DRAFT

Scope and Sequence – British Columbia Science 6

Welcome to the outline of HCOS's Science 6 curriculum!

In this document, you will find the Biblical Attributes that underpin each module, as well as the correlation for the core competencies, the curricular competencies and the specific content outcomes for each of the modules, Earth Science, Physics, Chemistry and Biology. Included is a table that summarizes where each of the curricular competencies are found so you can see where they are all covered within the course.

First, we'd like to offer a brief synopsis of each module, explaining the rationale and the project that is interwoven into each unit. Then you will find the particulars following those. We hope you enjoy your Science course! As always, if there are any questions or concerns please don't hesitate to reach out to us!

The HCOS Team

Earth Science
Come explore our universe, created and held in the palm of God's hand. Students will enjoy journeying throughout this vast space. With a focus on the Milky Way and its parts, this unit starts off with an extreme environment on Earth that bridges the gap between Earth and Space. We then move beyond Earth to explore the planets and other components of the Universe. Along the way students will be creating a Survival Guide which will help anyone know what is needed to survive in these different extremes, or if it is even possible!

Biology
Eww! Gross! This unit is sure to be a favorite for students as we explore our amazingly designed human bodies and discuss why 'gross' isn't gross, but is totally natural and expected! Students will compile reports, interview adults, write speeches, draw comic strips and in the end, compile a book entitled 'A Teen's Guide to the Gross and Glorious Human Body'.

Physics
The laws have changed – it's no longer a requirement for adults to wear seatbelts, but is this the right choice? We'll explore Newton's Three laws of Physics, and apply them to the idea of cars and seatbelts to determine if it's a wise choice to wear or not wear a seatbelt. In the end, students will become an activist for their choice and should be able to defend their choices based on the labs, results and information they've learned through the module.

Chemistry
Do we have any food lovers? Whether you are or you aren't, we all need food to survive, and even better if it tastes good! Students will apply their Chemistry learning to create a cookbook called, Mix-It-Up – Cooking with Chemistry, involving both homogeneous and heterogeneous mixtures, as well as separated mixtures. Maybe by the end of this module students will be able to cook dinner?

Scope and Sequence Legend	
Green Text	Video or Multimedia Components of the course. These could be animated or instructional videos and interaction pieces such as a simulation.
Italic Text	Project components vary from module to module. Some components are video based, text based or printable PDF's.

DRAFT

Heritage Christian Online School

Curricular Competencies Overview				
	Module:			
Questioning and Predicting	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Demonstrate a sustained curiosity about a scientific topic or problem of personal interest	x	x	x	
Make observations in familiar or unfamiliar contexts	x		x	
Identify questions to answer or problems to solve through scientific inquiry			x	
Make predictions about the findings of their inquiry		x	x	x
Planning and Conduction	**Earth Science**	**Biology**	**Physics**	**Chemistry**
With support, plan appropriate investigations to answer their questions or solve problems they have identified	x		x	x
Decide which variable should be changed and measured for a fair test			x	
Choose appropriate data to collect to answer their questions	x		x	
Observe, measure, and record data, using appropriate tools, including digital technologies			x	
Use equipment and materials safely, identifying potential risks			x	x
Processing and Analyzing Data and Information	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Experience and interpret the local environment	x			
Identify First Peoples perspectives and knowledge as sources of information	x		x	x
Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data	x		x	x
Identify patterns and connections in data			x	
Compare data with predictions and develop explanations for results			x	x
Demonstrate an openness to new ideas and consideration of alternatives	x	x	x	
Evaluating	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Evaluate whether their investigations were fair tests			x	
Identify possible sources of error			x	x
Suggest improvements to their investigation methods			x	x
Identify some of the assumptions in secondary sources			x	
Demonstrate an understanding and appreciation of evidence		x	x	
Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations			x	
Applying and Innovating	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Contribute to care for self, others, and community through personal or collaborative approaches		x	x	
Co-operatively design projects	x	x		
Transfer and apply learning to new situations	x		x	x
Generate and introduce new or refined ideas when problem solving		x		
Communicating	**Earth Science**	**Biology**	**Physics**	**Chemistry**
Communicate ideas, explanations, and processes in a variety of ways	x	x	x	x
Express and reflect on personal, shared, or others' experiences of place		x	x	

