Long Range Plan Model 2 - Grade 1

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

Overview:
Observing and documenting like a scientist will be connected in all learning areas when building routines and norms at the beginning of the year. Students will develop observational skills including documentation, questioning, and investigating through the pet (or alternatives) journal, the developing ceiling analemma, and the 30cm square of life. The analemma, the journal, and observations from the completed weather station can be continued throughout the year and can be connected to, or replaced by, the bird observation coming in November. The garden plan will be the launch of the yearlong dedication to growing and observing plants and will be extended to include growing from seeds and planning a composter in late March, or early April.

To (re)introduce vocabulary and the concepts of coding, the year will begin with concrete examples in unplugged activities, before moving to more abstract formats with technology. Careers in STEM should be highlighted throughout the year to prepare for both live guest speakers as well as pre-recorded job shadows included in resources. In this month, many careers can be highlighted in the areas of meteorology, astrophysics, and plant husbandry. Look to these topics to find emerging technologies that would fit with and excite grade 1, like indoor farming.

Leaders and international contributors can be found in Saudi Arabia, Japan, the Philippines, Denmark, Lithuania, Canada, and South Africa. Indigenous Europeans practiced vertical farming. Long-standing rice farms do as well. Indigenous farming focused on availability. The burning of the prairies for vast pasturelands and the planting of mast trees all along the eastern seaboard provided for many. The Amazon bears evidence of mass plantings as well. The three sisters and far more complex interplanting techniques in Mesoamerica allowed for centuries of same-crop planting in one field.

Finely engineered irrigation across North Africa allowed for personal micro-crops and internal courtyards cooled by transpiration and evaporation. Highlight a scientist who made great gains in the fields most interesting to your class, like Ebrahimali Abubacker Siddiq who developed high-yield rice varieties, or 1800s pea geneticist, Gregor Johan Mendel, or any Indigenous genetic breeding that created crops like corn, chocolate, cassava, coffee, potatoes, wheat, barley, or quinoa, from wild plants and grasses.

Strands & Expectations (in addition to the Strand A expectations listed at the beginning of this document):
B. Life Systems: Needs and Characteristics of Living Things
B2.1 demonstrate an understanding of the natural environment as a place where living and non-living things are interconnected
B2.2 identify the basic needs of living things, including the need for air, water, food, heat, shelter, and space
B2.3 identify the physical characteristics of various plants and animals, including humans, and explain how these characteristics help the plants and animals meet their basic needs

C. Matter and Energy: Energy in Our Lives
C2.3 identify food as a source of energy for living things

E. Earth and Space Systems: Daily and Seasonal Changes
E2.3 describe the changes in the amount of light and heat from the Sun that occur throughout the day and in the four seasons
E2.4 describe and compare the four seasons in terms of the weather, including precipitation and temperature, in their local area

Potential to introduce and discuss the following
D. Structures and Mechanics: Everyday Materials, Objects, and Structures
D2.3 identify materials that are used to make various everyday objects, including structures

D2.4 describe observable characteristics of various everyday objects, including structures, using qualitative information gathered through their senses
D2.5 describe purposes of everyday objects, including structures
D2.6 identify properties of materials that enable the objects made from them to perform their intended function
D2.7 identify different kinds of fasteners and describe uses for

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
September	 **A1.2** **Make an Analemma** Tape a small mirror by a south-facing window in the school and at the exact same time, every few days, make a mark on the ceiling where the sun hits. At the end of the year, the tape will make most of a figure 8 outline - an analemma - showing the path of the sun. See activity "Seasons Follow the Sun" **Observing Plants** Draw or photograph plants out of the soil. Observe their parts. Draw or photograph the plants and label the parts with names and functions. Compare the parts and functions to themselves. **Planning to Grow Plants** Discuss a good location for, and begin planning, a school garden, even if it is just a single bed, or raised bed, or a large planter. **Pet Care Journal** Begin a pet care journal - for cycles of the day and year, care of living things, responsibility, and self in the community. This can be a personal pet, a class pet, one	**Living Things** What is alive? Where does it live? What does it need? What are its parts? What do the parts do for the plant? How does it use those parts to get what it needs? When do plants grow? How can Indigenous ways of ownership inform how we care for living things? How can I make it better? **Daily Changes** What happens in a day - at home, at school, outside? What are the parts of my day- at home, at school, outside? How are those parts different - at home, at school, outside? Can I measure the changes? How? **Seasonal Changes** What season is changing? How	**Language**-reading of and making infographics, Procedure writing - use diagrams, speech to text, photography Following instruction, Group communication Documenting Engineering Design Process **Math** Coding sequential events, counting, sorting, looking at relationships, measuring temperature, time, parts of the day, graphing flora and fauna sets **Arts**-Photography, Infographic Building, and Design **Other**- Healthy-Phys.Ed & Dance linked to coding sequences	STAO Safety in Elementary Science and Technology There are many unplugged coding activities that outline the basic rules, like this one from Science North, a-MAZE-ing Seasons that has students "be a bot" and explore the seasons at the same time. *Follow the Sun* by Science North is an activity that shows the movement of the sun across the ceiling Discuss and develop a habitat with your students OR Use a guide found online for setting up an aquarium or snail habitat. There are many online resources and YouTube videos showing how to create a worm or ant habitat. Here is a coding activity from	First Step: define living using an artificial plant vs a plant outside in the schoolyard or in the class Next Steps: Have students find out how their family checks the weather to make plans because some seasons are more critical than others due to upcoming safety outside **Indoor Biome**: Teachers will need to source an appropriate container, soil, plants, and possibly animals, if they need to be purchased, eg., fish. **Indoor Habitat** - procure a small, see-through habitat for

