Long Range Model 2 - Grade 2

STRAND A: STEM Skills and Connections	 A1.1 Scientific Research	 A1.2 Scientific Experimentation	 A1.3 Engineering Design	 A1.4 Safety	 A1.5 Communication	 A2. Coding and Emerging Technologies	 A3. Applications Connections and Contributions

A1. STEM Investigation and Communication Skills: use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures

 A1.1 use a scientific research process and associated skills to conduct investigations

 A1.2 use a scientific experimentation process and associated skills to conduct investigations

 A1.3 use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems

 A1.4 follow established health and safety procedures during science and technology investigations, including wearing appropriate protective equipment and clothing and safely using tools, instruments, and materials

 A1.5 communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes

 **A2. Coding and Emerging Technologies:** use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life

A2.1 write and execute code in investigations and when modelling concepts, with a focus on creating clear and precise instructions for simple algorithms

A2.2 identify and describe impacts of coding and of emerging technologies on everyday life

 **A3. Applications, Connections, and Contributions:** demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences

A3.1 describe practical applications of science and technology concepts in their home and community, and how these applications address real-world problems

A3.2 investigate how science and technology can be used with other subject areas to address real-world problems

A3.3 analyse contributions to science and technology from various communities

Grade 2 is an exciting year full of exploration and experimentation. Students begin to use a focused lens to observe the world around them, with particular attention given to animals, solid and liquids, simple machines, and air and water. Their developing skills in language and numeracy will help students in this grade to use additional primary and secondary resources to access and record scientific thoughts and observations. Throughout this long range plan are hands-on opportunities for students to learn, practise, and refine their investigation and communication skills. A suggested timeline is given in the first column to assist with the pacing of the curriculum. The second column "STEM Skills and Connections" lists numerous examples of learning activities and investigations that help to address specific expectations, though it is by no means exhaustive. Teachers are encouraged to add their own unique activities that will further enrich the science and technology experience in their classrooms. The third column, "Guiding Questions", helps educators facilitate and guide inquiry throughout the school year. These questions are suggestions but certainly can be modified depending on student interest and the locale of the school. The "Resources" column lists a suggested list of possible lesson plans, websites, and other helpful items that support the STEM activities listed in the second column. The final column, "First and Next Steps," offers a solid starting point to plan for materials, identify supports, and recruit volunteers and field experts that will bolster students' opportunities to fully engage with the Science and Technology curriculum. When used in its entirety, this long range plan fully supports the expectations of the Grade 2 Science and Technology document.

SEPTEMBER

Overview:
During the first few weeks of school, students will work to develop an understanding and working answer to the question "What do scientists, and engineers, do?" Students will take part in activities that review the skills of observing, recording, and discussing scientific concepts and ideas that were established in grade one. Other key learning activities, including beginning a year-long science journal, and setting safety parameters will also be established. In addition, teachers should establish regular and ongoing opportunities to speak with numerous professionals within the scientific community, from a variety of cultures and backgrounds, in order to learn about the different jobs available in the science, technology, and engineering fields and their contributions to our world.

Strands & Expectations (in addition to the Strand A expectations listed at the beginning of this document):

B-Growth and Changes in Animals
B 2.1 -compare the physical characteristics of various animals, including characteristics that are constant and those that change
B 2.2 describe the locomotion of various animals

C-Matter and Energy
C 2.6 -classify solid objects and materials in terms of their buoyancy and in terms of their ability to absorb or repel water

D-Simple Machines and Movement
D 2.1 -describe different ways an object can move
D 2.3 -identify the six basic types of simple machines: lever, inclined plane, pulley, wheel and axle, wedge, and screw

E-Air and Water in the Environment
E 2.5 -describe ways in which living things, including humans, depend on air and water

