MINISTRY OF EDUCATION

NATIONAL CENTRE FOR EDUCATIONAL RESOURCE DEVELOPMENT

NATIONAL SCHEME FOR SECONDARY SCHOOLS

GRADE 10

INTEGRATED SCIENCE



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NATIONAL SCHEME FOR SECONDARY SCHOOLS

Curriculum Area: Integrated Science **Grade 10**

WEEK 1

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Units of life.	Students will understand the importance of diffusion, osmosis, and active transport in daily life.	Analyse the processes of diffusion, osmosis, and active transport. (a) Definition of terms must include the movement of particles and concentration gradient. (b) Role of diffusion, osmosis, and active transport in moving substances in and out of cells and from one cell to another in all living organisms. (c) Reference to the cell membrane as a selectively permeable membrane. (d) Examples of diffusion in artificial and natural	Observing the process of diffusion using tea bags/ food colouring/ potassium permanganate crystals and water. Observing osmosis using potato/ cucumber, salt/sugar. Looking at a video clip of active transport. Defining the terms diffusion, osmosis, concentration gradient and active transport using observation from experiment and word bank. Discussing the role of diffusion, osmosis and active transport. Referencing to the cell membrane as a selectively permeable membrane. Stating examples of diffusion in artificial and natural	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 3-8 Materials for lab Work: water, dye, e.g., food colouring, ink, potassium permanganate, beaker, Tea bags Past CSEC Integrated Science questions on diffusion, osmosis, and active transport.	Oral Questioning 1. Define the terms diffusion, osmosis, and active transport. 2. State the difference between diffusion and osmosis. Written Assessment Answering past CSEC questions on diffusion, and osmosis. Laboratory reports on diffusion and osmosis.

		environments include but not limited to ash from volcanic eruptions, smog from car exhaust and industries, smoke from landfills	environments include but not limited to ash from volcanic eruptions, smog from car exhaust and industries and smoke from landfills. Answering and discussing solutions to past CSEC questions on diffusion and osmosis.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on diffusion, osmosis, and active transport: https://www.youtube.com/watch?v=PRi6uHDKeW4&t=3s https://www.youtube.com/watch?v=eDeCgTRFCbA				

NATIONAL SCHEME FOR SECONDARY SCHOOLS

Curriculum Area: Integrated Science **Grade 10**

WEEK 2

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Units of Life.	Students will: Know the structures of an unspecialised plant and animal cell. Become familiar with the functions of the parts of a cell.	(a) Functions of the cell structures in animal and plant cells (Simple treatment only. For example, the nucleus is responsible for cell division, making protein and contains genetic information). (b) Structures: cell wall, cell membrane, nucleus, cytoplasm, ribosomes, mitochondria, vacuoles, and chloroplast. Simple annotated diagrams are required (as seen under the light microscope).	Creating 2D or 3D models of an unspecialised plant and animal cell using recycled materials. Identifying the cell wall, cell membrane, nucleus, cytoplasm, vacuole, mitochondria, ribosomes, and chloroplast. Constructing a table showing the similarities and differences between an unspecialised plant and animal cell. Looking at the video clip on the organelle's song. Recalling the functions of the parts of the cell from the video clip. Drawing the structure of plant and animal cells. Make posters of plants and animal cells.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 8-20	Oral Questions 1. Define the term cell. 2. State two (2) similarities and differences between an unspecialised plant and animal cell. Written Quiz 10 Objective-type questions on cell structures. Construct models of an unspecialised plant and animal cells.
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on cells and cell structure: https://www.youtube.com/watch?v=3nBtY6LR030&authuser=0 https://www.youtube.com/watch?v=rbeQl-_svSI				

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Curriculum Area: Integrated Science **Grade 10**

WEEK 3

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Reproduction and growth in Plants.	Students will know the importance of sexual reproduction to living organisms.	Distinguish between asexual and sexual reproduction. (a) Role of cell division - meiosis and mitosis (stages are not required). (b) Advantages and disadvantages of asexual reproduction (variety, adaptation, livestock, and crops). Examine various methods of asexual reproduction in plants. Methods of asexual reproduction: (a) Natural vegetative propagation (examples of perennating organs): (i) corms. (ii) bulbs. (iii) rhizomes; and, (iv) runners. Details of structures are not required. (b) Brief description of artificial methods of propagation: (i) budding. (ii) cuttings. (iii) tissue culture. (iv) cloning; and, (v) grafting.	Defining asexual and sexual reproduction. Examining the process of mitosis and meiosis and stating the role of mitosis and meiosis. Comparing asexual and sexual reproduction. Stating the advantages and disadvantages of asexual reproduction (variety, adaptation, livestock, and crops). Observing and drawing storage organs including corms, bulbs, rhizomes, runners, and cuttings. Demonstrating budding, cutting, and grafting using realia (hibiscus or broad-leaf thyme stems).	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 25-31 Materials for lab Work: carrot, sweet potato, ginger, onion, dasheen. Drawing paper, pencil, and eraser. Hibiscus/ broad leaf thyme, masking tape and blade. Past CSEC Integrated Science questions on asexual reproduction.	Oral Questioning (Pair Sharing) 1. Construct a model of the stages of mitosis and meiosis. 2. What types of cells are produced during mitosis and meiosis? Models of the stages of mitosis and meiosis.

			Explaining tissue culture, and cloning using illustrations. Answering and discussing the solutions to past CSEC questions on asexual reproduction in plants.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Link	Video link on asexual reproduction: https://www.youtube.com/watch?v=i9zj9V8OWRk&t=1s				

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WEEK 4

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Reproduction and growth in Plants.	Students will appreciate the method of sexual reproduction as it is a means of food production.	Examine the process of sexual reproduction in plants. (a) Structure and function of flowers. (b) Pollination: (i) definition. (ii) types – self and cross-pollination (advantages of cross-pollination); and, (iii) agent of pollination (wind, animal). (c) Fertilisation. (d) Development of seeds/fruits (outline).	Describing the process of sexual reproduction in plants using flowers and fruits. Examining the external and internal structures of a hibiscus flower. Identifying the external and internal parts of the hibiscus flower. Drawing and labelling the external and internal parts of the hibiscus flower. Matching the parts of the hibiscus flower to their respective function/s. Demonstrating self and cross-pollination. Defining self and cross-pollination.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 33-39 Materials for lab Work: hibiscus flower or any other suitable flower. Hand lens, blade, or scalpel, drawing paper, pencil and eraser. Materials for poster and chart: markers, and pictures of the stages of development from pollination to fruit and seed formation. Past CSEC Integrated Science questions on sexual reproduction in flowering plants.	Oral Questioning 1. What is the importance of flowers to plants? 2. What is the name of the male and female parts of the flower called? Drawings of the hibiscus flower. Create a flow chart to show the process of sexual reproduction in plants. Written Assessment Answers to past CSEC questions on sexual reproduction in plants.

			Discussing the advantages of cross-pollination. Identifying agents of pollination. Creating a flowchart to show the various processes that a flower undergoes in order to develop into a fruit.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on sexual reproduction in plants, dissection of a flower, seed, and fruit formation: https://www.youtube.com/watch?v=R8_ScKzLAfE https://www.youtube.com/watch?v=493WeySyf-8 https://www.youtube.com/watch?v=nax2mH1bFa4				

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Curriculum Area: Integrated Science **Grade 10**

WEEK 5

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Reproduction and growth in Plants.	Students will: Understand that organisms increase in mass, size, and complexity during their lives. Students will appreciate and care for plants in their environment.	Growth patterns in plants. Define the terms growth and germination. (a) Conditions necessary for the germination of seeds (temperature, oxygen, and water). (b) Growth patterns of seeds of annual plants - bean and corn (maize). From germination to fruit formation. Plot graph of plant growth at regular intervals of one week and extrapolate to predict height at a future time. Methods used in the production of crops: Brief description of: (a) strip planting. (b) crop rotation. (c) greenhouse farming. (d) hydroponics. (e) tissue culture. (f) organic farming. (g) container gardening.	Defining the term growth and germination. Investigating the conditions needed for germination. Describing the growth patterns of annual plants- balsam, bean and corn (maise). Suggested lab work: Investigating and Analyzing the growth patterns of corn and bean seeds. Visiting a nearby farm and interviewing the farmer on farming methods they practice. Looking at videos on various farming methods. Presentation- Briefly describe the following farming methods: strip	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 6 Materials for an experiment: corn and bean seeds, cotton wool, petri dish, ruler, and string. Materials for graph: graph paper, pencil,ruler, data.	Written Assessment Lab report on growth patterns in plants and humans. Written Assessment Answers to past CSEC questions on growth and germination. Presentation on farming methods.

