سلطنة عمان
وزارة التربية والتعليم
المديرية العامة للمدارس الخاصة
دائرة برامج ومناهج المدارس الخاصة

Syllabus	الإطار المنهجي
Science	مادة العلوم
Bilingual Program	برنامج ثنائي اللغة
Grades: 7-8	الصفوف: ٧–٨
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Contents

Introduction

Science plays a major role in the evolution of knowledge. It empowers us to use creative and independent approaches to problem solving. It arouses our natural curiosity and enables us to meet diverse and ever-expanding challenges. It enhances our ability to inquire, seek answers, research, and interpret data. These skills lead to the construction of theories and laws that help us to explain natural phenomena and exercise control over our environment. Science is, thus, an integral component of a balanced education.

This syllabus focuses on the content essential for preparing students to be engaged and productive citizens. A good foundation in the sciences will help citizens to respond to the challenges of a rapidly changing world using the scientific approach. It addresses, in addition to a specific knowledge base, the development of related skills and attitudes. Critical thinking, enquiry and reasoning are emphasized to ensure that students develop the ability to work creatively, think analytically and solve problems. The syllabus also ensure that students become aware of their moral, social, and ethical responsibilities, as well as the benefits intrinsic to the practical application of scientific knowledge to careers in the scientific field. Teaching these standards requires teaching methods that are varied and experiential. Effective lessons will concert and incorporate with: Practical work and the science standards, the place of information and communications technology in the science standards, teaching about science, technology and society, the mathematical requirements of the science standards**.**

The overall aims of science standards are that students should:

1. develop and sustain an interest in science and its applications.
2. have a sound and systematic knowledge of important scientific facts, concepts, and principles, and possess the skills needed to apply these in new and changing situations in a range of personal, domestic, industrial, and environmental contexts.
3. recognize the importance of the application of scientific knowledge in the modern world and be aware of the moral, ethical, social, and environmental implications.
4. develop relevant attitudes, such as a concern for accuracy and precision, objectivity, integrity, enquiry, initiative, and inventiveness.
5. develop an understanding of the scientific skills essential for both further study and everyday life.
6. plan, design and perform experiments to test theories and hypotheses.
7. be proficient in the use of a range of scientific methods and techniques and in handling apparatus.
8. develop the ability to work independently and collaboratively with others when necessary.
9. integrate Information and Communication Technology (ICT) tools and skills**.**

Important Skills

- **Scientific enquiry skills:** Scientific enquiry, which ensures the development of scientific skills, intellectual and practical, should be integrated in the learning of the scientific content across all the science branches. Scientific enquiry skills include the following:

1. carry out the practical experiments to develop the practical skills which will be mentioned in detail below.
2. find secondary information sources such as the resources available in the public libraries and on the Internet and use these after validation and making sure of the suitability of the subject.
3. apply Scientific knowledge and procedures to the situations of the reality Life.
4. recognizes the importance of cooperative teamwork, put work plans, distributes responsibilities, and regulates and sets specific targets for work.

- **Know how scientists are working:**

1. realize that with science we can bring great benefits to humanity also if it is abused can cause serious damage to the environment.
2. know how scientists are carrying out their work, such as environmental monitoring and control of industrial processes.
3. know how scientists publish and present their ideas and results to encourage debate and development.
4. know that science could lead to the emergence of ethical considerations and discuss them.
5. know that there are many questions and considerations that cannot be answered by science.
6. trace the historical development of some key scientific models and knows what contributions Scientists presented in this development.

- **Processing and delivery of information**

1. present qualitative and quantitative data using a variety of methods, such as descriptive texts, graphics, images, tables, and maps with the use of technology methods and computer when it is appropriate, then analyse and explain this date to extract conclusions from them.
2. use mathematical relationships routinely to calculate the quantities.
3. do calculations based on data taken from the graphs and distinguishes between Independent and dependent variables.
4. handle data and writes reports about the results.
5. use symbolic equations to represent chemical reactions and simple physical relationships.
6. use the appropriate methods to deliver scientific information.

- **ICT application:**

This syllabus provides students with a wide range of opportunities to use ICT in their study of science in order to play a full part in modern society, students need to be confident and effective users of ICT. Opportunities for ICT include:

1. gathering information from the internet, DVDs and CD-ROMs.
2. using spreadsheets and other software to process data.
3. using animations and simulations to visualize scientific ideas.
4. using software to present ideas and information on paper and on screen.

