

Curriculum Correlation

Nelson B.C. Science Probe 4

GRADE 4 PROCESSES OF SCIENCE

Key Elements

Interpreting Data	Section
Interpreting data is a critical-thinking process used by scientific researchers to review the data gathered in the course of an investigation. Scientists explain the data to others and communicate a reasonable explanation about the trends and relationships they see.	Chapter 1 Apply What You've Learned, 2.1, 2.3, 2.4, Chapter 2 Apply What You've Learned, 3.3, Chapter 6 Apply What You've Learned, 7.5, 7.6, 7.8, 8.3, 9.4

Predicting	Section
Predicting involves making an objective guess about a future event, based upon what has been observed in the past and what might be expected to happen. Scientists always test whether their predictions might be correct or not. Predictions should not involve guessing wildly, but should be based on prior knowledge and prior observations.	2.4, 2.5, Chapter 2 Apply What You've Learned, 3.1, 3.3, Unit A Making Connections, Chapter 5 Apply What You've Learned, 7.5, Chapter 7 Apply What You've Learned, 8.3

Prescribed Learning Outcomes

Prescribed Learning Outcome	Suggested Achievement Indicator	Section
make predictions, supported by reasons and relevant to the content		3.1, 8.3
	carefully observe a pattern of events (e.g., changes in vibration, pitch, weather patterns)	2.4, Chapter 2 Apply What You've Learned, Unit A Making Connections, 6.2, 7.5, Chapter 7 Apply What You've Learned
	make initial predictions and refine them, based on test results (e.g., path light travels)	2.4, 3.3, Chapter 5 Apply What You've Learned
use data from investigations to recognize patterns and relationships and reach conclusions	gather and correctly organize comprehensive data (e.g., weather charts)	Chapter 1 Apply What You've Learned, 2.4, Chapter 2 Apply What You've Learned, 3.3, Unit A Making Connections, Chapter 6 Apply What You've Learned, 7.5, 8.3
	accurately interpret what a given graph shows using detailed examples	2.3, 7.6, 9.4

EARTH AND SPACE SCIENCE

Weather: Key Elements

Vocabulary Term	Section
temperature	1.3
wind speed	1.6
wind direction	1.6
water cycle	1.1
cloud	1.5
evaporation	1.1
condensation	1.1

Vocabulary Term	Section
precipitation	1.1
erosion	3.1
barometer	1.7
anemometer	1.6
thermometer	1.3
rain gauge	1.4
weather vane	1.6

Knowledge	Section
the surface of the planet Earth is surrounded by a blanket of air called the atmosphere	1.1
most of the Earth's surface is covered by water and circulates through the water cycle	1.1
the Earth's surface is heated by energy from the Sun	1.3, 2.1
weather conditions that can be observed and/or measured include temperature, wind speed, wind direction, precipitation, air pressure, and cloud formations	1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, Chapter 1 Apply What You've Learned, 2.2, 2.3, 2.5, 2.6, Chapter 2 Apply What You've Learned, Unit A Making Connections
weather conditions affect living things (e.g., growth, behaviour, food, shelter)	3.2, 3.3, 3.4
weather conditions (e.g., erosion) affect non-living things	3.1, 3.4

Skills and Attitudes	Section
observe weather conditions and record using graphs, tables, and charts	1.2, 1.3, 1.7, Chapter 1 Apply What You've Learned, 2.6, Chapter 2 Apply What You've Learned, Unit A Making Connections
interpret data from recorded observations	1.5, 1.6, 1.7, 2.1, 2.3, 2.4, Chapter 2 Apply What You've Learned, 3.3, Unit A Making Connections
predict weather conditions	2.5, 2.6, Chapter 2 Apply What You've Learned, Unit A Making Connections
construct simple instruments	1.6, 1.7

Prescribed Learning Outcomes

Prescribed Learning Outcome	Suggested Achievement Indicator	Section
measure weather in terms of temperature, precipitation, cloud cover, wind speed, and direction		1.2, 1.7
	systematically chart daily temperatures using a thermometer	1.3, Chapter 1 Apply What You've Learned, Chapter 2 Apply What You've Learned
	design, build, and test a simple rain gauge, weather vane, and anemometer	1.4, 1.6
	identify, chart, and illustrate daily cloud cover	1.5, Chapter 1 Apply What You've Learned, 2.6, Chapter 2 Apply What You've Learned
	make a detailed local weather report based on collected data	Chapter 1 Apply What You've Learned, Chapter 2 Apply What You've Learned
analyze impacts of weather on living and non-living things		3.2, 3.4
	predict and report on how freezing and thawing affect a variety of materials (e.g., water and soil)	3.1
	accurately predict and test various materials for water resistance and insulation from cold (e.g., slow down the rate of a melting ice cube)	3.3
	research and create a comprehensive report on the effects of erosion, drought, or other local weather impacts (e.g., sand table rivers, effects of run-off)	3.1, Chapter 3 Apply What You've Learned

