SCHEME OF WORK

SCHOOL NAME:

TEACHER'S NAME:

SUBJECT**: Biology**

CLASS: **Form SIX**

YEAR: 2025 / **2026**

SCHEME OF WORK

SCHOOL

TEACHER'S NAME: SUBJECT**: Biology** CLASS: **Form SIX** YEAR: **2026**

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
By the end of this topic, a pupil should have ability to demonstrate appropriate use of biological knowledge, concepts, principles and skills in evaluating the roles of various transportation processes in plants and animals and in solving various problems related to transportation in daily life.	By the end of this sub-topic, a pupil should be able to identify vascular tissues in plants, describe vascular tissues in plants and how they are adapted to their function, and distinguish between active and passive transport in plants.	JULY	1		Transportation in plants	8	-To guide pupils to observe the structures of vascular/ conducting tissues using charts/diagram/picture/microscope slides. -To lead plenary discussion on passive and active transport in plants.	-Using guiding questions, to discuss in groups and present in a plenary session the adaptation of vascular tissues. -To brainstorm on the differences between passive and active transport.	Microscope slides, Microscope, Charts, Diagrams showing vascular tissues and videos relating to transport in plants.	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987).		Is a pupil able to identify vascular tissues in plants, describe vascular tissues in plants and how they are adapted to their function, and distinguish between active and passive transport in plants?	
	By the end of this sub topic, a pupil should be able to describe paths of movement of water and mineral salts across the root (Symplasmic vacuolar and apoplasmic) and explain the role of Casparian strip.	JULY	2		Movement of materials across the root.	8	-To guide pupils to observe charts/diagrams/slides showing movement of water and mineral salts across the root and discuss movement of water and mineral salts across the root.	-Using guiding questions, to describe the Symplasmic, vacuolar and apoplasmic path way. -To observe chart/diagram/ picture and discuss the role of casparian strip. -To draw the casparian strip.	-Diagram/charts /simulations showing movement of water and mineral salts across the root. -Videos showing movement of materials across the root			Is a pupil able to describe paths of movement of water and mineral salts across the root (Symplasmic vacuolar and apoplasmic) and explain the role of Casparian strip?	
	By the end of this subtopic, a pupil should be able to explain the path of upward transport of water and	JULY	3		Upward movement of water and mineral salts.	8	-To guide pupils to perform an experiment on capillarity. -To lead plenary discussion on forces governing	-In groups using guiding questions, to discuss the path of upward	-Beaker -Transparent plastic tube seedlings -Commelina leaf			Is a pupil able to explain the path of upward transport of water and mineral salts,	

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	mineral salts, describe the forces governing the upward movement of water and mineral salts, outline the mechanism of stomata opening and closing (basing on osmotic pressure differences theory), explain the effects of transpiration in plants and distinguish between transpiration and guttation.						upward movement of water and mineral salts (capillarity, root pressure and transpiration pull). -To guide pupils to conduct an experiment of opening and closing of stomata. -To lead plenary discussion on the effects of transpiration in plants. -To guide pupils to discuss in groups the differences between transpiration and guttation.	movement of water and mineral salts. -Pupils to discuss in groups the mechanism of closing and opening of stomata. -Pupils to brainstorm on the effects of transpiration on plants	-Microscope slide, Slide cover, Charts showing opening and closing of stomata. -Charts/picture -Photographs/diagrams showing the effect of transpiration in plants.	*Understanding Biology*. United Kingdom: Nelson Thornes Ltd Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		describe the forces governing the upward movement of water and mineral salts, outline the mechanism of stomata opening and closing (basing on osmotic pressure differences theory), explain the effects of transpiration in plants and distinguish between transpiration and guttation?	
	By the end of this sub-topic, a pupil should be able to identify the path of manufactured food and explain mechanism of transport of manufactured food materials.	JULY	4		Translocation of manufactured Food	6	-To guide pupils to observe chart/ diagram and identify the path of manufactured food along phloem. -To lead plenary discussion on mechanism of transport of manufactured food in plants.	-In groups to visualize charts/ illustrations and discuss the transport of manufactured food in plants.	-Charts -Diagrams -Pictures -Microscope Slide -Plant tissues -videos showing the translocation of the manufactured food			Is a pupil able to identify the path of manufactured food and explain mechanism of transport of manufactured food materials?	
	By the end of this subtopic, a pupil should be able to describe the structure of cardiac muscles, distinguish between open and closed circulation systems, differentiate between single and double circulatory systems and explain the differences between foetal and adult blood circulation.	AUGUST	1		Transport in vertebrates	10	-To guide pupils to describe the adaptations of cardiac muscles to their functions. -To guide pupils to differentiate between foetal and adult blood circulation.	-To observe charts/ diagram/pictures microscope slides of cardiac muscle and discuss their structures. -To observe charts/diagrams/ microscope slides and discuss with examples, open and closed circulatory systems.	-Charts -Pictures -Diagram of cardiac muscles -Microscope slides -Microscope -Diagram and models showing open and closed			Is a pupil able to describe the structure of cardiac muscles, distinguish between open and closed circulation systems, differentiate between single and double circulatory systems and explain the differences	