Skills and abilities to be assessed:

The skills students are expected to develop on completion of this syllabus, have been grouped under three main headings:

1. knowledge and understanding.
2. application of knowledge and understanding, analysis and evaluation of information.
3. scientific enquiry skills and procedures.

1. Knowledge and understanding

Assessment Objectives	Skills: The ability to
Knowledge	• identify, remember, and grasp the meaning of basic facts, concepts, and principles.
Understanding	• select appropriate ideas, match, compare and cite examples of facts, concepts, and principles in familiar situations. • explain familiar phenomena in terms of theories, models, laws, and principles.

Questions testing these skills will often begin with one of the following words: define, state, describe, explain.

2. Application of knowledge and understanding, analysis and evaluation of information

Assessment Objectives	Skills: The ability to
Application	• use facts, concepts, principles, and procedures in unfamiliar situations. • transform data accurately and appropriately • use common characteristics as a basis for classification • use information to identify patterns, report trends and draw inferences. • use formulae accurately
Analysis and Interpretation	• identify and recognize the component parts of a whole and interpret the relationships between those parts. • identify causal factors and show how they interact with each other. • infer, predict, and draw conclusions. • make necessary and accurate calculations and recognize the limitations and assumptions of data. • present reasoned explanations for phenomena, patterns, and relationships
Synthesis	• combine component parts to form a new meaningful whole. • make predictions and solve problems. • locate, select, organize, and present information from a variety of sources.
Evaluation	• make reasoned judgments and recommendations based on the value of ideas and information and their implications.

Questions testing these skills will often begin with one of the following words: predict, suggest, calculate, or determine.

3. Scientific enquiry skills and investigations.

Assessment Objectives	Skills: The ability to
Planning and designing a practical procedure	• identify problems, make predictions, and design a practical procedure to answer a question, solve a problem or test a hypothesis. • select and use suitable apparatus for carrying out experiments accurately and safely. • consider possible sources of errors and danger in the design of an experiment. • evaluating experimental procedures and identifying weaknesses and develop realistic strategies for improvement • work in a way that is committed to ethical and moral standards such as honesty and authenticity of his results and writing of the used references.
Control	• use experimental controls where appropriate. • appreciate that, unless certain variables are controlled, experimental results may not be valid • recognize the need to choose appropriate sample sizes, and study control groups where necessary.
Risk assessment	• identify possible hazards in practical situations, the risks associated with these hazards, and methods of minimizing the risks.
Manipulation and measurement	• follow a detailed set or sequence of instructions. • make measurements with due regard for precision and accuracy. • handle chemicals and living organisms with care. • cut, stain and mount sections and make temporary mounts. • set up light microscope for optimum use both under low power and high power. • use the stage micrometer and eyepiece graticule for accurate measuring. • assemble and use simple apparatus and measuring instruments.
Observation, recording and reporting	• select observations relevant to the activity. • make accurate observations and minimise experimental errors • record observations, measurements, methods, and techniques with due regard for precision, accuracy, and units. • record and report unexpected results. • select and use appropriate models of recording data or observations, for example, graphs, tables, diagrams, and drawings.

Assessment Objectives	Skills: The ability to
	• organize and present information, ideas, descriptions, and arguments clearly and logically in a complete report, using spelling, punctuation, grammar, and scientific terminology with an acceptable degree of accuracy.
Analyzing and interpreting data	• appreciate when it is appropriate to calculate a mean, calculate a mean from a set of at least three results and recognize when it is appropriate to ignore anomalous results in calculating a mean. • recognize patterns in data, form hypotheses and deduce relationships. • use and interpret tabular and graphical representations of data. • evaluate data, considering its repeatability, reproducibility, and validity in presenting and justifying conclusions.
Making conclusions	• draw conclusions that are consistent with the evidence obtained and support them with scientific explanations
Drawing	• make clear, accurate line representations of specimens, with no shading or unnecessary details, and with clean continuous lines. • label drawings accurately and use label lines which do not cross each other or carry arrowheads or dots • make drawings which are large enough to display specific details • calculate the magnification of the drawings.

Science Syllabus

The study of science subject leads to an understanding and appreciation of the concept of life at all levels and, hence, to a greater respect and reverence for life. Students should recognize the enormous responsibility they must undertake to ensure the continuity of life in all its forms. It is incumbent on them to use this knowledge to protect, sustain, conserve, and improve the variety of life in the ecosphere. Additionally, the study of science prepares students for careers in biological, chemical, physical, agricultural, environmental, medical, paramedical and applied science.