PHYSICAL SCIENCE

Light and Sound: Key Elements

Vocabulary Term	Section
<i>Light</i>	
reflect	5.2
refract	5.4
absorb	5.2
transmit	5.2
natural	4.2
artificial	4.3
light beam	5.1
transparent	5.2
translucent	5.2
opaque	5.2

Vocabulary Term	Section
<i>Sound</i>	
vibration	6.2
vocal cords	6.2
pitch	7.3
frequency	7.3
loudness	7.2
sound wave	7.1
reflect	7.7
absorb	7.8
transmit	7.6
echo	7.7

Knowledge	Section
light carries energy	4.1, 5.2
brighter light carries more energy	4.1 (TR)
forms of light can be either visible or invisible	5.5 (TR)
natural and artificial light have measurable properties (e.g., colour, wavelength, brightness)	5.5
light can travel in a straight path (rays)	5.1
light rays change direction (bend, refract) as they pass from one medium to another	5.2, 5.4
materials may transmit, absorb, or reflect light	5.2, 5.3
sound carries energy	6.1, 6.2, 6.3, 7.2
loud sounds carry more energy	7.2 (TR), 7.7 (TR)
forms of sound can be audible or inaudible	6.1, 6.2, 7.4
sound is caused by vibrations in a medium	6.2, 7.1, 7.5
sound can travel through many substances (e.g., air, water, metal)	6.3, 7.5, 7.6
the shaking (oscillation) of objects is called vibrating	6.2, 7.2
vibrations are measured in the number of oscillations per time (called the frequency)	7.3
higher (faster) frequency corresponds to higher-pitched sounds	7.3
lower (slower) frequency corresponds to lower-pitched sounds	7.3
materials may transmit, reflect, or absorb sound (an echo is reflected sound)	7.6, 7.7, 7.8
sound travels through gas, liquid, and solid	6.3, 7.5, 7.6

Skills and Attitudes	Section
use appropriate vocabulary to describe observations, explorations, and experiments	4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 5.4, 5.5, Chapter 5 Apply What You've Learned, 6.1, 6.2, 6.3, Chapter 6 Apply What You've Learned, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, Chapter 7 Apply What You've Learned, Unit B Making Connections
predict the results of light and sound experiments	5.4, Chapter 5 Apply What You've Learned, 7.5, 7.7, Chapter 7 Apply What You've Learned
compile and interpret data to record and present results using tally charts, tables, and graphs	5.2, 6.3, Chapter 6 Apply What You've Learned, 7.5
communicate the procedures and results of investigations by using oral presentations, written notes and descriptions, drawings, and diagrams	Chapter 4 Apply What You've Learned, 5.1, 5.2, 5.3, 5.4, 5.5, Chapter 5 Apply What You've Learned, 6.1, 6.2, 6.3, Chapter 6 Apply What You've Learned, 7.1, 7.2, 7.5, 7.7, 7.8, Chapter 7 Apply What You've Learned
handle a variety of materials safely	Unit B Preview, 4.1, 5.2, 5.3, 5.4, 5.5, Chapter 5 Apply What You've Learned, 7.2, 7.3, 7.5, 7.7, Chapter 7 Apply What You've Learned

Prescribed Learning Outcomes

Prescribed Learning Outcome	Suggested Achievement Indicator	Section
identify sources of light and sound	accurately sort various sources of light within their environment as natural or artificial	4.1, 4.2, Awesome Science, 4.3, Chapter 4 Apply What You've Learned
	relate vibrations to the production of sound (e.g., the human voice relies on the vibrations of vocal cords)	6.1, 6.2, 6.3
explain properties of light (e.g., light travels in a straight path, can be reflected)		Unit B Making Connections
	predict, demonstrate, and report on how light travels in a straight path and through different materials (e.g., reflects, refracts; is transparent, translucent, opaque)	5.1, 5.2, 5.3, 5.4, 5.5, Chapter 5 Apply What You've Learned
	with teacher support, conduct an experiment to demonstrate how white light can be separated into colours	5.5
explain properties of sound (e.g., travels in waves, travels in all directions)		7.1, 7.4, Unit B Making Connections
	demonstrate and report on how various materials will absorb, reflect, or transmit sound	7.5, 7.6, 7.7, 7.8, Chapter 7 Apply What You've Learned
	predict and record changes in vibration and pitch (e.g., by using a ruler) and describe the relationship between pitch and vibration	7.2, 7.3, Chapter 7 Apply What You've Learned