			planting, crop rotation, greenhouse farming, hydroponics; tissue culture, organic farming; and container farming.		
Additional Textbooks	Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. Integrated Science for CSEC Examinations by Tania Chung. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on human growth and germination and farming methods: https://www.youtube.com/watch?v=xx0TXbsY4ek https://www.youtube.com/watch?v=w77zPAtVTuI https://www.youtube.com/watch?v=FhB1pZLK4Gc https://www.youtube.com/watch?v=O9YDlcKG4rA https://www.youtube.com/watch?v=KsSI4w3CqEo https://www.youtube.com/watch?v=V0BrgBF9IQM https://www.youtube.com/watch?v=IoQyKn4-CKU https://www.youtube.com/watch?v=WhOrIUlrnPo https://www.youtube.com/watch?v=y1eXnlzXdBE				

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WEEK 6

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Reproduction and growth in Plants.	Students will beaware of the relationship between soil fertility and the physical and chemical properties of soil.	Soil fertility to the physical and chemical properties of soil. (a) Characteristics of sandy, clay, loam soils. (Include soil profiles). (i) soil composition. (ii) particle size. (iii) air content. (iv) pH of soil. (v) water holding capacity (drainage and retention). (b) Presence of soil organisms (earthworms, nematodes). (c) Role of nitrifying bacteria, denitrifying bacteria, and nitrogen-fixing bacteria. (d) Role of Humus. (e) Role of decomposers. (f) Role of composting.	Defining soil fertility. Explaining how the physical and chemical properties of soil affect its fertility. Examining samples of sand, loam, and clay. Investigating the characteristics of sandy, loam and clay soil- soil profiles, soil composition, particle size, air content, pH, and water holding capacity. Investigating sedimentation tests to make inferences about the amount of clay and sand in the soil. Identifying the layers of the soil profile. Making a model of a soil profile or drawing and labelling a soil profile.	Samples of sand, loam, clay, and petri dishes. Materials for lab activity on soil properties: sand, loam and clay, petri dishes, measuring cylinder, beakers, funnel, filter paper, conical flasks, and universal indicator solution. Materials for lab activity on soil profile: sample of soil, measuring cylinder, beaker, and water. Materials for a model of soil profile: recycled materials and glue. Soil organisms: earthworms, nematodes, beetles, forceps, petri dishes. Materials for composting: garden	Oral Questioning 1. Explain how EACH of the following affects soil fertility: i. its physical properties ii. its chemical properties iii. its humus content. Create the soil profile. Written Assessments: Lab report on the properties of soil. Answers to past CSEC questions on soil.

			Identifying soil organisms and discussing the role they play in maintaining soil fertility. Discussing the role of nitrifying, denitrifying, and nitrogen-fixing bacteria to soil fertility. Examining the composition of humus. Investigating the role of decomposers in soil fertility. Making a compost heap and discussing the role of composting. Answering and discussing the solutions to past CSEC questions on soil.	tools- fork and shovel, kitchen scraps (organic waste). Past CSEC Integrated Science questions on soil.	
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on the importance of soil, soil formation, components of soil, physical properties of soil, permeability, testing pH of soil, soil profile: https://www.youtube.com/watch?v=H_YXEh0eQD4 https://www.youtube.com/watch?v=PyZHPmXp2pQ https://www.youtube.com/watch?v=7PISyM1Na6g https://www.youtube.com/watch?v=JkZPaYhZWb8 https://www.youtube.com/watch?v=1wpfA7yikOc https://www.youtube.com/watch?v=VeuQeAxJIjs https://www.youtube.com/watch?v=nEShY_S_KGc				

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Curriculum Area: Integrated Science **Grade 10**

WEEK 7

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Reproduction and growth in Plants.	Students will understand the causes of soil erosion and methods of prevention.	The impact of soil erosion on food production. (a) Cause and effect of soil erosion: wind, water. (Simple treatment). (b) Methods of prevention: (i) contour farming (ploughing, planting, cultivating, harvesting) (ii) terracing (iii) crop rotation (iv) wind breaks (v) crop cover. (c) Impact on food production.	Identifying the causes of soil erosion: (a) Cause and effect of soil erosion: wind, water. Explaining methods of preventing soil erosion: (i) contour farming (ploughing, planting, cultivating, harvesting) (ii) terracing (iii) crop rotation (iv) wind breaks (v) crop cover. Outlining the importance of soil and its impact on food production. Answering and discussing the solutions to past CSEC questions on soil.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 390 Past CSEC Integrated Science questions on soils.	Oral Questioning 1. What is soil erosion? 2. What causes soil erosion? 3. List three (3) methods of preventing soil erosion. Written assessments Discuss the impact of soil erosion on food production in 200 words. Answers past CSEC questions on soil.
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on soil erosion, and solutions to soil erosion, contour farming, terracing, crop rotation, wind breaks and crop cover:				

	https://www.youtube.com/watch?v=im4HVXMGI68 https://www.youtube.com/watch?v=s0F2c1ECuo4 https://www.youtube.com/watch?v=TmMh1Ub8m_E https://www.youtube.com/watch?v=7LqAJoD-PpA https://www.youtube.com/watch?v=O9YDlcKG4rA https://www.youtube.com/watch?v=95Slo2Fv3og https://www.youtube.com/watch?v=bNIQIT9tNbQ

					WEEK 8
TOPIC/ SUB-TOPIC	**GENERAL OBJECTIVE**	**CONTENT**	**ACTIVITY**	**RESOURCE**	**EVALUATION STRATEGY**
Reproduction and growth in animals.	Students will: Be aware of 4 methods of asexual reproduction in animals. Appreciate the importance of sexual reproduction as a means of continuity for the species.	Methods of asexual reproduction in animals: Budding, binary fission, fragmentation, parthenogenesis. Structure and function of the sexual reproductive organs in humans: (a) Functions of organs (structures) in the human reproductive system. (i) Female – Ovary, Oviduct (fallopian tube), Uterus, Cervix and Vagina. (ii) Male: Testes, Scrotum, Epididymis, Vas deferens or sperm duct, Seminal vesicle, Prostate gland, Cowper's gland, Urethra and Penis.	Observing video clips of the methods of asexual reproduction in animals: Budding, binary fission, fragmentation, and parthenogenesis. Drawing, and annotating the male and female reproductive system in humans: Ovary, Oviduct (fallopian tube), Uterus, Cervix and Vagina. Testes, Scrotum, Epididymis, Vas deferens or sperm duct, Seminal vesicle, Prostate gland, Cowper's gland, Urethra and Penis. Discussing the functions of the parts of the male and female reproductive system in humans. Answering and discussing the solutions to past CSEC questions on asexual reproduction and sexual reproduction in animals.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 44-51 Chart of the male and female reproductive system in humans Models of the reproductive system (male and female). Past CSEC Integrated Science questions on methods of asexual reproduction.	Oral Questioning: 1. Identify two (2) methods of asexual reproduction in animals. 2. Explain any method of asexual reproduction in animals. Written Assessment Answers past CSEC questions on sexual reproduction in humans.

Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.
Video Links	Video links on budding, binary fission, fragmentation, parthenogenesis: https://www.youtube.com/watch?v=F89XgjHyt0Q https://www.youtube.com/watch?v=LvHvHvLP-xc Video link on sexual reproduction in humans: https://www.youtube.com/watch?v=-ekRRuSa_UQ&authuser=0

WEEK 9

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Reproduction and growth in animals.	Students will: Be aware of the role the menstrual cycle plays in the process of sexual reproduction. Be familiar with the stages of sexual reproduction in humans.	The menstrual cycle in humans. (a) Ovulation (definition, and time of occurrence). (b) Roles and levels of oestrogen and progesterone (include changes in the uterine lining). (c) Menopause (definition, level of oestrogen). Graphs showing changes in the uterine lining during a 28-day menstrual cycle. The stages of pregnancy (a) Stages of pregnancy: (i) fertilization (ii) implantation (iii) simple description of the development of the foetus and birth with a brief description of: - contraction and dilation - contraction, crowning and expulsion of foetus - contraction and expulsion of the placenta.	Defining the term ovulation and identifying the time of occurrence. Identifying the 4 hormones and stating the role each plays in regulating the menstrual cycle. Explaining how the levels of oestrogen and progesterone change the uterine lining. Looking at a video clip on the menstrual cycle. Defining the term menopause. Explaining how the level of oestrogen changes during menopause. Examining graphs showing the changes in the uterine lining during a 28-day menstrual cycle. Observing video clip of the stages of pregnancy: fertilization, implantation, and fetus development.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 44- 51 Charts of the menstrual cycle. Illustrations of the birthing process.	Oral Questioning: 1. What is the difference between ovulation and the period? 2. Identify the two (2) hormones that control the uterine lining. Written Assessments: Briefly describe the stages of birth: contraction and dilation, contraction, crowning and expulsion of the foetus, and contraction an expulsion of the placenta. Answers past CSEC questions on sexual reproduction in humans.