Aims: Science syllabus enables students to:

1. acquire a body of knowledge and develop an understanding of scientific concepts and principles.
2. develop the ability to apply scientific knowledge and skills essential for both further studies as well as in everyday life situations.
3. recognize the dynamic nature of the interrelationships between organisms and their environment.
4. develop a natural curiosity about living organisms and a respect for all living things and the environment.
5. understand how new information results in reformulation or rejection of earlier models and concepts.
6. recognize the scope of Biology from the molecular level to that of entire ecosystems.
7. Understand how new hypothesis, themes, and scientific concepts in physics.
8. Recognize the new concepts and methods in chemistry part.
9. develop an ability to communicate scientific information in a variety of acceptable ways.
10. acquire an understanding of the scientific method and be able to apply it to solving problems, both in academic and non-academic settings.
11. appreciate the impact of scientific knowledge on society and its relevance to ethical, economic, environmental, and technological issues.
12. acquire training in the practical skills and thought processes associated with the study of science.
13. Most of the learning outcomes for grades 7 and 8 are in the textbooks of the same grade in the series, but there are some outcomes to be found and covered in grade 9 textbook of the same series.
14. Teachers have to achieve the learning outcomes of scientific enquiry and must not skip or neglect them.

Scientific Enquiry Outcomes:

Scientific Enquiry (grades 7 & 8)	
Topic	**Learning outcomes**
Question, Ideas and Evidence	• Recognize scientific questions. • Understand the importance of questions, evidence, and explanations. • Describe how explanations are developed. • Try to answer questions by collecting evidence through observation. • Be able to develop a scientific question that can be investigated. • Explain why some explanations are accepted and others are not • Understand that explanations change as new observations are made. • Understand how scientists worked in the past and how they work now.
Plan Investigative Work	• Understand that scientists make predictions and check whether their evidence matches these predictions • Understand how to plan an investigation to test an idea in science. • Recognize that there are lots of ways to find out the answers to questions in science. • Make predictions. • Decide what to do to try to answer a science question. • Work out which variables must be changed, controlled, and measured. • Explain what is meant by continuous variables.
Obtain and Present Evidence	• Explore and observe to collect evidence and measurements. • Use tools and equipment and technology laboratory in appropriate, safe and accurate manner when implementing the scientific surveys. • Describe how to present results in tables • Describe how to draw line graphs. • Record stages in work. • Talk about risks and how to avoid them.
Consider Evidence and Approach	• Make comparisons between their results and others results. • Compare what happened with predictions. • Review and explain what happened. • Model and communicate ideas in order to share, explain and develop.

Grade 7: Biology	
Topic	**Learning Outcomes**
Plants and Humans as Organisms	
Plant Organs	• Recognize plant parts. • Describe the function of each part of a plant.
Human Organ Systems	• List the names of the human organ systems. • Identifying different organs in our organ systems.
The Human Skeleton	• Describe the role of a skeleton in terms of support and protection. • State that a skeleton holds your body together in the right shape. • Identify some delicate organs, their location in the human body and bones that are protect them. <u>Movement:</u> • Define *joint* as two bones meet. • Explain two main kinds of joints and their importance in relation to movement. explain why joints are needed.
Muscles and Movement	• Explain how the muscle movements control the movements of bones, joints, and ligaments. • Describe the different types of muscles. • Explain what is meant by voluntary and involuntary muscles and their actions.
Studying the Human Body	• Understand the necessity of studying the human body. • Describe the use of specific equipment and technology to study the human body. • Identify the main parts of a microscope. • Find the size of microscopic specimen. (Simple calculation).
Cells and Organisms	
Characteristics of Living Organisms	• Identify the seven characteristics of living things. • Recognize these characteristics in familiar and unfamiliar organisms.
Plant and Animal cells	• Compare plant and animal cells. • Identify different cell organelles and their specific functions.
Specialized Cells	• Identify the different types of specialized cells such as red blood cells, muscle cells, nerve cells, leaf cells, root hair cells, and xylem and phloem cells. • Relate the structure of cells to their functions.
Cells, Tissues and Organs	• Define tissue as the collection of similar cells that work together. • Describe how different tissues form an organ. • Describe how different organs form an organ system.
Micro- organism	• Understand the necessity of microorganisms in human welfare. • Describe the harmful and useful microbes and their applications. • Describe the role of microbes in food decay. • Recognize the process of fermentation and its uses. • Understand what is meant by an ‘infectious disease. • Give some examples of diseases caused by micro-organisms. • Suggest how to avoid infections.

