
Grade 4 Learning Experiences: Pollinators and Creating Sustainable Spaces

Experience 1: Research Pollinators

[Long Range Plan Model 2](#)

Students will develop their knowledge of pollinators, specifically bees, and their role in our ecosystem. Through interactive activities, students will investigate the impacts humans have on pollinators and brainstorm realistic solutions to create sustainable spaces for such species.

<p>Overview of learning experiences – why these activities</p>	<p>In these activities, students will explore the life of pollinators and how to create a sustainable ecosystem in which they can thrive. The learning experiences will allow students to engage in research to learn the importance of pollinators and complete hands-on action-based solutions to ensure we reverse the negative factors that are hindering their survival.</p> <p>LRP Grade 4 Model 2 - Page 3 and 4</p>
<p>Prior Knowledge / Prior Skill Set(s)</p>	<p>Background Knowledge and Concepts (Teacher)</p> <ul style="list-style-type: none"> ● Aware of health & safety procedures ● Aware of Global Competencies & Transferable Skills ● Aware of Culturally Relevant & Responsive Pedagogy ● Understand how to implement the UDL framework ● Understand how to engage in an Engineering Design Process ● Aware of strategies to help new language learners ELL/MLLs ● Understand basic block-based coding concepts, platforms, functions and algorithms for software such as Scratch and Micro:bit Make Code <p>The following resources can be used by teachers to review the material or for students to do research:</p> <ul style="list-style-type: none"> ● Pollinators are Important - Let's Talk Science

	<ul style="list-style-type: none"> • World Bee Day - UN • Goal 15 of UN Goals for Sustainability • WWF Endangerment of Butterflies • Pollinator Infographic • Canadian Wildlife Foundation <p>Background Knowledge and Skills (Students)</p> <ul style="list-style-type: none"> • Understand ways in which plants are beneficial to society and the environment (Gr 3) • Understand ways in which human activities have an impact on plants and plant habitats (Gr 3) • Understanding of the composition of soils, of different types of soils, and of processes and practices that can affect the health of soil (Gr 3) • All about Bees • Simplified Text for researching about Bees • Video about Climate Change Action - World's Largest Lesson • Block-based coding concepts, platforms, functions and algorithms for software such as Scratch and Micro:bit Make Code and Do Your :bit
<p>Strand A - STEM Investigation and Communication Skills</p>	<p>The following expectations from the A strand will be covered in the activities.</p> <p> A.1.1 Scientific research: use a scientific research process and associated skills to conduct investigations (learning about pollinators and the risks to their ecosystem).</p> <p> A.1.2 Scientific Experimentation: use a scientific experimentation process and associated skills to conduct investigations (bee pollination process).</p> <p> A.1.3. Engineering Design Process: use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems (design/build a pollinator garden to attract pollinators)</p> <p>  A.1.5. Communication: communicate findings, using science and technology vocabulary and formats that are appropriate</p>

	<p>for specific audiences and purposes (creating a poster, justification of the pollinator garden design)</p> <p> A.2 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 and in STEM-related fields (Bee Pollination process, My Garden App)</p> <p> 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 (Bee Keepers and their importance, creating a poster to bring awareness)</p>
<p>Overview / Big Ideas/Fundamental Concepts</p>	<p>Overview: In these learning experiences, students will first research the role of pollinators such as bees and factors affecting their habitats. They will then participate in a hands-on activity to learn about the pollination process and how this affects humans' access to food. For the Career Spotlight, the class can connect with a local beekeeper or watch a video to learn more about the importance of their role in supporting bees and the pollination process. To take action, students will identify factors affecting pollination in a local community garden and will redesign it to maximize its effect. Using various media tools and options, students will communicate the critical need for pollinators in our life, and how we can reduce negative human activity toward them.</p> <p>Big Ideas: The activity of both humans and pollinators interact together and affect life on earth. The engineering process can help us find solutions to problems resulting from animals and human activity.</p> <p>Fundamental Concepts: https://www.dcp.edu.gov.on.ca/en/curriculum/science-technology/context/fundamental-concepts</p> <p>Systems and Interactions</p>

