

Science (S1-3) Curriculum

Scientific Practice

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
<p style="text-align: center;">Scientific Knowledge</p>	<p><u>Science and technology create value and change human life (P3, P5 and P6)</u></p> <ul style="list-style-type: none"> • Be aware that some scientific discoveries have enhanced people’s understanding of the world (e.g. Newton’s research on forces and motion laid the foundation for people’s understanding of the universe and the movement of celestial bodies) • Be aware that scientific discoveries can foster technological development, and technological development can also drive scientific advancement • Recognise the balance between scientific and technological development and ethics • Be aware of the limitations of scientific knowledge <p><u>Innovation and technology development (P3 and P5)</u></p> <ul style="list-style-type: none"> • Recognise the evolution process of the design for some common products (e.g. telephone, television, automobile) • Be aware of the development of some innovative technologies (e.g. artificial intelligence, big data, the Internet of Things) and their applications in the society • Recognise the impact of the development of innovative technologies on human life
<p style="text-align: center;">Scientific Observation and data</p>	<p><u>Science inquiry processes (From P2 to P4)</u></p> <ul style="list-style-type: none"> • Be aware that science inquiry is derived from observation • Be aware that science is evidence-based • Recognise that scientific knowledge is derived from systematic observation, testing and analysis, through which imagination and creativity are required • Be aware that scientific knowledge is subject to change as new evidence becomes available (e.g. the change from “Flat Earth Theory” to “Round Earth Theory”)
<p style="text-align: center;">Laboratory Safety</p>	<p><u>Physical change and chemical change (P6)</u></p> <ul style="list-style-type: none"> • Be aware that combustion requires oxygen, and produces carbon dioxide and water • Recognise the necessary conditions for combustion, and the working principles of fire-fighting equipment (e.g. fire extinguishers, fire blankets, etc.)
<p style="text-align: center;">Scientific Inquiry</p>	<p><u>Science inquiry processes (P3 and P4)</u></p> <ul style="list-style-type: none"> • Be aware of science inquiry processes and steps • Be aware of the different types of science inquiry (e.g. classifying, pattern seeking, modeling) • Recognise the concept of fair testing

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Looking at Living Things

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
Grouping of living things	<p><u>Difference between living things and non-living things (P1 and P2)</u></p> <ul style="list-style-type: none"> • Be aware that both animals and plants are living things • Give examples of common animals and plants found in Hong Kong • List the survival conditions for animals and plants (e.g. air, water) • Describe some simple shared characteristics of animals (e.g. movement) • Be aware of the differences between living things and non-living things (e.g. living things can reproduce, grow and develop, and respond to stimuli, while non-living things cannot) <p><u>Structures of living things (P2 and P3)</u></p> <ul style="list-style-type: none"> • State the major structures in plants and their functions (leaves make food, roots absorb water and nutrients and anchor plants, stems support the plant and transport water, food and nutrients) • Using mammals as an example, be aware of the major structures in some animals, including bones, muscles, lungs, heart, and stomach, and their functions • Be aware of the major parts in flowers, including sepals, corolla, stamens and pistils, and their functions <p><u>Diversity and classification of living things (P3)</u></p> <ul style="list-style-type: none"> • Be aware that animals are classified into vertebrates and invertebrates • Describe the key characteristics of some animal groups (insects, fish, amphibians, reptiles, birds, mammals) • Classify animals according to their characteristics • Be aware that plants are classified into flowering plants and non-flowering plants
Life cycles	<p><u>Life cycle of living things (P3)</u></p> <ul style="list-style-type: none"> • Be aware that living things go through the life cycle of birth, growth, reproduction and death • Using frogs, butterflies, dogs and chickens as examples, recognize the changes in different animals at different stages of their life cycles • Identify the different stages of the life cycle of flowering plants (germination, growth, reproduction, seed dispersal)
Cells	<p><u>Cells and microscope (P6)</u></p> <ul style="list-style-type: none"> • Be aware that cells are the basic units of living things • Use a microscope to observe animal cells and plant cells • Identify the different parts of animal and plant cells, and compare the similarities and differences between animal and plant cells (plant cells have cell walls while animal cells do not, most plant cells have chloroplasts while most animal cells do not)

