اكاديمية امباسادور الدولية
AMBASSADOR
INTERNATIONAL ACADEMY
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# Science Scope and Sequence

- Living Things
- Materials and Matter
- Forces and Energy
- Earth and Space

# Living Things

<table>
<tr><td>PYP Science Skills across all grades</td><td colspan="2">
<ul>
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<li>Identify or generate a question or problem to be explored</li>
<li>Plan and carry out systematic investigations, manipulating variables as necessary</li>
<li>Make and test predictions</li>
<li>Interpret and evaluate data gathered in order to draw conclusions</li>
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</ul>
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<tr><td rowspan="2">Learning outcomes</td><td><u>Pre-K</u><ul><li>Notice detailed features of objects in their environment.</li><li>Comment and ask questions about aspects of their familiar world such as the place where they live or the natural world.</li><li>Talk about some of the things they have observed such as plants, animals, natural and other objects found in the environment.</li></ul></td><td><u>KG1</u><ul><li>Demonstrate awareness of the need for recycling</li><li>Show care and concern for living things and the environment.</li><li>Identify and describe the different parts of the human body.</li><li>Express her/his feelings of wonder and curiosity about the world.</li><li>Sort and classify groups based on similarities and differences.</li></ul></td></tr>
<tr><td><u>KG2</u><br>Plants<ul><li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li><li>Identify and describe the basic structure of a variety of common flowering plants, including trees.</li></ul>Animals<ul><li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li><li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</li><li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</li></ul>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</td><td><u>Grade 1</u><br>Plants<ul><li>Observe and explain how seeds and bulbs grow into mature plants</li><li>Explore and investigate how plants need water, light and a suitable temperature to grow and stay healthy.</li></ul>Living Things<ul><li>Compare and contrast the differences between things that are living, dead, and things that have never been alive</li><li>Determine that most living things live in habitats to which they are suited and explain how different habitats provide for the basic needs of different kinds of animals and plants, and explore how they depend on each other</li><li>Identify and categorise a variety of plants and animals in their habitats, including micro- habitats</li><li>Analyse how animals obtain their food from plants and other animals, by interpreting a simple food chain, and explore different sources of food.</li></ul>Animals<ul><li>Justify that animals, including humans, have offspring which grow into adults</li><li>Summarize the basic needs of animals, including humans, for survival (water, food and air)</li></ul>Determine the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</td></tr>
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|---|---|---|---|
| | **Grade 2**<br>Plants<br>• **Investigate** and **summarize** the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.<br>• **Explore** and **justify** the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how they vary from plant to plant<br>• **Investigate** how water is transported within plants<br>• **Analyse** and **describe** the role that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.<br>Animals<br>• **Conclude** that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat<br>• **Compare and contrast** the skeletons of different animals including humans and **justify** the function of the bones and the muscles. | **Grade 3**<br>Living Things<br>• **Classify** a variety of living things in their local and wider environment with the help of branching database or keys.<br>• **Predict** and **interpret** the dangers to living things due to changes in the environment. **Suggest** ways to control these changes.<br>• Animals (including humans)<br>• **Compare** and **contrast** the functions of the basic parts of the digestive system in humans.<br>• **Compare** the different types of teeth in humans and **explain** their simple functions based on their shape.<br>• **Construct** and **interpret** a variety of food chains, identifying producers, predators and prey. | **Grade 4**<br>Living Things<br>• **Summarize** the differences in the life cycles of a mammal, an amphibian, an insect and a bird<br>• **Illustrate** and **explain** the life process of reproduction in some plants and animals.<br>Animals (including humans)<br>**Analyse** the changes a human being goes through as they grow old. |

# Material and Matter

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<tr><td rowspan="3">Learning outcomes</td><td><u>KG1</u>
<ul>
<li>Sort and classify materials based on similarities and differences.</li>
<li>Investigate characteristics of various objects and materials.</li>
<li>Identify and describe different types and uses of materials.</li>
<li>Experiment with common objects</li>
<li>Make predictions and observations during investigations.</li>
<li>Communicate results and findings from individual and group observations.</li>
<li>Demonstrate an awareness of the safe use of all materials and tools used in class, remote control, I pad, Bee-bots, camera… etc</li>
<li>Understand and communicate the importance of water in our lives and where it comes from.</li>
</ul></td><td><u>KG2</u>
<ul>
<li>Distinguish between an object and the material from which it is made</li>
<li>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li>
<li>Describe the simple physical properties of a variety of everyday materials</li>
<li>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</li>
</ul></td></tr>
<tr><td><u>Grade 1</u>
<ul>
<li>Compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard and their uses.</li>
<li>Investigate how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li>
</ul></td><td><u>Grade 3</u>
<ul>
<li>Compare and categorize materials, according to whether they are solids, liquids or gases</li>
<li>Summarize through observation that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees celsius(°c)</li>
<li>Analyse and illustrate the role of evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li>
</ul></td></tr>
<tr><td colspan="2"><u>Grade 4</u>
<ul>
<li>Compare and categorize materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</li>
<li>Predict and investigate materials that dissolve in liquid to form a solution and explain the process of extracting a substance from a solution.</li>
<li>Use knowledge of solids, liquids and gases to separate mixtures, through filtering, sieving and evaporating and justify your choice of separation method.</li>
<li>Justify the uses of everyday materials including metals, wood and plastic, based on evidence from comparative and fair tests.</li>
<li>Demonstrate that dissolving, mixing and changes of state are reversible changes.</li>
<li>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</li>
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# Forces and Energy

