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## Grade 1 Learning Experiences: Seasonal Changes

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### Experience 3: How Do Living Things Adapt to Seasonal Changes?

This series of learning experiences will introduce students to seasonal changes from a scientific approach as they observe changes in the weather throughout the school year (with opportunities to connect to other science strands and other curriculum expectations). Students will engage in the driving question “How Do Living Things Adapt to Seasonal Changes?” through a provocation activity to get them to share what they already know about the four seasons and what they wonder about seasonal changes. Students will then engage in the Engineering Design Process by designing and constructing a variety of devices to collect information about the weather that will contribute to a classroom indoor/outdoor weather station. The goal of the weather station is to help students observe, track and monitor the weather throughout the school year so they can witness first hand the seasonal changes and how it impacts the world around us. A variety of extensions and cross-curricular opportunities will allow teachers to customize these experiences to suit their students' needs and learning styles while allowing for authentic assessment for, as, and of learning.

In the real world, scientists and engineers need to record their thinking and keep records of their scientific processes and engineering designs for several different reasons. In these experiences, students will be using a science journal to track their scientific thinking as they emulate scientists and engineers while learning to make predictions, record processes, and observations, and draw conclusions about scientific phenomena. The journal will also be used during STEM investigations as a place for solving solutions to real-world problems (brainstorming, describing plans, and drawing designs for prototypes) and will be an evidence-based source of assessment information

[Long Range Plan Grade 1 - Model 2](#)

Overview of learning experiences – why these activities	<p>In this learning experience, students will have the opportunity to participate in the Scientific Research Process by identifying and recording information and findings about the weather using their classroom weather station. Students will use their science journals to track, record, and pose questions about their findings, then analyse and communicate their results to demonstrate understanding.</p> <p>These learning experiences link to the <a href="#">Long Range Plan Grade 1 Model 2</a>, found in September.</p>
Prior Knowledge / Prior Skill Set(s)	Teachers may wish to consider a modeled or shared approach to completing a science journal until students are able to complete a journal

	<p>activity on their own. The journal can then be used as a form of assessment throughout the school year as students make observations about seasonal changes. See <a href="#">Appendix B: Science Journal Entry - Plan/Design</a> and <a href="#">Appendix C: Science Journal Entry - Observations</a> for sample journals. Teachers may also wish to display frequently used sentence starters or prompts to model and guide students on how they can share and observe their findings (i.e. I noticed..., I wonder..., I see..., I feel..., I hear..., etc..)</p> <p>Students should be familiar with the seasons and the different forms of weather that can happen in their communities.</p>
<p>Strand A - <a href="#">STEM Investigation and Communication Skills</a></p>	<p> <b>A1.1</b> use a scientific research process and associated skills to conduct investigations</p> <p> <b>A1.2</b> use a scientific experimentation process and associated skills to conduct investigations.</p> <p> <b>A1.3</b> use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems.</p> <p> <b>A1.4</b> 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.</p> <p> <b>A1.5</b> communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes</p> <p> <b>A2.1</b> write and execute code in investigations and when modelling concepts, with a focus on creating clear and precise instructions for simple algorithms</p> <p> <b>A3.1</b> describe practical applications of science and technology concepts in their home and community, and how these applications address real-world problems</p>

