

SMK CONVENT BUKIT NANAS, KUALA LUMPUR
SCHEME OF WORK 2007
BIOLOGY
UPPER SIX SCIENCE

FIRST TERM : 03 JANUARY 2008 - 23 MAY 2008

LEARNING AREA : REPRODUCTION, DEVELOPMENT AND GROWTH

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|--------------------------|---|---|--|--------------------------|-----------------------|-------|
| 13.0 REPRODUCTION | | | | | | |
| 1 | 13.1 Sexual reproduction 13.1.1 Plants Algae : <i>Spirogyra</i> Bryophyta : <i>Marchantia</i> Filicinophyta: <i>Dryopteris</i> Coniferophyta : <i>Pinus</i> Angiospermophyta : <i>Caesalpinia</i> 13.1.2 Fungi <i>Mucor</i> 13.1.3 Animals Ciliophora : <i>Paramecium</i> Cnidaria : <i>Hydra</i> Annelida : <i>Pheretima</i> Arthropoda : <i>Periplaneta</i> Amphibia : <i>Rana</i> Reptilia : <i>Naja</i> Osteichthyes : <i>Tilapia</i> Aves : <i>Columba</i> Mammalia : | Able to : <ul style="list-style-type: none"> • Explain the structure of sexual reproductive organ • Explain the life cycle with emphasis on sexual reproduction Able to : <ul style="list-style-type: none"> • Explain the structure of sexual reproductive organ • Explain the life cycle with emphasis on sexual reproduction Able to : <ul style="list-style-type: none"> • Explain the diversity of sexual reproduction systems and overall comparison • Explain the mechanism of fertilization (internal and external) • Describe on the oviparity, ovoviviparity and viviparity | Discussion and explaining on the structure of sexual reproductive organ and life cycle with emphasis on sexual reproduction Carry out experiment to : <ul style="list-style-type: none"> • examine the slides of <i>Spirogyra, Marchantia, Dryopteris, Pinus, Caesalpinia</i> • investigate the structure of f lowers Discussion and explaining on sexual reproduction systems, mechanism of fertilization (internal and external), the oviparity, ovoviviparity and viviparity | Creative Thinking ICT | Appreciate Patient | |

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|--------------------|---------------------------------------|--|---|---------------------------------|--------------|-------|
| | | <ul style="list-style-type: none"> Explain the mobilization of nutrients after inhibition (role of gibberelin) | Discuss and explanation on the mobilization of nutrients after inhibition | | | |
| 15.0 GROWTH | | | | | | |
| | 15.1 Measurement | Able to : <ul style="list-style-type: none"> Explain through examples the parameters and methods of measurement Solve problems | Discuss and explanation on parameters and methods of measurement | | | |
| | 15.2 Types of growth curve | Able to explain : <ul style="list-style-type: none"> absolute growth curve absolute growth rate curve relative growth rate curve | Discuss and explanation on the types of growth curve | | | |
| | 15.3 Growth pattern | Able to explain : <ul style="list-style-type: none"> limited growth in human unlimited growth in perennial plants or woody saka allometric growth in human isometric growth in fish intermittent growth in insect | Discuss and explanation on the growth pattern | | | |
| | 15.4 Ecdysis and metamorphosis | Able to : <ul style="list-style-type: none"> Define ecdysis and metamorphosis Explain the role of hormones such as neurosecretion, juvenile hormone and ecdysone Describe the process of ecdysis and metamorphosis in insects | Group discussion on ecdysis and metamorphosis and the role of hormones such as eurosecretion, juvenile hormone and ecdysone | Study skills Future research | Cooperation | |
| | 15.5 Dormancy | Able to explain the concept, importance and examples of dormancy | Explanation on the concept, importance and examples of dormancy in animals and plants | | | |
| | 15.5.1 Animals | Able to explain hibernation, aestivation and diapause | | | | |

| | | | | | | |
|--------|--------|---|--|--|--|--|
| 15.5.2 | Palnts | <p>Able to :</p> <ul style="list-style-type: none"> • explain about seed dormancy • explain through examples the factors affecting seed dormancy and methods of overcoming them | | | | |
|--------|--------|---|--|--|--|--|

