Grade 2 Earth Science Unit (2.E.1)

Decision 1: What will students learn in this unit?

Standards Addressed:
1. Science 2.E.1 - 2.E.1.1; 2.E.1.2; 2.E.1.3; 2.E.1.4
2. Reading Informational Text 2.RIT.1; 2.RTI.2, 2.RTI.3, 2.RTI.7, 2.RTI.8, 2.RTI.9, 2.RTI.10
3. Math 2.MD.10; 2.NBT.2
5. Technology 2.SE.1.1
6. Other

What do I want my students to KNOW, UNDERSTAND and be able to DO at the end of this unit?

<table>
<thead>
<tr>
<th>Know</th>
<th>Understand</th>
<th>Do</th>
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</thead>
<tbody>
<tr>
<td>Know that light travels from the sun to the earth. Some of the light is reflected back into space, some is absorbed by the land, water, and air.</td>
<td>I understand patterns of weather and factors that affect weather over time. I understand the use of the sun’s energy. I understand how to use tools to measure weather.</td>
<td>Conduct experiments, research, and observations that utilize weather tools. Make different weather measuring instruments. Reading non-fiction texts using print and technology. Group project on different types of weather (Weather Expert). Compare and contrasting of weather patterns. Analyze and interpret data such as temperatures in different locations and different times (use of graphs). Create culminating weather project (mobil; powerpoint; photostory; book; poster) Write weather data in observation journal</td>
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<tr>
<td>Know that numbers are used to describe air temperature, wind speed, and the amount of precipitation that occurs. Know how to measure air temperature using a thermometer, wind direction with a wind sock, or vane, wind speed with an anemometer, and precipitation with a rain gauge. Students are familiar with manual and electronic weather instruments, sensors, and computers as well as how they can produce a record of weather changes that occur over time by collecting and recording data.</td>
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<tr>
<td>I know how to draw a picture and a bar graph to represent a data set with up to 4 categories. I know how to skip count by 5s and 10s. I know how to read and comprehend informational text and can make connections between scientific ideas and concepts. I know how to use technology hardware and software responsibly. I know how to write an opinion writing piece. I know how to write an informational writing piece. I know how to write a narrative writing piece.</td>
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Decision 2: Assessment

Plan for how students will indicate learning and understanding of the concepts in the unit. How will you assess learning?

Possibilities/options:
- Pre-assessment
- Short answer tests or quizzes
- Student logs, journals and informal writing
- Lab activities
- Formal writing assignments
- Informal or formal student Interviews, conferences, observations etc.

Describe the performance, product, or project that will be the culminating activity for the unit.

The student’s assignment for the Culminating Activity includes:

- **Unit** essential question or “I Can” statement for the culminating activity.
- A thorough **description** of the activity including steps or task **analysis** in completing the culminating activity.
- A copy(ies) of the rubric(s) you will use to assess the culminating activity or any other aspects of the unit.
Assessment (Pre- and Post)

1. Circle the picture that shows a windy day.
   a) 
   b) 
   c) 

2. Which rain gauge shows more precipitation?
   a) 
   b) 
   c) 

3. Which tool would you use to measure wind speed?
   a) thermometer 
   b) anemometer  
   c) rain gauge
4. Use the following chart to describe what you would wear, or outdoor activities you could do based on the given temperatures.

| 32 degrees | 75 degrees |

5. If I was measuring precipitation, which weather tool would I use?
   a) wind sock
   b) rain gauge
   c) thermometer

6. Counting by 5’s draw a thermometer that shows 70 degrees.
7. Put a circle around the picture that shows the sun’s heat energy warming the water.

   a) sun warming a lake

   ![Sun warming a lake](image)

   b) sun warming a cactus

   ![Sun warming a cactus](image)

   c) moon shining at night

   ![Moon shining at night](image)

8. Describe three things the sun warms with its energy?

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

9. Name the four seasons and provide a detail about each season.
10. Why is the temperature usually cooler in the morning than in the afternoon? (Bonus Question)
## Decision 2: Assessments – Rubric Reminders:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Scale</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
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<tr>
<td>Pre-/Post Assessment</td>
<td>Less than five correct answers out of ten.</td>
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</tbody>
</table>

Indicators

What does each number or adjective in your scale mean?
### Decision 3: Student Learning Map

**Key Learning Targets:**

I can understand patterns of weather and factors that affect weather.

