

Curriculum Correlation

Nelson B.C. Science Probe 6

GRADE 6 PROCESSES OF SCIENCE

Key Elements

Controlling Variables	Section
determining equal measures by mass or volume of the test objects	1.3, 3.3, 3.4, 4.2, 11.4
setting standard conditions for light, temperature, and water	1.3, 3.3, 3.4, 11.4
identifying other variables or factors that could affect the outcome	1.3, 3.3, 3.4, 5.3, 6.3, 6.5, 7.3, 10.3, 11.4
limiting or removing those other variables not involved in the study	1.3, 3.3, 3.4, 4.2, 5.3, 6.3, 6.5, 7.3, 10.3, 11.4
following the experimental design by controlling relevant variables	1.3, 3.3, 3.4, 4.2, 5.3, 6.3, 6.5, 7.3, 10.3, 11.4
repeating the experiment many times to yield consistent results	3.3, 4.2, 5.3
using the recorded data as evidence of a “cause” relationship	1.3, 5.3, 6.5, 7.3

Problem Solving	Section
determine the human needs involved in the situation (or assigned task)	2.3, 7.6, 9.5, 10.5, 11.2
identify the task, and observe the key attributes involved	2.3, 7.6, 9.5, 10.5, 11.2
establish the criteria for use of the prototype (set limits)	2.3, 7.6, 9.5, 10.5, 11.2
plan creatively a possible set of solutions	2.3, 7.6, 9.5, 10.5, 11.2
determine the available materials or equipment, and select a course of action	2.3, 7.6, 9.5, 10.5, 11.2
draw a series of possible solutions for building	2.3, 7.6, 9.5, 10.5, 11.2
build a prototype or model	2.3, 7.6, 11.2
test and evaluate the model according to the criteria	2.3, 7.6, 11.2
evaluate the results and redo if necessary	2.3, 7.6, 10.5, 11.2
communicate success to others	2.3, 7.6, 9.5, 10.5, 11.2

Prescribed Learning Outcomes

Prescribed Learning Outcome	Suggested Achievement Indicator	Section
manipulate and control a number of variables in an experiment	identify quantities of key factors (e.g., light, water, nutrition, temperature) as relevant variables in a test (e.g., biological growth)	1.3, 5.3, 10.3, 11.2, 11.4
	suggest and systematically implement controls on variables directly related to the outcome of an experiment (e.g., amount, quality, length)	1.3, 5.3, 10.3, 11.2
	explain, with reference to possible consequences, the importance of a consistent and standardized approach to dealing with variables	1.3, 5.3, 11.2, 11.4
apply solutions to a technical problem (e.g., malfunctioning electrical circuit)	make adjustments in technique when immediate results are not obtained (e.g., adjust microscope settings)	3.2, 3.3, 3.4, 11.2, 11.4
	use a persistent and organized approach to determine why a technical product (e.g., an electrical circuit) is not working, and modify it to make it work	6.5, 7.6
	suggest effective and practical ways to modify a technological instrument or tool (vehicles, clothes, food, buildings, wrenches) to permit its function in an extreme environment	9.5, 10.3, 10.5

LIFE SCIENCE

Key Elements

Vocabulary Term	Section
microscopes	3.1
slide	3.2
cover slip	3.2
magnify	3.1
micro-organism	2.7
species	2.4
kingdoms	2.4
Plantae	2.4
Animalia	2.4
Monera	2.4
Protista	2.4
Fungi	2.4
invertebrate	2.5
vertebrate	2.5
mammals	2.5

Vocabulary Term	Section
birds	2.5
reptiles	2.5
amphibians	2.5
fish	2.5
classification systems	2.1
cell	1.1
cell membrane	2.4
nucleus	2.4
chloroplasts	2.4
chlorophyll	2.4
coloration	4.1
mimicry	4.5
camouflage	4.1
behaviours	4.1

Knowledge	Section
cells are the basic units of life and carry on all the functions needed for survival	1.1, 2.4
living things may be unicellular or multicellular	2.4, Unit A Making Connections
plant cells differ from animal cells in their structure	2.4
scientists classify organisms into groups according to internal and external features	2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, Unit A Making Connections
scientists traditionally use a five-kingdom system to classify organisms	2.4, 2.5, 2.6, 2.7, Unit A Making Connections
the kingdoms are: Animalia, Plantae, Protista, Monera, and Fungi	2.4, 2.5, 2.6, 2.7, Unit A Making Connections
each of the kingdoms has its own set of characteristics	2.4, 2.5, 2.6, 2.7

Skills and Attitudes	Section
classify organisms using attributes	2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, Unit A Making Connections
demonstrate the use of a microscope to view a prepared slide	3.2, 3.3, 3.4, Unit A Making Connections
demonstrate safe practices in investigations	1.3, 2.5, 2.6, 3.2, 3.3, 3.4, 4.2, Unit A Making Connections
show respect for all living organisms	1.2, 2.3, 2.5, 2.6, 3.3, 3.4, Unit A Making Connections
use appropriate tools and techniques to gather, analyze, interpret, and share scientific ideas	1.3, 2.3, 2.5, 2.6, 3.2, 3.3, 3.4, 4.2, Unit A Making Connections