DRAFT

Heritage Christian Online School

Earth Science:
Come explore our universe, created and held in the palm of God's hand. Students will enjoy journeying throughout this vast space. With a focus on the Milky Way and its parts, this unit starts off with an extreme environment on Earth that bridges the gap between Earth and Space. We then move beyond Earth to explore the planets and other components of the Universe. Along the way students will be creating a Survival Guide which will help anyone know what is needed to survive in these different extremes, or if it is even possible!

Big Ideas: The solar system is part of the Milky Way, which is one of billions of galaxies.

Biblical Attributes:
Worship: in awe of God - Students will revel in the wonder for God's beauty, power, person, and goodness in creation and history; His work in the world and their own lives.
Steward: take care **-** Students will learn about humanity's role in creation.

Lesson Name	Lesson Activities	Core Competency	Curricular Competency	Content Outcome
Introduction to Survival	What is Extreme? Water Food Shelter *Activity: Project Survival Guide* StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) T Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	

Ocean Extreme	Ocean Exploration *Project: Survival Guide* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries)  Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas  Personal and Social - Contributing to community and caring for the environment - Solving problems in peaceful ways	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the position, motion, and components of our solar system in our galaxy - extreme environments including contributions of Canadians to exploration technologies (e.g., Canadarm, Newt Suit, VENUS and NEPTUNE programs)

Technology in Exploration	Robots Big Robots Telescopes Travel Systems Assignment: Design a Robot StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) T Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the position, motion, and components of our solar system in our galaxy - extreme environments including contributions of Canadians to exploration technologies (e.g., Canadarm, Newt Suit, VENUS and NEPTUNE programs)
Explore the Universe	The Universe What is Space? The Big Bang In the Beginning StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) T Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the overall scale, structure, and age of the universe

Survival in Space	ISS – Cooperation at it's Finest Assignment: Is Space Exploration Worth it? *Project: Survival Guide* StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) T Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the position, motion, and components of our solar system in our galaxy - extreme environments including contributions of Canadians to exploration technologies (e.g., Canadarm, Newt Suit, VENUS and NEPTUNE programs)
Earth and Moon	Rotations and Revolutions Earth Moon Eclipses *Project: Survival Guide* StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) T Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the overall scale, structure, and age of the universe the position, motion, and components of our solar system in our galaxy - planets, moons, asteroids, meteors, comets, etc.

Modeling	Activity: Modeling Rotations and Revolutions	C Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities - Explain/recount and reflect on experiences and accomplishments T Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Make observations in familiar or unfamiliar contexts Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data Communicate ideas, explanations, and processes in a variety of ways	
Sun and Stars	The Solar System Sun Stars Activity: Sun Dial *Project: Survival Guide* StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) T Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the overall scale, structure, and age of the universe the position, motion, and components of our solar system in our galaxy - planets, moons, asteroids, meteors, comets, etc.

Inner Planets	Light Year and AU Mars Mercury Venus *Project: Survival Guide* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries)  Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the overall scale, structure, and age of the universe the position, motion, and components of our solar system in our galaxy - planets, moons, asteroids, meteors, comets, etc.
Outer Planets	Asteroids and Meteors Jupiter Saturn *Project: Survival Guide* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries)  Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the overall scale, structure, and age of the universe the position, motion, and components of our solar system in our galaxy - planets, moons, asteroids, meteors, comets, etc.

More Outer Planets	Uranus Neptune Pluto *Project: Survival Guide* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries)  Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations	the overall scale, structure, and age of the universe the position, motion, and components of our solar system in our galaxy - planets, moons, asteroids, meteors, comets, etc.
Comets, Black Holes, and Other Things in Space	Comets Black Holes Dark Matter *Project: Survival Guide* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries)  Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations Demonstrate an openness to new ideas and consideration of alternatives	the overall scale, structure, and age of the universe the position, motion, and components of our solar system in our galaxy - planets, moons, asteroids, meteors, comets, etc.