<table>
<thead>
<tr>
<th>Concept:</th>
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<tbody>
<tr>
<td>Weather Tools</td>
<td>Sun’s Energy</td>
<td>Weather Patterns Daily and Over time</td>
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</table>

<table>
<thead>
<tr>
<th>Lesson EQ(s):</th>
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</thead>
<tbody>
<tr>
<td>I can distinguish between the different types of weather tools and how they are used.</td>
<td>I can discuss how solar energy from the sun warms (is absorbed) by land, water, and air.</td>
<td>I can tell the names of the seasons and weather patterns that are associated with each.</td>
</tr>
<tr>
<td>I can identify manual and electronic weather instruments, sensors, and computers to collect, record, and analyze data.</td>
<td>I can use my cardinal directions to describe wind direction.</td>
<td>I can understand the differences with the changes that occur with our daily weather.</td>
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<tr>
<td>I can use numbers to represent air temperature, wind speed, and precipitation.</td>
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</table>

<table>
<thead>
<tr>
<th>Vocabulary:</th>
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<tbody>
<tr>
<td>Thermometer Anemometer</td>
<td>Water cycle Condensation</td>
<td>Seasons Tornado</td>
</tr>
<tr>
<td>Celsius Weather satellite</td>
<td>Evaporation Precipitation</td>
<td>Windy Partly cloudy</td>
</tr>
<tr>
<td>Degrees Weather balloon</td>
<td>Absorb</td>
<td>Snowy Rainy</td>
</tr>
<tr>
<td>Fahrenheit Meteorologist</td>
<td>sensor</td>
<td>Blizzard Drought</td>
</tr>
<tr>
<td>Wind sock Air temperature</td>
<td>Solar energy</td>
<td>Hurricane Warm</td>
</tr>
<tr>
<td>Wind vane Weather</td>
<td>Solar power</td>
<td>Sunny Hot</td>
</tr>
<tr>
<td>Rain gauge Barometer</td>
<td>reflect</td>
<td>Foggy Cold</td>
</tr>
<tr>
<td>Weather instruments/tools Cardinal/ordinal directions</td>
<td></td>
<td>Overcast</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freezing point of water</td>
</tr>
</tbody>
</table>
Decision 4: Launch Activities

Hooks and Links

Develops student interest and links prior knowledge. Provides the Student Learning Map and the key vocabulary to students.

Guiding Questions:

1. How are you going to get students engaged?
2. How are you going to develop student interest and link their prior knowledge?
3. How are you going to start the Student Learning Map of the unit with students?
4. How are you going to preview key vocabulary with students?

- Use dye cut outs in shape of snowflakes, raindrops, etc and ask students to write down any prior knowledge about weather. “What do you know about weather?”
- Divide students into groups and assign a weather website for them to visit. Discuss the similarities or differences between the websites for your area.
- Use of Weather Words by Gail Gibbons to introduce weather vocabulary.
Decision 5: Acquisition Lesson One

**Language Objective(s), where appropriate:**
Weather Tools

**Lesson Essential Question(s) or “I Can” Statement(s):**
- I can distinguish between the different types of weather tools and how they are used.
- I can identify manual and electronic weather instruments, sensors, and computers to collect, record, and analyze data.
- I can use my cardinal directions to describe wind direction.
- I can use numbers to represent air temperature, wind speed, and precipitation.

**Activating Strategies: (Learners Mentally Active)**
- **Hot/Cold sheet**
  - Have each child draw a picture to represent hot/cold
  - Make a T-chart with ideas – cut pictures apart and post on chart

**Acceleration/Previewing: (key vocabulary)**
thermometer, hot/cold

**Teaching Strategies: (Explain and Model Collaborative Pairs; Distributed Guided Practice; Distributed Summarizing; Graphic Organizers)**

**Materials:** 2 bowls – 1 warm and 1 cold; hot/cold drawing sheet; journals

**Procedure:** Have each child put hands in warm water. Discuss how the water feels. Have each child put hands in cold water. Discuss how the water feels. Compare and contrast.

**Summarizing Strategies: Learners Summarize and Answer Essential Questions**
Journal writing describing temperatures of hot and cold.

**Lesson Resources:**
- Foss Science kit
- LiveBinder
Decision 5: Acquisition Lesson Two

Language Objective(s), where appropriate:

| 2.E.1.1 - Sun’s Energy |

Lesson Essential Question(s) or “I Can” Statement(s):

| I can identify and describe ways the sun’s energy warms the earth. |

Activating Strategies: (Learners Mentally Active)

Student will be asked the following questions:

- When you are cold, what kinds of things or activities help you stay warm?
- What helps you to stay warm when you are indoors? Outdoors?
- Is it usually warmer during the day or at night? Why?
- What is the sun? Where is it? What kind of things does the sun do?