Diversity Of Life: Prescribed Learning Outcomes

Prescribed Learning Outcome	Suggested Achievement Indicator	Section
demonstrate the appropriate use of tools to examine living things that cannot be seen with the naked eye	correctly use tools such as a magnifying glass or microscope to observe a variety of microscopic organisms	3.1, 3.2, 3.3, 3.4, Unit A Making Connections
	precisely draw various characteristics of microscopic organisms on the basis of their own observations	3.3
analyze how different organisms adapt to their environments	identify two or more specific adaptations of various life forms (e.g., coloration, mimicry, camouflage, feeding, behaviour and survival tactics)	4.1, 4.2, 4.3, 4.4, 4.5, Unit A Making Connections
	suggest a plausible explanation of how particular adaptations help life forms interact in their environments	4.1, 4.2, 4.3, 4.4, 4.5
	create a detailed report describing symbiosis between two organisms	4.1
distinguish between life forms as single or multi-celled organisms and belonging to one of five kingdoms: Plantae, Animalia, Monera, Protista, Fungi	accurately list the characteristics that define all living things, including ability to reproduce, grow, respire, use energy, respond to stimuli	1.1, 1.2, 1.3, 1.4
	identify and distinguish Plantae, Animalia, Monera, Protista, and Fungi as kingdoms of life	Ch. 2, Unit A Making Connections
	correctly sort micro-organisms according to their characteristics, with teacher support (e.g., a descriptive key for Monera, Protista, and Fungi)	2.7, Unit A Making Connections

PHYSICAL SCIENCE

Key Elements

Vocabulary Term	Section
atoms	5.1
electrons	5.1
static electricity and current electricity	5.2, 6.1
electric current	6.1
closed and open circuit	6.1
conductors	6.1
insulators	6.3
battery	6.1
magnetism	7.2
parallel circuit	6.4
series circuit	6.2
switch	6.1
voltage	6.1
geothermal (energy)	8.5
nuclear (energy)	8.4
tidal (energy)	8.5

Vocabulary Term	Section
solar (energy)	8.5
wind power	8.5
biomass power	8.5
coal	8.4
(natural) gas	8.4
fossil fuels	8.4
hydro	8.3
hydroelectric dams	8.3
renewable	8.1
non-renewable	8.1
consumption	8.2
conservation	8.2
electrocuted	8.2
direct current	6.1
(light) bulb	7.1
positive	5.1
negative	5.1

Knowledge	Section
static electricity is the result of the accumulation of excess charges on an object	5.1, 5.2, 5.3
an electron is a negatively charged particle	5.1, Awesome Science
the presence of excess electrons produces a net negative charge, and the lack of electrons produces a net positive charge	5.1, Awesome Science, 5.2
unlike electric charges attract, and like charges repel	5.1, Awesome Science, 5.2, 5.3
electric current is the movement of electrons through a conductor	6.1, 6.3
conductors permit a flow of electric current, while insulators block the flow of electric current	6.1, 6.3
chemicals can be used to transfer electrical energy (e.g., dry cell batteries)	6.1, 6.2, 8.7
electric currents have magnetic fields	7.2, 7.3
electricity may flow in series or parallel circuits	6.2, 6.4, 6.5
electrical energy can be transferred to produce heat, light, motion, and chemical activity (e.g., inside the standard light bulb is a filament that gives off heat and light energy); likewise, heat, light, motion, and chemical activity can be transferred to produce electrical energy	7.1, 7.4, 7.5, 7.6
different sources of energy can be transferred to produce electrical energy (e.g., wind, water, steam, solar, tidal, etc.)	8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7

Skills and Attitudes	Section
demonstrate curiosity, creativity, open mindedness, accuracy, precision, and persistence, and appreciate their importance as scientific attributes	5.1, 5.2, 5.3, 6.1, 6.2, 6.3, 6.4, 6.5, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, Unit B Making Connections
manipulate, construct, and test electrical circuits that use batteries	6.1, 6.2, 6.3, 6.4, 6.5, 7.2, 7.3, 7.6, Unit B Making Connections
show increasing confidence as scientific problem solvers by asking questions, solving problems, and making decisions	5.3, 6.2, 6.3, 6.5, 7.3, 7.6, 8.6
demonstrate the safe use of electricity	6.1, 6.2, 6.3, 6.4, 6.5, 7.2, 7.3, 7.4, 7.6, 8.1, Unit B Making Connections
demonstrate the safe use and handling of home electrical appliances	5.2

