Navigating the Revised Science Curriculum

Document 2: Linking the Big Ideas through Inquiry Questions for Combined Classes

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A Science Implementation Tool

Created By

The Science Implementation Committee SD41

Committee Members

Ron Coleborn Olwen Cowan Scott Hodges Melissa Salter Liz Cramb Steve Bell Renee Kerluke Ron Hall

Linking the Big Ideas through Inquiry Questions for Combined Classes

Our Rationale

The science implementation committee tried to link the *Big Ideas* with the *Content* students are expected to know through the use of the guiding and/or *Inquiry Questions* suggested in the curriculum. We have created a one-page document for each possible combined class grouping that connects the *Big Ideas* to possible *Content* through these *Inquiry Questions*. There are more combinations that could be created, but we have tried to identify the more obvious/easier links. This is not meant to be a tracking document or a prescription, but as a combined-grade planning tool. We noticed easier links across the combined grades of 1-2, 3-4, 5-6, and 7-8. This may be something to think about during class loading or when planning with other teachers.

How To Use this Document

- Each page represents a combined grade grouping
- On each page you will find *Big Ideas*, *Content,* and possible questions to guide *Scientific Inquiry*

Please Remember

- What a grade 4 is expected to know about light is very different from what a grade 1 should know - adjust for your grade level!
- It will take a few years to learn and implement your program effectively - give yourself a break!
- Resources will be developed over time and we are working with the DLRC to buy/create content based packages
- The Content should be used to explore/teach the Curricular Competencies.
- The *Scientific Inquiry Processes* (curricular competencies) are essential and are to be developed and emphasized throughout K-12

Grades K/1

	Big Ideas	Possible Inquiry Questions	Content
Biology	Plants and animals have observable features. (K) Living things have features and behaviours that help them survive in their environment. (1)	• How do the different features of plants and animals help them meet their basic needs? (K) • What basic needs do plants and animals have in common? (K) • What are your basic needs? (K) • How do local plants and animals depend on their environment? (1) • How do plants and animals use their features to respond to stimuli in their environments? (1) • How do plants and animals adapt when their basic needs are not being met? (1)	• basic needs of plants and animals (K) • features of local plants and animals that help them meet their basic needs (K) • First Peoples' uses of plants and animals (K) • the classification of living or non-living things (1) • structural features of living things in the local environment (1) • behavioural adaptations of animals in the local environment (1)
Chemistry	Humans interact with matter every day through familiar materials. (K) Matter is useful because of its properties. (1)	• What is matter? (K) • How do you interact with matter? (K) • What qualities do different forms of matter have? (K) • What makes the properties of matter useful? (1) • How do the properties of materials help connect to the function of materials? (1)	• properties of familiar materials (K) • specific of materials connected to the function of the materials (1)
Physics	The motion of objects depends on their properties. (K)	• How can you make objects move? (K) • How does the shape or size of an object effect the object's movement? (K) • How does the material the object is made of effect the object's movement? (K)	• effects of pushes/pulls on movement (K) • effects of size, shape, and materials on movement (K)
Physics	Light and sound can be produced and their properties can be changed. (1)	• How can you explore the properties of light and sound? (1) • What discoveries did you make? (1)	• natural and artificial sources of light and sound (1) • properties of light and sound that depend on their source and the objects they interact with (1)

Grades K/1

	Big Ideas	Inquiry Questions	Content
Earth & Space	Daily and seasonal changes affect all living things. (K) Observable patterns and cycles occur in the local sky and landscape. (1)	• What daily and seasonal changes can you see or feel? • How are plants and animals affected by daily and seasonal changes? • What kinds of patterns in the sky and landscape are you aware of? • How do patterns and cycles in the sky and landscape affect living things	• weather changes (K) • seasonal changes (K) • changes that living things make to accommodate daily and seasonal cycles (K) • common objects in the sky (1) • Aboriginal knowledge of the sky and landscape (1) • local patterns in events that occur on Earth and in the sky (1)