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
September	 **A1.1, A1.5** Create a year-long science journal (revisiting each section for animal observation, with additional entries for other concepts as appropriate.) Choose a science professional to create a picture collage about (either virtual or cut and paste, use the 5 Ws to help gather information about each career.)  **A1.2, A1.3, A1.5** Dancing Rice/Raisins (using senses to observe raisins in club soda). See link in resources for a full explanation.  **A1.2, A1.3, A1.4, A1.5** Animal Observation Using scientific research and exploration skills, students will observe some local insects or invertebrates (e.g. earthworms) in the classroom, record their observations, and discuss their findings with others.	What do scientists do? What do engineers do? What are some different kinds of jobs in science? How can science be explored safely? How can you communicate your science learning with others? *Encourage students to formulate their own questions about science and technology and about topics that may interest them throughout the year.*	**Language** Reading, writing (can do theory concepts during language arts), diagram with labels, media literacy with collage, writing for different purposes **Art** Create a variety of art pieces (portrait of a scientist, animal drawing) **Math** Measurement time (how long raisins "dance" and linear measurement (length of worms, ordering length) **Drama** Move in a variety of ways (dancing raisins, move like the insects) **Health** Safety rules for home/school/science	Let's Talk Science Dancing Raisins Activity -picture collection of different careers within the science and technology community -secure one (or more) interviews/talks with professionals in science and technology Begin a "Scientist/Engineer of the Month" project where one (Canadian) scientist and their contributions are highlighted each month (or more frequently if desired.) Digital Human Library **Combined Grade Opportunities** **Grade One** Science Strand A-Safety **Grade Three** Science Strand A-Safety	**Materials for these activities**: ● Club soda, rice/raisins, clear plastic cups ● Paper plates, local insects or invertebrates (earthworms are excellent for this activity), spray bottle with water to keep worms moist (not wet), magnifying glasses ● notebook/folder for journal **Next Steps:** ● scout areas for animal observation near the school ● collect natural materials to create animal habitats (or make arrangements for students to find their own materials) ● recruit volunteers who are comfortable using tools ● collect a variety of hand tools and materials to use with them Ensure that an adequate release plan is made to return the insects and invertebrates back to their natural environment before the

	 **A1.2, A1.4, A1.5** **Simple Machine Observation** Students choose a simple machine to examine and explore, focusing on the skills of observation, recording, and discussing.				weather gets too cold. When selecting scientists/engineers for "Scientist of the Month" ensure that there is representation from multiple cultures and backgrounds, including Indigenous keepers of knowledge. A few examples are David Suzuki, Roberta Bondar, Charles Henry Turner, Autumn Peltier, Frederick Banting, Kirsty Duncan, Gladys West, Alexander Graham Bell, and Elijah McCoy. The Digital Human Library is also an excellent resource to connect with current-day science professionals.

OCTOBER AND NOVEMBER

Overview:
During this block of learning, students will begin their year-long exploration of how animals change and adapt to the different seasons and environments. Opportunities to observe local animals first-hand (both wild and domesticated) should be provided as much as possible. When first-hand experiences are not available a teacher can access numerous resources (books, videos, animal webcams, expert visits, etc.) to help supplement these observations. Students will also look to see how the changing state of liquids (e.g., water) affects their local environment, and how it also affects the local animals' abilities to adapt to the changing seasons. Connections between how animals move, and how some simple machines move will also be made toward the end of the block (e.g., November) as the focus of study shifts from animals to simple machines.

Strands & Expectations (in addition to the Strand A expectations listed at the beginning of this document):

B-Life Systems
B 1.1 -examine impacts that animals can have on society and the environment, and describe some ways in which any negative impacts can be minimized
B 1.2 -assess impacts of various human activities on animals and the places where they live, and describe practises that can minimize negative impacts
B 2.1 -compare physical characteristics of various animals, including characteristics that are constant and those that change

B 2.2 -describe the locomotion of various animals

C-Matter and Energy
C 1.2 -assess the impacts of changes of state of liquids and solids on humans and on environments

D-Structures and Mechanisms
D 1.1 -assess the impact of simple machines on the daily lives of people in various communities
D 2.1 -describe the different ways an object can move
D 2.2 -identify ways in which the position of an object can move
D 2.3 -identify the six basic types of simple machines: lever, inclined plane, wedge, pulley, wheel and axle, and screw