		(b) Simplified diagrams to illustrate processes.	Looking at a video clip showing the birthing process. Examining the simple illustrations of the process of birth. Answering and discussing the solutions to past CSEC questions on sexual reproduction in animals.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on the menstrual cycle, fertilization, implantation, development of the foetus and the birthing process: https://www.youtube.com/watch?v=vXrQ_FhZmos https://www.youtube.com/watch?v=y4HK5CTVkXM https://www.youtube.com/watch?v=WH9ZJu4wRUE https://www.youtube.com/watch?v=duPxBXN4qMg https://www.youtube.com/watch?v=6_ekhqTDGRY				

WEEK 10

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Reproduction and growth in animals.	Students will: Appreciate the need for family planning. Be aware of the importance of pre- and post-natal care for mothers and babies. Be aware of the effects of unprotected sex.	Methods of birth control: Advantages and disadvantages: (a) Natural (rhythm, withdrawal, billings. (b) Barrier (male and female condom, diaphragm, cervical cap, Intrauterine devices). (c) Hormonal (pill, injections, patch, implants). (d) Surgical (vasectomy, hysterectomy, tubal ligation). Mention abstinence. Importance of pre-natal and postnatal care of mothers and babies. (a) The effects of nutrition, drugs, x-rays, and diseases. (b) Advantages of breast feeding, and immunisation. (c) Use and importance of ultrasound.	Designing a chart of the methods of birth control. Talking circle discussion on the advantages and disadvantages of each method: (a) Natural (rhythm, withdrawal, billings. (b) Barrier (male and female condom, diaphragm, cervical cap, Intrauterine devices). (c) Hormonal (pill, injections, patch, implants). (d) Surgical (vasectomy, hysterectomy, tubal ligation). Abstinence. Identifying the most and least effective method of birth control. Discussing the effects of nutrition, drugs, X-rays, and diseases: advantages of breastfeeding and immunisation. Also, the use of ultrasound.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 5 Samples of the various methods of birth control, e.g., condoms. Pictures of the devices used in birth control. Materials for brochures: cardboard, pictures, markers etc.	Oral presentation on the advantages and disadvantages of the methods of birth control. Written Assessments: Create a chart showing birth control methods. Answers past CSEC questions on methods of birth control.

			Past CSEC Integrated Science questions on methods of birth control.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on methods of birth control, and pre- natal care: https://www.youtube.com/watch?v=Zx8zbTMTncs https://www.youtube.com/watch?v=vIIcKmKNkk8				

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WEEK 11

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
SBA SKILLS	Students will: Understand the importance of School-Based Assessment skills. Become familiar with the format of a lab report	Skill- refers to the use of one's knowledge effectively and readily in execution or performance. **Integrated Science SBA Skills** i. Measurement and manipulation. ii. Observation, recording and reporting. iii. Analysis and Interpretation. iv. Drawing v. Planning and Designing *Project A planning and designing that is implemented and is marked from PD and A/I. *SBA the marked lab report.* *One SBA can be accessed for **no more than two (2)** skills.* The above skills are assessed using a minimum of eighteen (18) practicals over a period of two (2) years. The 18 compulsory TOPIC/ SUB-TOPIC are on the CSEC Integrated Science Moderation Feedback Report.	Discussing the importance of SBA to the final grade at CSEC. Discussing the format of a lab report Manipulating thermometer, measuring cylinder, dropper, Bunsen burner. Observing videos and record observations Using data to plot a graph	Integrated Science Syllabus Lab equipment Mark schemes for ORR, AI, DRW, MM and PD skills. Content page with a list of labs. Graph paper	Oral questioning on the format of a lab report. Assessing how students manipulate lab equipment. Plotting graph work on the relationship between variables.
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph. D. Integrated Science CSEC Syllabus.				

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WEEK 12

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Reproduction and growth in animals.	Students will: Understand that organisms increase in mass, size, and complexity during their lives. Know the importance of human population control.	Growth patterns of males and females. Analysis of data of height and weight with increase in age of boys and girls. Graphs are required. Human population control. (a) Problems arising from over population (effects on quality of life): (i) world food production; and, (ii) management of natural resources and material RESOURCE. (b) Effects of teenage pregnancy and birth control methods on population growth.	Plotting and analysing growth patterns of Grade 7 and Grade 10 boys and girls (height and weight). Defining the term population control. Discussing the need for population control: (a) Problems arising from over population (effects on quality of life): (i) world food production; and, (ii) management of natural resources and material resources. Role-playing the effects of teenage pregnancy and birth control methods on population growth.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 6. Materials for growth pattern investigation: Bathroom scale, Meter rule or measuring tape. Materials for graph: graph paper, pencil,ruler, data. Past CSEC Integrated Science questions on population growth	Written Assessment Lab report on growth patterns in humans. Answering past CSEC questions on the need to control population growth. Role play on teenage pregnancy.

			Answering and discussing the solutions to past CSEC questions on population growth.		
Lab # 1	Expose students to their first (1st) practical. *Note: Students should have a copy of the mark scheme for each laboratory skill.* *This lab should not be marked using a skill but should not be considered a School Based Assessment (SBA).*				
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on overpopulation, and teenage pregnancy: https://www.youtube.com/watch?v=QsBT5EQt348 https://www.youtube.com/watch?v=kUL-q7ptDW4 https://www.youtube.com/watch?v=yYoyBdtGwx4				

WEEK 13

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Transport systems	Students will: Know the functions of the parts of the transport system in plants and animals. Know the parts of the transport system in humans.	The need for transport systems within a living organism. (a) Surface area/volume ratio. (b) Movement of nutrients, gases, excretory products, and metabolic products. (c) Role of transpiration in plants. Structures in transport systems and function. (a) Composition of blood (plasma, blood proteins, blood cells, platelets). (b) Types of blood cells and their functions: (i) Red Blood Cells (mention blood doping) (ii) White Blood Cells (lymphocytes and phagocytes). (c) Internal structures of the heart (diagram required): (i) left and right atria (ii) left and right ventricles; and (iii) valves (tricuspid, bicuspid semi-lunar).	Investigating the need for a transport system: using cubes of different sizes to show how surface area/volume ratio affects total diffusion. Identifying the substances that are carried by the transport system of plants and animals. Discussing the role of transpiration in plants. Investigating the factors which affect the rate of transpiration. Identifying the components of blood-plasma, blood proteins, blood cells and platelets. Examining the structures of red blood cells, and white blood cells (lymphocytes and phagocytes) and stating the functions of each. Dissecting the cow's heart and identifying the parts.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 113-125 Materials for lab Work: a soft stem plant. E.g. balsam, water, red dye, scalpel or knife, hand lens. Materials for dissection: Cow heart, and scalpel. Materials for models: Cardboard, play dough, foam boards, glue or recycled materials. Past CSEC Integrated Science questions on the	Oral Questioning 1. Explain why multicellular organisms need transport systems within their bodies. 2 Name the TWO tissues that transport substances around plants and identify the substance(s) transported by EACH. Written Assessments: Answers to past CSEC questions on the transport system. Create a model of the heart.

			Drawing, labelling, and annotating the parts of the human heart showing the following parts: i) left and right atria. (ii) left and right ventricles; and (iii) valves (tricuspid, bicuspid semi-lunar). Making a model of the human heart. Answering and discussing the solutions to past CSEC questions on transport system- heart and blood.	transport system- heart and blood.	
Review of Lab. #1	Students are allowed to make corrections to lab # 1.				
Lab. # 2	Students conduct experiments and submit lab reports.				
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on surface area/ volume ratio, transpiration, red blood cells, white blood cells, and white blood cells in the human body, exploring the circulatory system: https://www.youtube.com/watch?v=huKUJsqik2I https://www.youtube.com/watch?v=Kv_0udatlh8 https://www.youtube.com/watch?v=erMPkJt8Ndg https://www.youtube.com/watch?v=qWSWWPZYGHU https://www.youtube.com/watch?v=Z_mXDvZQ6dU https://www.youtube.com/watch?v=-s5iCoCaofc				

WEEK 14

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Transport systems	Students will know the importance of knowing one's blood group, especially in emergency situations.	Explain the process of the heartbeat (diastole, atrial systole, ventricular systole). Names of major blood vessels (aorta, vena cava, pulmonary artery, and vein). Function of stem-xylem and phloem (simple explanation). Distinguish among the different blood groups. (a) Blood groups (A, B, AB and O). (b) Antigen and antibody for each group. (c) Precaution in transfusion and handling; include the term agglutination. (d) Rh factor - risk in pregnancy and precautions. Mention that blood type is an inheritable trait.	Looking at video clip of the Heartbeat (diastole, atrial systole, ventricular systole). Identifying major blood vessels in the human body (aorta, vena cava, pulmonary artery, and vein). Making a model of the xylem and phloem vessels. Demonstrating on the models how the xylem and phloem transport water and food. Investigating compatibility of blood types using food colouring. Arranging the blood groups to match their respective antigens and antibodies. Discussing the precautions in blood transfusion and handling blood includes the term agglutination.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 128-131 Materials for models: Cardboard, play dough, foam boards, glue or recycled materials. Materials for lab activity: red, and blue food colouring, test tubes, test tube rack, droppers, distilled water, and beakers.	Oral Questioning 1. Name the TWO different blood grouping systems and explain why different blood groups exist. 2. Outline THREE precautions that should be taken when handling and transfusing blood. Written Assessment 1. Explain the potential risk to a woman with Rh-negative blood who wishes to have children, and what precautions she must take if she gives birth to a baby with Rh-positive blood. Create models of the xylem and phloem vessels.