<p>Level of organisation of organisms</p>	<p><u>Human body systems (P5 and P6)</u></p> <ul style="list-style-type: none"> • Recognise the major parts of the human respiratory system (trachea, bronchi, lungs) and their functions • Recognise the major parts of the human nervous system (sensory organs, brain, spinal cord) and their functions • Recognise the major parts of the human digestive system (stomach, small intestine, large intestine) and their functions • Recognise the major parts of the human circulatory system (heart, blood vessels) and their functions
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Human Reproduction and Heredity

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
<p style="text-align: center;">Human reproduction</p>	<p><u>Human body systems (P5)</u></p> <ul style="list-style-type: none"> Recognise the major parts of the human reproductive system (male: testes, sperm ducts, urethra, penis; female: ovaries, oviducts, uterus, vagina) and their functions <p><u>Life cycle of living things (P1 and P5)</u></p> <ul style="list-style-type: none"> State the major physical changes during infancy, early childhood and childhood (e.g. increase in height and weight, loss of primary teeth and growth of permanent teeth) Describe the characteristics of different developmental stages in humans (infancy, childhood, adolescence, adulthood, and old age) Recognise the physiological and psychological changes in males and females during adolescence Recognise the factors that influence growth and development during adolescence (e.g. heredity, nutrition, sleep and exercise, etc.) Accept individual differences in growth and development during adolescence
<p style="text-align: center;">Heredity and variation</p>	<p><u>Heredity and reproduction (P3 and P4)</u></p> <ul style="list-style-type: none"> Recognise the reproductive processes of live-bearing and egg-laying animals Recognise the different ways living things increase the number of offspring and their chances of survival (e.g. plants produce a large number of seeds, mammals care for their young offspring) Be aware that offspring produced by reproduction of animals and plants have similar characteristics to their parents Identify characteristics that animals and plants inherited from their parents (e.g. skin colour, eye colour and shape of earlobe in humans; colour and number of petals) as well as those that are not inherited from their parents (e.g. hair length in humans) Be aware that some human characteristics are inherited (e.g. ability to roll the tongue and bend the thumb backward) and cannot be changed through learned behaviors

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Earth and Space

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
The Earth	<p><u>Daily weather phenomena (P3)</u></p> <ul style="list-style-type: none"> State the processes of water cycle (evaporation, condensation, precipitation) <p><u>Properties of matter (P5)</u></p> <ul style="list-style-type: none"> State the major components of air and the percentage of main gases in air <p><u>Earth's characteristics (P4)</u></p> <ul style="list-style-type: none"> State the structure of the Earth (crust, mantle, and core) and the physical characteristics of these distinct parts Be aware that the Earth's crust is composed of rocks, including igneous rocks, sedimentary rocks, metamorphic rocks
Earth's resources	<p><u>Earth's resources (P3)</u></p> <ul style="list-style-type: none"> Be aware of the sources of salt water and fresh water, and their uses in daily life Be aware that drinking water needs to be filtered and purified Give examples of Earth's resources that are renewable (e.g. water, wind, forests) and that are non-renewable (e.g. petroleum, natural gas, minerals) <p><u>Earth's history (P6)</u></p> <ul style="list-style-type: none"> Be aware of the formation processes of fossils and fossil fuels <p><u>Impact of human behavior on the natural environment (P2 and P5)</u></p> <ul style="list-style-type: none"> Recognise the impact of human behavior on the environment (e.g. causing air and water pollution) Give examples of how pollution affect the survival of animals and plants Show concern for safeguarding and improving the environment, and take action accordingly
Space exploration	<p><u>The Sun and the eight planets (P3 and P5)</u></p> <ul style="list-style-type: none"> Be aware that the solar system is mainly made up of the Sun and eight planets Be aware that the eight planets, including the Earth, revolve around the Sun Be aware that the Sun is the star in the solar system and emits light and heat energy to other celestial bodies Recognise the eight planets in the solar system and their basic characteristics (e.g. diameter, number of discovered natural satellites, periods of revolution and rotation) Recognise the overview of the universe and be aware that the Milky Way is one of the many galaxies <p><u>Phenomena and patterns observed on the Earth caused by the movements of the Sun, Earth and Moon (P3 and P6)</u></p> <ul style="list-style-type: none"> Be aware that the Moon is the Earth's only natural satellite and revolves around the Earth