	of the animal habitats in the classroom, or attention given to local wildlife. The bird feeder activity is upcoming in November.  **A1.3** **30cm^2 Of Life** Create 30cm^2 (or smaller) frames from available materials to place on a nature area - yard grass, nearby field, or forest, edge of a pond if it can be managed safely, naturalized aquarium. Observe different plants and animals within the grid, count the number of all or of single kinds, and note their interactions. Draw or photograph the different plants and animals. OR **Animal Habitat Options** Set up an animal habitat (snail, ant, earthworm, fish) that includes soil, plants, and other small animals. Observe as long an animal can be kept before releasing safely to prepare for winter. If creating a fish biome, include plants and tank-cleaning fish for a self-sustaining habitat. OR **Animal Observation Options** Choose a place within or near the school yard to observe the local wildlife in the community habitat - squirrels, chipmunks, birds, deer, and waterfowl.	is it different? What will change? What is temperature? How is it changing? What happens when it rains? How does the wind blow? Does it change? **Everyday Materials** What are materials? What are the best materials I can use to make this? What do I need to consider to make a good choice? Why is one better than another?	**Gr. 2 Connections** B1.2, B2.1, B2.2 C1.2, C1.2, C2.1, C2.3, C2.4, C2.6 D1.2, D2.1, D2.2, D2.3, D2.4, D2.5 (weather station) E2.4, E2.5	Science North (Making Code out of Anthills) using Scratch Jr. that codes the tunnels of an ant hill and instructs students how to use block code to move an ant through them. The class can discuss what to track in a weather station and may be able to design one on their own. For guidance, there are many resources online for DIY weather stations that range in sophistication. Check online for examples of building and using a school garden. For example, Whole Kids Foundation School Garden. Land Based Learning Learning the Land Activities that begin exploring materials, as in Science North's Material Matters.	worms or ants, OR - gathering large jars - like from a restaurant - gathering soil, animals and - gathering coverings (e.g. screen or landscape cloth) **Growing Small Plants** - Fast-germinating seeds or small fast-growing plants like spider plants, herbs, or some flowers - Soil - Variety of containers - Boxes for blocking light - Fertilizer **Weather Station** Teachers need to source outdoor thermometers and materials to withstand weather and get permission to install it where it is within easy access of the classroom or can be seen from the window

	Build a Weather Station Design and build a weather station to monitor temperature, wind direction, and rainfall. If you have the ability, mark a part of the shadow of a fixed element in the school yard at chosen times of the day, throughout the course of the year. **A1.4** Wear a hat and sunscreen (if needed) when going outside in September. Wear washable clothing when working with soil and wash your hands thoroughly after. Ask before you pick up insects, handle them carefully and with respect, and return them to where you found them; they have important work to do that makes our world better and cleaner. **A2** Practice unplugged coding to learn the process of creating clear and precise instructions for simple algorithms. Using block-code programs like Scratch Jr. or unplugged activities like Simon Says or a procedural diagram. You can: Code the background, foreground, plants, and animals in the 30cm^2 of life. Code the care cycle for a pet, class, room, or home. Code the care cycle and/or development of a personal/ group or class plant. Code the cycle of the day: light, dark, temperature, wind, classroom routines, etc.				**Materials** Collect enough materials so that students can: - differentiate material properties - rank materials for usefulness - observe the function of different choices - can analyse benefits in action **Next Steps:** Check the materials you will need to gather.

	A1.5 Communicate with group partners about and share observations of 30cm^2 and research of plants and animals with class using drawings, photography, code, and conferencing. Begin documenting in the Pet Journal. **A1.1, A3** Research the needs of locally observed animals, whether or not these needs are being met in the community, and how the local community can help them thrive. Research the needs of local plants (e.g. community, native species, garden, or crop plants) and whether or not they are being met in the community, and how the local community can help them thrive. Research how native local plants support the local animals and how the community can facilitate the health of both.				

Overview:
Students will continue to build knowledge and develop an understanding of and empathy towards living things within their care and in the wild, through observation. This unit will add modeling, experimentation, and research as learning modalities. Students will follow models that explore the cycles of day/night and of seasons using light sources and sample, explore and sort materials. They will experiment with and examine variables to test for heat absorption and retention as well as the best materials for specific uses when they design birdhouses. They will have the opportunity to research and examine some historical and contemporary relationships between humans and animals and how both adapt to daily and seasonal changes. Look for career links that match your region and the interests of the students: animal caretakers and vets; resource extraction and manipulation; carpentry, metalwork, welding and tool and die; engineering; meteorology and climate science. The class can address star learning, alternative constellation names, and the Indigenous oceanic navigators of Hawaii and the Philippines (as showcased in the movie *Moana*). Emerging and traditional technologies in plant and animal husbandry are international and interesting as are pioneers in materials science - birch bark, pine pitch, alpaca wool, the Malaysian glass airport that lets in light but not radiation, and the sunshade on the James Webb telescope.

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

B. Life Systems: Needs and Characteristics of Living Things
B1.2 identify actions that can be taken to contribute to a healthy environment
B2.1 demonstrate an understanding of the natural environment as a place where living and non-living things are interconnected
B2.2 identify the basic needs of living things, including the need for air, water, food, heat, shelter, and space
B2.5 describe the characteristics of a healthy environment, including clean air and water and nutritious food, and how a healthy environment enables living things to meet their needs
B2.6 describe ways in which living things provide for the needs of other living things

D. Structures and Mechanics: Everyday Materials, Objects, and Structures
D2.1 describe objects as things that are made of one or more materials
D2.2 identify structures that are objects designed to support a load, including those acting as supporting frameworks for objects
D2.3 identify materials that are used to make various everyday objects, including structures
D2.4 describe observable characteristics of various everyday objects, including structures, using qualitative information gathered through their senses
D2.5 describe purposes of everyday objects, including structures
D2.6 identify properties of materials that enable the objects made from them to perform their intended function
D2.7 identify different kinds of fasteners and describe uses for each
D2.8 identify sources in nature of some common materials that are used to make various objects, including structures

E. Earth and Space Systems: Daily and Seasonal Changes
E1.1 assess the impact of daily and seasonal changes on human outdoor activities, and identify innovations that enable people to engage in various activities year-round
E1.2 assess ways in which daily and seasonal changes have an impact on society, the environment, and living things in the natural environment
E2.1 demonstrate an understanding of Earth's relationship to the Sun and that this relationship results in daily and seasonal changes on Earth
E2.2 demonstrate an understanding that a cycle is a series of repeating events, and that cycles can be observed in daily and seasonal changes
E2.3 describe the changes in the amount of light and heat from the Sun that occur throughout the day and in the four seasons
E2.4 describe and compare the four seasons in terms of the weather, including precipitation and temperature, in their local area
E2.5 describe changes in the appearance or behaviour of living things that are adaptations to seasonal changes
E2.6 describe how humans prepare for, and respond to, daily and seasonal change