Grades 1/2

	Big Ideas	Inquiry Questions	Content
Biology	Living things have features and behaviours that help them survive in their environment. (1) All living things have a life cycle. (2)	• How do local plants and animals depend on their environment? (1) • How do plants and animals use their features to respond to stimuli in their environments? (1) • How do plants and animals adapt when their basic needs are not being met? (1) • Why are life cycles important? (2) • How are the life cycles of local plants and animals similar and different? (2)	• the classification of living or non-living things (1) • structural features of living things in the local environment (1) • behavioural adaptations of animals in the local environment (1) • metamorphic and non-metamorphic life cycles of different organisms (2) • similarities and differences between offspring and parent (2) • Aboriginal knowledge of life cycles (2)
Chemistry	Matter is useful because of its properties (1) Materials can be changed through physical and chemical processes. (2)	• Why are life cycles important? (1) • How are the life cycles of local plants and animals similar and different? (1) • TBA (2)	• specific properties of materials connected to the function of the materials (1) • physical ways of changing materials (2) • chemical ways of changing materials (2)
Physics	Light and sound can be produced and their properties can be changed. (1)	• How can you explore the properties of light and sound? (1) • What discoveries did you make? (1)	• natural and artificial sources of light and sound (1) • properties of light and sound that depend on their source and the objects they interact with (1)
Physics	Forces influence the motion of an object. (2)	• TBA (2)	• types of forces (2)

Grades 1/2

	Big Ideas	Inquiry Questions	Content
Earth & Space	Observable patterns and cycles occur in the local sky and landscape. (1)	• What kinds of patterns in the sky and landscape are you aware of? (1) • How do patterns and cycles in the sky and landscape affect living things? (1)	• common objects in the sky (1) • Aboriginal knowledge of the sky and landscape (1) • local patterns in events that occur on Earth and in the sky (1)
Earth & Space	Water is essential to all living things, and it cycles through the environment (2)	• Why is water important for all living things? (2) • How does water cycle through the environment? (2)	• water sources including local watersheds (2) • water — a limited resource (2) • the water cycle (2)

Grades 2/3

	Big Ideas	Inquiry Questions	Content
Biology	All living things have a life cycle. (2) Living things are diverse, can be grouped, and interact in their ecosystems. (3)	• Why are life cycles important? (2) • How are the life cycles of local plants and animals similar and different? (2) • What is biodiversity? (3) • What is the relationship between observable characteristics of living things and biodiversity? (3) • How does Aboriginal knowledge of living things honour interconnectedness? (3)	• metamorphic and non-metamorphic life cycles of different organisms (2) • similarities and differences between offspring and parent (2) • Aboriginal knowledge of life cycles (2) • Biodiversity in the local environment (3) • Aboriginal knowledge of ecosystems (3) • energy — needed for life (3)
Chemistry	Materials can be changed through physical and chemical processes. (2) All matter is made of particles. (3)	• TBA (2) • Why is matter known as the material of the universe? (3) • What is an atom? (3) • What are its parts? (3)	• physical ways of changing materials (2) • chemical ways of changing materials (2) • atoms or molecules as particles of matter (3) • properties of materials related to the particles they consist of (3)
Physics	Forces influence the motion of an object. (2)	• TBA (2)	• types of forces (2)
Physics	Thermal energy can be produced and transferred. (3)	• What are the sources of thermal energy? (3) • How is thermal energy transferred between objects? (3)	• sources of thermal energy (3) • transfer of thermal energy (3)
Earth & Space	Water is essential to all living things, and it cycles through the environment (2) Wind, water, and ice change the shape of the land. (3)	• Why is water important for all living things? (2) • How does water cycle through the environment? (2) • How is the shape of the land changed by environmental factors? (3) • What are landforms? What landforms do you have in your local area? (3)	• water sources including local watersheds (2) • water — a limited resource (2) • the water cycle (2) • major local landforms (3) • observable changes in the local environment caused by erosion and deposition by wind, water, and ice (3)

Grades 3/4

	Big Ideas	Inquiry Questions	Content
Biology	Living things are diverse, can be grouped, and interact in their ecosystems. (3) All living things and their environment are interdependent. (4)	• What is biodiversity? (3) • What is the relationship between observable characteristics of living things and biodiversity? (3) • How does Aboriginal knowledge of living things honour interconnectedness? (3) • How do living things sense, respond, and adapt to stimuli in their environment? (4) • What evidence is there of interdependence between living and non-living things in ecosystems? (4)	• Biodiversity in the local environment (3) • Aboriginal knowledge of ecosystems (3) • energy — needed for life (3) • The ways organisms in ecosystems sense and respond to their environment (4)
Chemistry	All matter is made of particles. (3) Matter has mass, takes up space, and can change phase. (4)	• Why is matter known as the material of the universe? (3) • What is an atom? (3) • What are its parts? (3) • How can you explore the phases of matter? (4) • How does matter change phases? (4) • How does heating and cooling affect phase changes (4)	• atoms or molecules as particles of matter (3) • properties of materials related to the particles they consist of (3) • solids, liquids, and gases as matter (4) • the effect of temperature on pressure in a gas (4)
Physics	Thermal energy can be produced and transferred. (3) Energy comes in a variety of forms that can be transferred from one object to another (4)	• What are the sources of thermal energy? (3) • How is thermal energy transferred between objects? (3) • What is energy input and energy output? (4) • What is energy conservation? (4) • What is the relationship between energy input, output, and conservation? (4)	• sources of thermal energy (3) • transfer of thermal energy (3) • energy (4): • has various forms • is conserved • devices that transform energy (4)