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
October November	**A 1.1, A1.5** Science journal entries. Begin a year-long comparison of how animals change over the course of a year, noting specific changes in appearance, habitat, and diet. **A 1.1, A1.5** **Who Would Win?** Animal Comparisons (looking at the characteristics of animals). Students select an animal to research, noting key characteristics of their creature (e.g., physical, animal class, etc.) Once completed students play the game "Who Would Win?", based on the book series. Students compare their animal characteristics with other animals researched in the class.	Where can we find animals in our area? What kinds of animals do you see? What are some of the ways that animals are the same? Different? What do animals need to survive? (focus on the changing season) What is movement? Of an animal? Of a machine? How do objects move? Can other things change how an object moves? What is a simple machine? How do they work?	**Language** Reading, writing: simple report, persuasive and procedural writing **Media Literacy** Poster or picture collage advertising animal **Math** Data (tallying animals), measuring distance (e.g., how far an animal travels, how far a simple machine moves a load), mass, capacity, location, and movement **Art** Using mixed media to create an art project (sculpture for animal, diorama for habitat)	Simple Machine Experiments/Activities: There are innumerous activities, web resources, and information for hands-on experiential learning activities available to teachers through their own school boards, internet searches, and professional communities. Tool Time activity- When signing up volunteers to help with this activity consider checking with the local high school or local hardware store for individuals who are comfortable using these materials. Also, ensure that adequate safety rules	**Materials Needed for Activities:** ● various "craft" materials (e.g., paper tubes, wooden sticks, plasticine, etc.) ● marbles/small balls ● age-appropriate resources for animal research (reading level and interest level) **Next Steps:** ● locate examples of Rube Goldberg machines and collect possible materials to create one (home request?) ● practise building a simple Rube Goldberg machine to become familiar with the process and to

	 **A2.1** ***Extension to Who Would Win** Students can explore some "unplugged" coding activities that would move their animal through a series of competitions (steps) to take the animal in different directions toward a final goal.  **A1.3** Using the engineering design process students will create and build a sustainable habitat for an animal. OR create and build a new animal based on the characteristics studied during class observation and research.  **A1.1** Scavenger Hunt for Simple Machines (outside on the playground or inside the classroom)  **A 1.2, 1.3, 1.4,** **Tool Time** Using the scientific experimentation process students can explore common tools to recognize some of the simple	How can we safely explore simple machines? *Encourage students to formulate their own questions about animals, simple machines, and water usage/effects to investigate further.	**Drama** Movement of different animals and machines	are well established and understood before beginning this activity. Connect with a local conservation authority to find out what kinds of animals are native to your area. Science North Design an Animal **Combined Grade Opportunities** **Grade One** Strand B-Needs and Characteristics of Living Things Strand D- Everyday Materials, Objects and Structures **Grade Three** Strand B-Growth, and Changes in Plants Strand D - Strong and Stable Structures	determine the number of steps your particular class can successfully accomplish

	machines (e.g., nails, screws, hand drills, screwdrivers, pry bars, etc.) *Special safety precautions need to be planned for this exploration, including bringing in volunteers to reduce group size.  **A 1.2, A1.3, A1.4** Construct simple machines while following the engineering design process. Some examples include ● simple vehicle ● popsicle stick catapult ● lever/fulcrum trampoline toy ● Inclined plane marble run  **A 1.2, A1.4** Moving loads up and down with inclined planes and pulleys while using the scientific experimentation process.				

DECEMBER

Overview:
Typically a shorter month, students will continue to observe animals and comment on the different adaptations they observe as animals prepare for the winter months (e.g. changes in fur, appetite, size, exploring those animals that hibernate, migration, etc.) A STEM challenge of a Rube Goldberg machine is offered as a “fun” way to celebrate the upcoming break while solidifying the learning achieved in the previous block about simple machines. Some Rube Goldberg machines can be quite complicated so it will be important for the teacher to consider the skill level of students in their class before setting the final task.

