



Immaculate Conception High School
Grade 7
General Science
Course Outline
2024-2025



- 1. Department Name: Science**
- 2. Grade Level: 7**
- 3. Title of Course: General Science**
- 4. Duration: September 2024-July 2025**

5. Description of the Course:

This course introduces Grade 7 students to the essential concepts of science, including physical science, life science, and earth science. The course is designed to build foundational knowledge and foster an interest in scientific inquiry through engaging activities and experiments. Students will explore the natural world, develop scientific skills, and apply the scientific method to solve problems in everyday life.

6. Course Prerequisites:

The prerequisite for this course is PEP Integrated Science. It is designed for students new to the study of science at this level.

7. Course Objectives:

Upon completion of this course, students will:

- Understand the basic principles and concepts of science.
- develop critical thinking and problem-solving skills through scientific inquiry.
- encourage curiosity about the natural world and the processes within it.
- enhance students' ability to conduct experiments and interpret data.
- use mathematics as a tool for problem-solving, and as a means of expressing and/or modelling scientific concepts.
- appreciate the influence and limitations of science with consideration for ethical issues.

7. Course Objectives:

Upon completion of this course, students will have the ability to:

- demonstrate a positive attitude towards the use of scientific language.
- demonstrate positive interpersonal skills in order to foster good working relationships.
- apply scientific knowledge and processes to the solution of real-world problems.

8. Student Learning Outcomes:

By the end of this course, students will be able to:

- recall and define key scientific concepts and terminology relevant to physical, life, and earth sciences.
- explain scientific principles, theories, and processes using appropriate vocabulary.
- use the scientific method to design and conduct experiments, demonstrating proper use of laboratory equipment and techniques.
- interpret data and draw conclusions by identifying patterns, relationships, and anomalies in experimental results.
- critically assess scientific information and arguments presented in various sources.
- develop and present a research project that integrates knowledge from multiple scientific disciplines, showcasing creativity and original thought.
- work effectively in groups to solve problems and complete scientific investigations, demonstrating communication and teamwork skills.
- present scientific findings and ideas clearly and persuasively in written, oral, and visual formats.
- relate scientific concepts to real-world situations, making connections between scientific knowledge and everyday life.
- evaluate personal learning experiences and set goals for further scientific inquiry and exploration.

9. Topical Outline of the Course Content:

TERM 1
<p><i>Working like a Scientist</i></p> <ul style="list-style-type: none">● Define the terms science and technology.● Explain how science and technology are related.● Using our senses and identifying the Science Process Skills to keep us informed about our environment <p>Skills: Observing, Experimenting, Recording, Inferring, Conclusion, Classifying, Defining Operationally, Controlling variables, Communication, Measuring, Interpreting Data, Hypothesizing, Predicting.</p>
<p><i>Scientific method</i></p> <ul style="list-style-type: none">● Explain the stages in the scientific method.● Formulate criteria for the presentation of observations in an experimental format.
<p><i>Jamaican scientists</i></p> <ul style="list-style-type: none">● To research Jamaican scientists and international scientists/innovators.
<p><i>Lab apparatus & Lab safety</i></p> <ul style="list-style-type: none">● List and state the function of each laboratory equipment.● Identify potentially dangerous situations and know how to correct them.● Describe ways to be safe in the lab.● Interpret lab safety symbols.
<p><i>Grouping things</i></p> <p>a) Classify materials as solids, liquids and gases.</p> <ul style="list-style-type: none">● Demonstrate that solids and liquids are made up of tiny particles.● Relate the arrangement of tiny particles to the states of matter. <p style="text-align: center;"><i>Non-Living (Nature of Matter):</i></p> <ul style="list-style-type: none">● Compare the three states of matter in terms of physical properties.● Plan and design an investigation to show how matter changes state.● Formulate a working definition of matter.● Describe the processes involved in the water cycle.