	<ul style="list-style-type: none"> • Recognise the relative sizes, positions and movements of the Sun, Earth and Moon <p><u>The nation's and the world's aerospace technology development (P4 and P6)</u></p> <ul style="list-style-type: none"> • Appreciate the nation's contributions to the development of aerospace technology • Show concerns for the nation's significant achievements in space exploration (e.g. lunar and deep space exploration) and aerospace technology (e.g. Tiangong space station, BeiDou Navigation Satellite System) • Realise the importance of aerospace technology development to the nation's interests and security
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Living Things and the Environment

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
Photosynthesis and respiration	<p><u>Food chain (P6)</u></p> <ul style="list-style-type: none"> • Be aware that photosynthesis is the process by which plants produce food • Be aware of the conditions necessary for photosynthesis in plants (sunlight, water, carbon dioxide, chlorophyll) • State the importance of photosynthesis in plants to other living things Be aware that animals obtain the energy required for life processes (growth and repair, activity, reproduction) through feeding
Ecosystems/ Interrelationships in ecosystem	<p><u>Food Chain (P2 and P4)</u></p> <ul style="list-style-type: none"> • Be aware that animals obtain the energy required for life processes (growth and repair, activity, reproduction) through feeding • Describe the role of each living thing in a simple food chain (e.g. plants produce their own food, some animals eat plants, some animals eat other animals) • Identify common predators and their prey, and describe their relationships <p><u>Ecological environment (P2 and P4)</u></p> <ul style="list-style-type: none"> • Be aware that plants need (sun) light, air and water to provide the energy required for life processes (growth, reproduction) • Be aware that animals respond to changes in environmental conditions (e.g. temperature, danger) • Be aware of different natural environments (e.g. tropical rainforest, temperate grassland, polar regions, desert) • Relate common animals and plants to the natural environments • Understand that some living things in an ecosystem compete with each other for resources (e.g. light, food, living space) <p><u>Biological forms and functions, and their adaptability to the environment (P4)</u></p> <ul style="list-style-type: none"> • Give examples of features of plants that help them adapt to their environment • Give examples of features of animals that help them adapt to their environment • Recognise some behaviors of animals for surviving in their habitats (e.g. migration, hibernation)
Biodiversity and Conservation	<p><u>Impact of human behavior on the natural environment (P2 and P5)</u></p> <ul style="list-style-type: none"> • Recognise the impact of human behavior on the environment (e.g. causing air and water pollution) • Give some examples of how pollution affect the survival of animals and plants • Recognise the importance of sustainable development and environmental protection to maintaining ecological security

Climate Change	<u>Daily weather phenomena (P4)</u> <ul style="list-style-type: none">• Show concern for the phenomenon of global warming and its impacts (e.g. glacier melting, rising sea levels, desertification)• Recognise some methods to slow down global warming• Show concern for environmental and climate change
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Matter and Energy

