.youtube.com/watch?v=Rfvh4LIsEEM&t=2s<br>The **ALDS** presentation *SB1h Substrate concentration* shows the effect of substrate concentration on the rate of an enzyme catalysed reaction. The second half of the **ALDS** animation *SB1h Enzymes* explains why temperature affects enzymes and the rate of enzyme catalysed reactions to reinforce concept.<br><br>The **ALDS** spreadsheet *SB1h pH and enzymes* gives students some experimental data from an investigation into the effect of pH on amylase. Students work in groups use the data to plot and analyse graphs (Exploring 2).<br><br>**Assessment Criteria/ Essential questions:**<br><br>**Support:** What is meant by the optimum pH/temperature of an enzyme? Identify optimum temperature/pH from a given graph.<br>**Stretch:** Why does the rate of reaction start falling beyond the optimum temperature?<br>Describe the effect of pH on enzyme activity.<br>Explain why an enzyme-controlled reaction stops at beyond a given substrate concentration.<br>**Extend:** A manufacturer is testing several high-temperature cellulase enzymes to break down plant cell walls in plant waste used for making biofuels. Suggest how the manufacturer might carry out the test and how they would decide which is the best enzyme for this process.<br><br>**Resources**: PowerPoint /Board work, Textbook &Video link |

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# ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

## Lesson Plan

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| **Subject** | **Biology** |
| **Class/ Section** | **Yr 10 A-F** |
| **Week** | **Week 5 : 26th September to 30th September,2021** |
| **Work send to students by** | **Google classroom** |
| **Total number of lessons per week** | **4** |
| **Unit/Topic** | **SB3-GENETICS** |
| **Key Vocabulary**<br><br>**Lessons 1,2,3 –Live Zoom lesson along with face to face instruction for students present on a particular day**<br><br>**Work will be assigned in google classroom which will be matched to the students ability** | **Homozygous, Heterozygous, Phenotype, Genotype, Dominant, Recessive.**<br>**Lesson 1: SB3f&g- MENDEL & ALLELES**<br><br>**Specific Learning objectives:** Explain monohybrid inheritance using genetic diagrams, Punnett squares and Monohybrid cross, Homozygous and Heterozygous cross.<br>**Specific Intended Learning Outcomes:**<br>Recall the works of Mendel. **Explain** the role of alleles in developing genetic variations**.** Construct a punnett square and make **simple** conclusions about monohybrid crosses<br>**Tasks:**<br>1.Differentiate a gene and an allele<br>**2.Students must watch the video link given below on**<br>https://www.youtube.com/watch?v=mvWy5lbUoHA<br>https://www.youtube.com/watch?v=Xld3-Fr9oUU<br>https://www.youtube.com/watch?v=agQpPPQ5IVQ<br>3.Read Text book Page-63-65<br>Complete the questions Complete Qn 6-7 (pg 63) and Qn 7, S1 and E1question-Pg 65 assigned from the Biology text book in the notebook. Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.<br>**Assessment Criteria/ Essential questions:**<br>**Support:** A Green pea plant Gg is being crossed with a green pea plant Gg. Predict the Genotype and Phenotype.<br>**Stretch:** In pea plants , yellow seeds, Y are dominant and green seeds y are recessive. A pea plant with yellow seeds is crossed with a pea plant with green seeds. The resulting offspring have about equal number of yellow and green seeded plants. What are the genotypes of the parents?<br>**Extended:** The phenotype for pea plant A is yellow pods and green pea coats. This plant has yellow pods because of a recessive allele for pod colour. The coat around its peas is green because the plant is heterozygous for the allele that causes pea coat colour. Pea plant B is homozygous for the dominant allele for pod colour, and so has green pods. It is homozygous for the recessive allele for pea coat colour, and so its peas have white coats. |