LEARNING AREA : GENETICS

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|-----------------------------------|--------------------------------|---|---|--|-----------------------|-------|
| 16.0 TRANSMISSION GENETICS | | | | | | |
| 4 | 16.1 Mendelian genetics | <p>Able to :</p> <ul style="list-style-type: none"> • Define terms • Explain Mendel's experiment on monohybrid and dihybrid crosses/inheritance • Listing and explain the characteristics of pea plants used by Mendel | <p>Group discussion on terms, Mendel's experiment on monohybrid and dihybrid crosses/inheritance and characteristics of pea plants used by Mendel</p> <p>Carry out experiment on monohybrid and dihybrid crosses</p> | <p>Study skills Future research Individualized instruction</p> | <p>Loves Obey</p> | |
| | 16.1.1 Monohybrid | <p>Able to :</p> <ul style="list-style-type: none"> • Explain about monohybrid cross and its results • Describe the Mendel's first law and its' relation with meiosis • Calculate the ratios of genotypic and phenotypic until F₂ generation | <p>Group discussion on monohybrid cross and its results and Mendel's first law and its' relation with meiosis</p> <p>Carry out activity on calculating the ratios of genotypic and phenotypic until F₂ generation</p> | | | |
| | 16.1.2 Dihybrid | <p>Able to :</p> <ul style="list-style-type: none"> • Explain about monohybrid cross and its results • Describe the Mendel's second law and its' relation with meiosis • Calculate the ratios of genotypic and phenotypic until F₂ generation | <p>Group discussion on monohybrid cross and its results and Mendel's second law and its' relation with meiosis</p> <p>Carry out activity on calculating the ratios of genotypic and phenotypic until F₂ generation</p> | | | |

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|------|---|---|---------------------|--------------------------|--------------------|-------|
| 4 | 16.2 Modification of Mendelian genetics 16.2.1 Codominance 16.2.2 Incomplete dominance 16.2.3 Multiple alleles 16.2.4 Lethal genes 16.2.5 Polygenes | Able to : <ul style="list-style-type: none"> • Give definition • Explain through examples of inheritance : MN blood group in humans • Calculate the ratios of genotypic and phenotypic Able to : <ul style="list-style-type: none"> • Give definition • Explain through examples of inheritance : <i>Antirrhinum</i> (Snapdragon) flower colour • Calculate the ratios of genotypic and phenotypic Able to : <ul style="list-style-type: none"> • Give definition • Explain through examples of inheritance : human ABO blood group • Calculate the ratios of genotypic and phenotypic Able to : <ul style="list-style-type: none"> • Give definition • Explain through examples of inheritance : coat colour in mice • Calculate the ratios of genotypic and phenotypic Able to : <ul style="list-style-type: none"> • Give definition | | Creative Thinking ICT | Appreciate Patient | |

| | | | | | | |
|--|--|--|--|--|--|--|
| | | Explain through examples of inheritance : height in humans | | | | |
|--|--|--|--|--|--|--|

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|----------------------|----------------------------|---|--|--------------------------|---------------|-------|
| 5 | 16.2.6 Linked genes | Able to : <ul style="list-style-type: none"> • Give definition on linked genes and sex-linked genes • Explain the effect of crossing-over on ratio of dyhybrid crosses • Explain through examples of <i>Drosophila</i> eye colour and haemophilia in humans on the parental and recombinant phenotypes • Calculate the ratios of genotypic and phenotypic • Describe about pedigree analysis • Explain on the sex determination in humans | Group discussion on linked genes and sex-linked genes, effect of crossing-over on ratio of dyhybrid crosses, parental and recombinant, pedigree analysis and sex determination in humans | Creative Thinking ICT | Loves Obey | |
| | 16.2.7 Epistasis | Able to give definition and examples | Explanation on epistasis | | | |
| 17.0 MUTATION | | | | | | |
| 6 | 17.1 Classification | Able to : <ul style="list-style-type: none"> • Explain spontaneous and induced • Describe examples of mutagens | Group discussion on spontaneous and induced and mutagens | | | |
| | 17.2 Gene mutation | Able to explain gene mutation at DNA level | Explanation on the gene mutation at DNA level | | | |
| | 17.2.1 Substitution | Able to : <ul style="list-style-type: none"> • Give definition • Explain through examples | Group discussion substitution, insertion/addition, deletion, inversion | | | |

| | | | | | | |
|--|-------------------------------|--|--|--|--|--|
| | 17.2.2 Insertion/ Addition | <p>the sickle-cell anaemia</p> <p>Able to :</p> <ul style="list-style-type: none"> • Give definition • Explain through examples <p>Frameshift mutation</p> | | | | |
|--|-------------------------------|--|--|--|--|--|