Strands & Expectations (in addition to the Strand A expectations listed at the beginning of this document):

B-Life Systems
B 1.1 -examine impacts that animals can have on society and the environment, and describe some ways in which any negative impacts can be minimized

B 1.2 -assess impacts of various human activities on animals and the places where they live, and describe practises that can minimize negative impacts
B 2.5 -describe adaptations, including physical and/or behavioural characteristics, that allow various animals to survive in their natural environment

D-Structures and Mechanisms
D 1.2 -assess the impact of the environment on technologies that use simple machines to facilitate movement
D 2.4 -describe ways in which each type of simple machine is used in daily life to make tasks easier
D 2.5 -compare, qualitatively and quantitatively the force required to move an object using various simple machines to the force required to move the object without using a simple machine

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
December	**A 1.1, A1.5** Science Journal Entries Comparing animal adaptations from October/November observations. **A 1.3, A1.4** Design a machine to perform a specific task (can use a simple machine or can be a collection of simple machines e.g., a Rube Goldberg machine). Some task suggestions include putting food/water out for an animal, putting an item in a desk, watering a plant, turning a button on/off, creating a holiday-themed machine, etc.	How do animals adapt to the changing season(s)? How do simple machines affect the daily lives of humans (and animals?) How do simple machines affect the amount of work a person (or animal) needs to do in order to complete a task?	**Language** Reading, writing (can do theory concepts during language arts) **Art** Making a plan before creating (sketching out their machines before building them)	Rube Goldberg resources can easily be found online, including biographies, examples, and instructional videos. board game “MouseTrap” **Combined Grade Opportunities** **Grade One** Stand B-Needs and Characteristics of Living things Strand D-Everyday Materials, Objects and Structures **Grade Three** Strand B-Growth and Changes in Plants	**Materials Needed:** ● various materials collected from school and home in the previous weeks to create student machines **Next Steps:** ● make arrangements with school custodian (or other appropriate guests) to visit your class to discuss school safety symbols ● locate (or develop) simple cooking recipes to use with the whole class that result in a matter’s change of state (e.g. a liquid to a solid) ● recruit volunteers to come in to help with cooking activities ● Check for food allergies, dietary restrictions or

				Strand D-Strong and Stable Structures	religious observations (e.g., fasting) before planning these activities.

JANUARY AND FEBRUARY

Overview:

During this segment students will look for any evidence of animals in their local environment, commenting on any adaptations or characteristics, and recording what they observe in their science journals. At the same time, students will explore, both outdoors and indoors, the concept of solids and liquids and their respective properties. In these winter months, the freezing and melting of water (and other liquids) can be easily and quickly seen, demonstrating the big idea that heat plays a key factor in changing matter from one state to another.

Strands & Expectations (in addition to the Strand A expectations listed at the beginning of this document):

B- Growth and Changes in Animals

B 1.2 -assess impacts of various human activities on animals and the places where they live, and describe practises that can minimize negative impacts
B 2.1 -compare physical characteristics of various animals, including characteristics that are constant and those that change
B 2.5 -describe adaptations, including physical and/or behavioural characteristics, that allow various animals to survive in their natural environment

C- Matter and Energy

C 1.1 -assess practices related to the use, storage, and disposal of liquids and solids in the home, in terms of the effects on personal health and safety and on the environment, and suggest ways to improve these practices
C 1.2 -assess the impacts of changes of state of liquids and solids on humans and on environments
C 2.1 -identify various types of matter in natural and built environments as liquids or solids
C 2.2 -describe the properties of liquids and solids
C 2.3 -describe the properties of liquid water and solid water, and identify the conditions that cause changes from one state to the other
C 2.4 -identify conditions in which the states of liquids and solids remain constant and conditions that can cause their states to change
C 2.5 -describe some ways in which liquids and solids can be combined to make useful mixtures
C 2.6 -classify solid objects and materials in terms of their buoyancy and in terms of their ability to absorb or repel water
C 2.7 -explain the meaning of international symbols that give us information on the safety of substances