Continue to discuss:
C2.2 demonstrate an understanding that the Sun is Earth's principal source of energy, including how it warms the air, land, and water; is a source of light for Earth; and makes it possible for plants to grow

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
October November	**A1.2** Maintain an animal care journal. Begin a “Changing Seasons” journal individually, in partners, in groups, or as a class Continue to monitor the weather station. CYCLE Investigations: 1: Investigate the spinning of the earth around the sun using a light and a ball to simulate night and day 2: Using a flashlight, simulate the angle of the sun through winter, summer, spring, and fall. With a light that produces heat, or a heat source, direct a beam to warm a variety of materials at a variety of angles. E3: Explore the build-up of heat using different structures - in a glass jar, in a box, in the open - and a heat source, or a window… **A1.3** **Material Wheel** Collect and organize small objects made of different materials over a period of time. For example, the class can create a giant classroom “materials wheel” with small	**Materials** What are things made of? What are the materials? Where do we get different kinds of materials? Are any of them from nature? What happens to some materials when we are done with the object? How are some materials the same and some different from one another? Ask “Important” questions: Is the colour important to what kind of material it is made of? Is blue metal more like red metal or more like blue wood? Is the colour a component of the material or is it another material? **Daily Changes** How does the day change? What do I do as the day changes? What do plants and animals do? How do I help them? **Seasonal Changes** How does the season change? What do I do as the season changes? What do plants and animals do? How do I help them? **Living Things and Cycles**	**Language** What is the pet or the plant thinking? Perspective: What would it say about the home or care you give it? Communicate in groups Listening Skills Following, sharing, negotiating instructions **Math** Continue to measure the plants, plot the growth in a chart, coding - what happens to animals in the winter **Phys-Ed** Moving safely through the class and schoolyard **Dance** Animal mimicry **Drama** A Day in the Life **Art** Many opportunities to use Land Based materials for the bird feeders Creations of materials	*The Important Book,* by Margaret Wise Brown “How It’s Made” series to follow student interest Activities that begin exploring materials, as in:“Material Matters” Materials Exploration Guides for building bird feeders and lessons that go with them. Milk Carton Bird Feeder Picture books, young readers’ guides, teacher-led reading about animals, their needs, and adaptations. Videos and shows like *Peep and the Big Wide World* or *Wild Kratts*. Sign up for digital zoo walks and/or to interact with the Digital Human Library talks and professionals. Land Based Learning Learning the Land **To help with winter considerations.** **Review again in December** Activities to show sun angles	**Journals:** Ensure students have a subject to examine (if one is not available at home). Align tech to enable communication - photographs, speech to text, scribes, recording… **Volunteers:** Expert builders are indispensable when building with young students. If possible, invite helpers (e.g. family members, older students, co-op students, and community volunteers) to assist with projects. **Materials for:** **Bird Feeder** Collect materials to build - recyclables, natural items, safe scraps from those who build at home… Also, artistic elements (that won’t frighten

	objects, like a colour wheel, but showing materials (cloth, metal, wood, paper, plastic, glass), and breaking them down when you notice and note differences: (i.e. cloth breaks down into wool, silk, cotton, polyester, heavy or light). **Material Exploration** Find objects and describe the different materials they contain. Objects can be from the classroom, found in the school, brought in from home, or found at an establishment on a field trip. Ensure all students have access to the requisite number of items. **Build a Winter Bird Feeder** Design and build a winter bird feeder with consideration given to the material properties: durability, winter-appropriate, landing availability, safety for building, and safety for the birds. **Create Suet Cakes from Lard And Seeds** Cook suet feeders. **A1.4** Wear washable clothing when working with soil and wash your hands thoroughly after. Ask an educator before you pick up animals, handle them carefully and with respect, and return them to where you found them; they have important work to do that makes our world better and cleaner. Follow the lessons taught when using	How do birds react to the changes in the season? What kinds of birds do we have locally? What do the birds need? How can I help the birds meet those needs? Some birds, while not domesticated, have been provided housing by Indigenous people for so long, that they no longer build their own homes. In fact, there is a gourd that was bred by Indigenous people specifically to house these birds. Why do you think people would want these birds near their settlements? How does housing purple martins help communities, animals, and people? Is it sustainable? How do wild animals help humans and humans help animals? **Materials and Living Things** What is the purpose of this technology? What should it do? What is the most important job it has to do? Why is one material better to use for this than another? What are the best materials I can use to make the bird feeder? What do I need to consider to make a good choice? How can I put the pieces together? What are some materials and items we use to	collection **Gr. 2 Connections** B1.2, B2.1, C2.6 E2.4,	for day and seasons, as it pertains to the loss of light and warmth such as this Angle of the Sun by Science North lesson plan, or this The Path of Sunlight by Science North lesson plan.	birds away) **Days/Seasons** Ensure there are appropriate light or heat sources. Gather a variety of materials to test for heat absorption Discuss, following student interest and understanding, the upcoming lunar eclipse on November 8th. **Animals Shelter** Collect materials to build - recyclables, natural items, safe scraps from those who build at home… Also, artistic elements Collect a variety of toy animals in different sizes. **Next Steps:** Gathering and storage of recycled materials as building materials and asking the parents and school community for large numbers of a similar item the class may need, like milk

	building tools in the classroom. Use appropriate caution with specific materials - sharp edges, splinters, points… Conduct experiments carefully and with focus.  **A2** The class can begin PRIM (Predict, Run, Identify, then Make) with already made block programs, like Scratch Jr. to become familiar with coding. Using block-code programs like Scratch Jr. or unplugged activities like procedural diagrams, tableau, Simon Says, and partner games you can create clear and precise instructions for simple algorithms. For example: Code the process of building the birdhouse Code the care cycle for a pet, class, or home. Code the care cycle and/or development of a personal/ group or class plant. Code the cycle of the day: light, dark, temperature, wind, routines, etc. Code the changes on Earth as it rotates or circles the sun Code the differences in temperature depending on the environment or materials. Code the changing of the seasons using weather, animals, plants, light, etc. Code similarities and differences in materials Create digital artifacts out of different materials	put materials together? What are their jobs? Does that change how they are made or made of? What are the best fasteners for the different parts of this job? **Impact of Cycles for December** What happens to the light throughout the day? What happens to the day as we move further into the year? How does this affect the temperature? How does that change what you, your family, your pets, livestock, and wild animals do in a day?			bags for mats or paper rolls. Line up experts, zoo walks, Digital Human Library, and video and print resources about animal tracks, adaptations, and winter dwellings.