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| | Plants A and B are crossed. Predict the ratio of phenotypes for the offspring<br>**Resources:** The **ALDS** video *SB3g Alleles SB3f Mendel*<br>Text Book, PowerPoint /Board work &Video link<br>Edexcel GCSE(9-1) Biology Textbook<br>Interactive power point from Board works . |
| | **Lesson 2: SB3i-MULTIPLE & MISSING ALLELES-1**<br><br>**Specific Learning objectives:** Describe the inheritance of the ABO blood groups with reference to codominance and multiple alleles.<br>**Specific Intended Learning Outcomes:**<br>**Explain** the role of multilple alleles in inheritance of blood group in humans.<br>**Differentiate** dominance, incomplete dominance & co-dominance **.**<br>**Tasks:**<br>1. Review the Role of gene and an allele.<br>2. **Students must watch the video link given below on** https://www.youtube.com/watch?v=Bo1rllFcehM<br>3. Read Text book Page-68-69<br>4. Complete Qn 1-3& Exam style question (pg 68-69) assigned from the Biology text book in the notebook. Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.<br>**Assessment Criteria/ Essential questions:**<br>**Support**: Give **few** examples of dominance, incomplete dominance & co-dominance traits in organisms.<br>**Stretch**: Differentiate single gene inheritance& multiple gene inheritance.<br>**Extend:** Explain how ABO blood group alleles illustrate dominance, recessiveness and co-dominance.<br>**Resources:** The **ALDS** presentation *SB3i Inheritance* of ABO blood groups.<br>Text Book, PowerPoint /Board work &Video link<br>Edexcel GCSE(9-1) Biology Textbook<br>Interactive power point from Board works |
| | **Lesson 3: SB3i-MULTIPLE & MISSING ALLELES-2**<br>**Specific Learning objectives:** Explain how sex-linked genetic disorders are inherited.<br>**Specific Intended Learning Outcomes:**<br>**Draw** simple conclusions from the pedigree chart related to sex linked inheritance.<br>**Describe** the dangers of a person suffering from haemophilia & colour blindness.<br>**Explain** how sex-linked genetic disorders are inherited.<br>**Tasks:**<br>1. Define Sex chromosome.<br>2. **Students must watch the video link given below on** https://www.youtube.com/watch?v=IJqFk-28G08 https://www.youtube.com/watch?v=-6RGz1YM11o<br>3. Read Text book Page-68-69<br>Complete the questions Complete Qn 5-6& S1 (pg 68-69) assigned from |

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| | the Biology text book in the notebook. Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.<br>**Assessment Criteria/ Essential questions:**<br>**Support:** Give examples of sex-linked genetic disorders.<br>**Stretch:** Interpret the family pedigree chart for inheritance of haemophilia.<br>**Extended:** Explain why some genetic disorders are sex-linked.<br>**Resources:** The **ALDS** video *on sex-linked genetic disorders.*<br>Text Book, PowerPoint /Board work &Video link<br>Edexcel GCSE(9-1) Biology Textbook<br>Interactive power point from Board works |
| | **Lesson 4: SB3h-INHERITANCE**<br><br>**Specific Learning objectives:** Describe how the sex of offspring is determined at fertilisation, using genetic diagrams and Introducing Pedigree Concepts on Analysis.<br>**Specific Intended Learning Outcomes:**<br>Draw a Punnet square to determine the sex of the offspring.<br>**Describe** how the sex of offspring is determined using a genetic diagram.<br>Interpret pedigree charts linked with sex linked inheritance.<br>**Tasks:**<br>1.Differentiate a gene and an allele<br>**2.Students must watch the video link given below on**<br>https://www.youtube.com/watch?v=gDYRH08S-Z4<br>https://www.youtube.com/watch?v=YhRxoA_49m8<br>3.Read Text book Page-66-67<br>Complete the questions 66-67assigned from the Biology text book in the notebook. Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.<br>**Assessment Criteria/ Essential questions:**<br>**Support:** In humans, which gamete is responsible for determining the sex of the offspring?<br>**Stretch:** Explain how the sperm cell is responsible for the determination of sex in humans.<br>**Extended:** *Explain why a female carrier of haemophilia allele does not suffer from the disorder.*<br>**Resources:** The **ALDS** video *CB3h Cystic fibrosis and its cause*<br>Text Book, PowerPoint /Board work &Video link<br>Edexcel GCSE(9-1) Biology Textbook<br>Interactive power point from Board works |

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# ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