	<p><b>A3.2</b> investigate how science and technology can be used with other subject areas to address real-world problems</p> <p><b>A3.3</b> analyze contributions to science and technology from various communities</p>
Overview / Big Ideas/Fundamental Concepts	Throughout the course of a year, living things in our province experience four seasonal changes and have a variety of ways to adapt to them. In this learning experience, students will follow the scientific research process by observing, monitoring, and tracking seasonal changes to find solutions to the driving question, “How Do Living Things Adapt to Seasonal Changes?”. Students will also use their co-created class Weather Station to collect measurable data about the weather.
Learning Goals / Success Criteria	<p>Students will design and build a weather station to track seasonal changes. The station can include a variety of tracking tools or devices that will monitor and observe information such as temperature, wind direction, and precipitation.</p> <p>The success criteria template (see <a href="#">Appendix A: Co-Created Success Criteria</a>) can be used as a starting point when collaborating and co-creating learning goals based on curricular expectations.</p> <p>Further evidence for assessment can be observed through</p> <ul style="list-style-type: none"> <li>● Scientific Journal</li> <li>● Student Conferences</li> <li>● Nature Walks</li> <li>● Presentations</li> <li>● Peer Discussions</li> </ul> <p><b>Ministry of Education Key Points:</b></p> <ul style="list-style-type: none"> <li>● STEM Skills &amp; Connections</li> <li>● Research &amp; Experimentation Processes</li> <li>● Engineering Design Process</li> <li>● Hands On Experiential Learning</li> <li>● Coding</li> <li>● Contributions to Science and Technology</li> </ul>
Learning Experience(s)	When it comes to understanding Earth systems and our changing world, our best resource is nature itself. During these learning experiences,

students will immerse in the scientific experimentation process and the engineering design process to create their own weather station to track seasonal changes in their communities and determine how living things adapt to them.

In this learning experience, students will use a science journal to document the weather changes and make note of the data they are collecting from the weather station. This final portion of this learning experience series should last throughout the duration of the school year, so students can witness the changes to their environment and notice the patterns that occur throughout the season. (i.e., There was more rain collected throughout the months of April-May, than the other months or there were more windy days in the fall than in the winter).

Classes can schedule daily or even weekly weather station check-ins to collect data. They can also venture outside for nature walks to make note of the changes they see in their communities. This learning experience is a sample of those weather station check-in days.



**A1.1, A1.2, A1.3,  
A1.4, A1.5, A2.1,  
A3.1, A3.2**

### **Minds On**

#### **What the Teacher Does:**

1. Gather the students together into a whole group. Let them know that today they are going to be meteorologists and research the weather by visiting the weather station.
2. Ask students what observations they have noticed about the weather today/this week. (Did it rain? If so, what happened? How did it feel? Did they have to wear something different?)
3. Ask students what materials they will need to observe and take notes of the information. ([Appendix B: Science Journal Entry - Plan/Design](#), clipboards, writing utensil)
4. Show students a sample of a completed data entry page, as a model to show the ways they can record their findings. Students can take pictures, draw, or write in their science journals. Some students may prefer a digital copy and record themselves in a video or audio format.
5. Review any safety procedures and ask students how they should prepare to go outside today? (Do they need a sweater? A hat? Sunscreen? Boots?)
6. Guide the students to the weather station.

**What the Students Do:**

## Thinking &amp; Investigating:

- Use of initiating and planning skills and strategies.
- Use of critical/creative thinking processes, skills, and strategies.

## Communication:

- expression and organization of ideas in oral, visual, and/or written forms.

**Action****What the Teacher Does:**

1. Have the class gather around the weather station so they can see it. Have them first observe without touching, and ask what they notice? Then ask what they wonder?
2. Students can take a closer look at their prototypes, record what they see in their science journals, and share their findings with their elbow partners. Circulate around the class and ask students about their entries.
3. Invite students to take a nature walk and remind them that they are looking for evidence of seasonal changes. While walking be sure to help guide students to notice things they may have missed. Some examples of seasonal changes are
  - a. Colour and number of leaves or needles in trees (i.e. evergreen trees) showing no change.
  - b. Squirrels collecting food and digging
  - c. Clothing that people are wearing
  - d. Plants/Flowers
  - e. Bee/Bug Activity
4. Take pictures and make recordings to post up in the classroom for reference.

**What Students Do:**

## Thinking &amp; Investigating:

- Use of processing skills and strategies.
- Use of critical/creative thinking processes, skills, and strategies.

## Communication:

- expression and organization of ideas in oral, visual, and/or written forms.
- Use of conventions, vocabulary, and terminology of the discipline in oral, visual, and/or written forms.