LIFE SCIENCE

Habitats and communities: Key Elements

Vocabulary Term	Section
habitat	8.1
adaptation	8.4
population	9.1
community	9.1
food chains	9.3
food web	9.5
organisms	8.1
producers	9.2
consumers	9.2
herbivores	9.2

Vocabulary Term	Section
omnivores	9.2
carnivores	9.2
predators	9.4
prey	9.4
scavengers	9.2
conservation	10.3
threatened	10.2
endangered	10.2
extinct	10.2

Knowledge	Section
living things find in particular environments the items and conditions that they need to grow and survive	8.1, 8.2, 8.3, 8.5, 8.6, 8.7, 8.8, Chapter 8 Apply What You've Learned, 9.2, Chapter 9 Apply What You've Learned
living things interact with each other in many ways and may depend on each other for food and shelter	8.8, Chapter 8 Apply What You've Learned, 9.1, 9.2, 9.3, 9.4, 9.5, Chapter 9 Apply What You've Learned
changes in habitat can affect the survival of an individual organism or an entire species	9.4, 10.2, Unit C Making Connections
food chains play an important role in population changes	9.4, Chapter 9 Apply What You've Learned
human choices and actions have a big impact on the environment	10.1, 10.2, 10.3, Tech.Connect, 10.4, 10.5, Chapter 10 Apply What You've Learned, Unit C Making Connections

Skills and Attitudes	Section
observe animals and plants sharing a habitat (e.g., terrarium, aquarium)	8.3
record observations and investigations using a variety of mediums such as journals, words, charts, and graphs	8.2, 8.3, Chapter 8 Apply What You've Learned, 9.2, Chapter 9 Apply What You've Learned
infer why particular organisms, animals, and plants are able to share a habitat	8.8, 9.3, 9.4, Chapter 9 Apply What You've Learned
predict the effect of a change in the environment to the habitat and the organisms living there	9.4, 10.1, 10.2, 10.3, 10.4
demonstrate respect for Aboriginal peoples	10.5, ScienceWorks
demonstrate respect for living things and environments and a commitment for their care	8.3, Chapter 10 Apply What You've Learned, Unit C Making Connections

Prescribed Learning Outcomes

Prescribed Learning Outcome	Suggested Achievement Indicator	Section
compare the structures and behaviours of local animals and plants in different habitats and communities	explain in detail why organisms are found in specific local habitats, based on their structures and behaviours	8.3, 8.4, 8.5, 8.6, 8.7, 8.8, Chapter 8 Apply What You've Learned
	identify the structural adaptations of two organisms	8.5, Awesome Science, Chapter 8 Apply What You've Learned
	with teacher support, infer and justify what communities might interact in a particular environment	8.8, 9.1, 9.2, Chapter 9 Apply What You've Learned
analyze simple food chains	construct and explain the elements of a simple food chain	9.3, 9.5, Chapter 9 Apply What You've Learned
	interpret population changes from data in one- or two-factor graphs (e.g., rabbit only; rabbit/coyote)	9.4
demonstrate awareness of the Aboriginal concept of respect for the environment	describe in detail how to show respect for the environment (e.g., clean up school yard, recycle, weed garden)	10.5, ScienceWorks, Chapter 10 Apply What You've Learned, Unit C Making Connections
	create accurate, detailed drawings to illustrate stories that demonstrate the relationship Aboriginal peoples have with the land, water, animals, plants, and the sky (e.g., respect for water, earth)	10.5
determine how personal choices and actions have environmental consequences		10.1, 10.2, 10.3, Tech.Connect, 10.4
	document the steps involved in supporting actions that positively affect the school environment (such as those involved in a garbage-less lunch campaign), using detailed checklists and various group projects	Chapter 10 Apply What You've Learned
	prepare and illustrate a simple, local habitat improvement plan that shows which plants and animals benefit from the plan	Unit C Making Connections