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
								-To visualize charts/diagram of single and double circulatory systems e.g. Fish, human and discuss their differences. -To search information on foetal and adult blood circulation of mammals.	circulation systems. -Diagrams models charts showing circulatory systems of fish and human. -Models showing foetal and adult blood circulation.			between foetal and adult blood circulation?	
END OF TRANSPORTATION TOPIC													

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
By the end of this topic, a pupil should have ability to demonstrate appropriate use of biological knowledge, concepts, principles and skills in evaluating the roles of various growth and development processes in plants and animals and in solving various problems related to growth and development in daily life.	By the end of this sub topic, a pupil should be able to explain the events that take place during mitotic stages and illustrate stages of mitosis in plant and animal cells.	AUGUST	2		Mitosis	8	-To guide pupils to carry out experiments to show stages of mitosis in cells.	- Using guiding questions, to observe chart/video/diagrams and discuss the events that take place during mitotic stages. -To illustrate stages of mitosis in plant and animals cells.	-Charts -Diagrams -Videos and Models that show events that take place during mitotic stages.	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		Is a pupil able to explain the events that take place during mitotic stages and illustrate stages of mitosis in plant and animal cells?	
	By the end of this sub topic, a pupil should be able to describe various patterns of growth in plants and animals and interpret various types of growth curves.	AUGUST	2		Growth patterns	6	-To lead plenary session on patterns of growth in plants and animals. -To guide pupil to interpret growth curves.	-In groups to observe charts/diagrams and discuss various patterns of growth in plants and animals. -In groups to plot and interpret growth curves.	Charts /diagram showing various patterns of growth in plants and animals			Is a pupil able to describe various patterns of growth in plants and animals and interpret various types of growth curves?	
	By the end of this sub topic, a pupil should be able to explain the role of apical meristem in primary growth, describe the role of lateral meristem in secondary growth and explain the origin of lateral branches and lateral roots.	AUGUST	3		Primary and secondary Growth in Angiosperms	8	-To guide pupils to conduct a practical observation of apical meristematic tissue -To guide pupils to visit outside environment to observe real plants and discuss the origin of lateral branches and lateral roots.	-In group to observe diagram/pictures / video and discuss apical meristematic tissues and discuss its roles in primary growth. -To conduct a practical observation of lateral meristematic tissues. -To discuss the lateral meristematic tissue and its roles in secondary growth.	-Microscope -Prepared slides/ specimens of meristematic tissues -Diagrams -Real plants -Charts showing meristematic tissues			-Is a pupil able to explain the role of apical meristem in primary growth, describe the role of lateral meristem in secondary growth and explain the origin of lateral branches and lateral roots?	

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
	By the end of this sub topic, a pupil should be able to explain the concept of seed dormancy and viability, describe types and causes of seed dormancy, suggest ways of overcoming seed dormancy and propose factors that govern seed viability. .	AUGUST	4th – 5th		Seed dormancy and viability	6	-To lead plenary discussion on the concept of seed dormancy and viability. -Through questions and answers, to guide pupils to discuss in a plenary session ways of overcoming seed dormancy.	-To observe seeds and brainstorm the meaning of seed dormancy, viability and its significance. -Using guiding questions, to discuss types and causes of seed dormancy. -To discuss and presents the factors which govern seed viability.	-Various seeds/variety of seeds. -Pictures			Is a pupil able to explain the concept of seed dormancy and viability, describe types and causes of seed dormancy, suggest ways of overcoming seed dormancy and propose factors that govern seed viability?	
END OF GROWTH AND DEVELOPMENT TOPIC													

