

ENGAGING SCIENCE • BC K–7 SCIENCE

HR MacMillan Space Centre – It’s the Earthquake’s Fault!

It’s the Earthquake’s Fault! complements the Kindergarten to Grade 7 Science curriculum in British Columbia.

Prescribed learning outcomes (PLOs) from the Processes of Science (PSS), Life Science (LS), Physical Science (PS) and Earth and Space Science (ESS) curriculum organizers are matched below with the major activities presented in this Playbook and the associated Engaging Science hands-on workshop.

To support cross-curricular teaching, links to Math and Language Arts curriculum areas are also included.

PSS = Processes of Science

PS = Physical Science

ESS = Earth and Space Science

T = Age of the Earth Timeline

AE = Apple Earth

EL = Constructing a Model of the Earth’s Layers

CP = Continental Puzzle

PF = Predicting the Future

MV = Moving Volcanoes

PT = Piecing it All Together

PB = Peanut Butter and Jam Boundaries

MD = Making or Destroying Land?

OE = Make your Own Earthquake

WC = What Causes an Earthquake?

MW = Modeling Waves

ML = Mapping the Layers of the Earth Using Seismic Waves

WS = Wave Shuffle

HI = How Intense Was that Earthquake?

LEARNING OUTCOMES		T	AE	EL	CP	PF	MV	PT	PB	MD	OE	WC	MW	ML	WS	HI
Kindergarten																
PSS	Use the five senses to make observations		•				•		•					•		
PSS	Share with others information obtained by observing				•				•		•					
ESS	Describe features of their immediate environment										•					
Grade 1																
PSS	Communicate their observations, experiences, and thinking in a variety of ways				•	•			•					•	•	•
Grade 2																
PSS	Use their senses to interpret observations				•				•					•	•	
PSS	Infer the probable outcome of an event or behaviour based on observations					•			•		•					
PS	Identify the properties of solids, liquids, and gases													•		
PS	Investigate changes to the properties of matter when it is heated or cooled									•						
Grade 3																
PSS	Ask questions that foster investigations and explorations relevant to the content	•			•	•						•				•
PSS	Measure objects and events	•														
Grade 4																
PSS	Make predictions, supported by reasons and relevant to the content				•	•			•			•			•	
PSS	Use data from investigations to recognize patterns and relationships and reach conclusions	•			•	•						•	•	•	•	•

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Grade 5																
PS	Demonstrate how various forces can affect the movement of objects										•					•
Grade 6																
ESS	Explain obstacles unique to exploration of a specific extreme environment					•					•					•
Grade 7																
PSS	Create models that help to explain scientific concepts and hypotheses	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ESS	Compare the characteristics of the Earth’s core, mantle, and crust, and describe the formation of rocks		•	•						•			•	•		
ESS	Analyse the dynamics of tectonic plate movement and landmass formation				•	•	•	•	•	•	•	•	•	•	•	•
ESS	Explain how the Earth’s surface changes over time	•			•	•	•	•	•	•	•					

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NC = Number Concepts
 NO = Number Operations
 PR = Patterns and Relations (Variables and Equations)
 SS = Shape and Space (3D Objects and 2D Shapes)

SSt = Shape and Space (Transformations)
 SSm = Shape and Space (Measurement)
 SP = Statistics and Probability (Data Analysis)
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Grades K–1																
NC	Count orally by 1s, 2s, 5s, and 10s to 100															●
SSm	Use comparative terms to describe time and temperature	●														
SS	Construct three-dimensional objects using materials such as plasticine, blocks and boxes										●					
SS	Identify and describe specific two-dimensional shapes such as circles, squares, triangles, or rectangles			●												
SSt	Identify and fit pieces of puzzles or shapes that go together (part to whole relationship)				●	●		●								
Grades 2–3																
SSm	Construct a shape, length or object using a specific non-standard or standard unit	●														
SSm	Estimate and measure the passage of time in seconds, minutes, hours, days, weeks, months, and years and relate the various measures to each other	●														
SSt	Communicate and apply positional language and cardinal directions (relating to compasses and maps) in verbal, written or numerical form				●	●										
SSt	Graph whole number points on a horizontal or a vertical number line											●				
SP	Display data in more than one way, including graphs, pictographs, bar graphs and rank ordering	●														
SP	Discuss data, communicate conclusions, and make predictions and inferences to solve similar problems					●										
SPc	Describe the likeliness of an outcome using terms such as <i>likely</i> , <i>unlikely</i> , <i>fair chance</i> , <i>probable</i> , and <i>expected</i>											●				