## Lesson Plan

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| **Subject** | **Biology** |
| **Class/ Section** | **Yr 11 A -F** |
| **Week** | **Week 5 : 26th September to 30th September** |
| **Work send to students by** | **Google classroom** |
| **Total number of lessons per week** | **5** |
| **Unit/Topic** | **SB6-Plant structures and their functions.** |
| **Key Vocabulary** | • Phototropism, gravitropism, auxins, gibberellins, ethene, minerals,photoperiodism, short day ,long day and day neutral plants,taxis,kinesis,cuticle,physical barrier,chemical barrier, Depedent variable,independent variable and controlled variable. |
| | **Lesson 1 &2 Topic: SB6 f &g-Plant hormones**<br>**Specific Learning objectives:**<br>• Explain how plant hormones control and coordinate plant growth and development, including the role of auxins in phototropisms and gravitropisms.<br>• Describe the commercial uses of auxins, gibberellins and ethene in plants, including:. auxins in weedkillers and rooting powders b. gibberellins in germination, fruit and flower formation and the production of seedless fruit c. ethene in fruit ripening<br>**Specific Intended Learning Outcomes:**<br>• Define the term tropism.<br>• **Identify** negative and positive photo- and gravitropisms.<br>• Explain how auxins cause phototropism in plant shoots and roots.<br>• **Establish the link** between levels of auxins in roots and shoots have opposite effects.<br>• State **few** commercial uses of auxins, gibberellins, cytokinins and ethane.<br>• Suggest why weeds on a playing field are killed without destroying grass.<br>• **Explain** why would a farmer use a selective weed killers on a lawn**.**<br>• **Describe** the uses of auxins ,ethene & gibberellin by plant growers.<br>• |

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| | **Tasks:**<br>1.Teacher shows the picture of some newly germinated cress seedlings that have been exposed to light from one side only, and another set of seedlings that have been illuminated from above. Ask students to describe how the bent seedlings have been grown and ask students to explain why this growth pattern may be an advantage for the plants.<br>2.Students go through the ALDS presentation *SB6f Plant hormones and* explain how auxins cause growth in response to light and gravity<br>***3.*** Give students lots of ways of remembering the different words in this spread. Photo- (to do with light; think of cameras), gravi- (to do with the ground; think of gravity), positive (something that is 'good' for the shoot/root, so plants will grow towards it); negative (something that is 'bad' for the shoot/root, so plants will grow away from it).<br>4.Students explain two reasons why a newly germinated root on the surface of the soil will grow downwards.<br>**5.**Identify the roles of different plant hormones in the life cycle of an apple tree. |
| **Assessment Criteria/ Essential questions** | **Assessment Criteria/ Essential questions:**<br>**Support**: Explain how auxins cause plant shoots to grow towards the source of light.<br>**Stretch**: Explain how the use of selective weedkillers allows grass on the playing field tobe killed without affecting the grass.<br>**Extend:** Wood lice move away from light .Explain why this is not an example of negative phototropism |
| **Resources** | ALDS PPT presentation on uses of plant hormones.<br>IGCSE slides-plant hormones<br>Biology 9-1 student book b.6.15<br>https://www.youtube.com/watch?v=_Bf5WKEMB5o<br>https://www.youtube.com/watch?v=fEo21LbnJJM |
| | **Lesson 3-Photoperiodism,Taxis aand kinesis**<br>**Specific Learning objectives:**<br>Describe photoperiodism as the physiological reaction of organisms to the length of night or a dark period and its impacts on plants and animals in the environment<br>**Specific Intended Learning Outcomes:**<br>• Define the term photoperiodism.<br>• Explain short day ,long day and day neutral plants<br>• Identify some examples of short day ,long day and day neutral plants<br>• Differentiate taxis and kinesis<br><br>**Tasks:**<br>1. Ask students, "How can sunlight impact plants and animals?" Follow up with the question, "Can darkness also impact plants and animals?".<br>2. Students to think about the length of day (amount of light vs darkness) in the spring and summer compared to the length of day in the fall and winter. Is there a difference Have students |

record in their notebooks that spring and summer have long days and short nights while fall and winter have short days and long nights.

3. Explain the differences between short day ,long day and day neutral plant.

4. Students complete research on taxis and kinesis.

4.Students complete the work sheet on photoperiodism.