	A1.5 Communicate with group partners. Discuss, analyse and make judgments with class, groups, or partners for the materials collection and sorting. Document Engineering Design Process for bird feeders, Follow instructions and give instructions. Present plans, products, and findings to teachers, peers, class, and parents. **A1.1, A3** Research the needs of local birds, whether or not they are being met in the community, and how the local community can help them thrive. Research different environments locally, provincially, nationally, or abroad. Research the adaptations of the needs of local plants and animals that enable them to meet their needs. Research how native plants in the area support the local animal. Research the cycles of day/night and seasons.				

Overview:
Students develop critical thinking skills and engineering design processes by assessing and adjusting chosen materials and previous work on the weather station and bird feeders. As well, they will synthesize information about seasonal changes and animal adaptations and welfare to either build a habitat for a local animal or create an animal and imagine adaptations that would enable it to survive in a specific ecosystem. Refer to trades and careers in working with animals, like in an animal shelter or a zoo, meteorology, building, design, and engineering. Find an expert in the community or online to address the issues. Look to Indigenous architecture for animal homes - gourds for purple martins, cages for crickets, various barns, lofts, coops, aviaries, and other animal homes over the centuries. Follow student interest to introduce emerging technologies related to animal homes like apiaries, coops, and barns, as well as shelters and other help for animals affected by climate change.

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

B. Life Systems: Needs and Characteristics of Living Things

B1.1 describe changes or problems that could result from the loss of living and nonliving things that are part of everyday life, while taking different perspectives into consideration
B1.2 identify actions that can be taken to contribute to a healthy environment
B2.1 demonstrate an understanding of the natural environment as a place where living and non-living things are interconnected
B2.2 identify the basic needs of living things, including the need for air, water, food, heat, shelter, and space
B2.5 describe the characteristics of a healthy environment, including clean air and water and nutritious food, and how a healthy environment enables living things to meet their needs
B2.6 describe ways in which living things provide for the needs of other living things

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D2.7 identify different kinds of fasteners and describe uses for each
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E. Earth and Space Systems: Daily and Seasonal Changes

E1.1 assess the impact of daily and seasonal changes on human outdoor activities, and identify innovations that enable people to engage in various activities year-round
E1.2 assess ways in which daily and seasonal changes have an impact on society, the environment, and living things in the natural environment
E2.1 demonstrate an understanding of Earth's relationship to the Sun and that this relationship results in daily and seasonal changes on Earth
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Continue to discuss:

C2.2 demonstrate an understanding that the Sun is Earth's principal source of energy, including how it warms the air, land, and water; is a source of light for Earth, and makes it possible for plants to grow

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
December	**A1.2** Observe the birds at the feeder. Use a system to monitor and count so the class can participate in crowd-sourced science through Birds Canada's Project FeederWatch program. Students continue to monitor their pets or class pet, group or class plant, and the weather station. Revisit the pattern of the analemma and discuss the upcoming longest night of the year. **A1.3** **Assess weather station design - Amend** Examine the weather station materials and gauge whether they need updating or changing with the change of the season. Discuss the materials used or needed **Winter Animal Shelter** Build a winter shelter for toy animals based on previous research and the time of the year and the needs of the animal. **A1.4** Careful with nature. Safety outdoors and coming back inside	**Daily Changes** How does the day change? What do I do as the day changes? What do plants and animals do? How do I help them? **Seasonal Changes** How does the season change? What do I do as the season changes? What do plants and animals do? How do I help them? **Living Things** How do other animals react to the seasons changing? (migration, hibernation, low activity, change in pelt). Why do some birds leave in the winter? What is missing in their environment? Does that happen to other plants and animals? How do they respond? What happens to us when we lose parts of our environment? What would we need to lose for us to move away? Does that happen to people? **Living Things and Changes** Where do animals live? How do they find shelter? Do they need	**Language** Perspectives of the plants or of the animals. Communication with groups. Listening Skills Following, sharing, and negotiating instructions. **Math** Continue to measure the plants, plot the growth in a chart Coding - what happens to animals in the winter? **Phys-Ed** Students move safely through the class and schoolyard. **Dance** Animal mimicry **Drama** A Day in the Life **Art**: Use land-based materials for the bird feeders, create grid wheel with materials collected	Crowd-sourcing bird count Feeder Watch Activities that explore different materials, like the Alka Seltzer Lava lamp in this lesson by Science North: Make Your Own Lava Lamp *The Important Book,* by Margaret Wise Brown "How It's Made" series to follow student interest Science North's Material Matters Materials Exploration Build a shelter for a toy animal Science North's Building a Shelter Science North, Angle of the Sun There are many resources explaining and celebrating the Solstice. Choose an appropriate approach based	**Documentation and Routines** Set up a system to make it easy for all students to identify and document the types and numbers of birds at the feeders. Find access to experts to engage learners in bird and animal observation. **Discussion** Prepare students in advance to notice the shortening of the days and the shortest day on the solstice. **Materials For:** **Animal Shelter** Gather materials to build shelters and, perhaps, toy animals in different sizes based on need. **Amend Feeds Weather Station** Have on hand a