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|------|------------------------------------|---|---|---------------------------------|--------------|-------|
| 6 | 17.2.3 Deletion | <p>Able to :</p> <ul style="list-style-type: none"> • Give definition • Explain through examples <p>Frameshift mutation</p> <ul style="list-style-type: none"> • Explain thalassaemia major | Group discussion on substitution, insertion/addition, deletion, inversion | Study skills Future research | | |
| | 17.2.4 Inversion | Able to give definition of inversion | | | | |
| | 17.3 Chromosomal mutation | Able to explain about chromosomal aberration | Group discussion on chromosomal aberration | | | |
| | 17.3.1 Change in chromosome number | <p>Able to :</p> <ul style="list-style-type: none"> • Explain through examples of aneuploidy and euploidy/polyploidy • Describe the definition of autosome and sex chromosome | Group discussion and explanation on aneuploidy and euploidy/polyploidy, autosome and sex chromosome | | | |
| | Aneuploidy | <p>Able to :</p> <ul style="list-style-type: none"> • Give definition • Explain non-disjunction during meiosis • Explain abnormalities of autosome number • Explain through examples of abnormalities of sex chromosomes number | | | | |
| | Euploidy/poliploidy | | | | | |

| | | | | | | |
|--|--|--|--|--|--|--|
| | | <p>Able to :</p> <ul style="list-style-type: none"> • Give definition of Euploidy/polyploidy, autopolyploidy and allopolyploidy • Explain through examples in plants | | | | |
|--|--|--|--|--|--|--|

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|------|--|-------------------------|--|---|---------------|-------|
| | <p>17.3.2 Change in chromosome structure :</p> <p>Inversion Translocation Deletion Duplication/ multiplication</p> | Able to give definition | Group discussion and explanation on inversion, translocation, deletion, duplication/, multiplication | Study skills Future research Individualized instruction | Loves Obey | |

18.0 POPULATION GENETICS

| | | | | | | |
|----------|--|---|---|--|--|--|
| 6 | <p>18.1 Concepts of gene pool</p> <p>18.2 Hardy-Weinberg law</p> | <p>Able to :</p> <ul style="list-style-type: none"> • Describe the concept of gene, allele and genotype frequencies in a population • Explain the relationship between population genetics and evolution <p>Able to :</p> <ul style="list-style-type: none"> • Explain genetic equilibrium and allele frequency • Describe the requirements of Hardy-Weinberg equilibrium • Calculate the frequency of allele and genotype in a population | <p>Group discussion and explanation on the concept of gene, allele and genotype frequencies in a population and the relationship between population genetics and evolution</p> <p>Group discussion and explanation genetic equilibrium and allele frequency, Hardy-Weinberg equilibrium</p> | | | |
|----------|--|---|---|--|--|--|

| 7 | FIRST TEST 11 FEBRUARY 2008 – 15 FEBRUARY 2008 | | | | | |
|--|---|---|---|--------------------------|--------------------|-------|
| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
| 19.0 GENE REGULATION AND EXPRESSION | | | | | | |
| 8 | 19.1 Lactose operon | <p>Able to :</p> <ul style="list-style-type: none"> Describe induced and constitutive enzyme production List the components of lactose operon and function Effect of presence or absence of lactose on lactose operon | Group discussion and explanation on components of lactose operon and function | | | |
| 20.0 MODERN GENETICS TECHNOLOGY | | | | | | |
| 9 | <p>20.1 Genetics engineering/ recombinant DNA technology</p> <p>20.1.1 Restriction endonuclease/ Restriction enzymes</p> <p>20.1.2 Vectors</p> <p>20.1.3 Cloning</p> <p>20.2 Gene libraries</p> | <p>Able to give definition</p> <p>Able to :</p> <ul style="list-style-type: none"> Give definition Explain the importance Explain the nomenclature Explain the restriction site :polindrome <p>Able to :</p> <ul style="list-style-type: none"> Give definition Explain the properties of cloning vectors Describe about plasmid Explain about phage <p>Able to :</p> <ul style="list-style-type: none"> Give definition Describe the steps of cloning processes Explain through examples of insulin production by <i>E.coli</i> | Group discussion and explanation on restriction, endonuclease, vectors, cloning | Creative Thinking ICT | Appreciate Patient | |