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
By the end of this topic, a pupil should have ability to demonstrate appropriate use of reproduction knowledge, concepts, principles and skills in solving various problems related to reproduction in daily life.	By the end of this sub topic, a pupil should be able to account for the events which take place during meiosis, illustrate stages of meiosis in plants and animal cells, explain the significances of meiosis in sexually reproducing organisms, explain the similarities and differences between meiosis and mitosis and relate meiosis to gametogenesis in both plants and animals.	SEPTEMBER	1		Meiosis	8	-To lead pupils to discuss and present in plenary session the events that takes place during meiosis in plant and animal cells. Pupils to illustrate stages of meiosis in plants and animal cells. -Using guiding questions, in groups to discuss how meiosis relates with gametogenesis in plants and animals.	-To observe charts/diagrams/microscopic slides showing stages of meiosis in plants and animal cells. -Pupils in groups to discuss significances of meiosis in sexually reproducing organisms. - In groups to observe charts/ diagrams/microscope slides showing stages of mitosis and meiosis. -Using guiding questions pupils to compare and contrast meiosis and mitosis.	-Microscopic slides showing stages of meiosis -Charts/diagrams showing meiosis and mitosis microscopic slides	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		Is a pupil able to account for the events which take place during meiosis, illustrate stages of meiosis in plants and animal cells, explain the significances of meiosis in sexually reproducing organisms, explain the similarities and differences between meiosis and mitosis and relate meiosis to gametogenesis in both plants and animals?	
	By the end of this sub topic, a pupil should be able to describe events leading to fertilization, explain the concept of double fertilization and account for the changes which occur in the flower after fertilization.	SEPTEMBER	2		Fertilization in plants	8	-To guide pupils to discuss in groups and presents in a plenary session, the concept of double fertilization and its consequences.	Using guiding questions, in groups to discuss and presents in plenary session the events leading to fertilization. -To observe charts/ diagram/ microscopes slides and discuss in groups the changes which lead to formation of fruit.	-Charts/ diagrams/ model showing the process of fertilization microscope slides - Charts showing changes which occur after fertilization microscopic slides -Microscope.			Is a pupil able to describe events leading to fertilization, explain the concept of double fertilization and account for the changes which occur in the flower after fertilization?	

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
	By the end of this sub topic, a pupil should be able to explain the events which lead to the formation of endospermic and non endospermic seed.				Fruit and seed development	6	-To guide pupils to discuss and presents the formation of endospermic and non- endospermic seed.	-To discuss and presents the formation of endospermic and non- endospermic seed	Charts showing endospermic and non endospermic seeds.	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		-Is a pupil able to explain the events which lead to the formation of endospermic and non endospermic seed?	
	By the end of this sub topic, a pupil should be able to explain the concept of alternation of generation and describe the generalized life cycles of Bryophytes, pteridophytes and angiosperms.		3		Life Cycles of Selected Plants	8	-To lead plenary discussion on the concept of alternation of generation. -To lead plenary discussion on the generalized life cycle of bryophytes, pteridophytes and angiosperms.	-To brainstorm on the concept of alternation of the generation. -To visualize charts/diagram of generalized life cycles of Bryophytes, pteridophytes and angiosperms.	-Charts -Diagrams -illustrations			-Is a pupil able to explain the concept of alternation of generation and describe the generalized life cycles of Bryophytes, pteridophytes and angiosperms?	
	By the end of this sub topic, a pupil should be able to explain the concept of menstruation and oestrus cycle, illustrate the stages of menstrual and oestrus cycle, explain hormones controlling menstrual and oestrus cycles and distinguish menstruation from Oestrus.		3		Menstruation and Oestrus	8	-To lead plenary discussion on the meaning and importance of menstruation and oestrus cycle. -To lead pupils in groups to discuss the differences between menstruation and oestrus. -Using guiding questions, to lead pupils in groups to discuss and present hormones controlling, menstrual and oestrus cycle and its role.	-To brain storm the meaning of menstruation and oestrus cycle. -To visualize charts/diagram/ picture/ models showing stages of menstrual and oestrus cycle and illustrate stages of menstrual and oestrus cycle.	Charts, models and videos showing menstruation and oestrus cycle.			-Is a pupil able to explain the concept of menstruation and oestrus cycle, illustrate the stages of menstrual and oestrus cycle, explain hormones controlling menstrual and oestrus cycles and distinguish menstruation from Oestrus?	
	By the end of this sub topic, a pupil should be able to explain the events which compromise the mechanism of fertilization, explain the		4		Fertilization and Zygote Development in Mammal	8	-To guide pupils to discuss in groups and present in plenary session on events which compromise mechanism of fertilization.	-To brainstorm on events which compromise mechanism of fertilization. -To observe charts/ microscope	-Charts -Video film showing mechanism of fertilization			-Is a pupil able to explain the events which compromise the mechanism of fertilization, explain the importance of	