	when it is colder. Safety with building tools and materials Conducting experiments carefully and with focus.  **A2** The class can continue PRIM (Predict, Run, Identify, then Make) with already made Block programs, like Scratch Jr. to become conversant with coding. Using block-code programs like Scratch Jr. or unplugged activities like procedural diagrams, tableau, Simon Says, and partner games you can create clear and precise instructions for simple algorithms. For example Code the care cycle for a pet, class, or home. Code the care cycle and/or development of a personal/ group or class plant. Code the differences in temperature depending on the environment or materials. Code the changing of the seasons using weather, animals, plants, light, etc. Code similarities and differences in materials Create digital artifacts out of different materials Code an animal using your shelter Code the types and numbers of birds using your feeder	a different shelter as the seasons change? What do animals need in a shelter? What do animals use as shelter? Do they build them? What do they use? How can you show that in your shelter? **Materials and Living Things** What is the purpose of this technology? What should it do? What is the most important job it has to do? Why is one material better to use for this than another? What are the best materials I can use to make the animal shelter? Where do these materials come from? How were they made? What do I need to consider to make a good choice? How can I put the pieces together? What are some materials and items we use to put materials together? What are their jobs? What is the best fastener for this job?	**Gr. 2 Connections** B1.2, B2.1, B2.2 C1.2, C1.2, C2.1, C2.3, C2.4, C2.6 D1.2, D1.1 E2.4, E2.5	on the tone of your community.	variety of materials to amend weather stations or bird feeders. **Next Steps:** Arrange for a guest speaker to talk about how animals meet their needs. If possible, source a variety of whole plants for students to see roots, stems, leaves, flowers, fruit, and seeds. Students will need large format paper to trace themselves next month.

	A1.5 Sharing observations, continuing with journals, communicating with partner groups and class, showing and sharing knowledge, showing and sharing Engineering Design Process for the animal shelter. Creating and giving presentations of findings. **A1.1, A3** Research the winter habits of different plants and animals including birds and humans. Research the shelter needs of different local birds and animals (and humans!). Research the types of shelters local creatures use or build.				

Overview:
Students will deepen critical thinking skills and engineering design processes by assessing and adjusting chosen materials and previous work on the weather station and bird feeders. As well, they will synthesize information about seasonal changes and animal adaptations and welfare to either build a habitat for a local animal or create an animal and imagine adaptations that would enable it to survive in a specific ecosystem. Refer to careers and trades in building, animal and plant care, human medical testing, fitness, and care. Try to find local experts, or DHL participants, as well as agricultural workers and Indigenous speakers who can discuss these different trades as well as reading weather signs, hunting, trapping, fishing, planting, caring, and harvesting as the seasons change. Emerging technologies around plant and animal management, husbandry, growth, and harvesting can be very interesting. Look to the use of different wavelengths to promote the different stages of plant growth in indoor farming.

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

B. Life Systems: Needs and Characteristics of Living Things
B1.2 identify actions that can be taken to contribute to a healthy environment
B2.2 identify the basic needs of living things, including the need for air, water, food, heat, shelter, and space
B2.3 identify the physical characteristics of various plants and animals, including humans, and explain how these characteristics help the plants and animals meet their basic needs
B2.4 identify the location and the function of various parts of the human body, including sensory organs

E. Earth and Space Systems: Daily and Seasonal Changes
E1.2 assess ways in which daily and seasonal changes have an impact on society, the environment, and living things in the natural environment

E2.1 demonstrate an understanding of Earth's relationship to the Sun and that this relationship results in daily and seasonal changes on Earth
E2.2 demonstrate an understanding that a cycle is a series of repeating events, and that cycles can be observed in daily and seasonal changes
E2.3 describe the changes in the amount of light and heat from the Sun that occur throughout the day and in the four seasons
E2.4 describe and compare the four seasons in terms of the weather, including precipitation and temperature, in their local area
E2.5 describe changes in the appearance or behaviour of living things that are adaptations to seasonal changes
E2.6 describe how humans prepare for, and respond to, daily and seasonal changes

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
January	**A1.2** Continue to monitor the weather station. Continue to chart the analemma. Continue the pet journal. Continue to monitor and count the birds at the bird feeders. If possible, look for animal tracks in fresh snow to match tracks to animals and to see which animals are still active. Examine toy animals, animal pictures, or real animals and discuss how the animal gets what it needs (e.g. air, water, food, heat, shelter, and space). Examine a plant and label the parts we know. Discuss how a plant meets its needs. **A1.3** Create life-sized outlines of animals and plants and label the parts that help the organisms meet their needs. Create life-sized outlines of each other and	**Daily Changes** How does the day change? What do I do as the day changes? What do plants and animals do? How do I help them? **Seasonal Changes** How does the season change? What do I do as the season changes? What do plants, birds, and other animals do? What do you do? **Living Things** How do animals get what they need - air, water, food, heat, shelter, and space? How do plants get what they need? How are the parts the same (function) and how are they different (form or "structure")? How do we get what we need? What parts of our bodies help us	**Language** Discussing and explaining, researching and sharing, group, class, and individual communication, media exploration **Math:** Measurement, Data, Number, Coding **Art** Drawing, Tracing, Painting, Using Collage, Seeing, Representing **Gr. 2 Connections** B1.2, B2.1, B2.2 C2.1, C2.3, C2.4, C2.6 D2.1 (movement) E2.4, E2.5	There are many resources that can help match animal tracks. Here is a lesson plan from Science North: Winter Tracks. Participate in a crowd-sourcing bird count. An example can be found at Feederwatch. Picture books, young readers' guides, teacher-led reading about animal abilities. Resources that provide information about local animals in the winter. Videos and shows such as Peep and the Big Wide World or Wild Kratts. Sign up for digital zoo walks and/or to interact with the Digital Human Library talks and professionals.	**Observe Animals** Gain access to animals so students can observe them and imagine what parts the animals use to meet their needs. **Acquire Plants** Gain access to whole plants (or images or videos of whole plants) so students can observe them and imagine what parts the plant uses to meet its needs. **Materials and Methods** Gather projection devices if you would like students to trace large animal outlines. Gather large format