| 10 | and gene banks | Able to : <ul style="list-style-type: none"> • Give definition and use • Describe the gene libraries • Explain about construction of genomic and cDNA libraries | Group discussion and explanation on gene libraries | | | |
|---|---|--|---|---------------------------|---------------------|--------------|
| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
| | 20.3 Use of recombinant DNA technology | Able to : <ul style="list-style-type: none"> • give definition of transgenic organisms such as bacteria • Explain about transgenic plants • Explain about transgenic animals | Group discussion and explanation on transgenic organisms | Creative Thinking ICT | Appreciate Patient | |
| | 20.4 Other uses | Able to : <ul style="list-style-type: none"> • give definition and brief description | Group discussion and explanation on amniocentesis and chorionic villus sampling (CVS), restoration of adenosine deaminase enzyme in infants | | | |
| | 20.4.1 Genetic screening | Able to: <ul style="list-style-type: none"> • Explain about amniocentesis and chorionic villus sampling (CVS) | | | | |
| | 20.4.2 Gene therapy | <ul style="list-style-type: none"> • Explain about restoration of adenosine deaminase enzyme in infants | | | | |
| | 20.4.3 DNA fingerprinting | <ul style="list-style-type: none"> • Explain the use in forensic science | | | | |
| | 20.5 Ethics of modern genetics | Able to describe the advantages and disadvantages of recombinant DNA technology | Group discussion and explanation on advantages and disadvantages of recombinant DNA technology | | | |
| FIRST TERM BREAK 08 MARCH 2008 – 16 MARCH 2008 | | | | | | |

LEARNING AREA : ENERGETICS

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|---------------------------|---|---|---|--------------------------------|-----------------------|-------|
| 4.0 PHOTOSYNTHESIS | | | | | | |
| 11 | 4.1 Light Reaction | Able to : <ul style="list-style-type: none"> • Explain the reaction and detailed description • Explain through example of photoactivation of photosystem I and photosystem II • Explain the process of photolysis of water • Explain the production and roles of NADPH and ATP • Explain the process of cyclic and non-cyclic photophosphorylation | Group discussion and presentation on : <ul style="list-style-type: none"> • light reaction • photosystem I and photosystem II • photolysis of water • cyclic and non-cyclic photophosphorylation | Constructivism Study Skills | Appreciate Patient | |
| 12 | 4.2 Dark Reaction Calvin cycle in C₃ and C₄ plants | Able to : <ul style="list-style-type: none"> • Explain the reaction and detailed description • Explain CO₂ fixation to RuDP • Explain the production of PGAL until the formation of carbohydrates • Explain the involvement in the formation of proteins and fatty acids • Distinguishes between leaves of C₃ and C₄ plants | Group discussion and presentation on : <ul style="list-style-type: none"> • dark reaction • CO₂ fixation to RuDP • the production of PGAL until the formation of carbohydrates • the formation of proteins and fatty acids • leaves of C₃ and C₄ plants | | | |

| | | | | | | |
|--|--|--------------------------------|---|--|--|--|
| | | (anatomical and physiological) | Carry out experiment to examine transverse sections of C ₃ and C ₄ leaves | | | |
|--|--|--------------------------------|---|--|--|--|

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|------------------------|--|---|--|--------------------------------|--------------------|-------|
| 13 | 4.2 <i>Dark Reaction growth Calvin cycle in C₃ and C₄ plants</i> | <ul style="list-style-type: none"> Explain through example Krantz's anatomy, Hatch-Slack pathway and Crassulacean acid metabolism (CAM) | Group discussion and presentation on : <ul style="list-style-type: none"> Krantz's anatomy Hatch-Slack pathway Crassulacean acid metabolism (CAM) | Constructivism Study Skills | Cooperation | |
| | 4.3 Factors limiting the rate of photosynthesis | Able to explain limiting factors of photosynthesis : <ul style="list-style-type: none"> Wavelength and intensity of light Temperature Carbon dioxide concentration Explain through examples the compensation point | Group discussion and presentation on : <ul style="list-style-type: none"> Wavelength and intensity of light Temperature Carbon dioxide concentration compensation point | | | |
| 5.0 RESPIRATION | | | | | | |
| | 5.1 Aerobiosis 5.1.1 Glycolysis | Able to : <ul style="list-style-type: none"> Explain the process of glucose phosphorylation and the production of fructose diphosphate Demonstrate the splitting into phosphoglyceraldehyde and dihydroxyacetone phosphate | <ul style="list-style-type: none"> Group discussion on glucose phosphorylation and the production of fructose diphosphate, splitting into phosphoglyceraldehyde and dihydroxyacetone phosphate, phosphoglyceraldehyde to pyruvate and production of | Constructivism | Appreciate Patient | |