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
Particle Theory	<p><u>State of matter (P3)</u></p> <ul style="list-style-type: none"> Be aware that matter can be classified into solids, liquids and gases, and describe their properties (whether it has a fixed volume, whether it has a fixed shape) <p><u>Properties of matter (P5)</u></p> <ul style="list-style-type: none"> Be aware that air has weight and occupies space
Density	<p><u>Properties of matter (P6)</u></p> <ul style="list-style-type: none"> Using water as an example, state that buoyancy is an upward force exerted by water on objects Recognise the phenomenon of floating and sinking of objects in water
Physical states of matter	<p><u>Physical change and chemical change (P3 and P4)</u></p> <ul style="list-style-type: none"> Describe the processes (melting, boiling, freezing, condensation, evaporation) of the change in states of water Identify some visible changes that do not produce new matter (physical changes) (e.g. dissolving, evaporation, squeezing or stretching objects)
Energy Transformation	<p><u>Sources and uses of energy (P5)</u></p> <ul style="list-style-type: none"> Give examples of the different forms of energy (e.g. kinetic energy, potential energy, chemical energy) Be aware that energy can be converted from one form to another
Heat Transfer	<p><u>Heat Transfer (P3)</u></p> <ul style="list-style-type: none"> Recognise the modes of heat transfer <p><u>Properties of matter (P4 and P5)</u></p> <ul style="list-style-type: none"> Determine whether a material is suitable for thermal conduction or thermal isolation based on its properties Be aware that air rises when heated, and the movement of air forms wind

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Atomic World

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
Substances	<p><u>Properties of matter (From P3 to P5)</u></p> <ul style="list-style-type: none"> • Compare some physical properties (e.g. weight, physical state under room temperature, whether it can be attracted by magnet, whether it can float in water) of different materials • Give examples of mixture (e.g. rocks and sand, sugar solution, sand and iron filings, air) • Recognise some methods of separating mixtures (sieving, magnetic attraction, filtration, evaporation) • Compare some physical properties (electrical conductivity and thermal conductivity) of metals and non-metals • Relate the properties of metals to their uses (e.g. copper which conducts electricity well can be used to make wires; iron that conducts heat well can be used to make cooking utensils)
Physical changes and chemical changes	<p><u>Physical changes and chemical changes (From P3 to P6)</u></p> <ul style="list-style-type: none"> • Describe the processes (melting, boiling, freezing, condensation, evaporation) of the change in states of water • Give examples of daily phenomena of evaporation and condensation (e.g. clothes drying in the sun, water droplets condensing on the surface of cold drink) • Identify some visible changes that do not produce new matter (physical changes) (e.g. dissolving, evaporation, squeezing or stretching objects) • Identify some visible changes that produce new matter (chemical changes) (e.g. rusting, burning, food rotting) • Recognise the necessary conditions for corrosion of metals (using rusting as an example) • Explain ways to prevent corrosion of metals • Be aware of some reversible changes (e.g. condensation and evaporation of water) and irreversible changes (e.g. burning) • Be aware that combustion requires oxygen, and produces carbon dioxide and water
Solution	<p><u>Physical changes and chemical changes (P2 and P3)</u></p> <ul style="list-style-type: none"> • Be aware that some substances (e.g. salt, sugar) are soluble in water while others (e.g. sand, rock) are insoluble in water • Be aware of some factors that speed up the dissolving of substances in water (e.g. surface area of solute, water temperature, stirring speed) • Distinguish between high and low concentrations of solution (e.g. same volume of water with different amounts of sugar added)

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Force and Motion

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
Characteristics of force and motion	<p><u>Force and motion-related phenomena (P2, P4 and P5)</u></p> <ul style="list-style-type: none"> • Be aware that force can cause objects to move • Be aware that force of gravity is the attractive force exerted by the Earth on other objects • Be aware that friction is the resistance that occurs when objects rub against each other • Be aware that the direction of friction is opposite to the direction of motion • Give daily examples where friction is applied (e.g. walking, writing) • Recognise that forces always work in action and reaction pairs • Recognise methods to compare the speed* of moving objects (compare the distances travelled by two objects within the same period of time, or compare the time taken for two objects to travel the same distance) [<i>*Students are only required to recognize the methods to compare the speed of moving objects, the formula and calculation related to speed will be covered in the Primary 6 Mathematics curriculum.</i>] • Be aware that forces can change the state of motion of an object (forces can make a stationary object move or stop a moving object; forces can change the speed of a moving object; forces can change the direction of a moving object)
Pressure	<p><u>Properties of matter (P5)</u></p> <ul style="list-style-type: none"> • Give examples of daily phenomena related to atmospheric pressure (e.g. suck air out through a straw will cause the beverage carton to cave in)
Pressure and particle movement	<p><u>Properties of matter (P5)</u></p> <ul style="list-style-type: none"> • Be aware that air has weight and occupies space