Grade 7: Biology	
Topic	**Learning Outcomes**
Plants and Humans as Organisms	
Living Things in their Environment	
Habitats and Adaptation	• Define the terms habitat and ecosystem. • Explain the terms adaptation and survival of the fittest. • Describe the different types of adaptations in plants and animals found in different environments.
Food Chains	• Define the term food chain. • Draw and model simple food chains. • Explain how energy is transferred through the various trophic levels of a food chain. • Explain the terms producer, consumer and decomposer, and their role in the ecosystem. • Explain the terms herbivores, carnivores and omnivores with examples.
Pollution	• Describe the human activities that harm the food chain and Ecosystem. • Explain the cause and effects of pollution to the environment. • Describe the different types of pollution. • Explain how pollution is depleting the ozone layer
Variation and Classification	
Species	• Define term species • Describe the binomial system of naming.
Variation	• Define the term Variation and how it helps in the formation of new species. • Explain variation within a species in terms of the development of special features within the species that help an organism to survive. • Describe continuous and discontinuous variation with examples. • Describe the term mutation. • Identify and analyze the data pertaining to variations within the same species.
Classifying Plants	• State the necessity of classification of the plant kingdom. • Classify plants as spore-bearing and seed-bearing with characteristics and examples.
Classifying Animals	• State the necessity of classifying animals. • Classification of vertebrates and invertebrates with their special features. • Describe the rules of classification. • Describe the binomial system of nomenclature.

Grade 7: Physics	
Topic	**Learning Outcomes**
Forces and Motion	
• Introduction to Forces	• Describe different types of forces. • Understand the effects of forces on moving objects. • Describe how to measure forces.
• Balanced Force	• Explain the difference between balanced and unbalanced forces. • Describe the effect of balanced forces. • Describe the effect of unbalanced forces.
• Friction	• Describe the effect of friction on moving objects. • Understand how to reduce friction. • Describe how friction can be useful.
• Gravity	• Explain the link between gravity, mass, and weight. • Describe how your weight can be different on different planets.
• Air Resistance	• Explain what affects air resistance. • Describe what is meant by terminal velocity.
• Tension and up thrust	• Describe what happens when you stretch a spring. • Explain what is meant by tension. • Explain the elastic limit. • Explain why things float or sink.
Forces in Action *(some outcomes are from Cource Book 9)*	
Pressure	• Explain the difference between weight and pressure. • Calculate the pressure. • Apply ideas of pressure to a range of situations.
Pressure in Gases and Liquids	• Explain what is meant by liquid pressure. • Describe what determines the pressure in a liquid. • Explain how hydraulic machines work. • Describe some uses of hydraulic machines. • Explain what is meant by gas pressure. • Explain the link between pressure and volume.
Density	• Explain what is meant by density. • Describe how to measure the density of solids, liquids, and gases. • Explain why solids are denser than liquids or gases. • Explain why objects float or sink.
The Earth and Beyond	
The Night Sky	• Know the types of objects that can be seen in the night sky. • Understand how we see different types of objects.
Day and Night	• Explain why the Sun appears to move across the sky. • Explain why we have day and night.
Seasons	• Describe the how the height of the Sun in the sky changes over the year.