| | | <ul style="list-style-type: none"> • Demonstrate the phosphoglyceraldehyde to pyruvate and production of ATP and NADPH <p>Explain the substrate level of phosphorylation</p> | ATP and NADPH, substrate level of phosphorylation | | | |
|------|--|--|---|--------------------------------|----------------------------|-------|
| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
| 14 | 5.1.2 Krebs Cycle growth tricarboxylic acid cycle growth citric acid cycle | <p>Able to explain :</p> <ul style="list-style-type: none"> • the formation of acetyl coenzyme A • formation of citrate • reformation of oxaloacetate from citrate via α-ketoglutarate and succinate (with emphasis on the formation of NADPH, FADH₂ and GTP and release of carbon dioxide • Calculating ATP production <p>Able to :</p> <ul style="list-style-type: none"> • Explain the electron flow from NADPHgrowth FADH₂ via flavoprotein, coenzyme Q and cytochrome to oxygen with the production of ATP and water <p>Explain through examples the effects of inhibitors (cyanide and carbon monoxide)</p> | <p>Group presentation and discussion on formation of acetyl coenzyme A, formation of citrate, reformation of oxaloacetate from citrate via α-ketoglutarate and succinate</p> <p>Carry out activity to calculate the production of ATP</p> <p>Group discussion on electron flow from NADPHgrowth FADH₂ via flavoprotein, coenzyme Q and cytochrome to oxygen with the production of ATP and water and effects of inhibitors (cyanide and carbon monoxide)</p> | Constructivism Study Skills | Cooperation Cleanliness | |
| 15 | 5.2 Anaerobiosis | <p>Able to :</p> <ul style="list-style-type: none"> • Defining and listing the differences between ethanol production in plants and lactic acid production in animals • Explain through examples the use of fermentation in industry | <p>Discuss to define and listing the differences between ethanol production in plants and lactic acid production in animals.</p> <p>Carry out experiment to investigate the use of yeast in respiratory</p> | | Appreciate Patient | |

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|-------------------------|--|--|---|--------------------------------|-----------------------|-------|
| <u>NUTRITION</u> | | | | | | |
| 16 | 5.1 Autotroph | | | | | |
| | 6.1.1 Chemosynthesis | Able to : <ul style="list-style-type: none"> Define and explain the process of Chemosynthesis Explain through examples of Chemosynthesis | Student group discussion on Chemosynthesis and photosynthesis in bacteria | Constructivism Study Skills | Appreciate Patient | |
| | 6.1.2 Photosynthesis | Able to : <ul style="list-style-type: none"> Explain briefly on description of photosynthesis in bacteria | | | | |
| | 5.2 Heterotroph | | | | | |
| 6.2.1 Holozoic | Able to : <ul style="list-style-type: none"> Define and explain on the holozoic, saprophytic, parasitic Give examples for holozoic, saprophytic, parasitic | Discussion on basic concept of holozoic, saprophytic, parasitic | | | | |
| 6.2.2 Saprophytic | | | | | | |
| 6.2.3 Parasitic | | | | | | |

LEARNING AREA : GASEOUS EXCHANGE, TRANSPORT AND HOMEOSTASIS

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|------------------------------------|------------------------|-------------------|---------------------|--------------------|--------------|-------|
| <u>6.0 GASEOUS EXCHANGE</u> | | | | | | |
| 17 | 7.1 Animals | | | | | |
| | 7.1.1 Gaseous exchange | Able to : | | | | |