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Making Use of Electricity

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
Electrical circuits	<p><u>Properties of electricity and related phenomena (From P4 to P6)</u></p> <ul style="list-style-type: none"> • Recognise simple closed circuits • Explain that a complete circuit is needed for the functioning of simple electrical appliances (e.g. light bulb) • Be aware that electrical energy can be converted to other forms of energy (e.g. thermal energy, light energy, sound energy) • Be aware of the heating effect and magnetic effect of electric current
Magnets	<p><u>Properties of matter (P2)</u></p> <ul style="list-style-type: none"> • Be aware that magnet can be used to attract some metallic objects • Be aware that each magnet has two different magnetic poles which always exist in pairs • Be aware of the phenomenon of ‘like poles repel and unlike poles attract’ • Be aware that the magnetised needle in a compass can be used to indicate the south and the north • Give examples of daily application of magnet <p><u>Properties of electricity and related phenomena (P6)</u></p> <ul style="list-style-type: none"> • Be aware of the heating effect and magnetic effect of electric current
Household electricity	<p><u>Properties of electricity and related phenomena (P5 and P6)</u></p> <ul style="list-style-type: none"> • Recognise how to use electricity safely • Explain the reasons why different parts of household appliances are made from conductive and insulating materials respectively • Give examples of daily applications of the heating effect (e.g. electric heaters, hairdryers, toasters) and magnetic effect (e.g. electromagnetic cranes, electromagnetic locks) of electric current

Science (S1-3) Curriculum

Healthy Body

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
Keeping our bodies healthy/ Dental care	<p><u>Healthy lifestyles (P1)</u></p> <ul style="list-style-type: none"> State the functions of various parts of the human body (e.g. eyes to see, teeth to chew food, spine to support the body) Be aware of the methods to protect various parts of the body (e.g. methods for protecting the eyes and teeth, proper standing and sitting postures) Give examples of healthy living habits (e.g. a balanced diet, exercising regularly, getting enough sleep, maintaining a relaxed and happy mood) Develop healthy living habits
Effects of taking drugs and alcohol	<p><u>Healthy lifestyles (P6)</u></p> <ul style="list-style-type: none"> Be aware of the adverse effects of smoking, alcoholism, drug abuse and drug use on the body <p><u>Human body systems (P6)</u></p> <ul style="list-style-type: none"> Recognise the major parts of the human nervous system (sensory organs, brain, spinal cord) and their functions
Effects of smoking	<p><u>Healthy lifestyles (P6)</u></p> <ul style="list-style-type: none"> Be aware of the adverse effects of smoking, alcoholism, drug abuse and drug use on the body <p><u>Human body systems (P5)</u></p> <ul style="list-style-type: none"> Recognise the major parts of the human respiratory system (trachea, bronchi, lungs) and their functions
Health and diseases	<p><u>Communicable and non-communicable diseases (P4)</u></p> <ul style="list-style-type: none"> Recognise common communicable diseases (e.g. influenza, cholera) and their major causes and symptoms Recognise the transmission routes of communicable diseases (e.g. droplet transmission, vector transmission, contact transmission, food transmission, blood transmission) and their prevention Recognise common non-communicable diseases (e.g. heart diseases, cancer) and their main causes, symptoms and prevention <p><u>Common microorganisms (P5)</u></p> <ul style="list-style-type: none"> Recognise common types of microorganisms (including bacteria, fungi, viruses) Recognise the uses of antibiotics and the effects of inappropriate use of antibiotics Recognise the benefits (e.g. probiotics inhibiting the growth of harmful bacteria, degrading pollutants) and negative impacts (e.g. causing diseases) of microorganisms to humans