	draw in the details that help humans get what they need (e.g feet, fingers, eyes and ears, mouths, brain). OR **Build an Animal** Create an animal that can meet its needs in the local community - urban or rural, in times of high heat or extremely low temperatures, easy or difficult food sources, predation, and other dangers. Match animal design with meeting a need and include sensory organs.  **A1.4** Being safe around animals. Following procedures for experiments. Using tools and materials safely during drawing and when people are lying on the ground. Respecting other students' experiments and workspaces.  **A2** The class can continue applying PRIM (Predict, Run, Identify, then Make) with already made Block programs, like Scratch Jr., or other programs in Code.org, to become adept at coding for their grade level. Using block code programs like Scratch Jr. or unplugged activities like procedural diagrams, tableau, Simon Says, and partner games you can create clear and precise instructions for simple algorithms.	meet our needs? (hands, feet, mouths, brain, eyes, and ears) Which animals are active at this time? How can we tell? Are there any clues that show what they are doing? How can we get information from those clues? How are they part of our ecosystem, our community? How do they affect or influence our community? Can we help them or do we need to stay out of their way?		Check online for examples of lesson for "outlining students".	paper, like roll-out paper, for students to outline each other. Gather materials to build an animal. This can be drawn or done digitally, depending on the interests and skills of your learner. **Next Steps** Students are exploring energy in the next time frame and will need supplies to build machines using different forms of energy - elastic bands, bouncy balls, baking soda and yeast, solar panels, windmills, kites, human-powered objects - sports equipment - Gather building materials to create machines.

	For example, Code how an animal uses its parts to meet its needs. Code how a plant uses its parts to meet its needs. Code how a person uses sensory organs to meet his, her or their needs. Code birds coming to and leaving the bird feeder Code animal tracks to match animals and their activities in the winter **A1.5** Note that since December 21, the days have been getting longer. Examine the difference that a sunny or cloudy day makes in the temperature. (In the North, a sunny day means no cloud cover or insulation, so the day is colder. In the South, a sunny day can mean the day is warmer.) Examine precipitation - snow instead of rain. Document the birds at the feeder. Share animal tracks found in the yard, on a field trip, or seen outside of school. Communicate with partners, groups, class, and teachers during investigations and activities. Explain information using speech, drawing, coding, movement, writing, and photography.				

	 **A1.1, A3** Research how local animals behave in the winter, which ones are active, and what they are doing to meet their needs (e.g. foxes, raccoons, coyotes, skunks, deer, otters, etc). Research how these animals are part of the ecosystem or the community and how they affect or influence the community.				

Overview:
Students will combine learning through experimentation with critical thinking skills and engineering design processes to create working machines that use different forms of energy. As well, they will synthesize information about the energy from the sun, heat in seasonal changes, and how this affects the way we use energy in our homes. Students will have the opportunity to explore where energy comes from, how energy use changes from one family or community member to another, and how they, themselves, can act to save energy as they go about their day. Refer to careers and trades in the energy sector, with an eye to “Green” energy: oil patch, solar installation, windmill farm design, development, and monitoring - see both anchored and floating ocean windmills - being developed by local, female engineers supported by the Obama foundation - off the coasts of South America and Africa. Emerging technologies abound in the energy sector. Also look at the use of solar energy to power satellites, the space station, and in-space telescopes. This offers opportunities to discuss orbits.

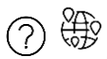
Strands & Expectations (in addition to the Strand A expectations listed at the beginning of this document):

B. Life Systems: Needs and Characteristics of Living Things
B1.1 describe changes or problems that could result from the loss of living and nonliving things that are part of everyday life, while taking different perspectives into consideration
B1.2 identify actions that can be taken to contribute to a healthy environment
B2.5 describe the characteristics of a healthy environment, including clean air and water and nutritious food, and how a healthy environment enables living things to meet their needs
B2.6 describe ways in which living things provide for the needs of other living thing
C. Matter and Energy: Energy in Our Lives
C1.1 describe everyday uses of energy at school and at home, and suggest ways to use energy responsibly
C1.2 describe how the lives of people and other living things would be affected if electrical energy were no longer available
C2.1 demonstrate an understanding that energy is the ability to move or change something
C2.2 demonstrate an understanding that the Sun is Earth’s principal source of energy, including how it warms the air, land, and water; is a source of light for Earth; and makes it possible for plants to grow
C2.3 identify food as a source of energy for living things
C2.4 identify everyday uses of various sources of energy
C2.5 demonstrate an understanding that humans get the energy resources they need from the world around them, and that the supply of many of these resources is limited
C2.6 describe seasonal differences in how we use energy and in the forms of energy we use
E. Earth and Space Systems: Daily and Seasonal Changes

E1.2 assess ways in which daily and seasonal changes have an impact on society, the environment, and living things in the natural environment
E2.1 demonstrate an understanding of Earth's relationship to the Sun and that this relationship results in daily and seasonal changes on Earth
E2.2 demonstrate an understanding that a cycle is a series of repeating events, and that cycles can be observed in daily and seasonal changes
E2.3 describe the changes in the amount of light and heat from the Sun that occur throughout the day and in the four seasons
E2.4 describe and compare the four seasons in terms of the weather, including precipitation and temperature, in their local area
E2.5 describe changes in the appearance or behaviour of living things that are adaptations to seasonal changes
E2.6 describe how humans prepare for, and respond to, daily and seasonal changes