**Assessment Criteria/ Essential questions**

**Support:**What is photoperiodism?

The table shows the results from an investigation into the amount of light and dark a plant needs to make it flower.

| Length of day | Length of night | Does the plant flower? |
|---|---|---|
| 24 | 0 | no |
| 20 | 4 | no |
| 16 | 8 | no |
| 12 | 12 | yes |
| 8 | 16 | yes |

**Stretch: Choose the best conclusion from these results and explain your choice**.

- This plant needs long days and short nights to stimulate flowering.
- This plant needs equal-length days and nights to stimulate flowering.
- This plant needs short days and long nights to stimulate flowering.
- Flowering is unaffected by the length of day.
- Flowering is only one response controlled by light. Others include germinating and growing.

**Extend:** Why might a flower grower want a plant to produce flowers all year round?

**Resources**

**https://www.youtube.com/watch?v=UW1NH02jV0Q**
**https://www.youtube.com/watch?v=kiap213j238**

**Lesson 4& 5-SB1h-Core Practical-pH & Enzymes**

**Specific Learning objectives:**

**.** Investigate the effect of pH on enzyme activity

**Specific Intended Learning Outcomes:**

- **Predict** how pH affect the rate of enzyme action.
- Outline a method to find how pH affect enzyme action**.**
- Draw & label the graph of the result obtained related to enzyme activity .
- Analyze & interpret the results obtained.
- Calculate rate of enzyme catalyzed reaction using 1/T or in terms of volume of gas produced

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| | **Tasks:**<br>1. Review the factors affecting enzyme action.<br>2. Students write a plan for the experiment.<br>**3. Students identify dependent, independent and controlled variables.**<br>4. Complete the exam style questions in the textbook page 23.<br>Students will be put in break out rooms during Zoom lesson to encourage collaborative learning. |
| **Assessment Criteria/ Essential questions** | **Support:** Identify controlled, the dependent and independent variable in the investigation.<br>**Stretch:** Draw and label graph for the obtained values.<br>**Extended** : Calculate rate of enzyme catalyzed reaction using 1/T |
| **Resources** | Biology 9-1 student book b1.10<br>**https://www.youtube.com/watch?v=8Yqbu56ImXk** |

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# ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

## Lesson Plan

| Subject | Biology |
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| **Class/ Section** | **Yr 12 – Batch (Mrs.Honey .A.S)** |
| **Week** | **Week 5 : 26 th September to 30th September, 2021** |
| **Work send to students by** | **Google classroom** |
| **Total number of lessons per week** | **3** |
| **Unit/Topic** | **1.2 -Biological Molecules** |
| **Key Vocabulary** | Nucleotides, Adenosine triphosphate (ATP), , ATPase, Adenosine diphosphate (ADP), Reduction/oxidation (redox) reactions, Nucleic acids, Phosphodiester bond, Genome, Replicates, DNA helicase, DNA polymerase, DNA ligase |
| **Lesson 1,2,3 - Live Zoom lesson along with face to face instruction for students present on a particular day**<br><br>**Work will be assigned in google classroom which** | **Lesson -1**<br>♠ **Specific Learning objectives:**<br>Relate the structure and properties of ATP to its function in the cell<br>Recognize and identify the three types of RNA.<br>♠ **Specific Intended Learning Outcomes:**<br>➢ **Students will be able to**<br>**Describe** the structure of RNA and DNA and explain the importance of base pairing and hydrogen bonding;<br>**Explain** the role of RNA in protein synthesis<br>**Compare** the structure of DNA and RNA |