Space in Culture	Aurora Borealis Cultural Connection Astronomy vs Astrology *Project: Survival Guide* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries)  Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Developing Ideas  Personal and Social Positive Personal and Cultural Identity - Relationships and cultural contexts Social Responsibility - Valuing diversity	With support, plan appropriate investigations to answer their questions or solve problems they have identified Choose appropriate data to collect to answer their questions Transfer and apply learning to new situations Experience and interpret the local environment Identify First Peoples perspectives and knowledge as sources of information	the overall scale, structure, and age of the universe the position, motion, and components of our solar system in our galaxy - First Peoples perspectives regarding aurora borealis and other celestial phenomena

Project Wrap Up	Activity: Finish Your Survival Guide	 Communication - Acquire, interpret and present information (includes inquiries)  Thinking Critical Thinking - Develop and design Creative Thinking - Novelty and value - Generating Ideas - Developing Ideas	Communicate ideas, explanations, and processes in a variety of ways	

DRAFT

Heritage Christian Online School

Biology:
Eww! Gross! This unit is sure to be a favorite for students as we explore our amazingly designed human bodies and discuss why 'gross' isn't gross, but is totally natural and expected! Students will compile reports, interview adults, write speeches, draw comic strips and in the end, compile a book entitled 'A Teen's Guide to the Gross and Glorious Human Body'.

Big Ideas: Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment.

Biblical Attributes:
Assurance: rest assured **-** Students will encounter the certainty of God's enduring love, protection, provision and dominion.
Worship: in awe of God **-** Students will revel in the wonder for God's beauty, power, person, and goodness in creation and history; His work in the world and their own lives.
Servant: love others - Students will understand their personal worth in the value structure of God's kingdom- one where humility, service, and self giving are beautiful and good.
Steward: take care **-** Students will learn about humanity's role in creation.

Lesson Name	Lesson Activities	Core Competency	Curricular Competency	Content Outcome
What is Grossology? The Benefits of Awareness and Communication	Introduction *Your Project* Communication in Our Bodies *Project: A Teen's Guide to the Gross and Glorious Human Body*		Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Make predictions about the findings of their inquiry	
Different Parts and Their Functions	The Excretory System Parts and Functions The Urinary System Activity: Try It! Urine Investigation StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities - Explain/recount and reflect on experiences and accomplishments  Thinking Critical Thinking - Analyze and critique - Question and investigate	Communicate ideas, explanations, and processes in a variety of ways	the basic structures and functions of body systems: excretory - kidneys, ureters, bladder, etc.

Constipation and Diarrhea	Constipation Diarrhea Farts Pee Vomit Poop Factory Activity: Try This! Gross Feast	 Personal and Social - Well-being Positive Personal and Cultural Identity - Personal values and choices	Contribute to care for self, others, and community through personal or collaborative approaches Demonstrate an understanding and appreciation of evidence	the basic structures and functions of body systems: excretory - kidneys, ureters, bladder, etc.
Sweat, BO and Acne	Puberty Introduction Sweat and BO Acne *Project: A Teen's Guide to the Gross and Glorious Human Body*	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities - Explain/recount and reflect on experiences and accomplishments	Communicate ideas, explanations, and processes in a variety of ways	the basic structures and functions of body systems: excretory - kidneys, ureters, bladder, etc. hormonal - chemical messengers in the body (e.g., insulin, adrenalin)