| | in mammals | <ul style="list-style-type: none"> • Explain the processes and structures involved • Explain the processes of oxygen and carbon dioxide transport • Explain partial pressure and Bohr effect • Explain oxygen dissociation curves | <p>Group discussion and presentation on :</p> <ul style="list-style-type: none"> • the processes of gaseous exchange in mammals and structures involved • partial pressure and Bohr effect • oxygen dissociation curves | <p>Study skills Future research Individualized instruction</p> | <p>Cleanliness Patient</p> | |
|---------|---|---|---|--|--------------------------------|-------|
| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
| 18 | 7.1.2 Breathing cycle | <p>Able to :</p> <ul style="list-style-type: none"> • Explain the mechanism of breathing control • Explain through examples of chemoreceptor • Explain through examples tidal volume, vital capacity, total lung capacity, inspiratory reserve volume, expiratory reserve volume and residul volume | <p>Group discussion on mechanism of breathing control and examples of chemoreceptor</p> <p>Individual activity on tidal volume, vital capacity, total lung capacity, inspiratory reserve volume, expiratory reserve volume and residul volume</p> <p>Carry out experiment on observing mammalian respiratory system</p> | <p>Study skills Future research Individualized instruction</p> | Loyalty | |
| | <p>7.2 Plants 7.2.1 Stomata</p> | <p>Able to :</p> <ul style="list-style-type: none"> • Illustrate structure of stomata • Explain the structure and function of stomata • Various animal cells • Describe the mechanism of stomatal opening and closing based on the starch-sugar hypothesis and K⁺ ions accumulation hypothesis | <p>Individual activity on defining and describing the structure, functions and distribution of stomata.</p> <p>Discussions on the mechanism of stomatal opening ang closing based on the starch-sugar hypothesis ang K⁺ ions accumulation hypothesis</p> | | | |
| 19 & 20 | <p>Mid-Year Examination 12 May 2008 – 23 May 2008</p> | | | | | |

Mid – Year Holidays
24 May 2008 – 8 June 2008

SECOND TERM : 9 JUNE 2008 – 14 NOVEMBER 2008

LEARNING AREA : GASEOUS EXCHANGE, TRANSPORT AND HOMEOSTASIS

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|-------------------------------|--|--|---|---|--------------------|-------|
| 7.0 TRANSPORT | | | | | | |
| 1 | 7.1 Animals | | | | | |
| | 8.1.1 Cardiac cycle | Able to <ul style="list-style-type: none"> • Define systole and diastole • Describe changes in pressure and volume in aorta, left atrium and left ventricle | Discussions on systole and diastole, changes in pressure and volume in aorta, left atrium and left ventricle | Study skills Future research Individualized instruction | Appreciate Patient | |
| | 8.1.2 Control of heart beat | Able to : <ul style="list-style-type: none"> • Explain about sinoatrial and atrioventricular nodes • Explain about sympathetic and parasympathetic nerves • Describe detailed description of heart beat | Discussions on sinoatrial and atrioventricular nodes, sympathetic and parasympathetic nerves, heart beat Carry out experiment to investigate mammalian circulatory system Carry out experiment to examine slides of transverse sections of vein, artery and capillary | | | |
| 8.1.3 Cardiovascular diseases | Able to : <ul style="list-style-type: none"> • Explain about hypertension, arteriosclerosis and myocardial infraction | Discussions on hypertension, arteriosclerosis and myocardial infraction from the meaning, causes and prevention | | | | |
| 2 | 7.2 Plants | | | | | |
| | 8.2.1 Xylem and ascent | Able to : <ul style="list-style-type: none"> • Explain about uptake of water | | | | |

| | | | | | | |
|--|--|--|---|--|--|--|
| | of sap 8.2.2 Phloem and translocation | and ions by roots <ul style="list-style-type: none"> • Describe the process of transpiration • Explain the root pressure and cohesion-tension theory • Describe the mechanism of transport based on water potential • Explain about pathways – apoplast,symplast and vacuoles | Discussions on uptake of water and ions by roots, the process of transpiration, the root pressure and cohesion-tension theory, the mechanism of transport based on water potential, pathways – apoplast,symplast and vacuoles | | | |
|--|--|--|---|--|--|--|