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| **will be matched to the students' ability.**<br><br>**Assessment Criteria/ Essential questions:** | State that deoxyribonucleic acid (DNA) is a polynucleotide, usually double stranded, made up of nucleotides<br>**Tasks:**<br>➢ **Independent student-led activity:**<br>Students Differentiate nucleotide and polynucleotide. Main difference between RNA & DNA<br>***Support***: Provide a list of keywords and a basic framework for main activities in the text book<br>***Stretch***: Research the topic of ATP-related diseases. Describe and explain the symptoms of these conditions<br>**Extended** -. Search online for 'DNA structure tutorial UMass' and follow the link to the *University of Massachusetts* DNA tutorial.<br><br>**DIFFERENTIATION STRATEGIES TO ACHIEVE THE SUCCESS CRITERIA**<br>Support- **Summary-structure of mononucleotides**<br>**Stretch**- Textbook-Q.NO -1 and 2-page no 43<br>***Extended* – Exam style question-1 and 2 Page no-52** |
| **Resources:** | Edexcel AS/A level Biologty 1 Textbook<br>**BOARD WORKS- Nucleic acids-No -3-12]**<br>**Video and PPT:** Types of RNA<br>**Video and PPT:** Structure of ATP<br>**Websites:** www.science.co.uk/biology/nucleicacids.html, www.internet4classrooms.com |
| | **Lesson - 2 & 3**<br>♠ **Specific Learning objectives:**<br>♠ Understand how DNA replicates semiconservatively including the role of DNA helicase, polymerase and ligaserelate the structure of the DNA molecule to the way in which it replicates<br>♠ **Specific Intended Learning Outcomes:**<br>➢ **Students will be able to**<br>Recap of complementary base pairs and hydrogen bonding<br>How DNA replication occurs including the breaking of hydrogen bonds and the roles of DNA helicase, polymerase and ligase<br>The work of Meselson and Stahl and how this supported the theory of semi-conservative replication<br>**Describe** semi-conservative method of replication.<br>**Explain** the functions of DNA polymerase, ligase, helicase.<br>**Tasks:**<br>➢ **Independent student-led activity:**<br>Working in groups, students use short sections of string to model Meselson and Stahl's experiment over several generations for both conservative and semiconservative replication.**:** Draw diagrams and identify the importance of enzymes in replication.<br>● ***Support***: Make a flow diagram to describe the sequence of events in DNA replication. Explaining the use of a centrifuge may help students to understand how heavy and light DNA could be separated. |

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| | Explaining replication step by step using paper models of DNA strands and free nucleotides can often help<br>***Stretch***: Research and write definitions for the biological terms 'replication', 'conservative' and 'semi-conservative'. Think about what non-biological meanings these words can have . Students could research the characteristics of inheritance online<br>Extended -. Research how DNA can be replicated in the laboratory using a process called polymerase chain reaction (PCR).<br><br>**DIFFERENTIATION STRATEGIES TO ACHIEVE THE SUCCESS CRITERIA**<br>**Support**-Summarise the role of enzymes in DNA replication<br>**Stretch**- Text book questions –1 and 2 page 43[[explain the stages of replication of DNA]<br>***Extended ;*****Exam style question-3 and 4—Page no-53[Desribe the role of cell organelles in protein synthesis]** |
| **Resources** | Edexcel AS/A level Biologty 1 Textbook<br>**Video and PPT:** DNA replication<br>**Websites:** www.science.co.uk/biology/dnareplication.html, www.internet4classrooms.com<br>There are some good interactive resources in the 'Code' section at www.dnai.org.<br>**BOARD WORKS- Nucleic acids-No -14-19]** |

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**ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI**

## Lesson Plan

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| **Subject** | **Biology** |
| **Class/ Section** | **Yr 12 (Mrs.Mary Augustine & Deepa Varghese )** |
| **Week** | **Week 5 : September 26th to 30th September ,2021** |
| **Work send to students by** | **Google classroom** |
| **Total number of lessons per week** | **3** |

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| **Unit/Topic** | **Topic 2 .1– Eukaryotes** |
| **Key Vocabulary** | **Exocytosis, Golgi apparatus, Lysosome, Apoptosis ,Cellwall, Suberin, Lignin, Middle lamella, Pectin, Primary cell wall, Secondary cell wall, Plant fibres, Plasmodesmata, Symplast, Tonoplast, Cell sap, Osmosis, Chloroplast, Chlorophyll, Amyloplast** |
| **Live Zoom lesson along with face to face instruction for students present on a particular day**<br><br>**Work will be assigned in google classroom which will be matched to the students ability.** | **Lesson 1:**<br><br>**Specific Learning objectives:** Describe the structure of Golgi Apparatus, Compare role of Lysosomes & Peroxisomes& discuss protein transport within cells.<br><br>**Specific Intended Learning Outcomes:**<br><br>**Students able to**<br>●Compare structure & functions of ER & Golgi apparatus .<br>●Differentiate primary lysosomes, secondary lysosomes & residual bodies<br>●Explain transport of protein within cells<br>.<br>**Tasks:**<br>● Show an animation of protein trafficking in the cell. Ask students to write down two new facts they have learned.<br>Ask students to list as many proteins in living things as they can. Discuss the idea that some are needed within the cell while some are exported from the cell.<br>● Use of Board works to discuss protein trafficking in cells<br>● Create a concept map which shows the functional links between organelles in protein synthesis<br><br>**Students to complete Text book questions pg. 82**<br>Students will be put in break out rooms during Zoom lesson to encourage collaborative learning. |
| **Assessment Criteria/ Essential questions:** | **Support :** Identify the organelles involved in synthesis & transport of proteins and types of lysosomes in animal cells<br>**Stretch :Describe** the role of vesicles & lysosomes within cells.<br>**Extension:** Research the effect of binge-drinking of alcohol on endoplasmic reticula.&Find out why glycoproteins make mucus slippery. |