Electricity: Prescribed Learning Outcomes

Prescribed Learning Outcome	Suggested Achievement Indicator	Section
evaluate various methods for producing small electrical charges	identify the charges (like, unlike, or no charge) of pairs of statically charged objects (e.g., charged through rubbing various fibres and solid materials) by systematically and accurately testing their attractions	5.1, 5.3
	describe and distinguish between friction-produced (static) electrical charge and chemically produced electric charge (batteries)	5.1 Awesome Science, 5.2, 6.1
	with teacher support, test and evaluate the effectiveness of various grounding techniques for preventing static charge build up on objects	5.2
test a variety of electrical pathways using direct current circuits	proficiently assemble a working electrical circuit with a switch	6.1, 6.2, 6.3, 6.4, 6.5
	correctly explain the solution for fixing an improperly arranged circuit (short-circuit)	6.3, 6.5
	demonstrate the difference between parallel and series circuits when using batteries	6.2, 6.4, 6.5
demonstrate that electricity can be transformed into light, heat, sound, motion, and magnetic effects	create circuits that reliably produce light, heat, sound, motion, and magnetic effects	7.2, 7.3, 7.4, 7.5, 7.6, Unit B Making Connections
	transfer electrical energy into multiple other forms of energy (e.g., light, heat, sound, motion energy), safely and reliably	7.1, 7.2, 7.4, 7.5, Unit B Making Connections
	produce demonstrable magnetic effects using electric current	7.2, 7.3
differentiate between renewable and non-renewable methods of producing electricity	compile a comprehensive list of ways in which electricity is generated	8.1, 8.2, 8.7
	summarize the main advantages and disadvantages of the various methods used to produce the electricity used in our daily lives	8.3, 8.4, 8.5, 8.6

EARTH AND SPACE SCIENCE

Key Elements

Vocabulary Term	Section
environment	9.1
extreme	9.1
extreme environments	9.1
technology	9.4
explorations	9.3
Canadarm	11.3
recycle	11.6
life-support systems	11.6
satellite	10.1

Vocabulary Term	Section
radar	10.1
sonar	10.1
insulator	10.2
scuba	10.4
water pressure	10.4
lift	11.1
spinoff	12.1
buoyancy	10.4
thrust	11.3

Knowledge	Section
there are living things naturally inhabiting many extreme environments, but much about them is still unknown	9.2, 9.3
technologies such as boats, clothing, and space ships have allowed humans to live in environments to which they are not fully adapted	9.2, 9.4, 10.2, 10.3, 10.4, 11.1, 11.3, 11.5, 11.6
humans need more complicated technology to survive in and explore more extreme environments, which may have conditions such as high or low temperature or pressure, or the absence of an atmosphere or gravity	9.1, 9.2, 9.3, 9.4, ScienceWorks, 10.1, 10.2, 10.4, 10.5, 11.3, 11.5, 11.6
Canadians have contributed to technological advancement in the exploration of extreme environments	ScienceWorks, 10.4, 11.3, 12.2

Skills and Attitudes	Section
ask questions and exchange ideas to solve problems related to the exploration of extreme environments	9.3, 10.3, 11.2, Ch. 12, Unit C Making Connections
evaluate information and ideas encountered during investigations of extreme environment	9.3, 10.3
use appropriate tools to gather, analyze, interpret, and share scientific ideas	9.5, 10.3, 11.4
formulate hypotheses	10.3
appreciate the cumulative nature of technological advancement	10.4, 11.1, 11.3
explain reasons for an adaptive technology and how it compensates for the extreme condition(s)	10.3, 10.4, 11.6
construct models of exploration technologies	10.5, 11.2, Unit C Making Connections

Exploration Of Extreme Environments: Prescribed Learning Outcomes

Prescribed Learning Outcome	Suggested Achievement Indicator	Section
explain obstacles unique to exploration of a specific extreme environment	identify the salient characteristics of an extreme environment (e.g., space, polar ice, oceans, volcanoes, and the atmosphere—a place that humans do not naturally inhabit but choose to explore)	9.1, 9.2, 9.5, 10.2, 10.4, 11.5, 11.6, Unit C Making Connections
	give several examples of resources and knowledge that can be obtained from distant explorations	9.3, 12.1, 12.2, 12.4
	give several examples of how technology can be used by humans to travel to and explore an unknown environment	9.4, 10.1, 10.4
assess technologies used for extreme environments	identify several types of equipment and methods currently used to explore extreme environments (e.g., scuba, fibre optics, Mars Lander)	9.3, 9.4, 9.5, 10.1, 10.4, 11.3, Awesome Science, 11.5, 11.6
	accurately describe the stages of development for a previously created technology (e.g., kites, balloons, planes, rockets, submarines, space suits)	10.1, 10.4, 11.1, 11.3, 11.6
	design a complete model for travelling into a specific extreme environment (e.g., submarines, sonic-aircraft, spaceships)	10.4, 10.5, 11.2, 11.3, 11.4, Unit C Making Connections
	coherently defend a position with respect to the ethical considerations involved in the development and use of new technologies (e.g., whether or not to take living samples, or use weapons in space)	Ch. 12 10.3
describe contributions of Canadians to exploration technologies	describe in detail the function of Canadian technologies involved in exploration of extreme environments (e.g., international space station, Canadarm, Newt Suit, satellite telecommunications, robotics, and ocean mapping)	ScienceWorks, 10.4, 11.3
	illustrate with accurate, detailed drawings a range of Aboriginal technologies (e.g., Inuit sleds, Haida ocean canoes, Algonquin/Cree snowshoes)	9.4