Climate Change

- Explain the meaning of the term ‘greenhouse effect’
- Investigate the principles governing the ‘greenhouse effect’
- Differentiate between the natural and manmade ‘greenhouse effect’
- Recall what is meant by climate change
- Identify some effects of climate change in the Caribbean
- Identify selected greenhouse gases and their sources
- Deduce the relationship between the greenhouse effect and global warming
- Evaluate the impact of at least three effects of climate change on living organisms and the environment
- Explain ways in which human practices contribute to climate change
- Describe at least three ways in which people can reduce the impact of climate change on their lives.

b) Classify living things into plants and animals.

Animals:

- a) Subgroups of animals.
- b) Characteristics of animal subgroups.

Plants:

- a) Subgroups of plants
- b) Characteristics of monocot and dicot plants-seeds, leaves, flowers.

Sexual reproduction in plants

- Make annotated drawings of the external and internal structure of seed and fruit.
- Differentiate between seed and fruit.
- Identify the main parts of a seed (testa, hilum, cotyledons, micropyle)- Monocot & Dicot
- Germination:
 - Stages of germination
 - Necessary conditions for germination
 - Types of germination:
 - Hypogeal
 - Epigeal

- Dissect and draw the reproductive structures of a flower.
- Describe the process and list the agents of pollination.
- Compare the structure of wind and insect-pollinated flowers.
- Explain the process of fertilisation.
- Describe what happens after fertilisation to form seeds and fruits.
- Relate the structure of seeds and fruits to the structure of the flower.

Asexual reproduction in plants

- Identify and list some plants that can reproduce without making seeds.
- Describe ways in which new plants can be grown without seeds.
- Compare asexual and sexual reproduction in plants.

TERM 2

Measurement

- List the fundamental quantities and their base SI units.
- Identify and correctly use instruments to measure the fundamental quantities.
- Helping our senses by using instruments.
 - To measure the area and volume of a regular and an irregular solid,
 - To determine the area of irregular surfaces using graph paper.
 - To measure mass and weight, differentiate between them.
 - To measure temperature and time.

Energy

- Recall that energy is the ability to do work.
- State the different forms of energy.
- Differentiate between energy forms and energy sources/resources.

- Investigate the energy conversions occurring in some devices.
- Use the terms kinetic energy and potential energy in describing energy transformations.
- Differentiate between renewable and non-renewable sources/resources of energy.
- Justify the need for alternative energy resources.
- Assess the advantages and disadvantages of using renewable and non-renewable sources of energy.
- Evaluate the importance of alternative energy solutions to Jamaica and the Caribbean.
- Investigate ways in which alternative energy sources are harnessed.

Cells

- Define the cell as the basic unit of structure and function of living organisms.
- Examine plant and animal cells using the light microscope.
- Draw and label diagrams of generalised plant and animal cells as seen under the light microscope.
- Relate selected cell structures/organelles to their specific functions (nucleus, cytoplasm, mitochondria, chloroplast, vacuole, cell wall and cell membrane)
- Compare the structure of typical plant and animal cells as seen under the light microscope.
- Differentiate between generalised plant and animal cells.
- Explain the structure and function of various specialised cells in animals: sperm, red blood cell, egg cell, nerve cell, white blood, ciliated epithelial cell.
- Explain the structure and function of various specialised cells in plants: palisade, root hair cell, xylem and phloem cell.

- Define cells, tissues, organs, organ systems and organisms and explain their hierarchical relationship.
- Describe the functions of selected basic tissues, organs and organ systems (e.g. blood as tissue – transports substances).
- Assess the impact of cell biology on society.

TERM 3

Sexual Reproduction in Humans

- Describe the human life cycle in terms of infancy, childhood, adolescence, maturity and ageing
- Distinguish between puberty and adolescence.
- Identify the changes in males and females during puberty.
- Identify the hormones that initiate puberty in males and females.
- Relate the structure of the main parts of male and female reproductive systems to their function.
- Relate the structure of the male and female sex cells (gametes) to their function.
- Explain the process of sexual reproduction in humans
 - **Formation of zygote**
 - **Development of foetus**
- Describe the main changes that occur during the menstrual cycle.
- Explain the importance of personal hygiene.

STDs, irresponsible living and drugs

- Explain the importance of responsible sexual behaviour.
- State the risks associated with irresponsible sexual behaviour.
- Defining sexually transmitted infection (STI).
- Explain the effects of common sexually transmitted diseases.
- State the symptoms and treatment of selected STIs.

