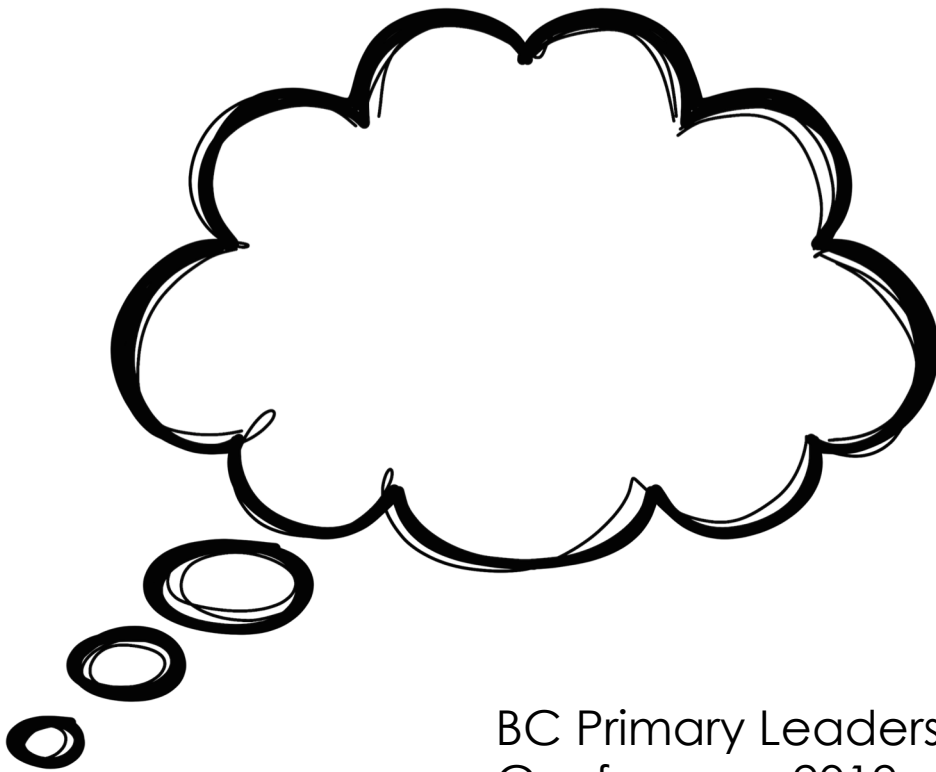


Using  
**Inquiry**  
to Develop the  
Curricular Competencies  
for **Science**  
(Grades 1-3)



BC Primary Leadership  
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Langley

# Inquiry Learning is about who you are as a teacher and how you will nurture the wonder in your students.

Shelley Hegedus

## **Inquiry teachers:**

- ✓ **Are playful**
- ✓ **Are curious**
- ✓ **Are passionate**
- ✓ **Teach slowly**
- ✓ **Know their curriculum**
- ✓ **Know their students**
- ✓ **Reflect and revise as they go**
- ✓ **Go outside to come back inside  
(learning can happen in or out of the classroom)**

Source: Trevor MacKenzie

## BC Curriculum Cross Grade Big Ideas

Grade 1	Grade 2	Grade 3
<p><b>Living things</b> have features and behaviours that help them survive in their environment</p>	<p><b>Living things</b> have life cycles adapted to their environment</p>	<p><b>Living things</b> are diverse and can be grouped and interact in their ecosystems</p>
<p><b>Matter</b> is useful because of its properties</p>	<p><b>Materials</b> can be changed through physical and chemical processes.</p>	<p>All <b>Matter</b> is made up of particles.</p>
<p><b>Light</b> and <b>sound</b> can be produced and their properties can be changed.</p>	<p><b>Forces</b> influence the motion of an object.</p>	<p><b>Thermal energy</b> can be produced and transferred.</p>
<p>Observable <b>patterns</b> and cycles occur in the local <b>sky</b> and <b>landscape</b>.</p>	<p><b>Water</b> is essential to all living things and it cycles through the environment.</p>	<p><b>Wind, water</b> and <b>ice</b> change the shape of the land.</p>

# BC Curriculum Curricular Competencies

## Science Grade 1-2

### **Questioning and Predicting**

- ❖ Demonstrate curiosity and a sense of wonder about the world
- ❖ Observe objects and events in familiar contexts
- ❖ Ask questions about familiar objects and events
- ❖ Make simple predictions about familiar objects and events

### **Planning and Conducting**

- ❖ Make and record observations
- ❖ Safely manipulate materials to test ideas and predictions
- ❖ Make and record simple measurements using informal or non-standard methods