	• Explain why there are seasons in different parts of the world.
Stars	• Explain why the stars appear to move in circles during the night. • Describe how the night sky changes over the year.
The Solar System	• Describe the planets in our Solar System. • Know the order of the planets, and where the asteroid belt is.
The Moon	• Describe the phases of the Moon. • Explain why we see phases of the Moon and eclipses.
Energy	
Introduction to Energy	• Describe where we get our energy from. • Know the unit of energy. • Understand why the energy in food comes from the Sun. • Describe some methods of generating electricity using the sun's energy.
Energy Type	• Name the different types of energy. • Give examples of processes that involve the different types of energy.
Energy Transfer	• Understand how energy transfers are shown in diagrams. • Construct energy transfer diagrams.
Conservation of Energy	• State the law of conservation of energy. • Explain how the law applies to different situations.
Gravitational Potential Energy and Kinetic Energy	• Explain what is meant by gravitational potential energy. • Explain what is meant by kinetic energy. • Describe situations which involve gravitational potential energy and kinetic energy. • Explain how the store of elastic potential energy can change. • Describe situations where the store of elastic potential energy increases or decreases.
Thermal Energy & Energy Resources *(Some outcomes are from Course Book 9)*	
Introduction to Thermal Energy	• Explain the difference between temperature and thermal energy. • Describe what happens to particles in solids, liquids, and gases when you heat them.
Thermal Energy Transfer	• State the names of some conductors and insulators. • Explain why some materials feel warmer than others. • Describe what happens in convection. • Explain how convection currents are formed. • Recognize some sources of infrared radiation and the similarities between light and infrared. • Describe how infrared is transmitted, absorbed, and reflected. • Explain what is meant by the greenhouse effect.
Energy in The World	• Explain the difference between primary and secondary energy sources. • Describe how the world's energy needs have changed and are likely to change in the future.
Fossil Fuels	• Describe how fossil fuels were formed. • Explain how a fossil fuel fired power station works.

Renewable and Non-renewables Energy Resources	• Describe how the energy from the sun can be used. • Explain how energy from the Earth can be used to generate electricity. • Describe how wind, waves, tides, and water behind dams can be used to generate electricity. • Describe some of the issues in providing energy for the future.
The Earth	
The Structure of The Earth	• Describe a model for the structure of the Earth. • Explain how we know about the Earth's structure.
Rocks	• Observe and classify different types of rocks and soils. • State properties of igneous, sedimentary and metamorphic rock and how each different type of rock is formed. • Relate properties of each type of rock to its formation.
Soil	• Observe and classify different types and soils. • List soil components • Name soil types. • Describe soil properties.
Fossil	• State what a fossil is. • Describe how fossils form. • Give examples showing what we can learn from the fossil record. • Describe how scientists have estimated the age of the Earth.

Grade7: Chemistry	
Topic	**Learning Outcomes**
States of Matter	
Particle Theory	• State the three states of water: solid (ice), liquid (water) and gas (steam). • Use ideas about particles to explain the behavior of substances in the solid, liquid, and gas states.
Changing of State	• Name the changes of state involving solids, liquids and gases. • Observe the changes of water in different states of matter (with reference to boiling point, melting point and freezing point). • Explain changes of state using ideas about particles. • Describe how melting points help identify substances. • State the difference between evaporation and boiling in terms of temperature.
Materials Properties	
Everyday Materials and their Properties	• Describe everyday materials and their physical properties. • Explain what an element is. • Identify metals and non-metals from the periodic table.
Metals and Non-metals	• Identify typical metal properties • Link the properties of two metals to their uses. • Identify typical non-metal properties. • Link the properties of non-metals to their uses.
Material Changes	
Acids and Alkalis	• Give examples of acids and alkalis • Compare the properties of acids and alkalis
The pH Scale and Indicator	• Explain the use of the pH scale. • Use indicators to distinguish acid and alkaline solutions. • Know the pH of acidic, alkaline, and neutral solutions. • Use indicators to measure pH. • Understand concentrated and dilute acids /alkali.
Neutralization	• Define neutralization. • State the word equation for neutralization. • Give examples of applications of neutralization.

Grade 8: Biology	
Topic	**Learning Outcomes**
Plants *(some outcomes are from Course Book 9)*	
Photosynthesis	• Describe the importance of plants to life in earth. • Describe the process of photosynthesis with word equation. • Explain the importance of (carbon dioxide, chlorophyll and sun light) for photosynthesis. • Investigate photosynthesis (oxygen bubbles correlated with light). • Explain Biomass and its uses.
Water and Minerals	• Describe how water and minerals are absorbed by roots and transported to leaves. • Explain the importance of water and minerals to plant growth.
Plant Reproduction *(some outcomes are from Course Book 9)*	
Investigation Flowers	• Identify the parts of a flower. • Describe the function of each part of a flower. • Recognize male and female parts of a flower.
Pollination	• Define pollination . • Identify different types of pollination. • Identify insect and wind pollinated flowers in relation to the types of pollination that they undergo. • Explain the importance of pollination in flowering plants.
Fertilization	• Define the terms zygote, gametes and fertilization. • Describe the formation of a pollen tube and the process of fertilization.
Fruits and Seeds	• Describe the process of seed formation and a fruit's development. • Explain seed dispersal and its importance in the survival of a species. • Types of fruits: dry and succulent fruits.
Food and Digestion	
Nutrient and Balanced Diet	• List the nutrients in food • Explain why each nutrient is needed • Describe what a balanced diet is • Recall some of the main roles of specific vitamins and minerals. • Explain some deficiency diseases, such as scurvy, obesity, anemia and rickets with their causes.
Human Digestive System	• Describe the human digestive system and its major organs that are involved in the digestion of food. • Identify different types of enzymes and their role in digestion in the various organs of the alimentary canal. • Explain the process of absorption and assimilation of food in our body.
Teeth	• Identify the different types of teeth. • Describe the structure and function of human teeth • Explain the importance of oral hygiene and preventing tooth and gum decay.