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
	importance of fertilization, describe the developmental changes which take place in a zygote up to gastrula stage and explain the embryonic membranes and their roles.						Using guiding questions pupils to discuss the importance of fertilization. -To lead pupils in groups to discuss and present in plenary session the developmental changes which takes place in zygote to gastrula stage. - To lead pupils to discuss in groups the embryonic membrane and its roles.	slides/video film/ models showing developmental changes which take place in zygote up to gastrula. -To observe diagrams/ charts/video film/microscopic slides and discuss the embryonic membrane and its role.		Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc.		fertilization, describe the developmental changes which take place in a zygote up to gastrula stage and explain the embryonic membranes and their roles?	
	By the end of this sub topic, a pupil should be able to accounts for the events that lead into birth and explain the causes of multiple births.				Birth	6	-To guide pupils to discuss and presents in plenary session the events that lead into birth.	To brainstorm on events that lead into birth. To discuss and present in plenary the causes of multiple birth.	-Charts -Diagrams -Models			-Is a pupil should be able to accounts for the events that lead into birth and explain the causes of multiple births?	
	By the end of this sub topic, a pupil should be able to explain the concept of metamorphosis, distinguish between complete and incomplete metamorphosis and illustrate the life cycles of housefly, cockroach, toad/ frog and mouse.	OCTOBER	4		Life Cycles of Selected Animals.	8	-To guide pupils to discuss in groups the meaning and importance of metamorphosis. -To guide pupils to illustrate the life cycle of housefly, toad/frog and mouse.	-To observe charts/diagrams/preserved specimen showing metamorphosis. -To observe charts/diagrams/ preserved specimens of selected animals and discuss the differences between complete and incomplete metamorphosis.	-Models preserved specimens of selected animals. -Charts -Diagrams showing life cycle of housefly, cockroaches and toad			-Is a pupil able to explain the concept of metamorphosis, distinguish between complete and incomplete metamorphosis and illustrate the life cycles of housefly, cockroach, toad/ frog and mouse?	
END OF REPRODUCTION TOPIC													

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
By the end of this topic, a pupil should have ability to demonstrate appropriate use of genetics knowledge, concepts, principles and skills in solving various problems related to genetics in daily life.	By the end of this sub topic, a pupil should be able to show that hereditary materials are located in the nucleus, describe properties of genetic materials, enumerate types of genetic materials and describe the chemical composition of genetic material.	NOVEMBER	1		Hereditary Materials	14	-To lead pupils to discuss and present in plenary the evidence that hereditary materials are located in the nucleus. -To lead a plenary session on types of genetic materials. -To lead pupils to discuss in groups and presenting in a plenary discussion the chemical composition of genetic material.	-In groups to observe charts/ microscope slides/ photographs of hereditary materials. -Using guiding questions, to discuss in groups and present in plenary session the general properties of genetic materials. -To brainstorm on the types of genetic materials -To observe charts/ diagrams/ models of genetic materials.	-Charts, models, picture microscope slides photographs showing hereditary materials -Charts/models/ video showing genetic materials. -Models of DNA and RNA.	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		-Is a pupil able to show that hereditary materials are located in the nucleus, describe properties of genetic materials, enumerate types of genetic materials and describe the chemical composition of genetic material?	
	By the end of this sub topic, a pupil should be able to identify types of RNA and describe structure of each types of RNA.	NOVEMBER	1		RNA	6	-To guide pupils to draw the structure of tRNA, rRNA and mRNA.	-In groups to observe models/pictures/ photograph of genetic materials and identify the types of Ribonucleic acid (tRNA, rRNA and mRNA -In groups to observe diagram/ model/ photographs of structures of tRNA, rRNA and mRNA.	-Models -Picture/video photograph showing types of RNA.			-Is a pupil able to identify types of RNA and describe structure of each types of RNA?	
	By the end of this sub topic, a pupil should be able to describe the structure of DNA molecule, explain the mechanism of DNA replication and its	NOVEMB	2		DNA	10	-To lead pupils to discuss in groups the significance of DNA replication. -To guide pupils to discuss in groups and present in plenary session the meaning and	-In group to observe models/ pictures/ photograph of genetic materials and discuss the	-Models -Diagrams, models and photograph showing DNA molecule.			-Is a pupil able to describe the structure of DNA molecule, explain the mechanism of DNA replication and its	