Heritage Christian Online School

Lifespan Development: Changes During Puberty	Introduction to Development Changes During Puberty – Female Changes During Puberty – Male Know What's Normal *Project: A Teen's Guide to the Gross and Glorious Human Body - Interview*	C Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities - Explain/recount and reflect on experiences and accomplishments PS Personal and Social - Well-being Positive Personal and Cultural Identity - Personal values and choices Social Responsibility - Building relationships	Communicate ideas, explanations, and processes in a variety of ways Express and reflect on personal, shared, or others' experiences of **place** Contribute to care for self, others, and community through personal or collaborative approaches	the basic structures and functions of body systems: hormonal - chemical messengers in the body (e.g., insulin, adrenalin)
Brain Function	Introduction to the Nervous System Parts and Functions of the Brain Tour of the Brain Keeping the Brain out of Grossology Interactive: Memory Game StudyForge Practice Questions	T Thinking Critical Thinking - Analyze and critique - Question and investigate	Demonstrate an openness to new ideas and consideration of alternatives	the basic structures and functions of body systems: nervous - brain, spinal cord, etc.; role of receptors — the brain interprets the signals received and can make mistakes (e.g., optical illusions) in those interpretations
Nerves and Signals	Introduction to Nerves Parts and Functions of Nerves Receptors Activity: Try This! Light Receptors StudyForge Practice Questions	T Thinking Critical Thinking - Analyze and critique - Question and investigate		the basic structures and functions of body systems: nervous - brain, spinal cord, etc.; role of receptors — the brain interprets the signals received and can make mistakes (e.g., optical illusions) in those interpretations

Heritage Christian Online School

Brain Development: Changes During Puberty	Introduction to Brain Changes in Puberty Brain Changes in Puberty *Project: A Teen's Guide to the Gross and Glorious Human Body – Speech to Adults*	 Thinking Critical Thinking - Analyze and critique - Question and investigate	Communicate ideas, explanations, and processes in a variety of ways	the basic structures and functions of body systems: nervous - brain, spinal cord, etc.; role of receptors — the brain interprets the signals received and can make mistakes (e.g., optical illusions) in those interpretations
Parts and Functions: What are Hormones?	Parts and Functions of Hormones Hormones Interactive: Endocrine and the Mail System StudyForge Practice Questions			the basic structures and functions of body systems: hormonal - chemical messengers in the body (e.g., insulin, adrenalin)
Lifespan Development: Changes During Puberty (Moods and PMS)	How are Hormones Involved in Puberty? Moods and PMS *Project: A Teen's Guide to the Gross and Glorious Human Body – Body Comic Strip*	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities Explain/recount and reflect on experiences and accomplishments	Communicate ideas, explanations, and processes in a variety of ways	the basic structures and functions of body systems: hormonal - chemical messengers in the body (e.g., insulin, adrenalin)
Female Reproductive System	Introduction to the Female Reproductive System Female Reproductive Parts Periods Making a Baby StudyForge Practice Questions			the basic structures and functions of body systems: reproductive - ovaries, testes, etc.

Male Reproductive System	Introduction to the Male Reproductive System Male Reproductive Parts Semen StudyForge Practice Questions *Project: A Teen's Guide to the Gross and Glorious Human Body – Ranking System*	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities Explain/recount and reflect on experiences and accomplishments	Communicate ideas, explanations, and processes in a variety of ways	the basic structures and functions of body systems: reproductive - ovaries, testes, etc.
Lifespan Development: Changes During Puberty	Attraction *Project: A Teen's Guide to the Gross and Glorious Human Body – Puberty Survival Kit*	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities Explain/recount and reflect on experiences and accomplishments	Communicate ideas, explanations, and processes in a variety of ways	the basic structures and functions of body systems: reproductive - ovaries, testes, etc. hormonal - chemical messengers in the body (e.g., insulin, adrenalin) First People's understandings of body systems in humans and animals
Wrap Up	Taking Gross out of Grossology *Project: A Teen's Guide to the Gross and Glorious Human Body – Taking Gross out of Grossology*	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities Explain/recount and reflect on experiences and accomplishments	Communicate ideas, explanations, and processes in a variety of ways Demonstrate an openness to new ideas and consideration of alternatives	

DRAFT

Heritage Christian Online School

Physics:
The laws have changed – it's no longer a requirement for adults to wear seatbelts, but is this the right choice? We'll explore Newton's Three laws of Physics, and apply them to the idea of cars and seatbelts to determine if it's a wise choice to wear or not wear a seatbelt. In the end, students will become an activist for their choice and should be able to defend their choices based on the labs, results and information they've learned through the module.