Grade 8: Biology	
Topic	**Learning Outcomes**
The Circulatory System	
Human Circulatory System	• List the components of the circulatory system. • Describe the function of each component. • Describe the structure and function of the heart as a pump organ. • Explain how the blood circulates throughout our body. • Explain the necessity of blood supplying nutrients and oxygen to the body tissues.
Blood	• List the components of blood. • Describe the function of each component. • Describe the function and structure of veins and arteries.
Reproduction and Development	
Reproduction	• Describe in brief the human reproductive organs and their functions (for male & female). • Identify female and male gametes. • Describe what happens during fertilization.
Fetal Development	• Describe fetal development.
Growth and Development	• Identify the main stages of person's development. • Describe the changes from zygote to adult in terms of growth and development. • Explain how growth involves the cell division and increasing in body size.
Adolescence	• Recognize the changes caused by puberty. • Explain why girls have periods.
Lifestyle and Health	• Explain how our lifestyle determines our health. • Explain the sedentary lifestyle and health-related problems. • Identify the various lifestyle disorders. • Identify how to create awareness about negative effects of drugs.
Respiration	
Human Respiratory System	• Understand the organs and their job to form respiratory system. • Explain the structure of lungs. • Explain the difference between breathing and respiration. • Explain the process of respiration (word equation). • Explain aerobic and anaerobic respiration using the word equations. • Investigate an aerobic respiration of yeast.
Smoking and Health	• Describe the effects of smoking. • Name some harmful substances in cigarette smoke. • Recognize how to create awareness about negative effects of smoking.

Grade 8: Biology	
Topic	**Learning Outcomes**
Keeping Fit	• Explain the relationship between exercise and fitness in terms of energy for muscles, this include: - Exercise and respiration - Exercise and the action of the heart. • Explain the relationship between diet and fitness, this includes: - Obesity, blocked tubes and heart attack and strokes • Investigate pulse rate and heart beat (data analysis).

Grade 8: Physics	
Topic	**Learning Outcomes**
Force and Motion	
Speed	• Calculate the speed of an object. • Explain what is meant by average speed.
Distance Time Graph	• Describe how a distance–time graph tells a story.
Acceleration and Speed – Time graph	• Describe how to calculate acceleration. • Explain what is meant by deceleration. • Explain how speed-time graphs tell a story.
Sound	
Properties of Sound Waves	• Describe how sound waves are produced. • Explain how sound waves travel. • Describe how to measure sound intensity or loudness. • Describe some of the risks of loud sounds and how to reduce the risks. • State the properties of waves. • Explain what affects the loudness of a sound. • Interpret waveforms shown on an oscilloscope. • Describe the link between pitch and frequency. • State the range of hearing in humans. • Describe differences between the range of hearing in humans and in animals. • Explain why musical instruments are distinct.
Speed of Sound	• Make calculations involving the speed of sound.
Detecting Sounds	• Describe how the ear detects sound. • Explain how your hearing can be damaged. • Describe how a microphone works.
Echoes	• Describe how echoes are formed. • Explain how echoes can be used.