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
	significance, explain the concept of genetic code and describe the process of protein synthesis.	E R					characteristics of genetic code. -To guide pupils to discuss in groups and present in plenary the stages of protein synthesis.	structure of DNA molecule. -To draw structure of DNA molecule. -In groups to observe charts/diagram/ photograph of DNA and discuss the mechanism of DNA replication. -To observe chart/ picture/ photograph showing the process of protein synthesis.	-Charts/Diagrams showing genetic code. Charts -Pictures Photograph showing the process of protein synthesis	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		significance, explain the concept of genetic code and describe the process of protein synthesis?	
	By the end of this sub topic, a pupil should be able to explain the factors which lead to Mendel's success with his breeding experiments, carry out monohybrid and dihybrid experiments to demonstrate Mendel's 1st and 2nd law of inheritance, explain the concept of dominance and recessiveness and illustrate and interpret monohybrid and dihybrid crosses.	N O V E M B E R	2		Mendelian Principle of Inheritance.	10	-To lead pupils to presents their findings in a plenary session. -To guide pupils to carry out experiments to demonstrate Mendel's first and second laws of inheritance. -To organize a study visit to a research centre/ institute to observe expressed and suppressed characters among organisms. -To guide pupils to illustrate and interpret monohybrid and dihybrid crosses.	-To search information on factors which lead to Mendel's success in his breeding experiment. -In groups to discuss Mendel's 1st and 2nd law of inheritance basing on observations made during the experiments. -In groups to discuss the concept of dominance and recessiveness. -In groups to discuss the meaning of monohybrid and dihybrid crosses	-Pea plants/ maize plant -Maize corb -Video showing experiments demonstrating Mendel's 1st and 2nd law of inheritance. -Charts -Genetic diagrams which show monohybrid and dihybrid crosses.			-Is a pupil able to explain the factors which lead to Mendel's success with his breeding experiments, carry out monohybrid and dihybrid experiments to demonstrate Mendel's 1st and 2nd law of inheritance, explain the concept of dominance and recessiveness and illustrate and interpret monohybrid and dihybrid crosses?	
	By the end of this sub topic, a pupil should be able to explain the concept incomplete dominance and				Non-Mendelian Inheritance	10	-To organize a study visit to observe expressed characters and suppressed characters among organisms.	-To discuss the concept of incomplete dominance and co-dominance.	-Video/charts showing organisms expressing incomplete dominance and			-Is a pupil able to explain the concept incomplete dominance and co-dominance	

Competence	Objectives	M o n t h	W e e k	S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References	Assessment	Remarks
	co-dominance, describe gene interactions and explain with examples multiple allele inheritance.					-To guide pupils to carry out incomplete and co-dominance crosses. -To lead plenary discussion on the meaning of interactions. -To lead plenary discussion multiple allele inheritance.	-To brainstorm on the meaning of interactions. -To illustrate gene interaction crosses. -To observe illustrations and discussion multiple allele inheritance.	co- dominance characters. -Charts -Illustrations -diagram	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc.	describe gene interactions and explain with examples multiple allele inheritance?	
	By the end of this sub topic, a pupil should be able to explain the concept of mutation, explain the causes and effects of mutation, account for different types of mutation, explain the concept of genetic engineering and explain merits and demerits of genetic engineering	J A N U A R Y	2	Mutation	10	-To lead plenary discussion on the meaning of mutation. -To guide pupils to discuss in groups the causes and effects of mutation in organisms. -To lead plenary discussion on types of mutation. -To guide pupils to discuss in groups the concept of genetic engineering. -To lead plenary discussion on the merits and demerits of genetic engineering.	-To brainstorm the meaning of mutation. -To brainstorm on the types of mutation. -To search information on the merits and demerits of genetic engineering.	-Charts/video showing the effect of mutation in organisms. -Diagrams/video charts showing genetically engineered organisms. -Charts/video showing advantages and disadvantages of genetic engineering.		-Is a pupil able to explain the concept of mutation, explain the causes and effects of mutation, account for different types of mutation, explain the concept of genetic engineering and explain merits and demerits of genetic engineering?	
END OF GENETICS TOPIC											