Application:

- Application of knowledge and skills in familiar contexts
- Transfer of knowledge and skills in new contexts.
- Making connections within and between various contexts

**Consolidation**

**What the Teacher Does:**

1. Invite the students to sit or stand in a circle, with their science journals/recordings.
2. Invite students to share what they noticed and discovered during their weather station check-in and/or nature walk.
3. As students share their findings, make observations, and assess their knowledge, thinking, communication and application.
4. Record and share the evidence students found by writing down what they share on chart paper, post photos and/or copies of students' drawings and recordings in the classroom.

**What the Students Do:**

Knowledge & Understanding:

- Knowledge of Content
- Understanding of Content

Communication:

- Expression and organization of ideas and information in oral, visual, and/or written forms.
- Communication for different audiences and purposes in oral, visual, and/or written forms.
- Use of conventions, vocabulary, and terminology of the discipline in oral, visual, and/or written forms.

Application:

- Transfer of knowledge and skills to new contexts.

	<p><b>Assessment AS/FOR/OF Learning Opportunity:</b> The students' science journal pages can be used as an assessment of learning. Be sure to check-in with students during the action portion of the experience to allow them to share their ideas orally in case their recordings are unclear. As students continue to track and monitor the weather and seasonal changes, give them opportunities through the student science journal and class discussions to communicate their own discoveries, conclusions and understanding.</p>
<p>Science and Technology Expectations</p>	<p><b>C. Matter and Energy</b></p> <ul style="list-style-type: none"> <li>- C2.6 describe seasonal differences in how we use energy and in the forms of energy we use.</li> </ul> <p><b>D. Structures and Mechanisms</b></p> <ul style="list-style-type: none"> <li>- D2.1 describe objects as things that are made of one or more materials.</li> <li>- D2.2 identify structures that are objects designed to support a load, including those acting as supporting frameworks for objects.</li> <li>- D2.3 identify materials that are used to make various everyday objects, including structures.</li> <li>- D2.4 describe observable characteristics of various everyday objects, including structures, using qualitative information gathered through their senses.</li> <li>- D2.6 describe purposes for everyday objects, including structures</li> <li>- D2.8 identify sources in nature of some common materials that are used to make various objects, including structures.</li> </ul>
<p>Science and Technology Vocabulary</p>	<p><b>Season:</b> a part of the year based on changes in weather. Seasons are the result of the Earth's orbit and position around the sun.</p> <p><b>Spring:</b> a season after winter and before summer. The weather is warmer, the days become longer, and it rains more often.</p> <p><b>Summer:</b> the season after spring and before fall. Summer is the hottest of the four seasons and the days are the longest.</p> <p><b>Fall/Autumn:</b> the season after summer and before winter. Fall is also known as Autumn. During the Fall, the temperature begins to cool down and the days become shorter.</p> <p><b>Winter:</b> is the season after Fall/Autumn and before spring. It is the coldest season of the year. The nights are longer, and the days are shorter.</p> <p><b>Temperature:</b> a measure of how hot or how cold something is. We can measure temperature by using degrees Celsius.</p>