Big Ideas: Newton's three laws of motion describe the relationship between force and motion.

Biblical Attributes:
Steward: take care - Students will learn about humanity's role in creation.
Community: be the connection - Students will discover that they are part of a living and growing organic whole. They'll discover how they were uniquely made to serve as a part of this whole and they'll discover and affirm gifts and skills in others.

Lesson Name	Lesson Activities	Core Competency	Curricular Competency	Content Outcome
Introduction	*Newscast – Seatbelts* *Project: Initial Responses* Activity: Profile of an Activist	PS Personal and Social Social Responsibility - Contributing to community and caring for the environment Positive Personal and Cultural Identity - Personal values and choices C Communication - Explain/recount and reflect on experiences and accomplishments	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Identify questions to answer or problems to solve through scientific inquiry Identify First Peoples perspectives and knowledge as sources of information Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations Express and reflect on personal, shared, or others' experiences of **place** Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Make observations in familiar or unfamiliar contexts Transfer and apply learning to new situations	

What is Force?	Forces Measuring Forces Interactive: Tug of War Interactive: Balloons StudyForge Practice Questions	 Thinking Creative Thinking - Developing Ideas	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Make observations in familiar or unfamiliar contexts Transfer and apply learning to new situations	Newton's three laws of motion - first law: objects will stay stopped or in constant motion until acted upon by an outside force Force of gravity - gravity is the force of attraction between objects that pulls all objects toward each other - on Earth, gravity pulls objects toward the centre of the planet (e.g., falling objects, egg drop)
Forces in a Car	*Project: Seatbelt Exploration* Activity: Profile of an Activist	 Personal and Social Social Responsibility - Contributing to community and caring for the environment Positive Personal and Cultural Identity - Personal values and choices  Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Make observations in familiar or unfamiliar contexts Make predictions about the findings of their inquiry Identify First Peoples perspectives and knowledge as sources of information Compare data with predictions and develop explanations for results Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations Transfer and apply learning to new situations	Newton's three laws of motion - first law: objects will stay stopped or in constant motion until acted upon by an outside force

Newton's First Law	Newton's First Law Activity: Try This! Paper and Coin Activity: Try This! Rolling Egg StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Make observations in familiar or unfamiliar contexts Make predictions about the findings of their inquiry Identify First Peoples perspectives and knowledge as sources of information Compare data with predictions and develop explanations for results Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations Transfer and apply learning to new situations	Newton's three laws of motion - first law: objects will stay stopped or in constant motion until acted upon by an outside force

Seatbelt Lab	*Seatbelts* *Project: Seatbelt Lab*	 Personal and Social Social Responsibility - Contributing to community and caring for the environment Positive Personal and Cultural Identity - Personal values and choices  Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities  Thinking Critical Thinking - Question and investigate - Develop and design	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Identify questions to answer or problems to solve through scientific inquiry Make predictions about the findings of their inquiry With support, plan appropriate investigations to answer their questions or solve problems they have identified Observe, measure, and record data, using appropriate tools, including digital technologies Use equipment and materials safely, identifying potential risks Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data Identify patterns and connections in data Compare data with predictions and develop explanations for results Evaluate whether their investigations were fair tests Identify possible sources of error Suggest improvements to their investigation methods Communicate ideas, explanations, and processes in a variety of ways	Newton's three laws of motion - first law: objects will stay stopped or in constant motion until acted upon by an outside force

Inertia in a Car	*Project: Inertia in a Car*	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities  Thinking Critical Thinking - Question and investigate - Develop and design	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Decide which variable should be changed and measured for a fair test Compare data with predictions and develop explanations for results Identify First Peoples perspectives and knowledge as sources of information Demonstrate an openness to new ideas and consideration of alternatives Transfer and apply learning to new situations Express and reflect on personal, shared, or others' experiences of **place**	Newton's three laws of motion - first law: objects will stay stopped or in constant motion until acted upon by an outside force