Grade 8: Physics	
Topic	**Learning Outcomes**
Light	
Light	• Describe what light is. • Explain how shadows form. • Describe how a camera works.
Seeing Things	• Describe what happens when light travels from a source. • Explain how we see things.
The Speed of Light	• Describe how fast light travels. • Explain how astronomers use the speed of light to describe distances.
Reflection	• Describe how an image in a plane mirror is formed. • Describe the differences between you and your image. • Explain why you see your image only in certain situations. • State the law of reflection. • Use the law of reflection. • Describe how to make accurate measurements.
Refraction	• Explain what we see when light is refracted. • Explain why light is refracted. • Use scientific knowledge to explain predictions. • Describe what happens when light goes through a glass block. • Explain total internal reflection.
Dispersion	• Explain how a spectrum of light is produced • Explain why we see rainbows. • Explain what happens when you mix light of different colors together. • Explain how filters work. • Explain why colored objects look colored in white light. • Explain why colored objects look different colors in different colors of light. • Describe how to present conclusions in appropriate ways.
Electricity *(some outcomes are from Course Book 9)*	
Electrostatic	• Stat the types of charge. • Explain why things become charged. • Explain the difference between conductors and insulators. • Describe how electrostatics can be dangerous. • Describe how touchscreens and digital cameras work.
Electric Circuits	• Describe how to draw components in circuit's diagrams. • Explain how to test whether something conducts electricity.

Grade 8: Physics	
Topic	**Learning Outcomes**
	• Describe what is meant by a series circuit. • Describe the differences between series and parallel circuits.
Electric Current and Voltage	• Describe what an electric current is and how we measure it. • Describe what is meant by voltage.
Magnetism	
Properties of Magnets	• Describe the properties of magnets. • Know what magnetic materials are. • Know what a magnetic field is. • Explain why compasses point north. • Describe how you can find the shape of a magnetic field around a bar magnet.
Electromagnets	• Describe how to make an electromagnet. • Describe how to change the strength of an electromagnet.
Using of Electromagnets	• Describe some uses of electromagnets. • Explain why electromagnets are used instead of permanent magnets.

Grade 8: Chemistry	
Elements and Compounds	
Topic	**Learning Outcomes**
Elements	• Explain what is meant by an element. • State the chemical symbols of the first twenty elements of the periodic table. • Explain why scientists use chemical symbols for elements.
Compounds	• Differentiate between an atom and a molecule. • Distinguish between element and compound. • Give examples of compounds and state how their properties are different from the properties of their elements.
Naming Compound and Writing Formula	• Name organic compounds. • Write and interpret formulae.
Mixtures	• Understand the differences between elements, mixtures, and compounds. • State the properties of mixtures. • Discuss how evaporation and distillation separate liquids and solids from solutions. • Describe the physical properties of solutions. • Explain what is meant by solubility. • Describe how to separate elements from some compounds. • Demonstrate how chromatography separates a mixture. • Give examples of uses of chromatography.

Grade 8: Chemistry	
Material Properties *(some outcomes are from Course Book 9)*	
Atomic Structure	• Name the three sub-atomic particles and describe their properties. • Describe the structure of an atom.
The Periodic Table	• Draw the structures of atoms of the first twenty elements • Describe patterns in the structures of these atoms • Recognize Groups and Periods in the periodic table.
Trends in Group 1,2 & 7	• Describe trends in periods of the periodic table. • Describe trends in properties of the Group 1 elements. • Describe trends in the properties of the Group 2 elements. • Describe trends in the properties of Group 7 elements.
Chemical Reactions	
Chemical Reactions	• Know what chemical reactions are. • Recognize different types of chemical reactions.
Writing Word Equations	• Write word equations to represent chemical reactions.
Corrosion Reactions	• Explain what corrosion is. • Understand the steps to prevent iron corroding.
Energy Changes	• Explain the difference between exothermic and endothermic reactions. • Recognize typical examples of energy changes in reactions as in combustion, respiration.

توزيع محتوى السلاسل التعليمية الأساسية على الفصلين الدراسيين

The Yearly Scheme of Work

- **Complete Science for Cambridge Secondary1: Oxford University Press**

Grade 7		
Semester	**Chapters**	**Main Resource**
Semester 1	Unit1: Plants Unit 2: Humans Unit 3: Cells and organisms Unit 4: Living things in the environment Unit5: Variation and classification	"Complete Biology for Cambridge Secondary 1"
	Unit 1: Forces Unit 8: Forces Unit 3: The earth and beyond	" Complete Physics for Cambridge Secondary 1"
Semester 2	Unit 2: Energy Unit 10: Energy	
	Unit1: States of matter Unit 2: Material properties Unit 3: Material changes Unit 4: The earth	" Complete Chemistry for Cambridge Secondary 1"