	<p>A system is a collection of living and/or non-living things and processes that interact to perform some function. Through these activities, students will learn the interaction between humans and pollinators and the system by which they both rely on one another.</p> <p>Sustainability and Stewardship Sustainability is the concept of meeting the needs of the present without compromising the ability of future generations to meet their needs. Stewardship involves understanding that we need to use and care for the natural environment in a responsible way and making the effort to pass it on to future generations no less than what we have access to ourselves. Students will redesign a garden to encourage the sustainability of pollination along with creating posters to encourage people to change their attitudes and actions towards pollinators and their importance.</p> <p>Change and Continuity Continuity represents consistency and connectedness within and among systems over time. Students will build an action and communicate it through their posters which will encourage the public to change the way they interact with our environment.</p>
<p>Learning Goals / Success Criteria</p>	<p>Learning Goals We are studying the role of local pollinators and the human impacts on their habitats/ecosystems.</p> <p>We are exploring the process of pollination and the important role of beekeepers.</p> <p>We are investigating the long term impacts of human activity on pollinators and identifying ways to reduce this impact through sustainable solutions that involve promoting stewardship.</p> <p>Success Criteria The following success criteria are examples of what can be co-created with the class.</p> <p>Experience 1: Research Pollinators I can use appropriate resources to research different pollinators. I can identify the role of pollinators in the ecosystem and human needs.</p>

	<p>research and learn more about. Let's find out what makes them so important to our lives and how we can support their existence.</p> <p>Take the time to co-create criteria for success for the research (see the section above Learning Goals / Success Criteria for ideas)</p> <p>Students will study the role of pollinators and how human activity is having an effect on them and their pollination process (See resources above in the Prior Knowledge / Prior Skill Sets section). Students are welcome to study pollinators other than bees (e.g., butterflies, moths, birds, and bats). Students can complete the research using a digital or printable graphic organizer. This research can be used to support Activity 3 as well as the consolidation in this document.</p> <p>Note: when reading texts online, students can benefit from hearing the text being read to them simultaneously using text-to-speech such as Read&Write and the use of online dictionaries.</p> <p>Options: This research can be completed in a small group, with partners, or independently.</p> <p>Presentation Options: Students can present their results by filling out the graphic organizer, creating a poster, a slide deck, recording an audio recording of them explaining their findings, or a video recording.</p>
<p>Science and Technology Expectations</p>	<p>Strand B. Life Systems: Habitats and Communities</p> <p>B.1 Relating Science and Technology to Our Changing World</p> <p>B1.1 assess positive and negative impacts of human activities on habitats and communities while taking different perspectives into account</p> <p>B1.2 analyse the impact of the depletion or extinction of a species on its habitat and community, and describe possible actions to prevent such depletions or extinctions</p> <p>B.2 Exploring and Understanding Concepts</p> <p>B2.6 describe structural adaptations of a variety of plants and animals and how these adaptations allow the organisms to survive in specific habitats</p>

	<p>B2.7 explain why all habitats have limits to the number of plants and animals they can support</p> <p>E. Earth and Space Systems E1.1 analyse ways in which geological processes impact society and the environment</p>
Science and Technology Vocabulary	<ul style="list-style-type: none"> ● habitat ● organisms ● species ● structural adaptations ● pollinators ● pollination ● stewardship ● sustainability
Equipment and Materials	<ul style="list-style-type: none"> ● Devices for researching and app designing
Timeline and Preparation	<p>These are approximate times that can be shortened or extended based on student engagement, interest and additional inquiry.</p> <p style="text-align: center;">Minds-on 40 minutes Experience 1 Research Pollinators 80 minutes</p>
Safety Considerations	<p>Depending on the building/testing projects that are chosen, review safety guidelines before using tools (saws, scissors, glue gun, etc.).</p> <p>Refer to these safety resources:</p> <ul style="list-style-type: none"> ● Safety in Elementary Science and Technology (STAO) ● Safe Activity Foundations in Education Document (SAFEdoc) Science and Technology, Grades 1-8 (OCTE) ● Ontario Curriculum Program Planning – Health and Safety <p>Students may need to be reminded of safety considerations (e.g., never point elastic launchers at others).</p> <p>Review of netiquette when browsing the internet for research</p>