	<p><b>Thermometer:</b> a device used to measure temperature.</p> <p><b>Meteorologist:</b> a scientist who studies processes in the earth's atmosphere that cause weather conditions.</p> <p><b>Precipitation:</b> water that falls to the earth as rain, sleet, hail, mist, or snow.</p> <p><b>Wind:</b> is the movement of air on the Earth's surface. The most powerful wind happens during storms. Changes in the temperature of air, land, and water cause wind.</p>
Equipment and Materials	<ul style="list-style-type: none"> <li>● Science Journal and/or Journal Handout (<a href="#">Appendix B: Science Journal Entry - Plan/Design</a> and <a href="#">Appendix C: Science Journal Entry - Observations</a>)</li> <li>● Weather Station Prototypes (from Learning Experience 2)</li> <li>● Clipboards</li> <li>● Writing Utensils</li> </ul>
Timeline and Preparation	<p><b>Minds On (10mins)</b>  <b>Action (30mins)</b>  <b>Consolidation (10mins)</b></p> <p><b>Preparation (15mins)</b>  To prepare for this learning experience, have a sample of a science journal entry/data recording page to model for students how to record and track data (see <a href="#">Appendix B: Science Journal Entry - Plan/Design</a> and <a href="#">Appendix C: Science Journal Entry - Observations</a> and <a href="#">Appendix D: My Daily Weather Tracker</a>). Be sure to check the weather and plan accordingly for weather station check-ins. Designate an area in the classroom/school to share students' findings and data collection from weather station check-ins and nature walks.</p> <p>Share with students' families that they will be participating in a nature walk, so they are prepared and dressed according to the weather.</p> <p><b>Next Steps</b>  Teachers can continue to record information about the data collected from the weather and seasonal changes. As one season ends, be sure to open up a conversation about what students noticed and discovered during that season, constantly referring back to the driving question, "How Do Living Things Adapt to Seasonal Changes". Teachers can post this question up in the school/classroom on a bulletin board throughout</p>



	<p>the year and add findings, evidence, and conclusions that students have made that respond to the question.</p>
<p>Safety Considerations</p>	<p><b>What does the teacher do?</b>          Consider safety procedures when venturing out on a nature walk and remind students of the expectations (e.g., walking buddings, teacher placement/position while walking). Make sure students have the appropriate documentation necessary to leave the school property for a nature walk. (If you choose to leave the property.) Students must be dressed appropriately for the weather.</p> <p><b>What do the students do?</b>          Follow teacher instructions and expectations and stay with a walking buddy at all times during the nature walk.</p> <p>Refer to these safety resources:</p> <ul style="list-style-type: none"> <li>• <a href="#">Safety in Elementary Science and Technology (STAO)</a></li> <li>• <a href="#">Safe Activity Foundations in Education Document (SAFEdoc) Science and Technology, Grades 1-8 (OCTE)</a></li> <li>• <a href="#">Ontario Curriculum Program Planning – Health and Safety</a></li> </ul>
<p>Opportunities For Assessment</p>	<p>According to the Ministry of Education, Growing Success Document (2010) assessment is about improving student learning:</p> <p><b>Assessment FOR Learning:</b> Occurs frequently and in an ongoing manner during instruction, while students are still gaining knowledge and practicing skills and 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 next steps, and differentiate instruction and assessment in response to student needs.</p> <p><b>Assessment AS Learning:</b> Occurs frequently and in an ongoing manner during instruction, with support, modeling, 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</p>

	<p>their learning approaches, reflect on their learning, and set individual goals for learning.</p> <p><b>Assessment OF Learning:</b> 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 summary is used to make judgements about the quality of student learning on the basis of established criteria, to assign a value to represent that quality, and to support the communication of information about achievement to students themselves, parents, teachers, and others</p> <p><b>NOTE:</b> The assessment in the learning experiences are intentionally assessment for learning and assessment as learning. The assessment modality is intentionally conversations and observations. This is to help move away from only product based assessment. Throughout the learning experiences students will have many opportunities to demonstrate their understanding through doing, talking and engaging in self-assessment. By collecting assessment for/as learning data teachers can be responsive and provide meaningful feedback. Teachers have been provided with assessment tools to collect evidence of student learning. Assessment opportunities are embedded throughout the learning experiences.</p> <p>Please use the following links for further reference:  <a href="https://www.dcp.edu.gov.on.ca/en/assessment-evaluation">https://www.dcp.edu.gov.on.ca/en/assessment-evaluation</a>  <a href="https://www.edu.gov.on.ca/eng/policyfunding/growsuccess.pdf">https://www.edu.gov.on.ca/eng/policyfunding/growsuccess.pdf</a></p>
<p>Instructional Strategies and Adaptability</p>	<p>This learning experience makes use of a variety of instructional strategies. You may wish to adapt or change the strategy as indicated in the instructions section of this document.</p> <p>Students may require multiple options to communicate their ideas in their science journal (i.e., draw pictures, take a picture and add it to the journal, use a digital journal, record voice memos, etc.) You may also need to scribe ideas or journals for students who require extra support.</p> <p>Some students may benefit from having the vocabulary and definitions on a handout sheet as well as being able to see and refer to them on a bulletin board.</p>