- List the different types of contraceptive methods used to prevent pregnancy.
- State how different contraceptive methods work in males and females.
- Interpreting data on STIs Distinguishing drug use, abuse and misuse.
- State the dangers of commonly abused drugs.
- Defining drug addiction.
- State the effects of drugs on the human body and society.

10. Guidelines/Suggestions for Teaching Methods and Student Learning

Activities:

- Lectures: Provide contextual background and detailed analysis of each topic.
- Group Discussions: Facilitate discussions on fundamental concepts in physical, life, and earth sciences.
- Document Analysis: Students analyze graphs, statistical data and images related to the course topics.
- Research Projects: Assign research on the application of science and technology and cell biology.
- Video presentations: Students watch videos relevant to the course topics.
- Differentiated Instruction: Tailoring instruction to meet the needs, strengths, and interests of each student.
- Lecture-Demonstration: Combining lectures with demonstrations to enhance understanding through verbal and visual learning
- Peer Teaching: Students teach their peers, which can reinforce their own learning and enhance their understanding.
- Socratic Method: Teaching by asking thought-provoking questions to challenge assumptions and encourage critical thinking.
- Laboratory Work: Provide hands-on experiments and lab activities to reinforce theoretical knowledge.
- Collaborative Projects: Encourage teamwork through group assignments and presentations.
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11. Guidelines/Suggestions for Methods of Student Evaluation:

- Quizzes and Tests: Regular assessments to check understanding of key concepts.
- Classwork: Assignments completed during class that help monitor ongoing student progress and understanding.
- Homework Assignments: Tasks assigned for completion outside of class, reinforcing concepts taught and promoting independent study.
- Class Participation: Assessment based on engagement in discussions and activities.
- Presentations: Students present their research findings to the class.
- Final Exam: A comprehensive exam covering all course material.
- Group Projects: Team assignments that assess collaborative and interpersonal skills along with individual contributions.
- Peer Reviews: A process where students evaluate each other's work, providing feedback and gaining insights from peers.
- Reflections: Written insights by students on their learning experiences, often discussing what they learned and areas for improvement.
- Self-Grading: Allowing students to evaluate their own work, fostering self-reflection and critical thinking about their performance.
- Online Quizzes and Exams: Digital tests that make use of technology to assess students' understanding in a more flexible or remote setting.
- Lab Reports: Evaluate students' ability to document and analyze experimental findings.
- Research Projects: Assign individual or group projects that require in-depth exploration of a scientific topic.

12. Suggested Readings, Texts, Objects of Study:

Mitchelmore, J. (2018). *Investigating Science for Jamaica: Integrated Science Grade 7*. London, UK: Oxford University Press.

Supplementary Materials: Articles and videos related to course topics.

13. Additional Readings:

Science Explorer: Physical Science by Prentice Hall

Online Resources: Websites like NASA for Students, National Geographic Kids, and BBC Bitesize for interactive learning.

BBC Bitesize <https://www.bbc.co.uk/bitesize/subjects/zyxyvwx>

14. Bibliography of Supportive Texts and Other Materials:

Mitchelmore, J. (2018). Investigating Science for Jamaica: Integrated Science Grade 7. London, UK: Oxford University Press.

Chinnery, L., Glasgow, J., Jones, M., & Jones, G. (2004). CXC Biology. London, UK: Cambridge University Press.

National Standards Curriculum: Integrated Science: Grade 7; Terms 1-3; Version 5; January 2017

15. Important Dates

Term 1

Midterm

October 17-21, 2024

1st sixth-week test-

TBA

2nd sixth-week test-

TBA

Term ends:

December 19, 2024

Term 2

Midterm

March 5 - 7, 2025

3rd sixth-week test-

TBA

4th sixth-week test-

TBA

Term ends:

April 30, 2025

Term 3

Midterm

May 21-23, 2025

5th sixth-week test-

TBA

Term ends:

July 04, 2025

Prepared by: Mrs. Jodi-Ann Gordon

<mailto:jgordon@immaculatehigh.edu.jm>

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