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
January February	**A 1.1, A1.5** Science Journal Entries Comparing animal adaptations from December observations. **A1.2, A1.4** Experimenting with Matter (exploring different types of matter and establishing safety rules when working with matter.) Ideas for exploration: ● set up stations with different states of matter ● go on a nature walk/scavenger hunt for matter in different states (liquids may be hard to find outside but water vapour will be easier to see) ● “Oobleck” (or cornstarch flour) ● Melting solids into liquids (e.g., ice, crayons, butter/margarine, and coconut oil) ● Cooking (both with and without heat) ● viscosity races (testing and timing the levels of runniness of different liquids) **A1.4** Some suggested safety rules	How do animals adapt to the changing season(s)? What is matter? How can we explain what matter is? How do I know what a solid is? A liquid? What are their properties? How can matter change from state to state? How can we safely work with solids and liquids? What happens when we mix liquids and solids together? What happens to the solid? To the liquid? How can solids and liquids affect our personal lives and communities (eg. freezing rain, flooding)? *Encourage students to formulate their own questions about solids and liquids that may interest them and facilitate new activities and learning.	**Language** Reading/writing (can do theory concepts during language arts), procedural/report/recount writing **Math** Data (sorting according to characteristics using different tables and charts), measurement (recording time, measuring ingredients, mass and capacity) **Art** Using solids and liquids to paint (warm and cool colours), texture, printmaking with different solids **Health** Personal safety at home, medications	Safety Rules and Symbols - enlist the help of your custodian to show and explain some of the common school safety symbols Use the dHL (Digital Human Library) to connect with scientists/engineers whose fields of study are with solids and liquids Picture Books Science North Coding Activities States of Matter with Ozobots Science North States of Matter with Block Code **Combined Grade Opportunities** **Grade One** Strand C-Energy in Our Lives	**Materials Needed for these Activities:** ● numerous objects that are examples of each state of matter ● Oobleck needs a 2:1 ratio of cornstarch to water ● Ingredients and cooking tools for recipes chosen ● volunteers arranged for cooking day(s) ● Variety of liquids and low friction surfaces for viscosity races ● Objects (solids) in a variety of materials (e.g. wood, plastic, metal, cloth etc.) that can be used to test buoyancy ● Large clear container and an unpeeled orange ● Materials that could be used for boat building (maker/craft items) **Next Steps:** Collect glass jars, foil plates, as well as materials that could be used for filtering air and water, and for creating parachutes

	(which can be added/adjusted as needed) ● Carefully handle sharp objects. ● If the object has a label pay attention to any warnings or recommendations printed there. ● Use substances appropriately. ● Do not taste any substance in class (unless directed by the teacher.) ● Remember to waft any smell to your nose (i.e., do not sniff any substance directly). ● Clean up messes and spills right away.  **A1.2, A1.3, A1.5** Revisit Dancing Raisins (review for buoyancy activities)  **A1.2, A1.4** Does it Float? Test the density of different solids (first with predictions) Floating Oranges demonstration of how air can get trapped within solids  **A1.2, A1.4** Building a Boat Build a boat using provided (or found) materials that can hold a			**Grade Three** Strand C-Forces and Motion	

	specific load without capsizing.  **A2.1** Coding Activities Using scientific exploration skills, students use two possible coding programs to further their understanding of: ● how particles move in different states of matter ● How to identify an imaginary object as either a liquid or a solid				

MARCH AND APRIL

Overview:

The warming weather will encourage an increased amount of activity from the local animal population and students can take advantage of that to continue their year-long observations. Through the next block of instruction, students will connect their knowledge and understanding of solids and liquids and apply them as they learn about air and water specifically. March's rising temperatures are perfect for continuing to observe the different states of matter while focusing on the effects that this weather has on air and water and the surrounding environment. The spring also motivates a new period of growth and anticipation; students are excited to see the first leaf, the first insect, the first animal. With this comes an eagerness to tackle environmental problems, including climate change, food security, and environmental stewardship. March is also National Engineers Month (Canada), and Earth Day is in April. Both events could be connected with some of the hands-on activities that investigate air and water.