Additional Supporting Resources	<a href="#">Appendix A: Co-Created Success Criteria</a> <a href="#">Appendix B: Science Journal Entry - Plan/Design</a> <a href="#">Appendix C: Science Journal Entry - Observations</a> <a href="#">Appendix D: My Daily Weather Tracker</a>
Cross-Curricular Opportunities	<p><b>Mathematics</b></p> <p>Data Literacy: record and analyse the data collected from the weather station and nature walk.</p> <p>Measurement: track temperature, read the date, and identify the days of the week, the month, and year.</p> <p>Number: making connections to numbers in temperature and on a calendar.</p> <p><b>Language</b></p> <p>Oral Communication: communicate ideas and brainstorm strategies with teachers and peers.</p> <p>Writing: record their ideas, and procedure for their plan, label their designs, and make a list of materials.</p>
Future Opportunities / Next Steps	<p><b>Coding Activities:</b></p> <ul style="list-style-type: none"> <li>● YouTube video: <a href="#">“Use ScratchJr to show Seasonal Changes”</a></li> <li>● Unplugged Opportunities: <ul style="list-style-type: none"> <li>○ Students can write and execute clear and precise instructions to construct their prototype.</li> <li>○ Students can write and execute code for their class nature walks, creating clear and precise instructions for a simple algorithm.</li> </ul> </li> </ul> <p><b>Data Literacy:</b></p> <ul style="list-style-type: none"> <li>● Students can use the data they have collected from the weather station to display sets of data using concrete graphs and/or pictographs for each season (i.e., a pictograph on number of days it rained in the fall).</li> </ul> <p><b>Language:</b></p> <ul style="list-style-type: none"> <li>● Students can write a simple report on a season using the information and research they’ve done through the weather station.</li> </ul>

	<ul style="list-style-type: none"><li>• Students can write a procedure on “how to build” their prototype.</li></ul>
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## **Appendix A - Co-Created Success Criteria**

Name: \_\_\_\_\_

**Co-Created Success Criteria – Grade One: How Do Living Things Adapt to Seasonal Changes?**

**Knowledge and Understanding**

<b>I Can:</b>	<b>Not Yet</b>	<b>Met</b>
Build a tool/device for the weather station by following the safety procedures for science.		
Describe changes in appearance or behaviour of living things that are adaptations to seasonal changes.		

**Thinking**

<b>I Can:</b>	<b>Not Yet</b>	<b>Met</b>
Identify and plan strategies to gather information to assess the impact on society, the environment, and living things in the natural environment.		
Use creative thinking processes, skills, and strategies to solve a learning task.		

## Communication

<b>I Can:</b>	<b>Not Yet</b>	<b>Met</b>
Express and organize my observations to communicate my understanding (using pictures, words, or verbally) to my peers and my teacher.		
Justify and prove my conclusions and solutions.		

## Application

<b>I Can:</b>	<b>Not Yet</b>	<b>Met</b>
Apply the engineer's design process to build a device/weather station that can withstand external forces using the techniques I've learned.		
Transfer my knowledge and skills to solve real-world problems by making connection between other subject areas.		