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
February March April	**A1.2** As long as birds are regularly using the feeder or can be observed consistently, continue to count and sort birds. Pay attention to the changes in the birds that stayed over the winter and the types and numbers of birds that have returned. Monitor the weather station carefully during this time of rapid, seasonal changes Using a flashlight, simulate the angle of the sun through winter, summer, spring, and fall. Note that since December 21, the days have been getting longer. What makes day and night? Examine the flow of energy from the sun to all living things with examples, books, activities, or videos.	**Energy and Cycles** How does the Sun's energy change from day to night and as the seasons pass? We know we are tilting towards the sun. Where is the sun rising? How is the weather changing as the season changes? How does the Sun give Earth energy? How do we use the Sun's energy? **Living Things and Cycles** Why don't gardens grow all year? **Energy** How do I use energy? What kinds of energy are there? What kinds of energy do I use? Where does energy come from? Will it last?	**Language** Communicate in groups Listening Skills Following, sharing, negotiating instructions **Math** Continue to measure the plants, data, plot the growth in a chart, plot the analemma, code the differences in heat, code how a pinwheel works in the wind **Phys-Ed** Moving safely through the class and schoolyard. **Dance** Animal mimicry, represent energy moving through the ecosystem - use as	Activities to show sun angles for day and seasons, as it pertains to the loss of light and warmth such as Science North's, Angle of the sun. Picture books, teacher-led reading, videos or activities that show the transfer of energy from the Sun. There are many ways to show how the heat of the sun affects land and water. Here is an example lesson from Science North, Warm Sun Discuss transportation for necessity and enjoyment, energy needs Many resources outline how to build energy-using devices using common items. Here is	**Materials** You will need supplies to build mini greenhouses - jars, plastic boxes - and items to put inside. If you do not have a sunny window, try to arrange to house your "greenhouses" in a sunny spot elsewhere in the school. Collect the supplies to make or demonstrate human-powered machines - elastics, instruments, sports equipment, lever-operated items, eg. a can opener, wind-powered items like small boats Collect supplies to

	Explore the build-up of heat from the sun Explore the way you, your family, your classroom, your farm, your business, and your parents' places of work use energy.  **A1.3** **Build Energy Machines** Build and explore a variety of machines that need an available energy source: falling water or sand toys, pinwheels in the wind, kites….. Build a device following student interest, that acts on another object and requires a power source (e.g., elastic band launchers, battery-powered vehicle or lift, solar or mousetrap-powered car, a windmill with dynamo) and LED. **Build Flow Resource Kits** (if available) Build and/or examine a device (following student interest if there are resources) that uses solar OR wind power such as a solar oven, a solar vehicle from kits, a windmill with a dynamo that lights an LED.  **A1.4** Being safe around electricity, heat, and energy sources. Following procedures for experiments. Using tools and materials safely during building. Respecting other students' experiments and building spaces.	Is it safe for me, for the environment? How do different people in my life use energy? Is it the same or different? Some machines, like a guitar or a ball, need human energy. Where do we get our energy? How is it delivered to our homes? How is coding a part of delivering our power? Why did our chocolate melt in the solar oven?	unplugged coding activities **Drama** A Day in the Life **Art** Design, build and decorate **Gr. 2 Connections** B1.2, C1.2, C2.3, D2.1, D2.2, D2.3, D2.4, D2.5 (build) E2.4	a lesson to build a trebuchet or an elastic-powered paper airplane from Science North: Energy: Where does it go?	create elastic or battery-powered machines. Arranged a space to let them loose, safely! **Experts / Guests** Connect with the local power supplier to see if a meeting or a field trip is possible. Contact the DHL (Digital Human Library) to see if they have any experts to discuss the power grid with your Grade 1s. **Germination Time** From early March to early April (depending on your growing season) collect items to begin germinating seeds. You will need plants if you are building a garden, and you will need plants to carry out experiments using variables that affect growth. Garden centers and local contractors will often donate or offer a reduced price for local schools' projects.

	 **A2** The class can continue applying PRIM (Predict, Run, Identify, then Make) with already made Block programs, like Scratch Jr., or other programs in Code.org, to continue developing code for their grade level. Using block code programs like Scratch Jr. or unplugged activities like procedural diagrams, tableau, Simon Says, and partner games you can create clear and precise instructions for simple algorithms. For example, Code the care cycle for a pet, class, or home. Code the care cycle and/or development of a personal/ group or class plant. Code the path of the analemma, Code the difference of heat in materials Code how different forms of energy are used, supplied, made, and flow. Code how energy makes things work **A1.5** Explain and diagram energy use in their lives. Communicate during experiments and Engineering Design periods. Examine, follow and give instructions.  **A1.1, A3** Research different forms of energy, how energy is created, when, how, and what				

	uses different forms of energy, and how students use forms of energy at home, at school, in the community, and the many ways they travel. Discuss ways to save energy safely for different people at home, in school, in the community, and when traveling. If you can, discuss the power grid with an expert, OR arrange a trip to a power station OR look at videos of how our electrical grid works				

Overview:
Students will consolidate their learning about living things, structures, and materials, the energy sources - especially the sun, and seasonal changes through the building, planting, and maintenance of a garden /planter /or pot of class-grown plants, preferably quick maturing vegetables. They will see materials to their end by reusing, recycling, and composting. They will be directly involved in the transfer of energy from the sun to humans through the consumption of the faster-growing plants, like lettuces, peas, and beans. Refer to related careers and trades in agriculture, waste management, recycling, plastics development, reuse, and disposal. Look to Indigenous technologies that reduce waste. Examine traditional vs. modern ideas of wealth, primarily the tension between what is available to all vs. what is laid claim to by a few to the exclusion of the rest - 'The Tragedy of the Commons'. Emerging technologies abound in the recycling field. Address progress made in wax worm enzymes that eat polyethylene, and meal worms - that you can buy right in the pet store! - that eat polystyrene (Styrofoam). If interested, look at the remediation potential of various swamp plants and many mushrooms - to clean sewage, agricultural toxicity, and even radioactivity.
(Work by Paul Stamets is accessible.)