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|------------------------|-----------------------------------|--|--|---------------------------------|------------------------|-------|
| 8.0 HOMEOSTASIS | | | | | | |
| 3 | 8.1 Concept of homeostasis | Able to : <ul style="list-style-type: none"> • Give definition and the importance of homeostasis • Explain the basis control of biological systems • Define and distinguish between positive and negative mechanisms • Explain through examples on temperature regulation (endothermic and ectothermic) • Explain through examples on control of blood glucose level (role of insulin) and its relationship with diabetes mellitus • Calculate the pressure in movement of fluid between blood capillaries and tissues | Discussion on basis control of biological systems, positive and negative mechanisms, temperature regulation (endothermic and ectothermic), control of blood glucose level (role of insulin) and its relationship with diabetes mellitus Calculating the pressure in movement of fluid between blood capillaries and tissues | Study skills Future research | Loyalty Cooperation | |
| | 8.2 Liver | Able to : <ul style="list-style-type: none"> • Explain the structure and function in mammals • Describe about Cori cycle and ornithine cycle (emphasis on the entrance of amino groups into the cycle and the | Discussion on the structure and function in mammals, Cori cycle and ornithine cycle | | | |

| | | | | | | |
|--|--|---------------------|--|--|--|--|
| | | production of urea) | | | | |
|--|--|---------------------|--|--|--|--|

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|--|---|---|---|---------------------------------|-----------------------|-------|
| 4 | 8.3 Osmoregulation | | | | | |
| | 9.3.1 Animals I. Kidney | Able to : • Describe the detailed process of urine formation • Explain the structure and functions of nephron and related blood vessels | Discussion on the formation of urine and structure and functions of nephron and related blood vessels | Study skills Future research | Appreciating the body | |
| | II. Antidiuretic hormone (ADH) | Able to : • Explain through examples the role and mechanism of action | Collect information on ADH role and mechanism of action | | | |
| | III. Control of blood Na ⁺ ions and pH | • Explain through examples the mechanism of action | Collect information on control of blood Na ⁺ ions and pH Carry out experiment to examine the slides of liver and kidney | | | |
| 9.3.2 Plants I. Role of stomata in the regulation of water loss | Able to : • Explain the role of stomata in the regulation of water loss • Explain the adaptation of plants to the environment | Discussion on the role of stomata in the regulation of water loss and adaptation of plants to the environment | | | | |
| | II. Adaptation of plants to the environment | | | | | |

LEARNING AREA : CONTROL AND COORDINATION

| | | | | | | |
|--|--|--|---|--|--|--|
| | | <ul style="list-style-type: none"> • Explain the importance role of sarcoplasmic reticulum, Ca^{2+} ions, myofibril and T tubule in muscle contraction • Explain the sliding filament hypothesis • Explain the mechanism of muscle contraction : roles of actin, myosin and troponin | reticulum, Ca^{2+} ions, myofibril and T tubule in muscle contraction, sliding filament hypothesis, mechanism of muscle contraction : roles of actin, myosin and troponin | | | |
|--|--|--|---|--|--|--|

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|------|--|---|---|---------------------------------|---------------|-------|
| 7 | 10.2 Autonomous nervous system in mammals 10.3 Drug abuse | <p>Able to :</p> <ul style="list-style-type: none"> • Discribe the organization of the sympathetic and parasympathetic nervous system and their relationship with central nervous system • Explain through examples the structure and function • Explain the comparison between the sympathetic and parasympathetic nervous system <p>Able to :</p> <ul style="list-style-type: none"> • Explain through examples the mechanism of action of drug on nervous system and neuromuscular junctions | <p>Discussion on the organization of the sympathetic and parasympathetic nervous system and their relationship with central nervous system, examples the structure and function</p> <p>Discussion and explanation on mechanism of action of drug on nervous system and neuromuscular junctions through examples of cocaine and kurare</p> | Study skills Future research | Loves Obey | |

10.0 HORMONE/CHEMICAL COORDINATION

| | | | | | | |
|---|---|---|--|--------------------------|--------------------|--|
| 8 | 10.1 HUMANS 11.1.1 Hormonal action | <p>Able to :</p> <ul style="list-style-type: none"> • Discribe through examples of steroid hormones on the mechanism of hormone action via gene activation | Discussion and explanation on the mechanism of hormone action via gene activation, the mechanism of nonsteroid | Creative Thinking ICT | Appreciate Patient | |
|---|---|---|--|--------------------------|--------------------|--|