Strands & Expectations (in addition to the Strand A expectations listed at the beginning of this document):

B-Growth and Changes in Animals

B 1.2 -assess impacts of various human activities on animals and the places where they live, and describe practises that can minimize negative impacts
B 2.1 -compare physical characteristics of various animals, including characteristics that are constant and those that change
B 2.5 -describe adaptations, including physical and/or behavioural characteristics, that allow various animals to survive in their natural environment

C-Properties of Solids and Liquids

C 2.3 -describe properties of liquid water and solid water, and identify the conditions that cause changes from one state to the other
C 2.4 -identify conditions in which the states of liquids and solids remain constant and conditions that can cause their states to change

E-Earth and Space Systems

E 1.1 -assess the impact of human activities on air and water, taking various perspectives into consideration, including those of First Nations, Metis, and Inuit, and plan a course of action

to protect the quality of air and/or water in the local community.
E 1.2 -assess their personal and household uses of water, and create a plan to use water responsibly
E 1.3 -examine the availability of fresh water and drinking water around the world, and describe the impact on communities
E 2.1 -demonstrate an understanding of the key properties of air and water
E 2.2 -identify sources of water in natural and built environments
E 2.3 -describe the stages of the water cycle, including evaporation, condensation, precipitation, and collection
E 2.4 -identify the three states of water in the environment, and describe how temperature changes affect the state of water within the water cycle
E 2.5 -describe ways in which living things, including humans, depend on air and water

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
March April	**A1.1, A1.5** Science Journal Entries Comparing animal adaptations from January/February observations. **A1.1, A1.2** **Water Cycle in a Bag** Have each student use a resealable plastic bag to draw on the parts of the water cycle and then add water to the bag and tape it into a sunny window to observe over the day few days. **A1.1, A2.1, A2.3** Using a coding program or other offline sequencing method build/animate the water cycle, including any possible changes to the environment/plants/animals around the area.	How do animals adapt to the changing season(s)? Are any of their needs being challenged (e.g., sources of clean water?) How do we use water (other than drinking?) What is the water cycle? How does the water cycle affect the weather on Earth? How is the water cycle affected by the changing weather on Earth (ie. climate change)? How can water, or the lack of it affect the diets of people in our world? The food we grow? Why is most of the water on Earth salt? How do you (the student) use	**Language** Reading, writing (can do theory concepts during language arts) **Math** Patterning, measurement **Music** Create a song about the water cycle **Drama** Acting out water cycle, the impact of water in different environments **Art** Painting with air, salt, printmaking	Let's Get Exploring! Ici On Explore! This bilingual PDF has a wonderful selection of activities including ● Water Cycle in a Bag (p. 17) ● Building a Buoyant Boat (p. 12) A quick internet search will provide planning instructions for the following STEM activities, as well as other opportunities to explore: ● Make it Rain (with Ice) ● Make it Rain (with shaving cream) ● creating water and air filters	**Materials Needed for these Activities:** ● resealable sandwich bags, permanent markers, water with blue food colouring ● glass jars, water, foil plate, ice cubes, kettle ● glass jars, unscented shaving cream, food colouring ● materials that could be used for filtering air and water (both natural and human-made) ● maker/craft items to create parachutes **Next Steps:** Source a supplier for frog or toad eggs for life cycle study in May and June (or raise butterflies, chicks, etc.) and locate required materials to

	 **A1.2, A1.4, A1.5** Make It Rain Use a glass jar, foil plate, ice cubes, and boiling water to create rain within the jar (demonstration) AND/OR use a glass jar filled with water, topped with shaving cream, and drop food colouring onto the top to see how moisture moves through a cloud and rains (activity). Consider doing this activity outside if the shaving cream has a strong scent.  **A 1.3, A1.4, A1.5** Filtering water Using the engineering design process students will design and create a simple water filter that removes visible contaminants.  **A1.3, A1.4** Parachutes Make a parachute using the provided (or found) materials that will slow the descent of an object.  **A 1.3, A1.4, A1.5** Filtering Air Using the engineering design process students will design and create a simple air filter that	water? How can you reduce the amount of water you use? What can be done to make sure everyone (in Canada and the world) has access to clean air and water? *Here the teacher can co-create the activity of filtering water with the students.		**Combined Grade Opportunities** **Grade One** Strand E-Daily and Seasonal Changes **Grade Three** Strande E- Soils in the Environment	care for these animals. Connecting with local conservatories or farmers may help direct/aid in preparing for this activity. Collect items including paper tube rolls, small cars, and support materials to build a roller coaster track

	removes visible contaminants by trapping any pollution particles for observation.  **A1.1, A1.2** Air Power Ideas for Exploration: ● testing air pressure in various ways (cup of water/paper) ● measuring the weight of air through balances ● Inchworm races (blowing through a straw to move a piece of folded paper) ● replicate a windmill/wind farm (using a wheel and axle to show the energy collected				

