



BPS SCIENCE LEARNING PROGRAM *EC – Grade 5)*

Sciences aim at discovering the elements natural world, their properties and their interactions to discover laws that allow us to predict and control these elements, to the benefit of humanity.

Science laws are validated by their success in predicting and controlling and are subject to review when one single well-controlled experiment proves the law to be wrong.

Scientist work then on refining the law to allow it to cover more cases that initially considered.

We focus more on the Skills involved in discovering science laws and reflecting on the processes that lead to the discovery, than on the content of the science topics and related laws.

This is the Essence of Scientific Knowledge and, at BPS, we adhere fully to adopting and implementing teaching-learning modalities that reflect and respect this essence.

The essential goals of learning science are for students to understand that science is

- A powerful tool for describing and analyzing the world,
- A highly effective tool for solving real world problems, and
- A way of thinking about the natural world in a logical and critical manner, far beyond seeing it as a series of facts to learn and equations to memorize

“Equipped with his five senses, man explores the universe around him and calls the adventure Science. “Edwin Powell Hubble

GRADE	CONCEPTS	COMPETENCIES	CHARACTER
ECE (3 yrs. old)	Life Science: Our Five senses Learners will understand that: <ul style="list-style-type: none"> • our senses provide different ways for the body to receive information about the world • the different parts of our bodies help us to be able to do things 	Learners will be able to: <ul style="list-style-type: none"> • gather information from experiences manipulate materials with guidance to test what happens, and make observations	Integrity Resilience
	Physical Science: The World Learners will understand that: <ul style="list-style-type: none"> • some changes can be observed and described • some changes can happen quickly some happen over a longer period of time 	Learners will be able to: <ul style="list-style-type: none"> • gather information from experiences and make concrete phenomena 	Reflection Empathy
	Earth Science: Water Play Learners will understand that: <ul style="list-style-type: none"> • water takes on different forms • the water moves in different ways • people can manipulate water 	Learners will be able to: <ul style="list-style-type: none"> • gather information from experiences manipulate materials with guidance to test what happens, and make observations	Playfulness



GRADE	CONCEPTS	COMPETENCIES	CHARACTER
KG1	<p>Life Science: Living Things</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • living things have characteristics and basic need • living things develop in predictable patters 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • use senses to gather information about living things • observe and explore the natural processes of growing, changing, and adapting to the environment • ask and pursue questions through simple investigations and observations of living things • collect, describe, and record information about living things through discussion, drawings and charts • identify the common needs such as food, air, and water of familiar living things • predict, explain, and infer patterns based on observations and representations of living things, their needs, and life cycles • make and record by drawing, acting out, or describing observations of living things and how they change over time 	<p>Integrity</p> <p>Resilience</p>
	<p>Physical Science: Objects</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • objects have properties and characteristics • there are cause-and-effect relationships in everyday experiences 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • use senses to gather information about objects • make simple observations, predictions, explanations, and generalizations • collect, describe, and record information through discussion, drawings, and charts • recognize and investigate cause-and- effect relationships in everyday experiences-Pushing, pulling. Kicking, rolling, or blowing objects 	<p>Reflection</p>
	<p>Earth Science: Earth</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • earth’s materials have properties and characteristics that affect how we use those materials • events such as night, day, the movement of object in the sky, weather, and seasons have patterns 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • use senses to gather information about Earth’s material • make simple observation, explanations, and generalizations about Earth’s materials based on real-life experiences • describe how various materials might be used based on characteristics or properties • identify, predict and extend patterns based on observations and 	<p>Empathy</p>



GRADE	CONCEPTS	COMPETENCIES	CHARACTER
Grade 1	<p>Life Science: Plants and Animals</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • plants and animals change as they develop and grow • plants and animals meet their needs in different ways • plants and animals need a range of elements from the environment to survive and grow (food, air, water, light and shelter) • plants and animals inherit traits 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • find answers to questions related and make observations and predictions • select relevant information from materials and resources provided • compare similarities and differences between plants and animals • infer that young plants and animals look like their parents but not the same • represent data using pictures, numbers, illustrations, bar graphs and simple written statements 	<p>Integrity</p> <p>Resilience</p>
	<p>Physical Science: Sound and Light</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • sound can make matter vibrate • vibrating matter can make sound 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate 	<p>Reflection</p> <p>Empathy</p>
	<p>Earth Science: Air and Weather</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • weather can be observed, measured and described • weather can change from day to day • trends in temperature of rain or snow tend to be predictable during a season • the sun warms the land, air and water 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • use simple tools (thermometer, wind wave) to measure weather conditions and record changes from day to day and across the seasons. • make close observations and describe what they notice orally • make simple predictions • respond to an experience by observation, pictures, graphics and simple written sentences 	<p>Playfulness</p>