| | | <ul style="list-style-type: none"> • Explain through examples of adrenaline the mechanism of nonsteroid hormones via activation of cyclic AMP system (cascade effect) • Explain the comparison between the two action mechanism | hormones via activation of cyclic AMP system (cascade effect) | | | |
|------|--|---|---|---|--------------|--------------------------|
| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
| 9 | <p>11.1.2 Role of hormones in reproduction</p> <p>11.2 Plants 11.2.1 Auxin 11.2.2 Gibberellin 11.2.3 Cytokinin 11.2.4 Abscisic acid (ABA) 11.2.5 Ethene</p> <p>11.3 Phytochromes and the effect of light on flowering</p> | <p>Able to :</p> <ul style="list-style-type: none"> • Explain the site of production and role of hormones in oestrus cycle • Explain the site of production and role of hormones during pregnancy <p>Able to :</p> <ul style="list-style-type: none"> • Explain the role of hormones in plant growth and development • Describe the interaction between hormones <p>Able to :</p> <ul style="list-style-type: none"> • Define phytochromes • Explain through examples the mechanism of phytochromes action • Define and explain photoperiodism • Explain the role of phytochromes in photoperiodism and flowering | <p>Discussion the site of production and role of hormones in oestrus cycle and during pregnancy</p> <p>Defining and listing the role of hormones in plant growth and development</p> <p>Defining and discussing on phytochromes, photoperiodism</p> | <p>Creative Thinking ICT Study skills</p> | Loyalty | Refer to 14.1.2 & 14.1.3 |

LEARNING AREA : IMMUNE SYSTEM

| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
|--|---|--|--|---------------------------------|---------------|-------|
| 12.0 IMMUNITY | | | | | | |
| 10 | 12.1 Antibody, antigen, epitope, cell-mediated response, humoral immune response | Able to describe and give description on antibody, antigen, epitope, cell-mediated response, humoral immune response | Group discussion on antibody, antigen, epitope, cell-mediated response, humoral immune response | Creative Thinking ICT | Loves Obey | |
| SECOND TERM BREAK 16 AUGUST 2008 – 24 AUGUST 2008 | | | | | | |
| WEEK | TOPIC | LEARNING OUTCOMES | LEARNING ACTIVITIES | SUGGESTED PEDAGOGY | MORAL VALUES | NOTES |
| 11 | 12.2 Lymphatic system 12.3 Development of immunity 12.4 Concept of self and non-self 12.5 Acquired | <p>Able to :</p> <ul style="list-style-type: none"> Explain the organization of lymphatic system and formation of lymphatic fluid Describe the relationship between lymphatic system and immunity <p>Able to :</p> <ul style="list-style-type: none"> Explain the roles of macrophages, T-cells and B-cells Explain the mechanism of cell-mediated response (T-cell) and humoral immune response (plasma cells) <p>Able to :</p> <ul style="list-style-type: none"> Explain through examples about the foreign tissue/graft rejection by the body Describe the application of concept in medicine (organ transplant) | <p>Group discussion on the organization of lymphatic system and formation of lymphatic fluid</p> <p>Group discussion on the roles of macrophages, T-cells and B-cells, mechanism of cell-mediated response (T-cell) and humoral immune response (plasma cells)</p> <p>Group discussion on the foreign tissue/graft rejection by the body and the application of concept in medicine (organ transplant)</p> | Study skills Future research | Loves Obey | |

| | | | | | | |
|--|---|---|---|--|--|--|
| | immune deficiency syndrome (AIDS) | Able to : <ul style="list-style-type: none"> • Explain the causes, causing agent (HIV), symptoms and prevention of AIDS • Explain the mechanisms of HIV infection | Collect information and discussion on the causes, causing agent (HIV), symptoms and prevention of AIDS and the mechanisms of the causes, causing agent (HIV), the mechanisms of HIV infection | | | |
| 12 | REVISION AND PREPARATION FOR STPM TRIAL EXAMINATION | | | | | |
| 13,14 & 15 | STPM TRIAL EXAMINATION 8 SEPTEMBER 2008 – 26 SEPTEMBER 2008 | | | | | |
| 16 –21 | INTENSIVE REVISION PROGRAMME | | | | | |
| 22 | SIJIL TINGGI PERSEKOLAHAN MALAYSIA EXAMINATION 10 NOVEMBER 2008 – 28 NOVEMBER 2008 | | | | | |
| FINAL YEAR HOLIDAYS 15 NOVEMBER 2008 – 4 JANUARY 2008 | | | | | | |