Descriptive Feedback:

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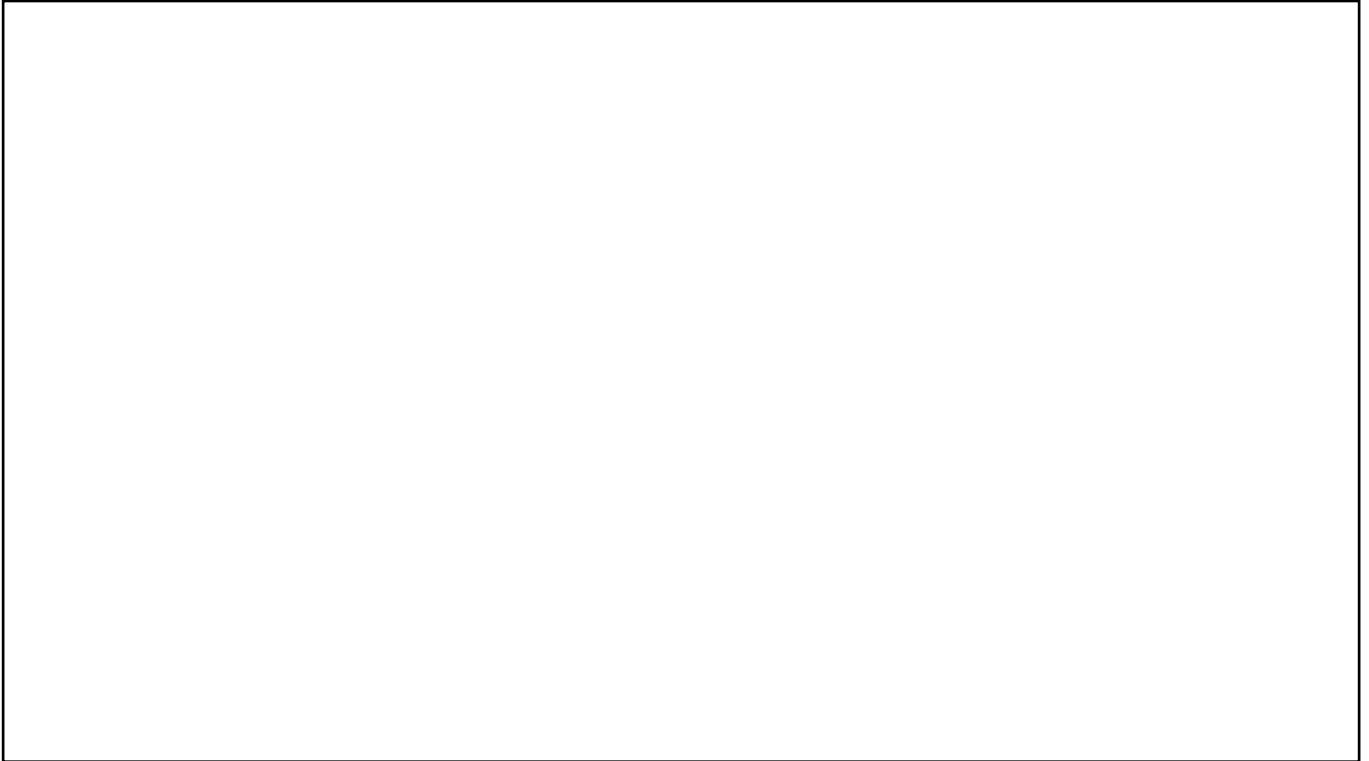
## **Appendix B: Science Journal Entry - Plan/Design**