	and producing final projects on the computer.
Opportunities For Assessment	<p>Assessment FOR Learning: Occurs throughout the learning experiences as students are still gaining knowledge and practicing skills. It is used by teachers to monitor students' progress towards achieving the overall and specific expectations, so that teachers can provide timely and specific descriptive feedback to students, scaffold the next steps, and differentiate instruction and assessment in response to student needs. This can be in the form of conversations with students and observations during hands-on activities. Exit tickets can also be completed as a quick check-in for understanding. Assessment FOR learning will take place through every activity listed in the above learning experiences.</p> <p>Assessment AS Learning: Occurs frequently and in an ongoing manner during instruction, with support, modelling, and guidance from the teacher and is used by students to provide feedback to other students (peer assessment), monitor their own progress towards achieving their learning goals (self-assessment), make adjustments in their learning approaches, reflect on their learning, and set individual goals for learning. In the above learning experiences, this can take place when students are researching pollinators, the coding processes with Scratch, Microbit and Sphero and creating questions for the interviewee. As a teacher, use the success criteria listed above to create checklists for peer and self-assessment. Ensure criteria that are co-created are student-friendly.</p> <p>Assessment OF Learning: Occurs at or near the end of a period of learning, and may be used to inform further instruction and is used by the teacher to summarize learning at a given point in time. This provides information on the quality of student learning on the basis of established criteria, and supports the communication of information about achievement to students themselves, parents, teachers, and others. In the above learning experiences, this will take place during</p> <p>Please use the following links for further reference: https://www.dcp.edu.gov.on.ca/en/assessment-evaluation https://www.edu.gov.on.ca/eng/policyfunding/growsuccess.pdf</p>

<p>Instructional Strategies and Adaptability</p>	<ul style="list-style-type: none"> ● Giving student voice and choice (options for communicating their learning and tools for learning) ● Pulling from students' lived experience (e.g., what gardening, farming looks like in other countries or in their homes) ● Building vocabulary collaboratively (e.g. use of images and creating an interactive word wall) ● Offering visuals to support language learning ● Using assistive technology to access texts (E.g., Google Read&Write) ● Offering multiple ways of showing understanding ● Using the triangulation of data (e.g., observations, conversations and products). ● Prompt students as required. Simplify resources and support as required. Enhance learning opportunities with extension activities where required. ● Offering different learning environments/spaces around the school (e.g., library, outdoor classroom)
<p>Additional Supporting Resources</p>	<ul style="list-style-type: none"> ● Pollination (Indigenous Perspectives Activity 1.4 & 2.2) ● Pollinators are Important - Let's Talk Science ● World Bee Day - UN ● Goal 15 of UN Goals for Sustainability ● WWF Endangerment of Butterflies ● Pollinator Infographic ● Canadian Wildlife Foundation ● All about Bees ● Simplified Text for researching about Bees ● Video about Climate Change Action - World's Largest Lesson ● Scratch ● Micro:bit Make Code and Do Your :bit <p>Other additional resources: Ecoschools Canada</p>
<p>Cross-Curricular Opportunities</p>	<p>Language Oral and written communication (recording research, listening to information from videos, presentation of the design), Media (Communicating their learning)</p>

	<p>Social Studies Looking at the Canadian regions and how adaptations of pollinators are suited for certain regions in Canada.</p> <p>Drama Students can act on the various effects on pollinators based on human activity.</p> <p>Health Discussing the importance of healthy eating, where our food comes from, and growing locally</p>
Future Opportunities / Next Steps	<p>Visit an outdoor education centre or conservation centre if possible (e.g., butterfly conservatory)</p> <p>Students can create and organize a schoolwide EcoClub that focuses on maintaining school garden spaces.</p>

Appendix A : We Need Bees to Make These Foods

We Need Bees to Make These Foods

Nous avons besoin des abeilles pour fabriquer ces aliments

- Tomatoes
- Onions
- Cucumbers
- Cacao bean (chocolate)
- Pumpkins
- Oranges
- Avocados
- Honey
- Bell peppers
- Chili peppers
- Cooking oil (sunflower, canola)
- Lemons
- Vanilla beans
- Almonds
- Watermelons
- Apples
- Blueberries
- Cherries
- Cranberries
- Oignons
- Concombres
- Fève de cacao (chocolat)
- Citrouilles
- Des oranges
- Avocats
- Mon chéri
- Poivrons
- Piments forts
- Huile de cuisson (tournesol, colza)
- Citrons
- Graines de vanille
- Amandes
- Pastèques
- Pommes
- Myrtilles
- Cerises
- Canneberges

- Tomates