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<tr><td rowspan="3">Learning outcomes</td><td><u>Pre-K</u><br>• Talk about why things happen and how things work.</td><td colspan="3"><u>KG1</u><br>• Plan and conducts and investigation to determine the effect of placing objects made with different materials in the path of a beam of light.<br>• Investigate that vibrating materials can make sound and that sound can make materials vibrate.<br>• Investigate and describes the functions and uses of light and sound.<br>• Understand and describe how the everyday lives of different living things would be affected if electrical energy were no longer available<br>• Predict how the size of shadow will change if the distance changes between the light sources and the object blocking the light.</td></tr>
<tr><td colspan="2"><u>Grade 2</u><br>Light<br>• Explain through illustration that light is required to see things and understand that darkness is the absence of light.<br>• Investigate how light is reflected from surfaces<br>• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes<br>• Investigate and explain that shadows are formed when the light from a light source is blocked by a solid opaque object.<br>• Predict and find patterns in the way that the size and shape of shadows change.<br>Forces and magnets<br>• Compare how things move on different surfaces<br>• Conclude through investigation that some forces need contact between two objects, but magnetic forces can act at a distance.<br>• Observe how magnets attract or repel each other and attract some materials and not others.<br>• Compare and categorize a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.<br>• Illustrate and describe the two poles of a magnet.<br>• Predict whether two magnets will attract or repel each other, depending on which poles are facing.</td><td><u>Grade 3</u><br>Sound<br>• Explain that sound is created due to vibrations and that vibrations from sounds travel through a medium to the ear<br>• Investigate and find patterns between the pitch of a sound and features of the object that produced it.<br>• Predict and investigate the relationship between the volume and the strength of the vibrations that produced it.<br>• Conclude and Justify that sounds get fainter as the distance from the sound source increases.<br>Electricity<br>• Identify and categorize appliances that that run on electricity/battery.<br>• Construct a simple series electrical circuit, identifying and naming its basic components, including cells, wires, bulbs, switches and buzzers.<br>• Investigate and conclude that a complete circuit is required for a lamp or any electrical appliances to work.<br>• Analyse and explain the function of a switch in a circuit.<br>• Categorize materials into conductors and insulators and associate metals with being good conductors.</td></tr>
<tr><td colspan="3"><u>Grade 4</u><br>• Investigate and explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object<br>• Analyze the effects of air resistance, water resistance and friction, that act between moving surfaces.<br>• Summarize the role of some mechanisms, including levers, pulleys and gears, to have a greater effect on the movement of the object through a smaller force.</td></tr>
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# Earth and Space

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<tr><td>Learning outcomes</td><td><u>KG2</u><br>• Observe changes across the four seasons and describe weather associated with the seasons and how day length varies.</td><td><u>Grade 2</u><br>• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties<br>• Describe in simple terms how fossils are formed when things that have lived are trapped within rock<br>• Recognise that soils are made from rocks and organic matter.</td><td><u>Grade 4</u><br>Earth & space<br>• Describe and compare the movement of the earth, and other planets, relative to the sun in the solar system<br>• Explain through accurate illustration the movement of the moon relative to the earth<br>• Summarize with the help of evidence that the sun, earth and moon as approximately spherical bodies.<br>• Use the idea of the earth’s rotation to explain day and night and the apparent movement of the sun across the sky.</td></tr>
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# Gr 5 Science Scope and sequence

Living things

- Classify living things based on common observable characteristics and categorize them based on their similarities and differences, including microorganisms, plants and animals.
- Justify reasons for classifying plants and animals based on specific characteristics.
- **Explore** the main organs of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
- **Analyse** the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- **Determine** the ways in which nutrients and water are transported within animals, including humans.
- **Analyse** how fossils provide information about living things that inherited the Earth millions of years ago and changed over time.
- Living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. **Justify** your finding with concrete examples.
- **Summarize** how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Forces and energy

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect
  *– if we do the unit energy*
- identify and describe different forms of energy
- demonstrate how energy can be stored and transformed from one form to another (for example, storage of fat, batteries as a store of energy)
- explain the impact of diet in providing the body with sources of potential energy
- assess renewable and sustainable energy sources (for example, wind, solar, water)
- examine ways in which the local community could be improved in relation to the conservation of energy.
- **Plan a investigation to conclude** that light appears to travel in straight lines
- **Associate** the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- **Explain** that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- **Explain** why shadows have the same shape as the objects that cast them. **Justify** your findings.