			Explaining the Rh factors and the risk in pregnancy and precaution. Discussing how blood type is inheritable. Answering and discussing the solutions to past CSEC questions on blood grouping.	Past CSEC Integrated Science questions on blood grouping.	
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on cardiac cycle, xylem, and phloem, experiment to determine blood group compatibility, Rh factor and pregnancy: https://www.youtube.com/watch?v=jtuX7H05tmQ https://www.youtube.com/watch?v=5tUWOF6wEnk https://www.youtube.com/watch?v=0h0UfNsyX8A https://www.youtube.com/watch?v=e2KK86bekNw				

NATIONAL SCHEME FOR SECONDARY SCHOOLS

Curriculum Area: Integrated Science **Grade 10**

WEEK 15

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Excretion	Students will: Know the difference between excretion and egestion. Understand the mechanism of excretion by the lungs, skin, and kidneys in humans.	Definition of terms excretion and egestion. Difference between excretion and egestion. The mechanism of excretion by the lungs, skin, and kidneys in humans: (i) Lungs (carbon dioxide and water vapour) (ii) Skin (water and salt) (iii) Kidneys (water, salt, and urea). Kidney – structure and function.	Distinguishing between excretion and egestion. Defining the term metabolism. Identifying excretory organs in the human body. Matching metabolic waste to their respective excretory organs. Explaining the mechanism of excretion by the lungs, skin, and kidneys. Dissecting the pig kidney/ making a 3D model of the kidney. Identifying the parts of the kidney. Drawing and labelling the parts of the human kidney. Answering and discussing the solutions to past CSEC questions on the effects of excretion.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 159-160 Chart of the urinary system in humans. Materials for dissection: Pig kidney, tray, and scalpel. Materials for model: Cardboard, foam, glue, or recycled materials. Past CSEC Integrated Science questions on the effects of smoking and excretion.	Oral Questioning 1. Define the terms excretion and egestion. 2. Identify the metabolic waste of the lungs, skin, and kidneys. Written Assessment In three sentences briefly discuss the need for an excretory system in humans. Dissecting and examining mammal's kidney.
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Link	Video link on the urinary system: https://www.youtube.com/watch?v=dxecGD0m0Xc				

Curriculum Area: Integrated Science **Grade 10**

WEEK 16

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Excretion	Students will: Understand the importance of osmoregulation. Be aware of the role of the skin in excretion and temperature regulation. Know the importance of excretion in flowering plants.	Kidney – structure of tubule related to ultrafiltration and reabsorption. The osmoregulatory function of kidneys (role of antidiuretic hormone ADH). Dialysis for malfunctioning Kidneys. Label the diagram of the skin and relate the structure of the skin to its functions – excretion, and temperature control. Methods of excretion in flowering plants. Waste products of respiration and photosynthesis only.	Identifying the structures related to ultrafiltration and absorption. Describing the role of the kidney in osmoregulation. Looking at video clip on the production of urine. Looking at a video clip on dialysis. Making a model of the skin and identifying the parts. Looking at a video clip on the function of the skin. Discussing the functions of the parts of the skin in relation to excretion and temperature control. Identifying the waste production of flowering plants produced from respiration and photosynthesis. Discussing how the waste products from photosynthesis and respiration are removed.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 167-172 Chart of the kidneys. Materials for a model of the skin: recycled materials and glue. Past CSEC Integrated Science questions on osmoregulation and temperature control.	Oral Questioning 1. Name the process by which the water content of body fluids is regulated. 2. Shania plays golf all day in the hot Sun and drinks very little. What effect will her behaviour have on the quantity and concentration of her urine? Explain your answer. Written Assessment Answers to past CSEC questions on osmoregulation and temperature control. Create a 3D model of human skin.

			Answering and discussing the solutions to past CSEC questions on osmoregulation and excretion in plants.		
Review of Lab. # 3	Students are allowed to make corrections to lab # 3 and grades will be adjusted.				
Lab. # 4	Students conduct experiments and submit lab reports.				
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on osmoregulation, kidney disease and dialysis, and the science of the skin: https://www.youtube.com/watch?v=ezDJ1GSXl4s https://www.youtube.com/watch?v=9KZHowze7lg https://www.youtube.com/watch?v=aMGgCxUyXT8				

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WEEK 17

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Sense Organs & Coordination	Students will: Know the sense organs and their functions. Understand the structure and function of the mammalian eye.	The sense organs and their functions: Stimulus associated with sense organs: eye (sight), ear (sound), tongue (taste), skin (touch), (e) nose (smell). The structures of the mammalian eye to their functions: (a) Functions of the following Structures as they relate to sight: retina, lens, iris, cornea, pupil, choroid, fovea, sclera, optic nerve; and ciliary body (ciliary muscles and suspensory ligaments). (Annotated diagrams are required). (b) Formation of an image on the retina. (c) Accommodation and control of the amount of light entering the eye.	Matching the sense organs to their respective stimulus. Drawing and labelling the parts of the mammalian eye. Looking at a video clip on the function of the parts of the eye. Matching the functions to the respective parts of the eye. Discussing how the image is formed on the retina. Relating the camera to accommodation and the control of light entering the eye. Answering and discussing the solutions to past CSEC questions on sense organs.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 177-184 Chart on the structure of the human eye. Past CSEC Integrated Science questions on the eye.	Oral Questioning 1. Identify each sense organ and the stimulus it detects. Written Assessment Answers past CSEC questions on the sense organs and the eye.

Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.
Video Link	Video link on how the eye works? https://www.youtube.com/watch?v=syaQgmxb5i0

WEEK 18

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Sense Organs & Coordination	Students will: Be aware of the sight defects that affect humans and their corrections. Be familiar with the structure and functions of the mammalian ear.	Analyses sight defects: (a) Causes and correction/treatment for the following defects: (i) long and shortsightedness (ii) glaucoma (iii) cataracts (iv) astigmatism (mention colour blindness). (b) Function of convex and concave lenses. Mention the effects of bright light and physical injury. Structures of the mammalian ear to their functions: (a) Functions of the following Structures of the ear: Pinna, Ear canal, Ear drum, Ear bones (anvil, stirrup, hammer), Eustachian tube, Semi-	Group presentation on the following: Examining diagrams showing long and short-sightedness. Discussing the cause, effects, and treatment of long and shortsightedness, glaucoma, cataracts, and astigmatism. (mention colour blindness). Investigating the simple use of convex and concave lenses. Stating the function of convex and concave lenses. Mentioning the effects of bright light and physical injury. Drawing and labelling the parts of the mammalian ear. Matching the functions of the ear to the respective parts. Looking at a video clip on the functions of the parts of the ear.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 185-192 Materials for group presentation: posters/ power point presentation, laptop, and projector. Materials for lab practical: concave and convex lenses, light source, screen. Create a chart to show the structure of a mammalian ear.	Oral Questioning 1. Identify two (2) sight defects. 2. Briefly explain how each eye defect mentioned is corrected. 3. Written Assessment Answers to past CSEC questions on the eye and ear. Presentation on sight defects.

		circular canal, Cochlea, and Auditory nerve. (Annotated diagrams are required). (b) Functions: hearing and balance. (c) Mention should be made of: (i) the approximate audio frequency spectrum of the human ear; and, (ii) the effects of loudness and pitch on human beings.	Explaining the function of hearing and balance. Stating the approximate audio frequency spectrum of the human ear. Discussing the effects of loudness and pitch on the human ear. Investigating the effects of pitch and loudness on human beings. Answering and discussing the solutions to past CSEC questions on the eye and ear.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on how the ear works, the ear and balance, investigating pitch and loudness of a sound, and the effects of loudness and pitch: https://www.youtube.com/watch?v=RiVx5Lih_44 https://www.youtube.com/watch?v=YMIMvBa8XGs https://www.youtube.com/watch?v=_wHx_tBfu5c https://www.youtube.com/watch?v=DztZDNDUaiQ https://www.youtube.com/watch?v=uvcvM5ujWJk				

WEEK 19

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Sense Organs & Coordination	Students will understand the structure and function of the nervous system in humans.	Structures of the nervous system to their functions: Structures of the central nervous system. (a) Functions of the brain with specific reference to cerebrum, cerebellum, medulla oblongata, pituitary gland, and hypothalamus. Brief description only. Include simplified diagrams of the brain. (b) Function of spinal cord. Brief description only. (c) Function of neurones (sensory neurone, relay neurone motor neurone). Adaptations to function are not required.	Examining the structure of the nervous system in humans. Looking at a video clip on the human nervous system. Outlining the functions of the nervous system. Making a model of the human brain. Matching the functions to the respective parts of the brain (cerebrum, cerebellum, medulla oblongata, pituitary gland, and hypothalamus). Drawing and labelling neurons. Performing lab activity on knee jerk reflex action. Answering and discussing the solutions to past CSEC questions on the nervous system.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 193-200 Charts on the structure of the human nervous system, brain, and neurons. Past CSEC Integrated Science questions on the nervous system.	Oral Questioning 1. Describe the main divisions of the human nervous system. Written Assessment Answers to past CSEC questions on the nervous system. Construct a model of the human brain.

Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.
Video Links	Video links on the nervous system song, the nervous system, the brain, https://www.youtube.com/watch?v=ivk_irrH1WY https://www.youtube.com/watch?v=KZVeFTDszTs https://www.youtube.com/watch?v=6O-0CVAgaEM

Curriculum Area: Integrated Science **Grade 10**

WEEK 20

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Sense Organs & Coordination	Students will be aware of the functions of the endocrine system.	(d) Examples of voluntary and involuntary actions. Mention malfunctioning of the system, for example, paralysis; and physical disabilities. Structures of the endocrine system to their functions: (a) Structural diagram – identifying the location of organs, hormones produced and their uses/effects. (b) Endocrine – hormones as messengers: thyroid (thyroxine), pancreas (insulin), sex organs (estrogen and testosterone), adrenal glands (adrenaline), pituitary glands (Antidiuretic hormone ADH).	Stating examples of voluntary and involuntary actions. Illustrating malfunctions of the nervous system e.g. paralysis and physical disabilities. Completing puzzles with endocrine glands in the human body. Looking at a video clip on the endocrine system. Identifying the hormone/s produced by each endocrine gland. Explaining the role of each hormone. Comparing the endocrine and nervous systems. Answering and discussing the solutions to past CSEC questions on the nervous and endocrine systems.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 193-200 Illustrations of nervous system disabilities. Puzzle on the endocrine system in humans. Materials for a model of the human brain: recycled materials and glue.	Oral questioning 1. Identify the six (6) endocrine glands you have studied. 2. Identify the hormones produced by any 3 of the glands. Written assessment Answers to past CSEC questions on the endocrine system. Solving a puzzle on the endocrine system.

Review of Lab. # 4	Students are allowed to make corrections to lab # 4 and grades will be adjusted.
Lab. # 5	Students conduct experiments and submit lab reports. *Note: This lab can be assessed as an SBA since students were exposed to marked lab reports for various skills.*
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.
Video Links	Video links on how the endocrine system works, and how your hormones work: https://www.youtube.com/watch?v=HXPCQBD_WGI https://www.youtube.com/watch?v=-SPRPkLoKp8

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Curriculum Area: Integrated Science **Grade 10**

WEEK 21

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Health	Students will: Appreciate the importance of microbes, especially in the food and medical industry. Be aware of the effects of unprotected sex.	Define the term microbes. Positive and negative effects of Viruses, bacteria, fungi. (How organisms contribute to soil fertility; the role of decomposers in the soil, Micro-organisms in food spoilage, production, and processing). (a) Definitions of disease, and communicable disease (infectious). (b) The causes, signs, and symptoms; and prevention, control and treatment of sexually transmitted infections to include: (i) Bacterial – Syphilis, Gonorrhoea, Chlamydia (ii) Viral – Herpes, Hepatitis, AIDS (iii) Fungal – Candida.	Defining the term microbes. Compiling a power point presentation on the positive and negative effects of microbes. Using illustrations to show the positive and negative effects of microbes. Defining the terms disease and communicable disease. Designing brochures on the cause, signs & symptoms, and preventive measures for the following STIs syphilis, gonorrhoea, chlamydia, herpes, hepatitis, AIDS, and candida. Answering and discussing the solutions to past CSEC questions on STIs.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 8-20 Power point presentation, google images. Materials for brochures: cardboard, pictures, markers etc.	Presentation on the positive and negative effects of microbes. Written Assessments: Brochure on STIs. Answers to past CSEC questions on STIs.
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				

Video Links	Video links on the benefits of bacteria, the benefits, and harmful effects of microbes, communicable diseases, and STIs. https://www.youtube.com/watch?v=eksagPy5tmQ https://www.youtube.com/watch?v=4XPQbipFR6M https://www.youtube.com/watch?v=dbd5iydu3EY https://www.youtube.com/watch?v=vYtV_Hf29RE

WEEK 22

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Health	Students will: Understand the significance of immunity in the human body. Know the physiological effects of exercise on the human body.	The principles of immunisation are used in the control of communicable diseases. (a) The immune system and how it is impacted by diseases. (b) Definition of immunity. (c) Role of white blood cells. (d) Types of immunity: (i) natural (ii) artificial (Covid, Polio vaccines) Non-communicable/infectious diseases. (a) Definition of non-infectious disease (noncommunicable). (b) Examples of non-infectious Diseases (noncommunicable diseases) include: (i) allergies (ii) autoimmune diseases (lupus, rheumatoid arthritis). (c) Diabetes and Hypertension (causes and effects). Physiological effects of exercise.	Demonstrating how the principles of immunisation and natural immunity are used in the control of communicable diseases using role play/ cartoon drawings/ puppetry. Defining the term immunity. Examining the role of white blood cells in response to pathogens. Discussing the types of immunity. Defining the term non-communicable diseases. Identifying examples of non-infectious diseases. Discussing the causes and effects of diabetes and hypertension. Researching the physiological effects of exercise on the respiratory and circulatory	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 132-140 Materials for role play/ cartoon drawings/ puppetry: crayons, paper, construction paper/ socks and glue. Materials for pulse rate: Stopwatch, note pad and pencil. Past CSEC Integrated Science questions on communicable, non-communicable and the effects of exercise.	Oral Questioning 1. Explain how artificial immunity is achieved. 2. What is the difference between communicable and non-communicable diseases? Written Assessment Lab report on the effects of exercise on heat rate. Role play/ cartoon drawings/ puppetry on immunity.

		Effects on circulatory and respiratory systems, lifestyle diseases, and effects on balancing energy input and output. Effects of exercise on muscle toning.	system, lifestyle diseases, and effects on balancing energy input and output. Investigating the effect of exercise on the pulse rate. Discussing the effects of exercise on muscle toning. Answering and discussing the solutions to past CSEC questions on communicable, non- communicable and the effects of exercise.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on the principles of immunity, role of white blood cells, non-communicable diseases, how high blood pressure works, diabetes: https://www.youtube.com/watch?v=VPoffYhtOXY https://www.youtube.com/watch?v=qWSWWPZYGHU https://www.youtube.com/watch?v=fK1_SH3X2ek https://www.youtube.com/watch?v=Ab9OZsDECZw https://www.youtube.com/watch?v=wZAjVQWbMlE				

Curriculum Area: Integrated Science **Grade 10**

WEEK 23

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Health	Students will: Be aware of the physiological, social, and economic effects of drug use. Students will: Understand the importance of good personal hygiene.	The effects of drug use. (a) Definition of drugs: (i) prescription drugs (steroids, diet pills and hormonal injections) (ii) non-prescription drugs (alcohol, illegal drugs, and recreational drugs). (b) Effects of drugs (stimulants, depressants, hallucinogens, and narcotics) on the nervous system. (c) Economic and social effects of drug use and abuse. Importance of practising good personal hygiene. (a) Practices: Elimination of body odours and care of genitalia. (b) Benefits: Social acceptance and prevention of infections.	Designing posters on drugs and defining and illustrating the types of drugs. prescription drugs (steroids, diet pills and hormonal injections), non-prescription drugs (alcohol, illegal drugs and recreational drugs), Effects of drugs (stimulants, depressants, hallucinogens, and narcotics) on the nervous system. Discussing the economic and social effects of drug use and abuse. Brainstorming the need for good personal hygiene. Creating posters to depict the benefits of good personal hygiene. Answering and discussing the solutions to past CSEC questions on drug abuse and hygiene.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 207-209 Materials for posters: cardboard, markers, pictures, and glue. Past CSEC Integrated Science questions on Drug abuse and hygiene.	Oral Questioning 1. What is the main reason for practising good personal hygiene? Written Assessment Answers past CSEC questions on hygiene and drug abuse.
Review of Lab. # 5	Students are allowed to make corrections to lab # 5 and grades will be adjusted.				
Lab. # 6	Students conduct experiments and submit lab reports. *Note: This lab can be assessed as an SBA since students were exposed to marked lab reports for various skills.*				

Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.
Video Links	Video links on drug abuse, and personal hygiene https://www.youtube.com/watch?v=b6Dte96WdqM https://www.youtube.com/watch?v=jQ2e0KH5WrI