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
By the end of this topic, a pupil should have ability to demonstrate appropriate use of biological knowledge, concepts, principles and skills in evaluating the roles of various evolution processes and in solving various problems related to evolution in daily life.	By the end of this sub-topic, a pupil should be able to explain the origin of life and outline strengths and weakness of each theory of the origin of life.	JANUARY	3		Theories of the origin of life	6	-To lead a plenary discussion on origin of life. -Using guiding questions, to lead pupils to discuss in groups about the strengths and weaknesses of each theory of origin of life.	-In groups to observe photographs/diagrams/video and discuss the origin of life as postulated, by theories of special creation, spontaneous generation, cosmozoic origin and naturalist theory and give examples.	-Photographs -Diagram -Film/video which show evolution of organisms	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		-Is a pupil able to explain the origin of life and outline strengths and weaknesses of each theory of the origin of life?	
	By the end of this sub topic, a pupil should be able to explain the mechanism of organic evolution and give strengths and weakness of each theory of organic evolution.	JANUARY	4		Theories of Organic Evolution	8	-To guide pupils to observe photographs/diagrams/films and discuss the mechanism of organic evolution according to Lamarckism, Darwinism theories and give examples of Darwin's theory. -To guide pupils to discuss in groups and present in plenary sessions the strengths and weaknesses of each theory of organic evolution.	-To observe photographs/diagrams/films and discuss the mechanism of organic evolution according to Lamarckism, Darwinism theories and give examples of Darwin's theory. -To discuss in groups and present in plenary sessions the strengths and weaknesses of each theory of organic evolution.	-Photographs -Diagrams -Films/video which show the process of evolution			-Is a pupil able to explain the mechanism of organic evolution and give strengths and weakness of each theory of organic evolution?	
	By the end of this sub topic, a pupil should be able to identify types of fossils and explain how fossil records support organic evolution.	FEBRUARY	1		**Evidence for Evolution** a. Paleontology	4	-To lead a plenary discussion on types of fossils. -To guide pupils to visit a museum of natural history to observe different types of fossils.	-In groups to observe pictures/charts of fossils and identify their types. -Using guiding questions, to discuss how fossils records support the theory of organic evolution	-Pictures -Photographs of fossils -Museums of natural history -diagrams			-Is a pupil able to identify types of fossils and explain how fossil records support organic evolution?	

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
	By the end of this sub topic, a pupil should be able to explain the concept of analogous, homologous and vestigial organs as applied to vertebrates and angiosperms, justify how homologous, analogous and vestigial organs support evolution and distinguish between divergent and convergent evolution				**Evidence for Evolution** b. Comparative Morphology and Anatomy	4	-To guide pupils to conduct a practical observation of homologous, analogous and vestigial organs in vertebrates and organs in vertebrates and angiosperm (prothalia cell of pinus, pollen grain, figwarts scrofilan flower stamens). -To lead a class discussion and summarize main points on how homologous, analogous and vestigial organs support evolution.	-To discuss in group the meaning and significance of analogous, homologous and vestigial organs. -In small groups to observe displayed charts and diagrams and discuss on how homologous, analogous and vestigial organs support evolution. -In groups to visualize pictures and discuss the differences between divergent and convergent evolution.	-Models -Diagrams -Chart of analogous, homologous and vestigial organs in vertebrates and angiosperms	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		-Is a pupil able to explain the concept of analogous, homologous and vestigial organs as applied to vertebrates and angiosperms, justify how homologous, analogous and vestigial organs support evolution and distinguish between divergent and convergent evolution?	
	By the end of this sub topic, a pupil should be able to enumerate chemical substance which occurs in chlorophyll and hemoglobin, describe physiological processes of common occurrence among groups of organisms and explain how the similarity of chemical constituents and physiological processes among groups of organisms support organic evolution	P E B U A R Y	1		**Evidence for Evolution** c. Comparative Biochemistry	4	-Using question and answers, to guide pupils to observe charts and discuss the chemical substances which occur in chlorophyll and hemoglobin. Using question and answers, to guide pupils to discuss the physiological processes of common occurrence among groups of organisms.	-Using guiding questions, in groups to observe charts/diagrams and discuss how the chemical constituents and physiological processes support organic evolution	-Charts -diagrams -Simulations -Video			-Is a pupil able to enumerate chemical substance which occurs in chlorophyll and haemoglobin, describe physiological processes of common occurrence among groups of organisms and explain how the similarity of chemical constituents and physiological processes among groups of organisms support organic evolution?	