Newton's Second Law	Introduction to Newton's Second Law Snowball Baseball Activity: Exploration to Newton's Second Law StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries)  Thinking Critical Thinking 1. Analyze and critique 2. Question and investigate	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Make observations in familiar or unfamiliar contexts Observe, measure, and record data, using appropriate tools, including digital technologies Use equipment and materials safely, identifying potential risks Identify possible sources of error Demonstrate an understanding and appreciation of evidence Transfer and apply learning to new situations	Newton's three laws of motion - second law: only an unbalanced force causes acceleration

Mass is Related to Force	*Project: Seatbelts: Mass is Related to Force* Activity – Profile of an Activist	 Personal and Social Social Responsibility - Contributing to community and caring for the environment Positive Personal and Cultural Identity - Personal values and choices  Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities  Thinking Critical Thinking - Question and investigate - Develop and design	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Compare data with predictions and develop explanations for results Identify First Peoples perspectives and knowledge as sources of information Demonstrate an openness to new ideas and consideration of alternatives Transfer and apply learning to new situations Express and reflect on personal, shared, or others' experiences of **place**	Newton's three laws of motion - second law: only an unbalanced force causes acceleration

Newton's Third Law	Actions and Reactions Activity: Try this! Rulers and Coins StudyForge Practice Questions		Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Make observations in familiar or unfamiliar contexts Observe, measure, and record data, using appropriate tools, including digital technologies Use equipment and materials safely, identifying potential risks Identify possible sources of error Demonstrate an understanding and appreciation of evidence Transfer and apply learning to new situations	Newton's three laws of motion - third law: every force has an equal and opposite reaction force effects of balanced and unbalanced forces in daily physical activities - balanced forces are equal and opposite forces (e.g., sitting in a chair) - unbalanced forces are unequal; one force is larger (e.g., race cars on different ramps, mousetrap cars, rockets)

Balloon Propeller	Activity: Balloon Propeller Lab		Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Identify questions to answer or problems to solve through scientific inquiry Make predictions about the findings of their inquiry With support, plan appropriate investigations to answer their questions or solve problems they have identified Observe, measure, and record data, using appropriate tools, including digital technologies Use equipment and materials safely, identifying potential risks Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data Identify patterns and connections in data Compare data with predictions and develop explanations for results Evaluate whether their investigations were fair tests Identify possible sources of error Suggest improvements to their investigation methods	Newton's three laws of motion - third law: every force has an equal and opposite reaction force effects of balanced and unbalanced forces in daily physical activities - balanced forces are equal and opposite forces (e.g., sitting in a chair) - unbalanced forces are unequal; one force is larger (e.g., race cars on different ramps, mousetrap cars, rockets)

			Communicate ideas, explanations, and processes in a variety of ways	
Action and Reaction Forces	*Project: Action and Reaction Forces in Collisions*	 Personal and Social Social Responsibility - Contributing to community and caring for the environment Positive Personal and Cultural Identity - Personal values and choices  Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities  Thinking Critical Thinking - Question and investigate - Develop and design	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Compare data with predictions and develop explanations for results Identify First Peoples perspectives and knowledge as sources of information Demonstrate an openness to new ideas and consideration of alternatives Transfer and apply learning to new situations Express and reflect on personal, shared, or others' experiences of **place**	Newton's three laws of motion - third law: every force has an equal and opposite reaction force

Your Argument	*Seatbelt Newscast* Newton's Three Laws *Project: Outline Your Argument*	 Personal and Social Social Responsibility - Contributing to community and caring for the environment Positive Personal and Cultural Identity - Personal values and choices  Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities  Thinking Critical Thinking - Question and investigate - Develop and design	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Identify questions to answer or problems to solve through scientific inquiry Choose appropriate data to collect to answer their questions Compare data with predictions and develop explanations for results Demonstrate an understanding and appreciation of evidence Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations Contribute to care for self, others, and community through personal or collaborative approaches Transfer and apply learning to new situations Communicate ideas, explanations, and processes in a variety of ways	Newton's three laws of motion - first law: objects will stay stopped or in constant motion until acted upon by an outside force - second law: only an unbalanced force causes acceleration - third law: every force has an equal and opposite reaction force effects of balanced and unbalanced forces in daily physical activities - balanced forces are equal and opposite forces (e.g., sitting in a chair) - unbalanced forces are unequal; one force is larger (e.g., race cars on different ramps, mousetrap cars, rockets)