WEEK 24

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Health	Students will: Know the conditions that encourage the breeding of household pests and parasites.	Conditions that encourage the breeding of household pests and parasites. (a) Definition of pests, parasites, pathogens, and vectors. (b) Conditions that encourage the breeding of Cockroaches, flies, rats, and mosquitoes. (i) impact of improper disposal of waste (industrial and domestic) (ii) improper household hygiene (household surfaces, storage of food) Appropriate methods of pest control. (a) Methods of pest control: Biological, chemical, sanitary, and mechanical. (b) The relevant methods of control for each developmental stage in the life cycles of mosquitoes and houseflies.	Outlining the conditions that encourage the breeding of household pests and parasites. Differentiating among pests, parasites, pathogens, and vectors. Making index cards on household pests (cockroaches, flies, rats, and mosquitoes), highlighting the conditions that encourage their breeding. Discussing the impact of improper disposal of waste (industrial and domestic), and improper household hygiene as it relates to (household surfaces, and storage of food). Researching and presenting methods of pest control (biological, mechanical, chemical, sanitary, and mechanical). Identifying the relevant methods of control for each developmental stage in	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 207-209 Materials to make index cards: cardboard, pictures, and glue. Charts/ Power point presentation on methods of pest control.	Oral Questioning 1. Identify three (3) conditions that encourage the breeding of household pests and parasites. 2. Suggest the most appropriate methods to control the different stages in the life cycle of a mosquito. Written Assessment Answers to past CSEC questions on the hygiene and household pests, parasites, pathogens, and vectors. Assessing group presentation on methods of pest control. Create index cards on household pests.

			the life cycles of mosquitoes and houseflies. Answering and discussing the solutions to past CSEC questions on hygiene and household pests, parasites, pathogens, and vectors.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Link	Video link on the life cycle of the mosquito https://www.youtube.com/watch?v=93wPfE78SYY				

WEEK 25

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Health	Students will: Be aware of the conditions that promote the growth of microorganisms in food. Become familiar with the principles used in food preservation.	Types of food contaminants. (a) Pathogens (virus, fungus, bacteria). (b) Chemical contaminant. (c) Physical contaminants. Conditions which promote the growth of microorganisms. (a) Conditions to include: (i) moisture (ii) optimal temperature (iii) nutrients. (b) The effects of microorganisms in food spoilage, production and processing. (c) Procedures for retarding and preventing the growth of bread mould. Principles used in food preservation. Definition of food preservation. Principles – altering conditions to delay the growth of microorganisms or to delay microbial decomposition of the food; for	Discussing ways food is contaminated (pathogens, chemicals, and physical contaminants). Describing the conditions that promote the growth of microorganisms in the food they handle on a daily basis e.g. bread. Experimenting on how to retard and prevent the growth of bread mould. Discussing the effects of microorganisms in food. Viewing a video clip of the growth of bread mould and its effects on the human body. Creating a portfolio on the various methods used in food preservation salting, drying, pickling, heating, canning, curing, refrigeration, adding	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 95-99 Materials for lab Work: bread, glass jars, Petri dishes, microscope. Sliced bread, zip lock bags/ clear plastic bags, marker (conditions- dark, sunny, cool, cold, moist environments). Materials for portfolio- book/paper, pictures, information on methods of food preservation.	Oral Questioning 1. Identify 2 methods of retarding the growth of bread mould. 2. State 2 effects of microorganisms on food. Written Assessment Portfolio on the methods of food preservation. Broadcasting awareness of findings from experiments on bread mould.

		example, removal of moisture, and inactivating enzymes. Methods: salting, drying, pickling, heating, canning, curing, refrigeration, adding sugar and treating with other preservatives. (i) brief description of the methods (ii) Application of principles to the methods. Mention solar drying and energy-efficient/inverter-type refrigeration.	sugar and treating with other preservatives. - Describing each method. - Describing the application of principles to the methods. Mention solar drying and energy-efficient/inverter-type refrigeration. Answering and discussing the solutions to past CSEC questions on food preservation and microbial growth.	Past CSEC Integrated Science questions on food preservation and microbial growth.	
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on food safety, contamination of food, and bread mold: https://www.youtube.com/watch?v=gzsV-neH3SI https://www.youtube.com/watch?v=-JoIDc_slC8 https://www.youtube.com/watch?v=4ro8sPOgCBg				

WEEK 26

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Conservation of energy.	Students will: Understand the concept of energy. Be familiar with interconversion and conservation of mass-energy.	(a) Energy as an ability to produce a change/do work. (b) Types and forms of energy. (c) Unit of energy (Joules) Interconversion and conservation of mass-energy. (a) Inter-conversion of energy for example: (i) in the sun (ii) nuclear reactors (iii) electrical devices (b) Methods used to save energy supply to vehicles. (c) Effects of the internal combustion engine on the environment. Mention how they can be reduced. Reference to photosynthesis, alternative energy sources, and efficiency of machines.	Explaining the concept of energy. Identifying the types and forms of energy. Stating the unit of energy. Performing calculations involving work and energy. Investigating the conservation of energy in a burning candle. Discussing interconversion and conservation of mass-energy. Drawing flow charts showing the inter-conversion and conservation of mass-energy using given examples. (i) in the sun (ii) nuclear reactors (iii) electrical devices Identifying methods used to save energy supply to vehicles. Discussing measures that may be taken to decrease the effects of the internal combustion engine on life and the environment.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 260-264 Materials for a chart on inter-conversion and conservation of mass-energy: cardboard, and markers. Materials for Lab work: candle, matches, ruler, stopwatch. Past CSEC Integrated Science questions on energy.	Oral Questioning 1. What is the difference between energy and work? 2. State the SI unit of energy. Written Assessments: 1. Charts on inter-conversion and conservation of mass-energy. 2. Solving questions on energy and work.

			Answering and discussing the solutions to past CSEC questions on energy.		
Review of Lab. # 6	Students are allowed to make corrections to lab # 6 and grades will be adjusted.				
Lab. # 7 & 8	Students conduct experiments and submit lab reports. *Note: These labs can be assessed as an SBA since students were exposed to marked lab reports for various skills.*				
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on the conservation of energy, and the internal combustion engine: https://www.youtube.com/watch?v=Um04eHOqGlM https://www.youtube.com/watch?v=5tN6eynMMNw				

Curriculum Area: Integrated Science **Grade 10**

WEEK 27

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Conservation of energy.	Students will appreciate and care for plants in their environment.	Role of photosynthesis in the conversion of energy. (a) Definition. (b) Identification of substrate, conditions and products; word and chemical equations. (c) Importance of: (i) substrates (carbon dioxide and water) (ii) conditions (light, chlorophyll) (photo chemical reactions) (iii) products (oxygen, glucose). Mention that glucose can be converted to other substances. (d) Awareness that light energy can be converted to chemical energy (glucose). Reference to excretion in plants and inter-conversion of energy.	Examining the role of photosynthesis in the conservation of energy. Defining the process of photosynthesis. Identifying the substrate, conditions, and products. Writing the chemical and word equations for photosynthesis. Investigating the importance of light, chlorophyll, and carbon dioxide to the process. Explaining the energy conversion during the process of photosynthesis. Conducting experiments to establish conditions for photosynthesis (light and chlorophyll), and tests for starch as a product of photosynthesis. Answering and discussing the solutions to past CSEC questions on photosynthesis.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 75-80 Materials for lab Work: beaker. Test tube. Bunsen burner, white tile, water, ethanol, green leaf, iodine solution, Variegated leaf, aluminium foil and potted plants. Past CSEC Integrated Science questions on photosynthesis.	Oral Questioning 1. Identify the substrate, conditions, and productions of photosynthesis. 2. Define the process of photosynthesis. Written Assessment Report on testing a leaf for starch. Written Assessment Answers past CSEC questions on photosynthesis.

Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.
Video Links	Video links on testing a leaf for starch, Is chlorophyll needed for photosynthesis, and Is light needed for photosynthesis: https://www.youtube.com/watch?v=0s_xZqvwm_s&t=21s https://www.youtube.com/watch?v=x17XhQJ3PxI&t=1s https://www.youtube.com/watch?v=UDzuG4jNfHs&t=11s

Curriculum Area: Integrated Science **Grade 10**

WEEK 28

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Conservation of energy.	Students will know the importance of the flow of energy in an ecosystem.	Transfer of energy in the environment. (a) Producers, consumers (primary and secondary) decomposers, habitat, herbivores, carnivores, omnivores, population, community, ecosystem. (b) Food chains and food webs, trophic levels. (c) Ecological pyramids: (i) pyramid of numbers (species numbers); (ii) pyramid of biomass (iii) pyramid of energy (energy efficiency). Make mention of ecological balance for environmental sustainability. Reference to water pollution.	Observing, and recording feeding relationships in the school yard. Analyzing the transfer of energy in the school yard. Classifying organisms observed in school yard as producers, primary consumers, secondary consumers, herbivores, carnivores, omnivores, and decomposers. Identifying populations and communities in the schoolyard. Describing the following terms producers, primary consumers, secondary consumers, herbivores, carnivores, omnivores, decomposers, population, community, and ecosystem. Constructing food chains and food web from organisms observed on the field trip. Identifying the trophic levels in food chains and food webs. Demonstrating how to analyze the pyramid of numbers, biomass, and energy. Make mention of ecological	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 81-85 Materials for lab Work: organisms found in their natural habitat, Notepad, pencil, smart phones, long boots, empty containers, forceps, and hand lens. Past CSEC Integrated Science questions on food chains and the food web.	Oral Questioning 1. Explain what is meant by EACH of the following terms: producer, decomposer, omnivore, population, and ecosystem. Written Assessment 1. Some whiteflies were observed on the bean plants in a garden and spiders were seen feeding on the whiteflies. The spiders were, in turn being eaten by birds. Use this information to draw a food chain for the organisms in the garden. 2. Label the trophic levels on the food chain.

			balance for environmental sustainability. Reference to water pollution. Answering and discussing the solutions to past CSEC questions on the feeding relationships on the food chains and food web.		
Review of Lab # 7 & 8	Students are allowed to make corrections to labs # 7 & 8 and grades will be adjusted.				
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on ecological terms: https://www.youtube.com/watch?v=E6WAQpRulhA				

WEEK 29

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Energy in life processes.	Students will appreciate that a balanced diet results in a healthy body.	Importance of food as a source of energy. (a) The Caribbean food groups, their sources and functions of their main nutrients. (i) carbohydrates (ii) proteins (iii) fats (iv) vitamins (A B12, C, D) (v) minerals (calcium, iron, iodine). (b) Importance of fibre and water to health. (c) Define a balanced diet. (d) Balanced diet related to age, gender, occupation/sport. (e) Food additives (artificial food colouring, salt, MSG, artificial sweeteners) and their effect on health. (f) Protein-energy malnutrition (PEM) deficiency disease, diabetes, and obesity.	Examining the importance of food as a source of energy. Identifying the 6 food groups in the Caribbean. Hosting a health fair on local foods. Classifying local foods into 6 food groups. Identifying the main nutrients and function/s of the nutrients to the human body: (i) carbohydrates (ii) proteins (iii) fats (iv) vitamins (A B12, C, D) (v) minerals (calcium, iron, iodine). Discussing the importance of fibre and water to health. Defining the term balanced diet. Discussing how to determine a balanced diet as it relates to age, gender, and occupation/sport. Discuss the use of food additives (artificial food colouring, salt, MSG, artificial sweeteners) and their effect on health.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 86-93 Local food items on display e.g., rice, cassava, beans, bell peppers etc., labels, containers, cling wrap, and meal plans for various categories. Diagrams showing the effects of an unbalanced meal. Materials for food testing: Local food samples, petri dishes, droppers, measuring cylinders, iodine, NaOH, copper sulphate, ethanol, and distilled water.	Assessing the presentation of the health fair. - Organization of display boots. - Ability to answer questions from visitors. - Willingness to provide added help.

			Displaying a meal based on occupation, sport PEM, deficiency diseases, diabetes, and obesity. Defining the term PEM, identifying common deficiency diseases, their cause, signs & symptoms, and treatment. Discussing the effects of diet on diabetes and obesity. Food testing: starch, protein, and lipid. Conducting experiments to measure the energy value of food. Answering and discussing the solutions to past CSEC questions on food groups and food nutrients.	Materials for energy content: local food samples, test tube, water, thermometer, and heat source. Past CSEC Integrated Science questions on food groups and food nutrients.	
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on starch test, protein test and fat test: https://www.youtube.com/watch?v=5YMDOX71TeI https://www.youtube.com/watch?v=ufec89A47uM https://www.youtube.com/watch?v=IGdb4X9swDQ				

WEEK 30

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Energy in life processes.	Students will understand the process of digestion in humans.	Process of digestion in humans. (a) Mechanical and chemical digestion. (b) Definition and role of enzymes (activation energy). (c) Role of bile. (d) Enzymes are active at different stages (salivary, amylase, pepsin, renin, pancreatic, lipase, pancreatic amylase, trypsin, maltase, lactase, sucrose, galatase), substrates and products. (e) Effects of temperature and pH on enzymes.	Examining the process of digestion in humans. Drawing and labelling the parts of the human digestive system. Matching the function/s to the respective parts of the human digestive system. Making a model of the human digestive system. Describing mechanical and chemical digestion. Defining the term enzymes. Discussing the role of enzymes (activation energy) in the process of digestion. Describing the role of bile in the process of digestion. Identifying the enzymes active at different stages (salivary, amylase, pepsin, renin, pancreatic, lipase, pancreatic amylase, trypsin, maltase, lactase, sucrose, galatase), substrates and products. Conducting experiments to show the effects of temperature and pH on enzymes. .	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 98-104 Materials for lab Work: chicken liver, hydrogen peroxide, test tubes, Bunsen burner, an acid, a base, ice, and hot water bath. Materials for a model of the human digestive system: recycled materials, markers, and glue. Past CSEC Integrated Science questions on digestion.	Oral Questioning 1. For lunch, John consumes an egg sandwich made with two slices of buttered bread and an egg spread. Describe how the starch, protein and lipid in John's sandwich are digested as it passes through his digestive system. Written Assessment Conduct an investigation on enzyme activity. Construct a model of the human digestive system.

			Answering past CSEC questions on the digestive system.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on digestion, the process of digestion, enzymes, bile, and emulsification: https://www.youtube.com/watch?v=kFx9a3TSvXg https://www.youtube.com/watch?v=Og5xAdC8EUI https://www.youtube.com/watch?v=rlH1ym916Fo https://www.youtube.com/watch?v=TNG-RRzwBVU&t=1s				

WEEK 31

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Energy in life processes.	Students will appreciate the importance of each tooth in the role they play in digestion.	Describe the process of: (f) Absorption. (g) Assimilation. (h) Egestion. Difference between excretion and egestion. Structure of the teeth to their function in human digestion. (a) Types of teeth and dental formula. (b) Structural and functional adaptation of the different types of teeth. (c) The role of mechanical digestion is to increase the surface area of food and diet. (d) Importance of the care of the teeth (brushing, flossing, rinsing, diet, visit to the dentist).	Differentiating between absorption, assimilation, and egestion. Stating the difference between excretion and egestion Designing a brochure with the following information: Identifying the types of teeth. Using the dental formula to calculate the total number of teeth in the human mouth. Drawing and labelling the parts of a tooth. Highlighting the structural and functional adaptations of the different types of teeth. Discussing the role of mechanical digestion to increase the surface area of food and diet. Discussing how we care for our teeth (brushing, flossing, rinsing, diet, visit to the dentist). Answering past CSEC questions on the teeth.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 98-104 Past CSEC Integrated Science questions on the teeth.	Oral questioning 1. Mary developed a cavity in one of her teeth. Suggest FOUR things she should do to prevent cavities from forming in her other teeth. Written Assessment Create a brochure on the teeth.
Lab # 9 & 10	Students conduct experiments and submit lab reports. *Note: These labs can be assessed as an SBA since students were exposed to marked lab reports for various skills.*				

Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.
Video Links	Video links on absorption, and structure of teeth in humans: https://www.youtube.com/watch?v=cEh2Qip0-E4 https://www.youtube.com/watch?v=FV1rrbTYIM4

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WEEK 32

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Energy in life processes.	Students will: Appreciate the significance of the respiratory system. Know the importance of aerobic and anaerobic respiration to our daily life. Understand the mechanism of breathing.	Importance of respiration in providing energy to organisms. (a) Definition. (b) Substrate and products, word, and chemical equation. (c) Site of respiration. (d) Importance of energy release. (e) Energy related to the type of substrate. Aerobic and anaerobic respiration. (a) Compare amounts of energy produced, products and use. (b) Relevance of anaerobic respiration to sports and industries (bakeries/breweries). Mechanism of breathing. (a) Inhalation and exhalation, pressure and volume changes, role of ribcage and diaphragm.	Defining the term respiration. Brainstorming the importance of respiration in living organisms. Writing the word and chemical equation for respiration. Identifying the substrate, conditions, and productions of respiration. Discussing the importance of the energy released and the energy related to the type of substrate. Distinguishing between aerobic and anaerobic respiration. Comparing the amounts of energy produced, products and use. Relating the relevance of anaerobic respiration to sports and industries (bakeries and breweries). Looking at a video clip on the production of rum. Investigating the conditions that affect the respiration of yeast. Demonstrating the mechanism of breathing using the bell jar model.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 154-156 Materials for a model of the human respiratory system: bell jar/ plastic bottle, straw/tube, balloon. Chart of the respiratory system in humans. Materials for lab activity: Yeast, sugar, test tubes, test tube rack, beakers, ice bath. Past CSEC Integrated Science questions on respiration.	Oral Questioning 1. Identify the substrate and products of aerobic and anaerobic respiration in humans. Written Assessments: 1. Lab report on respiration of yeast. 2. Answers to past CSEC questions on respiration. Create a model of the human respiratory system.