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
	By the end of this sub topic, a pupil should be able to describe the concept of biogeography and explain how the occurrence and distribution of organisms in oceanic islands and continents support organic evolution.	FEBRUARY	2		**Evidence for Evolution** d. Biogeography	4	-To lead plenary discussion on the concept of biogeography.	-To brain storm the meaning and importance of biogeography. -To observe diagrams and maps and discuss how occurrence and distribution of organisms in oceanic islands and continents support organic evolution.	-Diagrams -Charts -Maps	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc.		-Is a pupil able to describe the concept of biogeography and explain how the occurrence and distribution of organisms in oceanic islands and continents support organic evolution?	
	By the end of this subtopic, a pupil should be able to explain the concept of selective breeding and describe selective breeding as evidence for organic evolution	FEBRUARY	3		**Evidence for Evolution** e. Selective Breeding	4	-To guide pupils to brainstorm on the meaning and importance of selective breeding in organisms and give examples. -To lead a plenary session on the meaning and importance of selective breeding.	-To observe diagrams and discuss in groups the selective breeding as evidence for organic evolution.	Diagrams/charts showing selected breeding			-Is a pupil able to explain the concept of selective breeding and describe selective breeding as evidence for organic evolution?	
	By the end of this sub topic, a pupil should be able to explain the concept of speciation, describe types of speciation and explain the mechanisms that brings about speciation.	FEBRUARY	3		Speciation	6	-To lead a class discussion on concept of speciation. -To guide pupils to discuss in groups the types of speciation -To lead plenary discussion on mechanisms of speciation	-In groups to observe pictures/ video and discuss the meaning and importance of speciation. -Using guided questions, to discuss the mechanisms of speciation.	Illustrations/diagrams/video/ charts showing mechanisms of speciation			-Is a pupil able to explain the concept of speciation, describe types of speciation and explain the mechanisms that brings about speciation?	
END OF EVOLUTION TOPIC													