Become an Activist	*Project: Become an Activist*	 Personal and Social Social Responsibility - Contributing to community and caring for the environment Positive Personal and Cultural Identity - Personal values and choices  Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities  Thinking Critical Thinking - Question and investigate - Develop and design	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Identify questions to answer or problems to solve through scientific inquiry Choose appropriate data to collect to answer their questions Compare data with predictions and develop explanations for results Demonstrate an understanding and appreciation of evidence Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations Contribute to care for self, others, and community through personal or collaborative approaches Transfer and apply learning to new situations Communicate ideas, explanations, and processes in a variety of ways	Newton's three laws of motion - first law: objects will stay stopped or in constant motion until acted upon by an outside force - second law: only an unbalanced force causes acceleration - third law: every force has an equal and opposite reaction force effects of balanced and unbalanced forces in daily physical activities - balanced forces are equal and opposite forces (e.g., sitting in a chair) - unbalanced forces are unequal; one force is larger (e.g., race cars on different ramps, mousetrap cars, rockets)

Final Project	*Project: Become an Activist*	 Thinking Critical Thinking - Analyze and critique - Question and investigate  Personal and Social Positive Personal and Cultural Identity - Personal values and choices Social Responsibility - Contributing to community and caring for the environment - Solving problems in peaceful ways	Demonstrate a sustained curiosity about a scientific topic or problem of personal interest Identify questions to answer or problems to solve through scientific inquiry Choose appropriate data to collect to answer their questions Compare data with predictions and develop explanations for results Demonstrate an understanding and appreciation of evidence Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations Contribute to care for self, others, and community through personal or collaborative approaches Transfer and apply learning to new situations Communicate ideas, explanations, and processes in a variety of ways	Newton's three laws of motion - first law: objects will stay stopped or in constant motion until acted upon by an outside force - second law: only an unbalanced force causes acceleration - third law: every force has an equal and opposite reaction force effects of balanced and unbalanced forces in daily physical activities - balanced forces are equal and opposite forces (e.g., sitting in a chair) - unbalanced forces are unequal; one force is larger (e.g., race cars on different ramps, mousetrap cars, rockets)

DRAFT

Heritage Christian Online School

Chemistry:
Do we have any food lovers? Whether you are or you aren't, we all need food to survive, and even better if it tastes good! Students will apply their Chemistry learning to create a cookbook called, Mix-It-Up – Cooking with Chemistry, involving both homogeneous and heterogeneous mixtures, as well as separated mixtures. Maybe by the end of this module students will be able to cook dinner?

Big Ideas: Everyday materials are often mixtures.

Biblical Attributes:
Restoration: help and heal - We are agents of restoration and reconciliation, rebuilding the dignity that God intended

Lesson Name	Lesson Activities	Core Competency	Curricular Competency	Content Outcome
Mixtures All Around You	Introduction to Mixtures First Nations Maple Syrup Extraction *Cooking Chemistry* Activity: Mixture Hunt Activity: Try This! Separating Eggs *Make it: Fruit Salad* StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities PS Personal and Social Positive Personal and Cultural Identity - Relationships and cultural contexts Social Responsibility - Valuing diversity	Transfer and apply learning to new situations Use equipment and materials safely, identifying potential risks Identify First Peoples perspectives and knowledge as sources of information	mixtures: separated using a difference in component properties - density (e.g., centrifuge or settling, silt deposits in a river delta, tailings ponds, Roman aqueduct settling sections) - particle size (e.g., sieves, filters)