MAY AND JUNE

Overview:

In this final instruction block, students will go in-depth into their animal observations: observing some creatures from a distance and others in a more intimate setting. Special planning will need to be considered to ensure that any animal subjects are treated with care and compassion. A well thought-out aftercare plan will need to be in place to ensure that the observed animals will continue to be treated ethically once the observation period is over. Looking at a variety of animals and their life cycles during this time will help students to make those final connections between what they have observed throughout the school year and how the changes of each animal have brought them to this stage. As a final activity for simple machines, students will look at how roller coasters rely on all six machines and work to create their own simple roller coaster in the classroom.

Strands & Expectations (in addition to the Strand A expectations listed at the beginning of this document):

B-Life Systems

B 1.2 -assess impacts of various human activities on animals and the places where they live, and describe practises that can minimize negative impacts
B 2.1 -compare physical characteristics of various animals, including characteristics that are constant and those that change
B 2.2 -describe the locomotion of various animals
B 2.3 -describe the life cycle of a variety of animals, including insects, amphibians, birds, and mammals
B 2.4 -compare changes in the appearance and behaviour of various animals as they go through a complete life cycle
B 2.5 -describe adaptations, including physical and/or behavioural characteristics, that allow various animals to survive in their natural environment

D-Simple Machines and Movement
D 1.1 -assess the impact of simple machines on the daily lives of people in various communities
D 2.2 -identify the ways in which the position of an object can move
D 2.4 -describe ways in which simple machines are used in daily life to make tasks easier
D 2.5 -compare, qualitatively, the force required to move an object using various simple machines to the force required to move the object with using a simple machine

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
May **June**	**A1.1, A1.5** Science Journal Entries Comparing Animal Adaptations from March/April observations **Animal Observation in Class** Over a period of weeks observe and note the growth changes in a class animal (tadpoles, butterflies, chick, etc.) **A1.1, A1.2, A1.4, A1.5** **Outdoor Investigations** Over the same time period as the animal observation, take the class outside to look for the different stages of animals (and plants) in nature. This will give the opportunity to compare different living things and their own cycles.	How do animals adapt to the changing season(s)? How do animals grow and change? Do all animals grow and change in the same way? What are some differences between different kinds of animals? How can humans help (protect) animals? How can animals impact the lives of humans (both positive and negative?) What do we remember about simple machines? How could we use them to build a roller coaster? What would that look like? What are some safety	**Language** Reading, writing can do theory concepts during language arts), procedural, comparison writing **Math** Patterning, data collection, graphing, measurement **Health** Human development, personal safety, summer safety	Field trip(s) to these possible locations: ● Conservation area ● Animal sanctuary ● Outdoor learning area ● Local water area (stream, river, etc.) Contacting your local conservation authority or a local Indigenous community can help you identify the animals native to the area. Identify any dangers or safety concerns when exploring outside. Bring in a local expert about your outdoor environment **Combined Grade**	**Materials Needed for these Activities:** ● Items for tadpole (or another animal study) ● models/videos of roller coasters **Next Steps:** Ensure that you have a safe place for the observed animals to go when the class is done with the activity.

	A 1.4 Co-create safety rules and procedures for observing and handling animals in the classroom (and interacting with animals in general.) **A2.1** Using a sequencing system (either coding online or through patterning with pictures) compare the life cycle of various animals. **A1.3, A1.4, A1.5** Design and build a roller coaster for a theme park, noting the different simple machines that are used in its construction.	considerations?		**Opportunities** **Grade One** Strand B-Needs and Characteristics of Living Things **Grade Three** Strand B-Growth and Changes in Plants	