### **Processing and Analyzing Data and Information**

- ❖ Experience and interpret the local environment
- ❖ Recognize First Peoples stories (including oral and written narratives), songs and art, as ways to share knowledge
- ❖ Sort and classify data and information using drawings, pictographs and provided tables
- ❖ Compare observations with predictions through discussion
- ❖ Identify simple patterns and connections

### **Evaluating**

- ❖ Compare observations with those of others
- ❖ Consider some environmental consequences of their actions

### **Applying and Innovating**

- ❖ Take part in caring for self, family, classroom and school through personal approaches
- ❖ Transfer and apply learning to new situations
- ❖ Generate and introduce new or refine ideas when problem solving

### **Communicating**

- ❖ Communicate observations and ideas using oral or written language, drawing or role-play
- ❖ Express and reflect on personal experiences of place

# BC Curriculum Curricular Competencies

## Science Grade 3

### Questioning and Predicting

- ❖ Demonstrate curiosity *about the natural world.*
- ❖ Observe objects and events in familiar contexts
- ❖ **Identify** questions about familiar objects and events *that can be investigated scientifically*
- ❖ Make predictions *based on prior knowledge*

### Planning and Conducting

- ❖ *Suggest ways to plan and conduct an inquiry to find answers to their questions*
- ❖ *Consider ethical responsibilities when deciding how to conduct an experiment*
- ❖ Safely *use appropriate tools to make observations and measurements, using formal measurements and digital technology as appropriate*
- ❖ *Make observations about living and non-living things in the local environment*
- ❖ *Collect simple data*

### Processing and Analyzing Data and Information

- ❖ Experience and interpret the local environment
- ❖ **Identify** First Peoples *perspectives and knowledge as sources of information*
- ❖ Sort and classify data and information using drawings *or* provided tables
- ❖ Compare *results with predictions suggesting possible reasons for findings*

### Evaluating

- ❖ *Make simple inferences based on their results and prior knowledge*
- ❖ *Reflect on whether an investigation was a fair test*
- ❖ *Demonstrate an understanding and appreciation of evidence*
- ❖ *Identify some environmental implications of their and others' actions*

### Applying and Innovating

- ❖ *Contribute to care* for self, family, classroom and school through *collaborative* approaches
- ❖ Generate and introduce new or refine ideas when problem solving

### Communicating

- ❖ *Represent and communicate ideas and findings in a variety of ways, such as diagrams and simple reports, using digital technologies as appropriate*
- ❖ Express and reflect on personal experiences of place

Standards in italics are what have changed from grade 1-2 to grade 3

# What is Inquiry?

Inquiry is any learning that is student-centred, collaborative learning.

Passion projects

Genius Hour

Constructivism

Project Based Learning

Problem Based Learning

## Types of Inquiry

<b>Structured Inquiry</b>	<b>Controlled Inquiry</b>	<b>Guided Inquiry</b>	<b>Free Inquiry</b>
Students follow the lead of the teacher as the entire class engages in one inquiry together.	Teacher chooses topics and identifies the resources students will use to answer questions.	Teacher chooses topics/questions and students design product or solution.	Students choose their topics without reference to any prescribed outcome.

Source: [Inquiry Mindset](#) Trevor MacKenzie

## How Do I Know it is an Inquiry?

- ❖ Ask a question and make a prediction.
- ❖ Decide how you will find out more and possibly answer the question.
- ❖ Think about your inquiry. Share it with others. What have you learned? What new ideas or questions do you have?

Name: \_\_\_\_\_

# My Inquiry

Topic: \_\_\_\_\_

My question:

\_\_\_\_\_

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\_\_\_\_\_

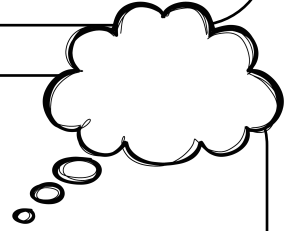
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\_\_\_\_\_

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\_\_\_\_\_

I predict:



How I plan to find out more:



Name: \_\_\_\_\_

# My Inquiry



Topic: \_\_\_\_\_

I learned:

\_\_\_\_\_

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\_\_\_\_\_

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\_\_\_\_\_

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\_\_\_\_\_

New questions: ?