Grades 3/4

	Big Ideas	Inquiry Questions	Content
Earth & Space	Wind, water, and ice change the shape of the land. (3)	• How is the shape of the land changed by environmental factors? (3) • What are landforms? What landforms do you have in your local area? (3)	• major local landforms (3) • observable changes in the local environment caused by erosion and deposition by wind, water, and ice (3)
Earth & Space	The motion of Earth and the moon cause observable patterns that affect living and non-living systems. (4)	• How do seasons and tides affect living and non-living things? (4) • What changes are caused by the movements of Earth and the moon? (4)	• local changes caused by Earth's axis, rotation, and orbit (4) • features of biomes (4) • the relationship between the sun and the moon (4)

Grades 4/5

	Big Ideas	Inquiry Questions	Content
Biology	All living things and their environment are interdependent. (4)	• How do living things sense, respond, and adapt to stimuli in their environment? (4) • What evidence is there of interdependence between living and non-living things in ecosystems? (4)	• the ways organisms in ecosystems sense and respond to their environment (4)

Biology	Multicellular organisms have organ systems that enable them to survive and interact within their environment. (5)	• How do organ systems interact with one another? (5)
		• How do organ systems interact with their environment to meet basic needs? (5)
			• basic structures and functions of body systems (5):
			  ○ digestive
			  ○ excretory
			  ○ respiratory
			  ○ circulatory

Chemistry	Matter has mass, takes up space, and can change phase. (4) Solutions are homogeneous mixtures. (5)	• How can you explore the phases of matter? (4) • How does matter change phases? (4) • How does heating and cooling affect phase changes? (4) • What are homogeneous solutions? (5)	• solids, liquids, and gases as matter (4) • the effect of temperature on pressure in a gas (4) • solutions and solubility (5)

Physics	Energy comes in a variety of forms that can be transferred from one object to another. (4)
	
	Machines are devices that transfer force and energy. (5)
		• What is energy input and energy output? (4)
		• What is energy conservation? (4)
		• What is the relationship between energy input, output, and conservation? (5)
		• How do machines (natural and human-made) transfer force and energy? (5)
		• What natural machines can you identify in your local environment? (5)
			• Energy (4):
			  ○ has various forms
			  ○ is conserved
			• devices that transform energy (4)
			• properties of simple machines and their force effects (5)
			• machines (5):
			  ○ constructed
			  ○ found in nature
			• power - the rate at which energy is transformed (5)

Grades 4/5

	Big Ideas	Inquiry Questions	Content
Earth & Space	The motion of Earth and the moon cause observable patterns that affect living and non-living systems (4)	• How do seasons and tides affect living and non-living things? (4) • What changes are caused by the movements of Earth and the moon? (4)	• local changes caused by Earth's axis, rotation, and orbit (4) • features of biomes (4) • the relationship between the sun and the moon (4)
Earth & Space	Humans use earth materials as natural resources. (5)	• How do we interact with water, rocks, minerals, soils, and plants? (5) • Why is Earth considered a closed material system? (5)	• local types of rock materials • rock cycle (5) • Aboriginal concept of interconnectedness in the environment (5) • the nature of sustainable practices around BC's living and non-living resources (5)

Grades 5/6

	Big Ideas	Inquiry Questions	Content

Biology	Multicellular organisms have organ systems that enable them to survive and interact within their environment. (5)
	
	Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment. (6)
		• How do organ systems interact with one another? (5)
		• How do organ systems interact with their environment to meet basic needs? (5)
		• How are internal systems necessary for survival? (6)
		• What do your body systems require for survival? (6)
		• How do your body systems interact with one another? (6)
			• basic structures and functions of body systems (5):
			  ○ digestive
			  ○ excretory
			  ○ respiratory
			  ○ circulatory
			• the basic structures and functions of body systems (6):
			  ○ musculoskeletal
			  ○ reproductive
			  ○ hormonal
			  ○ nervous