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| **Resources:** | AS Board works ,PowerPoint on protein trafficking & Video link<br>https://www.youtube.com/watch?v=yI5x3yI3frU<br>https://www.youtube.com/watch?v=whbJXQpswic<br>https://www.youtube.com/watch?v=nJMwvDMwgLE<br>https://www.youtube.com/watch?v=too8lwzJdT8<br><br>Worksheet file question on Eukaryote<br>AS Biology student book: **Text book : 2.1** |
| | **Lesson 2:**<br><br>**Specific Learning objectives:** Role of vacuoles in animals & plants .Explain Ultra structure of Cell wall<br>**Specific Intended Learning Outcomes:**<br>●Identify chemical components that make up the cell wall.<br>●Differentiate Primary & Secondary cell wall .<br>●Significance of Plasmodesmata in plant cells .<br>● Describe the role of vacuoles in animals & plant cells<br>**Tasks:**<br>● In groups, students look at a diagram of the ultrastructure of a plant cell and highlight any cell structures that are not present in animal cells. Video shown on cell wall structure<br>● Discuss the detailed structure of plant cell wall .using Ppt. on cell wall structure<br>● Produce a table to summarise plant cell structure. Columns could be headed 'Plant organelle or structure', 'Description of structure' and 'How the structure enables function'<br><br>**Students to complete Text book questions pg. 85**<br>Students will be put in break out rooms during Zoom lesson to encourage collaborative learning. |
| **Assessment Criteria/ Essential questions:** | **Support :** Enlist the key terms related to cell wall structure<br>**Stretch :** Differentiate primary cell wall & secondary cell wall .<br>**Extension:** Research in more detail the ultrastructure of the chloroplast and its function in photosynthesis. Find out about how and why chloroplasts move around in the cell. |
| **Resources:** | AS Board works &PowerPoint on cell wall & vacuoles & Video link<br>https://www.youtube.com/watch?v=yjrLbuzU70k<br>https://www.youtube.com/watch?v=too8lwzJdT8<br><br>Worksheet file question on eukaryote<br>AS Biology student book: **Text book : 2.1** |
| | **Lesson 3:**<br><br>**Specific Learning objectives:** Explain Ultra structure of Chloroplast in plant cells & role of other plastids in plants<br><br>**Specific Intended Learning Outcomes:**<br>● Draw & label various parts of chloroplast<br>● Describe the role of various parts of chloroplast<br>● Compare types of plastids in plants – amyloplast, chloroplast & chromoplast |

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| | **Tasks:**<br>● Watch video link posted in GC ,Students identify parts of chloroplast they have learned from the video.<br>● Use of board works & ppt. to discuss ultra structure of chloroplast<br><br>**Students to complete Text book questions pg. 87**<br>Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.<br>Complete true/false questions about plant cell structures & animal cell structures using doodle boardworks |
| **Assessment Criteria/ Essential questions:** | **Support :** Identify the role of various plastids in plants<br><br>**Stretch :** Explain how each part of chloroplast reated to process of photosynthesis<br><br>**Extension:** Research on link between chloroplast & endosymbiont theory . |
| **Resources:** | A2 Board works ,PowerPoint on chloroplast & Video link<br>**https://www.youtube.com/watch?v=eOPEn2qYff4**<br>**https://www.youtube.com/watch?v=9SPP7pJ_hX4**<br><br>Worksheet file question on eukaryote<br>AS Biology student book: **Text book : 2.1** |

مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

# ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

Lesson Plan

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| **Subject** | **Biology** |
| **Class/ Section** | **Yr 13 (Mrs.Honey.A.S & Mrs.Avita Franco)** |
| **Week** | **Week 5 : 26th September to 30th September, 2021** |
| **Work send to students by** | **Google classroom** |
| **Total number of lessons per week** | **3** |
| **Unit/Topic** | **6.1-Bacteria and Disease** |
| **Key Vocabulary** | Selective medium, Inoculation, Haemocytometer, Turbidimetry, Turbid, Dilution plating, Total viable cell count, Generation time, Lag phase, Log phase, Stationary phase, Death phase |
| **Lesson 1,2,3 - Live Zoom lesson along with face to face instruction for students present on a particular day**<br><br>**Work will be assigned in google classroom which will be matched to the students' ability.** | **Lesson -1**<br>**Specific Learning objectives:**<br>• Analyse the use of different media including broth cultures, agar, selective media and methods for bacterial growth.<br>**Specific Intended Learning Outcomes:**<br>**Students will be able to**<br>♠ **Identify** the use of different media including broth cultures agar and selective media.<br>♠ **Explain** the different method of measuring bacterial growth of bacterial cultures by cell counts ,dilution plating ,mass and optical methods(turbidity)<br>**Tasks:**<br>**Independent student-led activity:** In pairs, students discuss how a mixed culture of bacteria may be separated to achieve a pure culture. They then join together in groups of four to share their ideas<br>***Support***: The importance of staining specimens in microscopy<br>***Stretch***: **Explain** the principles and describe the basic aseptic techniques used in culturing organisms<br><br>**DIFFERENTIATION STRATEGIES TO ACHIEVE THE SUCCESS CRITERIA**<br>***Support***: **Explain** the principles and describe the basic aseptic techniques used in culturing organisms.<br>You could provide a risk assessment template if students have not carried out the pre-unit homework suggestion.<br>Some students may need to be reminded of the ultrastructure of bacteria and their previous knowledge of Gram staining |

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| **Assessment Criteria/ Essential questions:** | ***Stretch***: The response of the body to infection, including the action of the macrophages, neutrophils and lymphocytes<br>**Extended** - How other organisms can act as pathogens, including fungi, viruses and protozoa. |
| **Resources:** | Edexcel AS/A level Biologty 2 Textbook<br>www.science.co.uk/biology/culture techniques..html, www.internet4classrooms.com<br>**Video and ppt-** Dilution Plating and optical methods |
| | **Lesson -2&3**<br>**Specific Learning objectives:**<br>Analyse the different phases of a bacterial growth curve and calculate exponential growth rate constants.<br>Investigate the rate of growth of bacteria in liquid culture taking into account the safe and ethical use of organism<br>**Specific Intended Learning Outcomes:**<br>**Students will be able to**<br>**Describe** the different phases of bacterial growth curve and calculate exponential growth constants.<br>**Explain** the use of log scales in graphs to show the rate of bacterial growth.<br>State two ways in which antibiotics may inhibit the growth of bacteria.<br>**Tasks:**<br>**Independent student led activity/Group activity**- In pairs, students complete a 'Coach pair' activity to practise answering exam questions on the measurement and calculation of growth rates.<br>***Support***: Suggest why the agar plate was allowed to stand for 30 minutes at room temperature before being incubated.<br>***Stretch***: Draw growth curve and label the diagram.<br>Investigate the rate of growth of bacteria in liquid culture. In pairs, students complete a 'Coach pair' activity to practise answering exam questions on the measurement and calculation of growth rates.<br>**Extended** - Identify and explain systematic errors and random errors in generating results,<br>Analyse the risks associated with their planned approach and suggest ways of minimizing these risks.<br>Evaluate the methodology and suggestions are made to improve or further the work of the investigation<br>**DIFFERENTIATION STRATEGIES TO ACHIEVE THE SUCCESS CRITERIA**<br>**Support**- Textbook-Q.NO -1 and 2-page no ;49 and 51[Use of log scales in the given question<br>**Stretch**- Textbook-Q.NO -3 and 4 page no 49[Plot a graph based on the given data<br>***Extended* – Exam style question 2 and 3—Page no-62[Analyse the graph given** |

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| | Edexcel AS/A level Biologty 2 Textbook<br>www.science.co.uk/biology/culture techniques..html,<br>www.internet4classrooms.com<br>**Video and ppt-** Growth curve used in culturing microorganisms |

