**Navigating the Revised Science Curriculum**

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

***(Draft: May 2016)***

***A Science Implementation Tool***

*Created By*

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***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*](http://www.nsta.org/about/positions/inquiry.aspx)

**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**

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|  | **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)
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|  | **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)
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**Grades K/1**

**Grades 1/2**

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|  | **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)
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|  | **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)
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**Grades 1/2**

**Grades 2/3**

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|  | **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 matteris 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)
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**Grades 3/4**

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|  | **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 matteris 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)
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|  | **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)
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**Grades 3/4**

**Grades 4/5**

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|  | **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)
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|  | **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)
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**Grades 4/5**

**Grades 5/6**

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|  | **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)
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|  | **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)
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**Grades 5/6**

**Grades 6/7**

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|  | **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)
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**Grades 6/7**

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| --- | --- | --- | --- |
|  | **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)
 |