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Grade 4																
NO	Demonstrate and describe the process of addition and subtraction of numbers up to 10 000, using manipulatives, diagrams, and symbols	•														
SSm	Construct specific lengths	•														
SSm	Relate years, decades, centuries, and millenniums	•														
SSt	Communicate and apply terms of directions to maps (north, south, east and west)			•	•		•									
SSt	Place and object on a grid using columns and rows											•				
SSt	Describe the position of an object on a grid using columns and rows											•				
SP	Construct a bar graph and a pictograph using many-to-one correspondence and justify the choice of intervals and correspondence used	•														
SPc	Identify an outcome using the terms <i>possible, impossible, certain, or uncertain</i>											•				
SPc	Compare outcomes using the terms <i>equally, likely, more likely, or less likely</i>											•				
Grade 5																
NO	Add and subtract decimal fractions to hundredths concretely, pictorially and symbolically	•														
SS	Build, represent and describe geometric objects and shapes		•	•												
SSt	Use coordinates to describe the position of objects in two dimensions											•				
SSt	Plot whole number, ordered number pairs in the first quadrant with intervals of 1, 2, 5 and 10											•				

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Grade 5 cont																
SP	Use a variety of methods to collect and record data	●										●				●
SP	Create classifications and ranges for grouping data															●
SP	Display data by hand or by computer in a variety of ways, including frequency diagrams, line plots, broken-line graphs											●				
SP	Discuss the reasonableness of the data and the results				●	●						●				
SP	Make inferences from the data to generate a conclusion					●						●				●
Grade 6																
NC	Read and write numerals greater than a million	●														
NC	Read and write numbers to thousandths	●														
NC	Compare and order improper fractions, mixed numbers, and decimal fractions concretely and pictorially	●														
SSt	Draw designs using ordered pairs in the first quadrant of the coordinate grid, together with slide and flip images											●				
SP	Display data by hand or by computer in a variety of ways, including histograms, double bar graphs, and stem and leaf plots	●										●				

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Grade 7																
NC	Read and write numbers to any number of decimal places	●														
PR	Compare and order integers	●														
	Graph relations, analyse results, and draw conclusions											●				
SSm	Measure the diameter, radius and circumference of circles and generalize the relationships				●											
SSm	Research and report how measurement instruments are used in the community													●		●
SSt	Draw designs using ordered pairs in all four quadrants of the coordinate grid, together with slide and flip images											●				
SP	Display data by hand or by computer in a variety of ways, including circle graphs	●										●				●
SP	Interpolate from data to make predictions				●	●						●				

ENGAGING SCIENCE • BC K–7 LANGUAGE ARTS

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CR = Comprehend and Respond (Comprehension)
 CRc = Comprehend and Respond (Critical Analysis)
 CRs = Comprehend and Respond (Strategies and Skills)
 CRcc = Comprehend and Respond (Composing and Creating)
 SSw = Self and Society (Working Together)

CIlc = Communicate Ideas and Information (Composing and Creating)
 Clli = Communicate Ideas and Information (Improving Communications)
 Cllp = Communicate Ideas and Information (Presenting and Valuing)

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Grades K–1																
CR	Demonstrate abilities to follow simple oral instructions	•		•				•			•			•		
CR	Create simple charts, webs, or illustrations as a way of organizing information	•		•												
CIlc	Demonstrate a willingness to present relevant ideas in discussions	•	•	•			•	•		•	•		•	•		
CIlc	Apply various strategies to generate ideas							•						•		
SSw	Interact with others	•						•					•	•		
Grades 2–3																
CRs	Ask and respond to questions before, during and after reading, viewing or listening		•		•	•	•	•	•	•	•		•	•	•	•
CR	Predict, retell, and sequence events and ideas from selections they have read, heard, or viewed	•				•										•
CIlc	Use various strategies for generating questions				•	•										•
CIlc	Sort, organize, and represent specific information	•		•												•
CIlc	Contribute relevant ideas to discussions	•	•	•	•	•	•	•	•	•	•		•	•	•	•
Cllp	Demonstrate a willingness to participate in a variety of shared activities that include reading and listening to stories and poems, dramatic play, and presenting their own work	•			•	•			•					•		•
Cllp	Create a variety of personal communications, including charts, journals, lists, illustrations and stories															•
SSw	Seek opinions and consider the responses of others				•	•								•		

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Grade 7																
CR	Use information they have read, heard, or viewed in a variety of written or graphic forms, including written notes and charts	•		•	•	•		•	•	•	•	•	•	•	•	•
CR	Locate and interpret details in print and non-print media to gather information and build understanding	•										•				•
CR	Interpret details in simple and direct illustrations, maps, charts, and other graphic representations	•			•	•		•				•				
CRc	Explain how works of communication relate to the broader context of community and world issues															•
CIlc	Summarize what they know about specific topics or issues and identify and address gaps in the information available	•			•	•						•		•		•
CIlp	Create a variety of personal and informational communications, including fiction and non-fiction; written summaries, instructions and reports; oral and visual presentations; oral and written opinions; poems; or lyrics															•
SSw	Share responsibility for the effective functioning of groups	•			•	•		•	•					•		
SSw	Elaborate on others' ideas				•	•		•				•		•		•