مدرسة القديسة مريم الكاثوليكية الثانوية – دبي

# ST. MARY'S CATHOLIC HIGH SCHOOL, DUBAI

## Lesson Plan

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|---|---|
| **Subject** | **Biology** |
| **Class/ Section** | **Yr 13** |
| **Week** | **Week 5 : 26th September to 30th September** |
| **Work send to students by** | **Google classroom** |
| **Total number of lessons per week** | **3** |
| **Unit/Topic** | **Topic 7.3:- Gene Technology** |
| **Key Vocabulary** | **Genetic engineering/genetic modification ,Recombinant DNA, Reverse transcriptase, Complementary DNA (cDNA),Sticky end Replica plating, Gene gun, Liposome wrapping, Microinjection (DNA injection),transgenic plant** |
| **Live Zoom lesson along with face to face instruction for students present on a particular day**<br><br>**Work will be assigned in google classroom which will be matched to the students ability.** | **Lesson 1 &2:**<br><br>**Specific Learning objectives:**<br>Describe how genetically modified organisms (micro organisms and animals) can be produced .Discuss the risks and benefits associated with the use of GM organisms<br>**Specific Intended Learning Outcomes:**<br>● Outline the key steps involved in producing GM insulin using E. Coli.<br>● Compare GM insulin production using reverse transcriptase with E. Coli method.<br>●Describe the use of microinjection, micro projectile & liposome wrapping technique in producing GM animals. |

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| | **Tasks:**<br>● Display the terms 'restriction endonuclease' and 'ligase'. In pairs, students decide what they can deduce about these molecules from their names.<br>● Use of video & board works to discuss the concepts of genetic engineering **.**<br>● Students to summarise the key points from the video & board works shown on producing transgenic bacteria<br>**Students to research on**<br>**Genetic engineering techniques in animals- Micro injection ,Microprojectile method&Liposome wrapping**<br>**Students to complete text book questions**<br>**Pg.126 Q.1-3**<br>**●Students will be put in break out rooms during Zoom lesson to encourage collaborative learning.** |
| **Assessment Criteria/ Essential questions:** | **Support :** Draw an illustrated flow diagram to show how recombinant cells are produced by genetic engineering<br>**Stretch** Describe the significance of each stage of genetic engineering<br><br>**Extension:** Research on how antibiotic resistance markers and replica plating are used to identify recombinant cells. |
| **Resources:** | A2 Board works ,PowerPoint on gene technology & Video link<br>**https://www.youtube.com/watch?v=BK12dQq4sJw**<br>**https://www.youtube.com/watch?v=5Ryb7ZLJSh0**<br>A2 Biology student book: **Text book : 7.3** |
| | **Lesson 3:**<br><br>**Specific Learning objectives:**<br>Describe how genetically modified organisms plants can be produced .Discuss the risks and benefits associated with the use of GM organisms.<br>**Specific Intended Learning Outcomes:**<br><br>● Enlist uses of GMO<br>● Outline the key steps involved in producing GM plants using Agrobacterium tumefaeciens & Bacillus thuringiensis<br>●. Compare risks & benefits of GM bacteria, GM animals & GM plants<br><br>**Tasks:**<br>● An online search for 'creating transgenic plants video' will provide useful clips.<br>● In groups, students list all the reasons they can think of for genetically modifying commercial crops.<br>● Use of video & board works to discuss the concepts of producing GM plants **.** |

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| | **Students to research on**<br>**Use of gene technology in medicines , Students will be put in break out rooms during Zoom lesson to encourage collaborative *learning*.**<br><br>**Students to complete text book questions on Pg.126&128** |
| **Assessment Criteria/ Essential questions:** | **Support :** Produce a bulleted summary of how plants can be genetically modified using *Agrobacterium*<br><br>**Stretch :** Compare the process of genetic engineering done using virus,E.coli & Agrobacterium<br><br>**Extension:** Research on how homeotic genes and how 'knockout' of these genes has informed our knowledge of how the body develops. |
| **Resources:** | A2 Board works ,PowerPoint on gene technology& Video link<br>**https://www.youtube.com/watch?v=JtkhHIG3nx4**<br>**https://www.youtube.com/watch?v=M_ztZGbLEJ0**<br>A2 Biology student book: **Text book : 7.3** |