Chemistry	Solutions are homogeneous mixtures. (5) Everyday materials are often homogeneous solutions and heterogeneous mixtures. (6)	• How does heating and cooling affect phase changes? (5) • What are homogeneous solutions? (5) • What is a heterogeneous mixture? (6) • How does it compare to a homogeneous (solution) mixture? (6)	• solids, liquids, and gases as matter (5) • the effect of temperature on pressure in a gas (5) • solutions and solubility (5) • heterogeneous mixtures (6) • mixtures - separated using a difference in component properties (6)

Grades 5/6

	Big Ideas	Inquiry Questions	Content

Physics	Machines are devices that transfer force and energy. (5)
	
	Newton's three laws of motion describe the relationship between force and motion. (6)
		• What is the relationship between energy input, output, and conservation? (5)
		• How do machines (natural and human-made) transfer force and energy? (5)
		• What natural machines can you identify in your local environment? (5)
		• What is the difference between motion caused by balanced forces and motion caused by unbalanced forces? (6)
		• How are balanced and unbalanced forces evident in your life and activities? (6)
			• properties of simple machines and their force effects (5)
			• machines (5):
			  ○ constructed
			  ○ found in nature
			• power - the rate at which energy is transformed (5)
			• Newton's three laws of motion (6)
			• effects of balanced and unbalanced forces in daily physical activities (6)
			• force of gravity (6)

Earth & Space	Humans use earth materials as natural resources. (5)	• How do we interact with water, rocks, minerals, soils, and plants? (5) • Why is Earth considered a closed material system? (5)	• local types of rock materials • rock cycle (5) • Aboriginal concept of interconnectedness in the environment (5) • the nature of sustainable practices around BC's living and non-living resources (5)
Earth & Space	The solar system is part of the Milky Way, which is one of billions of galaxies. (6)	• What are the relationships between Earth and the rest of the universe? (6) • What is an extreme environment? (6) • What extreme environments exist on Earth or in our galaxy? (6)	• The overall scale, structure, and age of the universe (6) • the position, motion, and components of our solar system in our galaxy (6) • extreme environments exist on Earth and in the solar system (6)

Grades 6/7

	Big Ideas	Inquiry Questions	Content

Biology	Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment. (6)	• How are internal systems necessary for survival? (6)
		• What do your body systems require for survival? (6)
		• How do your body systems interact with one another? (6)
			• the basic structures and functions of body systems (6):
			  ○ musculoskeletal
			  ○ reproductive
			  ○ hormonal
			  ○ nervous

Biology	The theory of evolution by natural selection provides an explanation for the diversity and survival of living things. (7)	• How do ecosystems and Earth systems change over time? (7) • How do these changes affect biodiversity? (7)	• natural selection through adaptive radiation - a proposed mechanism of the theory of evolution (7) • survival needs and interactions between organisms and the environment (7)
Chemistry	Everyday materials are often homogeneous solutions and heterogeneous mixtures. (6) Elements consist of one type of atom, and compounds consist of atoms of different elements chemically combined (7)	• What is a heterogeneous mixture? (6) • How does it compare to a homogeneous (solution) mixture? (6) • TBA (7)	• heterogeneous mixtures (6) • mixtures - separated using a difference in component properties (6) • Elements and compounds are substances (7) • Chemical changes (7) • Crystalline structure of solids (7)
Physics	Newton's three laws of motion describe the relationship between force and motion. (6)	• What is the difference between motion caused by balanced forces and motion caused by unbalanced forces? (6) • How are balanced and unbalanced forces evident in your life and activities? (6)	• Newton's three laws of motion (6) • effects of balanced and unbalanced forces in daily physical activities (6) • force of gravity (6)
Physics	The electromagnetic force produces both electricity and magnetism. (7)	• How is electricity generated? (7) • What is the relationship between electricity and magnetism? (7)	• electricity — generated in different ways with different environmental impacts (7) • electricity — used to generate magnetism (7)

Grades 6/7

	Big Ideas	Inquiry Questions	Content
Earth & Space	The solar system is part of the Milky Way, which is one of billions of galaxies. (6)	• What are the relationships between Earth and the rest of the universe? (6) • What is an extreme environment? (6) • What extreme environments exist on Earth or in our galaxy? (6)	• The overall scale, structure, and age of the universe (6) • the position, motion, and components of our solar system in our galaxy (6) • extreme environments exist on Earth and in the solar system (6)
Earth & Space	Earth and its climate have changed over geological time. (7)	• How and why have Earth and its climate changed over time? (7) • How do people and their practices impact Earth and its climate? (7)	• fossil records and geological dating (7) • evidence of climate change over geological time and the recent impacts of humans (7)