GRADE	CONCEPTS	COMPETENCIES	CHARACTER
Grade 2	<p>Life Science: Insects and Plants</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • plants depend on water and light to grow • plants depend on animals for pollination or to move their seeds around • there are many different kinds of living things in any area, and they exist in different places on land and in water 	<p>Learners will be able to</p> <ul style="list-style-type: none"> • plan and conduct an investigation to determine if plants need sunlight and water to grow • develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants through sketched, drawing or physical models 	Integrity
	<p>Physical Science: Solids and Liquids</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • matters come in different forms (states) including solids, liquids, and gases • that solids, liquids, and gases have specific properties • the properties of substances can change when the substances are mixed, cooled or heated 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • identify objects same/different and sort them into groups based on a given criteria • make close observations and describe what they notice orally • classify information and justify groupings based on observation and experience • make simple predictions • manipulate materials with guidance to test what happens and make observations • respond to an experience by observation, pictures, graphics and simple written sentences 	Resilience Reflection
	<p>Earth Science: Pebbles, Sand and Silt</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • earth events can occur quickly or slowly • wind and water can change the shape of the land • maps show where things are located in any area on earth • water can be solid or liquid 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • make observations from media to construct an evidence-based account that Earth events occur quickly or slowly (volcanic explosions, earthquakes, erosion of rocks) • compare multiple solutions to slow or prevent wind or water from changing the shape of land (dikes, windbreaks, using shrubs, grass and trees to hold back the land) • develop a model to represent the shapes and kinds of land and bodies of water in an area • obtain information to identify where water is found on Earth (solid or liquid) 	Empathy Playfulness



GRADE	CONCEPTS	COMPETENCIES	CHARACTER
Grade 3	<p>Life Science: Structures of Life</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • reproduction is essential to the continued existence of every kind of organism • being part of a group helps animals obtain food, defend themselves and cope with changes • plants and animals have unique and diverse life cycles • all organisms have in common reproduction, birth, growth and death • plants and animals inherit traits from their parents • environment influence traits that an organism develops 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • models to describe that organisms have unique and diverse life cycles • construct an argument that some animals form groups that help survive • analyze and interpret data to provide evidence that plants and animals have traits inherited from parent • use evidence to support the explanation that traits can be influenced by environment • make a claim about the merit of a solution to a problem caused when the environment changes the types of plants and animals that live there may change 	<p>Integrity</p> <p>Resilience</p>
	<p>Physical Science: Motion and Matter</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • force and motion are fundamental to all matter in the universe • a force is anything that can push or pull an object and has strength and direction • forces influence objects that are at rest or that are moving in motion • the patterns of an object's motion in various situation can be observed and measured • objects in contact exert forces on each other • Electric, and magnetic forces between a pair of objects do not require that the object be in contact 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • conduct an investigation to provide evidence of the effects of balance and unbalanced forces on the motion of an object • make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion • ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other • define a simple problem that can be solved by applying scientific ideas about magnets 	<p>Reflection</p>
	<p>Earth Science: Water and Climate</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • weather can be observed, measured and described • scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. • obtain and combine information to describe climates in different regions of the world 	<p>Empathy</p>



<ul style="list-style-type: none"> • climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. • a variety of natural hazards result from natural processes. • humans cannot eliminate natural hazards but can take steps to reduce their impacts. 	<ul style="list-style-type: none"> • make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard 	Playfulness
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Grade 4	<p>Life Science: Environments</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • plants and animals have both internal and external structures that serve various functions in growth, survival, behavior and reproduction • animals are able to use their perceptions and memories to guide their actions 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • Construct an argument that plants, and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. • Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. 	Integrity
	<p>Physical Science: Energy</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> • the faster a given object is moving, the more energy it possesses • energy can be moved from place to place by moving objects, or through sound, light, or electric currents • the expression “produce energy” refers to the conversion of stored energy into a desired form for practical use • waves, which are regular patterns of motion, can be made in water by disturbing the surface. • when waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. • waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks) • an object can be seen when light reflected from its surface enters the eyes 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> • use evidence to construct an explanation relating the speed of an object to the energy of that object. • make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. • apply scientific ideas to design, test, and refine a device that converts energy from one form to another • use a model of waves to describe patterns of waves in terms of amplitude and wavelength and that waves can cause objects to move • develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen • generate and compare multiple solutions that use patterns to transfer information 	Resilience Reflection



	<ul style="list-style-type: none"> digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information that is, convert it from digitized form to voice and vice versa. different solutions need to be tested in order to determine which of them best solve the problem, given the criteria and the constraints. 		Empathy
	<p>Earth Science: Soils, Rocks and Landforms</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> energy and fuels that humans use is derived from natural sources, and their use affects the environment in multiple ways some resources are renewable over time, and others are not testing a solution involves investigating how well it performs under a range of likely conditions 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. generate and compare multiple solutions to reduce the impacts of natural Earth Processes on humans. 	Playfulness

GRADE	CONCEPTS	COMPETENCIES	CHARACTER
Grade 5	<p>Life Science: Living Systems</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> Plants and animals have structures for respiration, digestion and waste disposal. Organisms develop interdependent relationships in ecosystems 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> Support an argument that plants get the materials they need for growth chiefly from air and water. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment, and explain the mechanisms for these natural events. 	Integrity
	<p>Physical Science: Mixtures and Solutions</p> <p>Learners will understand that:</p> <ul style="list-style-type: none"> Matter of any type can be subdivided into particles. The amount of matter is conserved when it changes form. 	<p>Learners will be able to:</p> <ul style="list-style-type: none"> Develop a model to describe that matter is made of particles too small to be seen. Measure and graph quantities to provide 	Resilience