			Arranging the steps in breathing on a table (Inhalation and exhalation, pressure and volume changes, role of ribcage and diaphragm). Answering and discussing the solutions to past CSEC questions on respiration.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on the respiratory system, aerobic respiration, anaerobic respiration, how rum is made and breathing: https://www.youtube.com/watch?v=fQsgZloXNPY https://www.youtube.com/watch?v=ZkqEno1r2jk https://www.youtube.com/watch?v=HZtXLhm7ISA https://www.youtube.com/watch?v=k1qFmAgX8h8 https://www.youtube.com/watch?v=mh8owPHMUrg				

WEEK 33

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Energy in life processes.	Students will: Know the importance of gaseous exchange in living organisms. Be aware of the effects of smoking on the respiratory system.	(b) Composition of inhaled and exhaled air; structures of the lungs. (c) Using kinetic energy to bring air into and out of the lungs. (d) Stages of CPR. Reference to first aid methods, excretory system, and the effects of diving. Importance of gaseous exchange in organisms. (a) Features common to respiratory surfaces: alveoli, stomata, fish gills. (b) Significance of gaseous exchange. Reference to diffusion. Effects of smoking on the gaseous exchange process. (a) Importance of smoke-free environments. (b) Effect of second-hand smoke on the gaseous exchange process. (Tobacco, marijuana, vaping - electronic cigarettes). Reference to effects of air pollution.	Examining pie chart with the composition of inhaled and exhaled air. Linking the use of kinetic energy to bring air into and out of the lungs. Looking at video clips on the stages of CPR. Reference to first aid methods, excretory system, and the effects of diving. Manipulating simulation activity on gaseous exchange. Defining the term gaseous exchange. Looking at video clips on common respiratory features (alveoli, stomata, and fish gills). Drawings of the structures of stomata from prepared slides. Stating the significance of gaseous exchange. Reference to diffusion. Designing brochures on the effects of smoking on the gaseous exchange process. Designing signs of a smoke-free environment for the school.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 154-156 Illustrations of a pie chart showing the composition of inhaled and exhaled air. Microscope with prepared slides of stomata, pencil, drawing paper and eraser.	Oral Questioning 1. Name the THREE main components of cigarette smoke. 2. How does smoking cigarettes damage the lungs? Written Assessment Create a brochure on the effects of smoking on the respiratory system. Differentiate between breathing and gaseous exchange.

			Discussing the effects of second-hand smoke on the of secondhand smoke on the gaseous exchange process. (Tobacco, marijuana, vaping - electronic cigarettes). Reference to effects of air pollution. Looking at video clips on the effects of smoking on the respiratory system. Answering and discussing the solutions to past CSEC questions on gaseous exchange and smoking.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video links on how to do CPR, alveoli, stomata, fish gills, cigarettes, the lungs after 20 cigarettes, marijuana, vaping, and air pollution: https://www.youtube.com/watch?v=-NodDRTsV88 https://www.youtube.com/watch?v=mZvzl8KH6iI https://www.youtube.com/watch?v=9DQ014j6j70 https://www.youtube.com/watch?v=2hBaH14Kpnw https://www.youtube.com/watch?v=Y18Vz51Nkos https://www.youtube.com/watch?v=hUau1hYnIkQ https://www.youtube.com/watch?v=q8jJsyZhRyc https://www.youtube.com/watch?v=wGJpGSCBzZ8 https://www.youtube.com/watch?v=WKrPd-8CJBM Simulation on the respiratory journey: https://biomanbio.com/HTML5GamesandLabs/Physiologygames/respiratory_journeyhtml5page.html?authuser=0				

WEEK 34

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Fossil fuel and alternative sources of energy.	Students will: Know the various types of fossil fuels. Be familiar with the energy obtained from petroleum as stored energy.	Use of fossil fuels. (a) Types of fossil fuels: coal, natural gas, crude oil (petroleum derivates - diesel, kerosene, gasoline, fuel oil). (b) Interconversion of energy using fossil fuels (internal combustion engines, and power plants). (c) Advantages of using fossil fuels. (d) Disadvantages of using fossil fuels. (i) Fossil fuels as a nonrenewable and exhaustible resource. (ii) environmental effects (acid rain, greenhouse effect. (iii) the impact of emissions on air quality (sulphur dioxide, carbon dioxide, methane, carbon monoxide, lead).	Examining the use of fossil fuels. Defining the term fossil fuel. Identifying the types of fossil fuels: coal, natural gas, crude oil (petroleum derivates - diesel, kerosene, gasoline, fuel oil). Looking at video clip on the formation of fossil fuel, types of fossil fuels and the origin of fossil fuel in Guyana. Illustrating the interconversion of energy using fossil fuels (internal combustion engines, and power plants). Discussing the advantages and disadvantages of using fossil fuels: (i) Fossil fuels as a nonrenewable and exhaustible resource. (ii) environmental effects (acid rain, greenhouse effect. (iii) the impact of emissions on air quality (sulphur dioxide, carbon dioxide, methane, carbon monoxide, lead). Answering and discussing the solutions to past CSEC questions on fossil fuel.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 436 Sample of petroleum. Past CSEC Integrated Science questions on fossil fuels.	Oral Questioning 1. Describe the formation of crude oil and coal. Written Assessment Answers past CSEC questions on fossil fuels.

Review Lab # 9 & 10	Students are allowed to make corrections to labs # 9 & 10 and grades will be adjusted.
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.
Video Links	Video links on the formation of fossil fuels, types of fossil fuels, and how coal is formed. The origin of fossil fuel in Guyana, the internal combustion engine, global warming, and the greenhouse effect: https://www.youtube.com/watch?v=zaXBVYr9Ij0 https://www.youtube.com/watch?v=EYeSBNBCjx4 https://www.youtube.com/watch?v=BQ_Ethb6_Wk https://www.youtube.com/watch?v=wuNhqTX4gyw https://www.youtube.com/watch?v=5tN6eynMMNw https://www.youtube.com/watch?v=oJAbATJCugs https://www.youtube.com/watch?v=BPJJM_hCFj0

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WEEK 35

TOPIC/ SUB-TOPIC	GENERAL OBJECTIVE	CONTENT	ACTIVITY	RESOURCE	EVALUATION STRATEGY
Fossil fuel and alternative sources of energy.	Students will: Be aware of the problems associated with the use of fossil fuels. Appreciate the use of alternative sources of energy.	Alternative sources of energy can be used in the Caribbean. (a) Description of alternative sources of energy: solar, wind, wave, biofuels (biogas, biomass, biodiesel, ethanol), geothermal, hydroelectric. (b) Uses of solar and wind energy: to include water heating, solar cells (photovoltaic cells), solar cookers/cooking. (c) Sustainability of the use of alternative sources of energy: environmental, economic, and social. Reference to the inter-conversion of energy.	Appraising the extent to which alternative sources of energy are used in the Caribbean. Group Presentation outlining the following: Identifying alternative sources of energy: solar, wind, wave, biofuels (biogas, biomass, biodiesel, ethanol), geothermal, hydroelectric. Discussing the use of solar and wind energy: to include water heating, solar cells (photovoltaic cells), solar cookers/cooking. Looking at video clips on alternative forms of energy. Making models of wind, solar, and hydroelectric plants. Debating the sustainability of the use of alternative sources of energy versus the use of fossil fuels (environmental, economic, and social). Investigating the heat produced from a luminous and non-luminous Bunsen flame.	Integrated Science for CSEC Examinations 3rd Edition by Tania Chung. Pg. 439 Samples of fossil fuel: gasoline, diesel, kerosene etc. Materials for lab activity on burning fossil fuels: 2 tin cans, tripod stand, Bunsen burner, thermometer, stopwatch, 100 mL water. Past CSEC Integrated Science questions on fossil fuel and alternative sources of energy.	Written Assessment Answers to past CSEC questions on fossil fuel and alternative sources of energy. Debating on the sustainability of the use of alternative sources of energy versus the use of fossil fuels (environmental, economic, and social).

			Answering and discussing the solutions to past CSEC questions on fossil fuel and alternative sources of energy.		
Additional Textbooks	A. Concise Revision Course CSEC Integrated Science by Anne Tindale, Peter DeFreitas & Shaun deSouza. B. Integrated Science for CSEC Examinations by Tania Chung. C. CXC Study Guide: Integrated Science for CSEC by Lawrie Ryan, Denise Hernadez, Bermadee McKenzie- Briscoe, Marsha Russel, and Victor Joseph.				
Video Links	Video link on alternative forms of energy. https://www.youtube.com/watch?v=jo_IRDLLSNU				

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