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

B. Life Systems: Needs and Characteristics of Living Things
B1.2 identify actions that can be taken to contribute to a healthy environment
B2.1 demonstrate an understanding of the natural environment as a place where living and non-living things are interconnected
B2.2 identify the basic needs of living things, including the need for air, water, food, heat, shelter, and space
B2.3 identify the physical characteristics of various plants and animals, including humans, and explain how these characteristics help the plants and animals meet their basic needs
B2.5 describe the characteristics of a healthy environment, including clean air and water and nutritious food, and how a healthy environment enables living things to meet their needs
B2.6 describe ways in which living things provide for the needs of other living things

C. Matter and Energy: Energy in Our Lives
C2.2 demonstrate an understanding that the Sun is Earth's principal source of energy, including how it warms the air, land, and water; is a source of light for Earth; and makes it possible for plants to grow

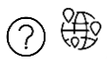
D. Structures and Mechanics: Everyday Materials, Objects, and Structures
D1.1 identify the kinds of waste materials produced by humans, and plan and carry out a course of action for minimizing waste in the classroom or at home, explaining why each action is important
D1.2 assess everyday objects, including structures, that have similar purposes, in terms of the materials they are made from, the source of these materials, and what happens to these objects when they are worn out or no longer needed
D2.3 identify materials that are used to make various everyday objects, including structures
D2.5 describe purposes of everyday objects, including structures
D2.6 identify properties of materials that enable the objects made from them to perform their intended function
D2.7 identify different kinds of fasteners and describe uses for each
D2.8 identify sources in nature of some common materials that are used to make various objects, including structures

E. Earth and Space Systems: Daily and Seasonal Changes
E2.1 demonstrate an understanding of Earth's relationship to the Sun and that this relationship results in daily and seasonal changes on Earth
E2.2 demonstrate an understanding that a cycle is a series of repeating events, and that cycles can be observed in daily and seasonal changes
E2.3 describe the changes in the amount of light and heat from the Sun that occur throughout the day and in the four seasons
E2.4 describe and compare the four seasons in terms of the weather, including precipitation and temperature, in their local area
E2.5 describe changes in the appearance or behaviour of living things that are adaptations to seasonal changes
E2.6 describe how humans prepare for, and respond to, daily and seasonal changes

Month or Suggested Timeline	STEM Skills and Connections	Guiding Questions	Cross-Curricular Integration	Resources	First Steps & Next Steps
April May June	**A1.2** Finish monitoring the weather station Finish the animal journal Finish the bird observation Design a plant experiment - in groups or as a class: grow a series of seeds or small cuttings while depriving one or two of them a single essential item - air, water, fertilizer/ food (grow in rocks), heat/shelter, space (grow within a very narrow diameter jar for instance) Spend a set amount of time collecting	**Days and Seasons** What did the change of seasons affect the weather station? How did the change of seasons affect day and night? What can we expect next year at school and at home? Why can't we grow a garden all year long outside? **Living Things** What did the seeds need to grow? What did the plants need?	**Language** Following instructions, labelling garden, information posters for compost and recycling, informing other classes about acceptable compost. **Math** Analyse the type and number of birds, count the birds, add how many used the feeder, draw the garden plans, and take and compare	Exploring solar energy Science North's Seeds and Solar Ovens Picture books and videos about germinating seeds and beginning plant growth, growing garden, harvesting, preparing, and eating plants. Designing tests to measure needs: light, water, soil, nutrients	**Volunteers** Try to find a family or community "garden coordinator". Gather family and school helpers to help when classes are outside in the garden. Enlist school helpers with compost collection. Try to find family or

	waste regularly to put into the new composter.  **A1.3** **Build a Growing Space** If the school does not have one yet, complete /build and prepare a garden /planter/ container for some plants. Plan plants to put into new or existing garden(s) and continue to germinate /prepare / and examine seedlings. **Plan or Build a Composter** Develop plans and/ or build a compost area. **Open Build: Upcycle to Build Useful Items** Following student interest and informed by available materials and community spaces, build something beneficial to plants or animals (including humans) out of repurposed material. **Solar Oven and Baking** Now that it is warmer and the sun is more intense, try cooking something more involved in a solar oven (tinfoil and pizza box style).  **A1.4** Being safe using tools and materials safely during building. Respecting other students' experiments and building spaces. Handle food safely.	What part of the plants was most important at the different stages? Matter and Energy What is important to plants when they are outside? What non-living supports do they need to grow? Why did our cheese melt? How does our planet use energy from the sun? **Materials, Objects, Structures** What are all the materials used to make the garden? Why did we build it the way we did? Now that you can see the garden, what do you think was the best way to build it? If we do it again, should we make any changes? What materials did we use? What were the best fasteners for the different connections we made? Do we have to throw objects out when we no longer need them? What else can we do with them? Can we help others by finding other ways of using our things? Can we help animals? How does finding a second and third life for, or recycling or composting goods help our	the measurements from the weather station. Look at the patterns in the temperature and precipitation. Analyse the likelihood of different animals in your ecosystem **Art** Looking at the uses Brian Jungen has for everyday objects, creating something new from something old **Dance** Unplugged coding opportunities **Gr. 2 Connections** B1.2, B2.1, B2.2, B2.3 (lifecycles) C 1.1, C1.2 (recycle) D1.2 E1.1, E2.5	Resources that define and explain wastes for compost Looking at the art of Brian Jungen: Everyday items telling tales Online resources that model creating useful items out of repurposed goods	community helpers to help build or assemble the composter. **Materials** Have students bring or have on-hand materials for them to build for others or for an animal from reused items. Have materials ready for the garden and composter if not already built. **Guests** Look to DHL and local experts to discuss recycling, agriculture, waste reduction - longer- or multiple-life products - and soil conditioning and remediation

	Handle garden produce safely Going outside safely - hats and sunscreen Safe soil handling. Coming in from a garden - washing hands Handle food waste safely  **A2** The class can continue applying PRIM (Predict, Run, Identify, then Make) with already made Block programs, like Scratch Jr., or other programs in Code.org, to begin exploring coding that will transition to the next grade level: concurrent events. Using block-code programs like Scratch Jr. or unplugged activities like procedural diagrams, tableau, Simon Says, and partner games you can create clear and precise instructions for simple algorithms. For example, Code the breakdown of waste in a composter. Code the process of recycling. Code the developments of a personal/ group or class plant when controlling the different variables. Code the path of the analemma.  **A1.5** Explain and diagram the response of plants to different variables. Create information about the kind of waste that will go into the school composter to share with the rest of the school.	world?			

	Students choose three personal items and explain what will happen when they are finished using them. Communicate during experiments and Engineering Design periods. Examine, follow and give instructions.  **A1.1, A3** Research how to add waste to a composter. Research how different materials are collected, grown and harvested. Research how different materials are recycled.				