Name: \_\_\_\_\_

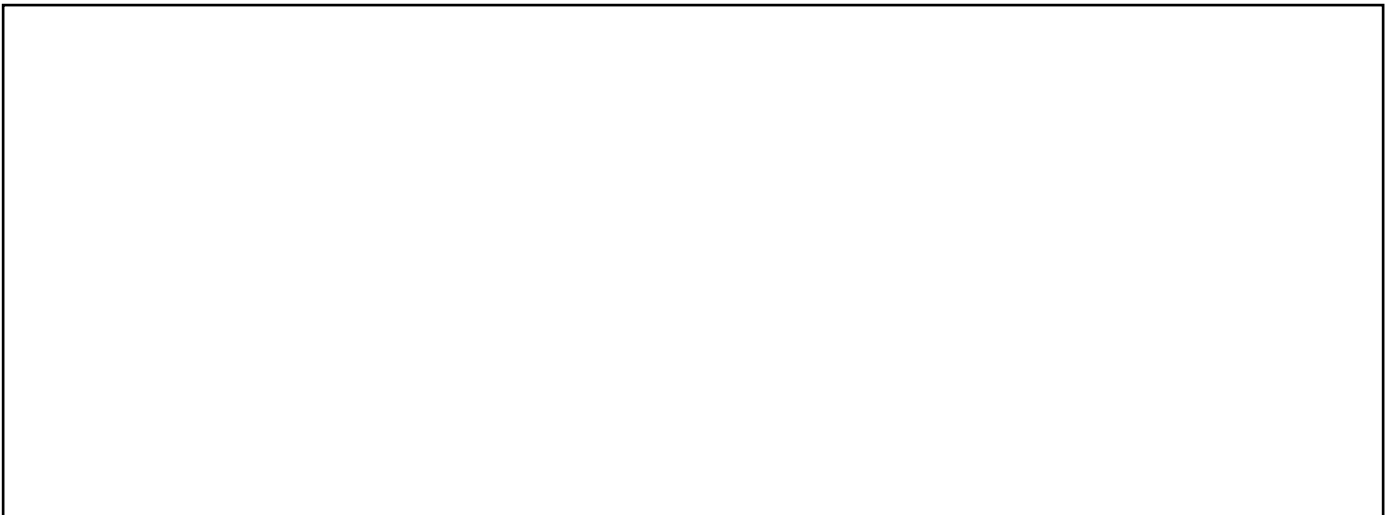
Date: \_\_\_\_\_

## Science Journal Entry: Plan/Design

My Ideas (Draw, Write, Record, Paste, etc.)



What I Need (Draw, Write, Record, Paste, etc.)



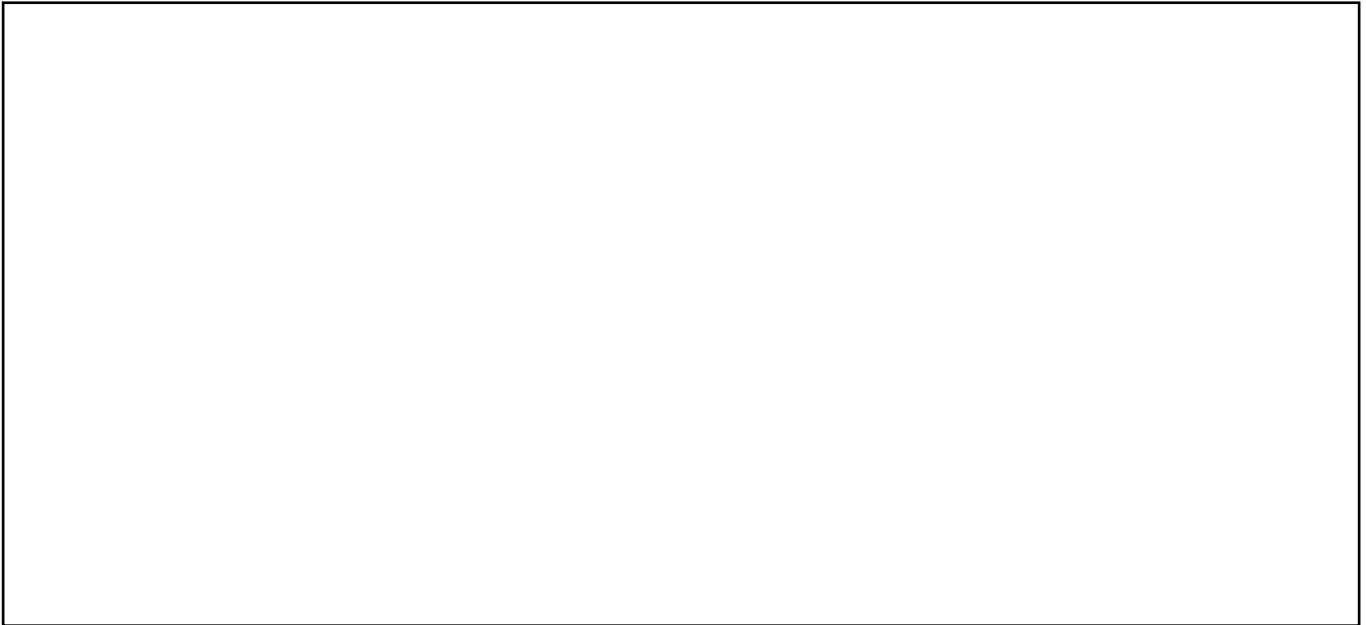
## **Appendix C: Science Journal Entry - Observations**