Particle Theory Review	Particle Theory Types of Mixtures Activity: Create a Model StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries) Collaborate to plan, carry out, and review constructions and activities  Thinking Creative Thinking Generating Ideas - Developing Ideas Critical Thinking Question and investigate - Develop and design	Communicate ideas, explanations, and processes in a variety of ways	heterogeneous mixtures - suspensions (e.g., salad dressing), emulsions (e.g., milk), colloids (e.g., aerosols)
Homogeneous Mixtures	Homogeneous Mixtures Solutions First Nations Maple Syrup Extraction *Make it : Iced Tea* StudyForge Practice Questions	 Personal and Social Positive Personal and Cultural Identity - Relationships and cultural contexts Social Responsibility - Valuing diversity	Identify First Peoples perspectives and knowledge as sources of information Use equipment and materials safely, identifying potential risks	

Heterogenous Mixtures and Suspensions	Heterogeneous Mixtures Suspensions *Make it: Suspensions* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities	Use equipment and materials safely, identifying potential risks	heterogeneous mixtures - suspensions (e.g., salad dressing), emulsions (e.g., milk), colloids (e.g., aerosols)
Colloids	Colloids *Make it: Jell-O* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities	Use equipment and materials safely, identifying potential risks	heterogeneous mixtures - suspensions (e.g., salad dressing), emulsions (e.g., milk), colloids (e.g., aerosols)
Emulsions	Emulsions *Make it: Mayonnaise* StudyForge Practice Questions	 Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities	Use equipment and materials safely, identifying potential risks	heterogeneous mixtures - suspensions (e.g., salad dressing), emulsions (e.g., milk), colloids (e.g., aerosols)

Medicines	Common Medicines First Nations Extractions *Make it: Food Coloring* StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities PS Personal and Social Positive Personal and Cultural Identity - Relationships and cultural contexts Social Responsibility - Valuing diversity	Identify First Peoples perspectives and knowledge as sources of information Use equipment and materials safely, identifying potential risks	local First Peoples knowledge of separation and extraction methods - historical and current First Peoples use of separation and extraction methods (e.g., eulachon oil, extraction of medicines from plants, pigments, etc.)
Separating Mixtures	Quiz – Mixtures Introduction to Mixture Separation Ways to Separate Homogeneous Mixtures StudyForge Practice Questions			separated using a difference in component properties

Density	Density StudyForge Practice Questions	T Thinking Creative Thinking - Generating Ideas Critical Thinking - Analyze and critique Question and investigate - Develop and design	Make predictions about the findings of their inquiry With support, plan appropriate investigations to answer their questions or solve problems they have identified Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data Compare data with predictions and develop explanations for results	separated using a difference in component properties - density (e.g., centrifuge or settling, silt deposits in a river delta, tailings ponds, Roman aqueduct settling sections)
Density Lab	How to Separate Mixtures Based on Density Making Gravy Activity: Try This! Does it Float? StudyForge Questions	C Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities	Observe, measure, and record data, using appropriate tools, including digital technologies Identify possible sources of error Suggest improvements to their investigation methods Use equipment and materials safely, identifying potential risks	separated using a difference in component properties - density (e.g., centrifuge or settling, silt deposits in a river delta, tailings ponds, Roman aqueduct settling sections)
Particle Size	Sieves and Filters Making Applesauce The Juicer *Make it: Cheese* StudyForge Practice Questions	C Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities	Use equipment and materials safely, identifying potential risks	separated using a difference in component properties - particle size (e.g., sieves, filters)

Jelly or Jam	*Make it: Jelly Part One*	C Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities PS Personal and Social Personal Awareness and Responsibility - Self-determination	Transfer and apply learning to new situations Use equipment and materials safely, identifying potential risks	
Final Recipe	*Make it: Jelly Part Two*	C Communication - Acquire, interpret and present information (includes inquiries) - Collaborate to plan, carry out, and review constructions and activities PS Personal and Social Personal Awareness and Responsibility - Self-determination	Transfer and apply learning to new situations Use equipment and materials safely, identifying potential risks	

Finish Your Cookbook	*Finish Your Cook Book!*	 Communication - Collaborate to plan, carry out, and review constructions and activities	Communicate ideas, explanations, and processes in a variety of ways	