\_\_\_\_\_

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\_\_\_\_\_

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\_\_\_\_\_

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\_\_\_\_\_

How I plan to find out more:





Name: \_\_\_\_\_

# My Inquiry



Topic: \_\_\_\_\_

My question:

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I predict:

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How I plan to find out more:

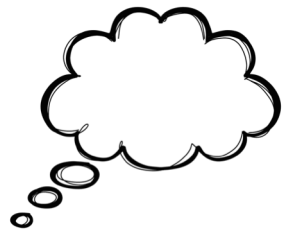


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Name: \_\_\_\_\_

# My Inquiry



Here is what I learned:

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Questions that have come up or new wonderings:

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Name: \_\_\_\_\_

# My Inquiry



I used to think:

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Now I think:

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# Sample Multi Primary Grade Inquiry Unit



## Topic: Rainforests or The Living Forest

### Big Ideas

**Gr. 1** Living things have features and behaviours that help them survive in their environment

**Gr. 2** Water is essential to all living things, and it cycles through the environment.

**Gr. 3** Thermal energy can be produced and transferred.

Living things are diverse, can be grouped, and interact in their ecosystems.

The **inquiry** process involves research, observation and **hands on** exploration. The inquiry might be **project** based or **problem** based. This may determine which essential question you might pose.



### Research:

The temperate rainforests of BC  
The Great Bear Rainforest  
Animals that live in the rainforest  
Forest/rainforest ecosystems  
The Water Cycle at Work

Rainforest Topic Big Ideas	Project Based	Problem Based
Gr 1 Living things have features and behaviours that help them survive in their environment	Research and create a habitat environment for a forest creature in a terrarium.	Create some tips for families who camp to help wildlife survive in environments where humans are.
Gr 2 Water is essential to all living things, and it cycles through the environment.	Plant seeds and see how water helps plants grow.	Investigate how conserving water at home can help living things in our environment.
Gr 3 Thermal energy can be produced and transferred. Living things are diverse, can be grouped, and interact in their ecosystems.	Create a rainforest environment in a 2 litre clear pop bottle and put it in direct sunlight. Observe the changes in heat/moisture and how things grow as a result.	Investigate the effects on an ecosystem if one member of the food chain does not get its needs met?

## Possible Questions



**Does the amount of water a plant receives affect its growth?**

**How does the water cycle work?**

**Will plants grow if they are not watered?**

**Does thermal energy affect life in the rainforests?**

**What kind of animals live in the temperate rainforest? Do they need to adapt to their environment?**

# Inquiry Assessment

**Questioning and Predicting:** Has the student used observations and prior knowledge to ask questions that could be investigated? Can they predict an inquiry outcome based on lots of thought and prior knowledge?

**Planning and Conducting:** Has the student used their senses to make applicable observations? Can they record their observations and measurements accurately and follow safety procedures?

**Processing and Analyzing Data and Information:** Can the student sort and classify materials and objects based on multiple attributes? Have they interpreted what happened based on observations that are connected to the initial question?

**Evaluating:** How well did the student compare observations with others and communicate and/or question the similarities and differences?

**Applying and Innovating:** Did the student identify some new ideas or improve the ideas with small changes that could be inquired into more? How well do they communicate and work with the group?

**Communicating** How well is the student able to communicate information about the observations and ideas?

# Resources

## ***Fiction Books:***

Cece Loves Science by Kimberly Derton and Shelli R. Johannes

Charlotte's Web by EB White

Salmon Forest by David Suzuki

Solomon's Tree by Andrea Spalding

The Darkest Dark by Chris Hadfield

Lucy's Lab by Michelle Houts

The Water Walker by Joanne Robertson

Over and Under the Pond by Kate Messner

Magic School Bus at the Waterworks by Joanna Cole

Water is Water: A Book About the Water Cycle by Miranda Paul and Jason Chin

## ***To compare tropical rainforest with temperate rainforests:***

The Great Kapok Tree by Lynn Cherry

## ***Non-fiction (Strong Nations)***

We are all Connected: Coast Salish, Coastal Rainforests and Cougars by Celestine Aleck, Terri Mack and John Haugen

## ***Government documents:***

### ***Play Today Handbook (K-3)***

<https://www2.gov.bc.ca/assets/gov/education/early-learning/teach/earlylearning/play-today-handbook.pdf>

## ***Digital and websites:***

**Kiddle.co** (Kid friendly research)

**Everyone Can Create** (photography, drawing editions etc.)

Wet Coast – short video of a walk through a forest in Nanaimo, BC

<https://www.youtube.com/watch?v=qXI0OgnXgeA>

## ***Other Inquiry/Science/Literacy Resources:***

<https://education.scholastic.ca/productlist/BC-LETS-DO-SCIENCE>

<https://thewritestuffteaching.com/>

(Genius Hour, Passion Projects, Science and Literacy, Real Life Learning, Mindfulness)

Credits:

Fonts/Clips Art: KG Fonts, Jackie G Fonts, Little Red Clip, Kate Hadfield Clip, Educlips

Digital Ideas from Apple

Shelley Hegedus, Oct. 2019