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
By the end of this topic, a pupil should have ability to demonstrate appropriate use of biological knowledge, concepts, principles and skills in evaluating the roles of various ecological processes and in solving various problems related to ecology in daily life.	By the end of this sub topic, a pupil should be able to explain the concept of ecology.	FEBUARY	4		Concept of Ecology	4	-To guide pupils through questions/ answers to discuss the concept of ecology using daily life experiences and examples. -To lead plenary discussion on the meaning and importance of ecology.	-To discuss the concept of ecology using daily life experiences and examples. -To discuss on the meaning and importance of ecology.	-Charts -diagrams	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc. -D.J. Taylor, N.P.O Green & G.W. stout (1984): *Biological science*: U.S.A: Cambridge university -Cecie, S (1991). *Biology concepts and applications.* California. Wadsworth publishing company. -Glenn Toole & Susan Toole (1987). *Understanding Biology*. United Kingdom: Nelson Thornes Ltd		-Is a pupil able to explain the concept of ecology?	
	By the end of this sub topic, a pupil should be able to explain the concept of ecosystem, identify components of ecosystem and how they interact, explain the concept of energy flow, nutrient circulation and ecological niche, outline the relationship of trophic levels in terms of energy flow and interpret ecological pyramids and their limitation.	MAECH			Ecosystem	16	-To lead a plenary discussion on the meaning and importance of ecosystem. -To guide pupils to list components of ecosystems and show how they interact with each other. -To guide pupils to discus meaning and importance of energy flow, nutrient circulation and ecological niche. -To guide pupils to interpret ecological pyramid.	-To brainstorm on the meaning of ecosystem. -To carry out library search energy flow, nutrient circulation and ecological niche. -To illustrate the relationship of trophic levels in relation to energy flow and give example. -To discuss the meaning of ecological pyramids and their limitations.	-Charts/video showing ecosystem. -Charts/ photographs/video showing energy flow, nutrient circulation and ecological niche. -Charts, maps trophic, video showing level			-Is a pupil able to explain the concept of ecosystem, identify components of ecosystem and how they interact, explain the concept of energy flow, nutrient circulation and ecological niche, outline the relationship of trophic levels in terms of energy flow and interpret ecological pyramids and their limitation?	
	By the end of this sub topic, a pupil should be able to explain the concept of sampling, describe systematic random and stratified sampling, outline the use of transects and quadrants in sampling flora and fauna and collect and analyze ecological data.	MARCH			Methods of studying Ecology	10	-To lead plenary discussion on the meaning and importance of sampling. -To lead discussion in a plenary session on different methods of sampling and their advantages and disadvantages. -To guide pupils to conduct a practical exercise on sampling of plants/ animals	-Using guided questions, to explore the meaning and need for sampling. -To discuss in groups the advantages and disadvantages of the sampling methods. -To carry out library search on the use of quadrants and	-Charts/video showing different methods of sampling. -Sampling equipments; tape measures, quadrants, notebooks, pencil, areas of natural vegetation/ wild animal population			-Is a pupil able to explain the concept of sampling, describe systematic random and stratified sampling, outline the use of transects and quadrants in sampling flora and fauna and collect and analyze ecological data?	

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
							-To demonstrate the analysis of ecological data (frequency, density, abundance)	transects in sampling. -In groups, to summarize main ideas on the use of transects and quadrants. -To collect and analyse data collected during sampling exercise (density, frequency, abundance)	-Calculator, notebooks computer	Verma, P & Pandey, B (2000): *Biology*: India: S. Chand & company Ltd - Campbell. A. N and Reece B. J and Mitchell G. L (1999); *Biology (5th Ed)*. California. An Imprint of Adson Wesley Longman, Inc - Davis, W & Solomon, E (1979); *The World of Biology*; USA McGraw-Hill, Inc.			
	By the end of this sub topic, a pupil should be able to explain the concept of population as an ecological unit, describe types of communities (biomes) and their global distribution, outline for factors affecting population growth and distribution, interpret different patterns of population growth, explain the concept of population explosions and their consequences and explain the concept and process of ecological succession.	APRIL			Population Dynamics	10	-To guide pupils in groups to brainstorm the meaning of population. -To lead a plenary session on the meaning of population as an ecological unit. -To guide pupils in groups to discuss and interpret different growth patterns and their interpretation -To lead a class discussion on the consequences of population explosions. -To lead class discussion on features observed in the field.	-To search information from various source on major biomes of the world and their distribution. -Using guiding questions, to discuss factors that affect population growth. -Using guiding questions, to search information on meaning and consequences of population explosions. -Using guiding question, to visit areas where natural succession (at different stages) is evident.	-Charts/video showing biomes of the world and their distribution. -Diagrams showing population growth and distribution -Prepared charts, diagrams showing different types of growth curves -Video/ charts showing population exploitation and their consequences -Field visit to areas undergoing ecological succession (eg abandoned fields at different age)			-Is a pupil able to explain the concept of population as an ecological unit, describe types of communities (biomes) and their global distribution, outline for factors affecting population growth and distribution, interpret different patterns of population growth, explain the concept of population explosions and their consequences and explain the concept and process of ecological succession?	
END OF ECOLOGY TOPIC													

Competence	Objectives	Month	Week		S/topic	No of periods	Teaching activities	Learning activities	T/L aids	References		Assessment	Remarks
					Revision								

Key

M/topic- Main topic
S/topic- Sub topic
T/L aids- Teaching/learning aids.
No of periods- Number of periods per each subtopic