Grade 8		
Semester	**Chapters**	**Main Resource**
Semester 1	Unit 6: Plants Unit 13: Plants Unit 7: Diet Unit 8: Digestion Unit 9: Circulation Unit 10: Respiration and breathing Unit 11: Reproduction and fetal development Unit 12: Drugs and disease	"Complete Biology for Cambridge Secondary 1"
	Unit 4: Forces Unit 5: Sound Unit 6: Light	" Complete Physics for Cambridge Secondary 1"
Semester 2	Unit 9: Electricity Unit 7: Magnetism	
	Unit 6: Material properties Unit 8: Material properties Unit 7: Material changes	" Complete Chemistry for Cambridge Secondary 1"

- **Cambridge checkpoint Science: Hodder Education**

Grade 7		
Semester	**Chapters**	**Main Resource**
Semester 1	Chapter 1: Plants Chapter 2: Major organ system Chapter 3: Cells Chapter 4: Microorganism Chapter 5: Living things in their environment Chapter 6: People and the plant Chapter 7: Classification and variation	" Cambridge Checkpoint Science 1"
	Chapter 13: Measurements Chapter 14: Forces and motion Chapter 17: The earth and beyond	" Cambridge Checkpoint Science 1"
	Chapter 13: Density Chapter 14: Pressure	" Cambridge Checkpoint Science 3"
Semester 2	Chapter 15: Energy	" Cambridge Checkpoint Science 1"
	Chapter 18: Heat energy transfers	" Cambridge Checkpoint Science 3"
	Chapter 8: The states of matter Chapter 9: Properties of matter and materials Chapter 10: Acids and alkalis Chapter 11: Rocks and soil Chapter 12: Finding the age of the earth	" Cambridge Checkpoint Science 1"

Grade 8		
Semester	**Chapters**	**Main Resource**
Semester 1	Chapter 1: How Plants Grow	Cambridge Checkpoint Science 2"
	Chapter 1: Photosynthesis Chapter 2: Reproductive in Flowering Plants	Cambridge Checkpoint Science 3"
	Chapter 2: The Healthy Diet Chapter 3: Digestion Chapter 4: The Circulatory System Chapter 5: The Respiration System Chapter 6: Reproduction in Humans Chapter 7: Diet, Drugs and Disease	Cambridge Checkpoint Science 2"
	Chapter 13: Speed Chapter 14: Sound Chapter 15: Light	" Cambridge Checkpoint Science 2"
Semester 2	Chapter 16: Electrostatics Chapter 17: Electricity	" Cambridge Checkpoint Science 3"
	Chapter 16: Magnetism	"Cambridge Checkpoint Science 2" " Cambridge Checkpoint Science 2"
	Chapter 9: Elements and Atoms Chapter 10: Elements, Compounds and Mixtures Chapter 11: Metals and Non- Metals Chapter 12: Chemistry in Everyday Life	
	Chapter 7: The Structure of Atom Chapter 8: The Periodic Table	" Cambridge Checkpoint Science 3"

- **Cambridge Checkpoint Science: Cambridge University Press**

Grade 7		
Semester	**Chapters**	**Main Resource**
Semester 1	Unit1: Plants and Humans as Organisms Unit 2: Cells and organisms Unit 3: Living things in their environment Unit4: Variation and classification Unit 9: Forces and motion Unit 11: The earth and beyond	" Cambridge Checkpoint Science 7
	Unit 9: Forces in Action	" Cambridge Checkpoint Science 9
Semester 2	Unit 10: Energy	" Cambridge Checkpoint Science 7
	Unit 11: Energy	" Cambridge Checkpoint Science 9
	Unit 5: States of Matter Unit 6: Material Properties Unit 7: Material Changes Unit 8: The Earth	" Cambridge Checkpoint Science 7

Grade 8		
Semester	**Chapters**	**Main Resource**
Semester 1	Unit 1: Plants	" Cambridge Checkpoint Science 8
	Unit 1: Plants	" Cambridge Checkpoint Science 9
	Unit 2: Food and Digestion Unit 3: The Circulatory System Unit 4: Respiration Unit 5: Reproduction and Development	" Cambridge Checkpoint Science 8
	Unit 10: Measuring Motion Unit 11: Sound Unit 12: Light	" Cambridge Checkpoint Science 8
Semester 2	Unit 10: Electricity	" Cambridge Checkpoint Science 9
	Unit 13: Magnetism	" Cambridge Checkpoint Science 8
	Unit 7: Elements and Compound Unit 8: Mixtures Unit 7: Material Changes	" Cambridge Checkpoint Science 8
	Unit 4: Materials Properties	" Cambridge Checkpoint Science 9

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End of Biology Syllabus