Nutrition and health/ Balanced diet and unbalanced diet	<p><u>Healthy lifestyles (P3)</u></p> <ul style="list-style-type: none"> • Be aware of the types of food commonly found in a balanced diet • Recognise the healthy eating pyramid • Recognise the nutrients in food (carbohydrates, proteins, fats, vitamins, minerals, dietary fiber, water) and their functions • Maintain healthy eating habits
Digestion and absorption of food	<p><u>Human body systems (P5)</u></p> <ul style="list-style-type: none"> • Recognise the major parts of the human digestive system (stomach, small intestine, large intestine) and their functions

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Light and Sound

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
Light	<p><u>Properties of light and related phenomena (P1, P4 and P6)</u></p> <ul style="list-style-type: none"> • Be aware of the source of light • Give examples of uses of light in daily life (e.g. for illumination and reading) • Be aware that light shining on opaque objects will produce shadows • Be aware that sunlight consists of light of different colours • Differentiate light coming from a light source (e.g. sunlight, light from a flashlight) from that reflected from objects (e.g. moonlight) • Be aware of some examples of reflection of light (e.g. reflection on water surface, mirror) • Recognise the changes in length and position of shadow under sunlight at different times • Recognise the mode of light propagation • Recognise the characteristics of images formed by a plane mirror, including being the same size as the object and laterally inverted • Be aware that refraction occurs when light passes through different transparent materials
Sight and hearing	<p><u>Healthy lifestyles (P1)</u></p> <ul style="list-style-type: none"> • State the functions of various parts of the human body (e.g. eyes to see, teeth to chew food, spine to support the body) • Be aware of the methods to protect various parts of the body (e.g. methods for protecting the eyes and teeth, proper standing and sitting postures)
Sound	<p><u>Properties of sound and related phenomena (P2 and P5)</u></p> <ul style="list-style-type: none"> • Be aware that sound is produced by the vibration of objects • Be aware that the greater the vibration of an object, the louder the sound produced • Be aware of some phenomena related to sound (e.g. echo) • Be aware that sound can travel through different media • Be aware that changes in pitch are caused by changes in vibration • Recognise ways to measure the loudness of sound, and the commonly used unit (decibel)
Convex lenses and concave lenses	<p><u>Properties of light and related phenomena (P6)</u></p> <ul style="list-style-type: none"> • Give daily application of different types of mirrors, including plane, convex and concave mirrors • Give examples of daily applications of refraction of light (e.g. glasses, magnifying glasses, microscopes)

Electromagnetic spectrum	<u>Properties of light and related phenomena (P1)</u> <ul style="list-style-type: none"> • Be aware that sunlight consists of light of different colours
Sound and environment	<u>Properties of sound and related phenomena (P5)</u> <ul style="list-style-type: none"> • Recognise the causes of noise and ways to cope with it • Recognise the ways to protect our sense of hearing

Science (S1-3) Curriculum

Our Planet Earth

Major Learning Content	Relevant Learning Objectives in Science (Primary 1 – 6)
The Atmosphere	<p><u>Impact of human behavior on the natural environment</u> (P2)</p> <ul style="list-style-type: none"> Recognise the impact of human behavior on the environment (e.g. causing air and water pollution) Give examples of how pollution affect the survival of animals and plants <p><u>Properties of matter</u> (P5)</p> <ul style="list-style-type: none"> State the major components of air and the percentage of main gases in air
The Ocean	<p><u>Earth's resources</u> (P3)</p> <ul style="list-style-type: none"> Be aware of the sources of salt water and fresh water, and their uses in daily life Be aware that drinking water needs to be filtered and purified
Rocks and minerals	<p><u>Earth's characteristics</u> (P4)</p> <ul style="list-style-type: none"> State the structure of the Earth (crust, mantle, and core) and the physical characteristics of these distinct parts
Useful materials from crude oil	<p><u>Earth's history</u> (P5 and P6)</p> <ul style="list-style-type: none"> Be aware that fossils are the remains of ancient organisms preserved in rocks and ice Be aware of the formation processes of fossils and fossil fuels
Environmental problems associated with the use of materials	<p><u>Impact of human behavior on the natural environment</u> (P5)</p> <ul style="list-style-type: none"> Give some approaches in the application of science and technology to address environmental issues Recognise the importance of sustainable development and environmental protection to maintaining ecological security