Name: \_\_\_\_\_

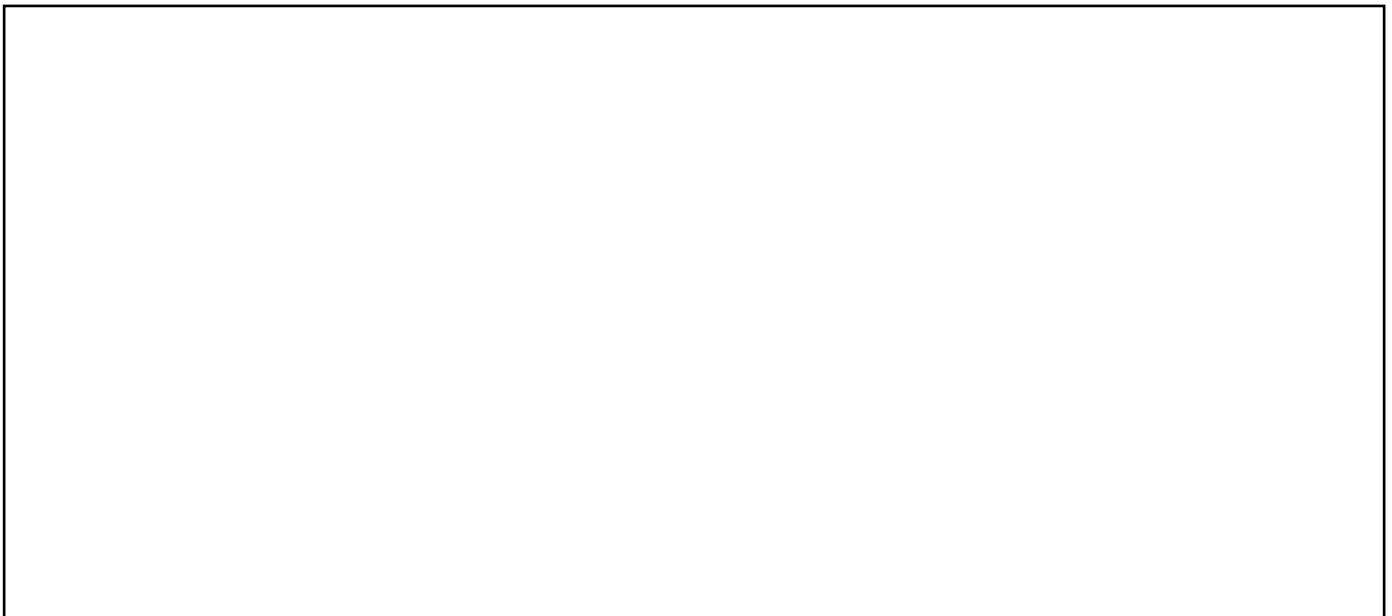
Date: \_\_\_\_\_

## Science Journal Entry: Data/Observation Recording

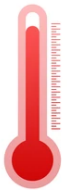
What Did You Notice? (Draw, Write, Record, Paste, etc.)



What Do You Wonder? (Draw, Write, Record, Paste, etc.)



## **Appendix D: My Daily Weather Tracker**



Hot



Snow



Thunder & Lightening



Rain



Light Rain



Dry



Windy



Fair

# MY DAILY

# WEATHER TRACKER

Date:



Breeze



Sunny



Partly Cloudy



Cloudy



Foggy