Teaching Strategies: (Explain and Model Collaborative Pairs; Distributed Guided Practice; Distributed Summarizing; Graphic Organizers)

<table>
<thead>
<tr>
<th>Warmth Chart</th>
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<tbody>
<tr>
<td>Investigation: Students will observe the sun’s energy melting an ice cube in direct sun and in a dark area of the room. Students will check the water temperature and chart each ice cube hourly.</td>
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</table>

Distributed Guided Practice/Summarizing Prompts: (prompts designed to Initiate Periodic Practice or Summarizing)

<table>
<thead>
<tr>
<th>Summarizing Strategies: Learners Summarize and Answer Essential Questions</th>
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<tbody>
<tr>
<td>Students will be assessed on post assessment, investigation, and journal.</td>
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Lesson Resources

## Decision 5: Acquisition Lesson Three

### Language Objective(s), where appropriate:

| Weather Patterns |

### Lesson Essential Question(s) or “I Can” Statement(s):

| I can compare weather patterns over time. |

### Activating Strategies: (Learners Mentally Active)

- **Activator:** Class discussion/ brainstorming.
- **Example:** What is the weather like today? How is it different from yesterday? Does the weather affect what you can do today?
- **Then ask:** Can you find clues around the classroom to help you determine what the weather is like.
- **Example:** rain boots, umbrellas, jackets. Would you have found the same types of items in the classroom last month?

### Acceleration/Previewing: (key vocabulary)

### Teaching Strategies: (Explain and Model Collaborative Pairs; Distributed Guided Practice; Distributed Summarizing; Graphic Organizers)

- **Teach:**
  - Work in small groups and cut out the pictures and post on the chart that would go with Summer, Winter, Spring, and Fall.
  - Students have their own weather graph. Each day for the unit they will graph the general weather pattern for the day.

### Distributed Guided Practice/Summarizing Prompts: (prompts designed to Initiate Periodic Practice or Summarizing)

### Summarizing Strategies: Learners Summarize and Answer Essential Questions

- **Summarizer:** Analyze data- Students will look at their data and write about their results. Students will include which weather patterns that they observed the most and which ones occurred most often. In their writing, students will need to include what they think their graph would look like the following month or during another part of the year.

### Lesson Resources
### Decision 5: Acquisition Lesson Four

**Language Objective(s), where appropriate:**
- Weather Patterns

**Lesson Essential Question(s) or “I Can” Statement(s):**
- I can compare and contrast weather patterns throughout the seasons.

**Activating Strategies: (Learners Mentally Active)**
- Class discussion on what students know about the seasons. Then read the book Four Seasons.
- Acceleration/Previewing: (key vocabulary)

**Teaching Strategies: (Explain and Model Collaborative Pairs; Distributed Guided Practice; Distributed Summarizing; Graphic Organizers)**
- **Teach:**
  - Frayer Map for each season. Small groups. Each group be responsible for a season.
  - Groups work together to use the internet for additional research on seasons.
  - Groups will come back together and share their Frayer map.

- Distributed Guided Practice/Summarizing Prompts: (prompts designed to Initiate Periodic Practice or Summarizing)

**Summarizing Strategies: Learners Summarize and Answer Essential Questions**
- Students will write an informative paper on a season or students can write an opinion paper on their favorite season.

**Lesson Resources**
- *Four Seasons Make A Year* by Anne Rockwell
- *The Reasons for Seasons* by Gail Gibbons
- *The Sour Seasons* by Mary Rius
- *Four Seasons Series* by Nuria Roca
Decision 6: Extending Thinking Activities

Include extending activities for several lessons in the essential units.

<table>
<thead>
<tr>
<th>Cause/Effect</th>
<th>Compare/Contrast</th>
<th>Deduction</th>
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<tbody>
<tr>
<td>Justification</td>
<td>Induction</td>
<td>Analyzing Perspective</td>
</tr>
<tr>
<td>Error Analysis</td>
<td>Abstracting</td>
<td>Evaluation</td>
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<tr>
<td>Classifying</td>
<td>Constructing Support</td>
<td>Writing Prompt</td>
</tr>
</tbody>
</table>

Culminating Activity:

EQ: I can understand patterns of weather and factors that affect weather.

Teach:
- Teach about weather and how weather instruments are used.
- Teach how to use PowerPoint

Summarizer: Create a PowerPoint on weather tools and how they are used based on the sun’s energy. 2-3 Weather instruments and how they are used. Include pictures with captions.

EQ: I can understand patterns of weather based on the seasons.

Teach: Teach about weather patterns and how they correspond with the seasons.

Summarizer- 3-4 slides on the seasons and how they correspond with weather patterns.

Ideas for Compare/Contrast
- hot/cold weather
- seasons
- different tools for measuring weather
- things that are hot/cold
- places that are hot/cold
- high/low temperatures

Ideas for Cause/Effect
- temperature – what you wear activities

Ideas for Writing Prompts
- favorite time during season
- favorite weather
- informational types of weather, weather tools, extreme weather
- opinion – why you like summer, fall, etc.
**Decision 7: Differentiating the Unit**

What accommodations will you make in order to meet the varied interests, learning styles, and ability levels of all students?

<table>
<thead>
<tr>
<th>choice menus</th>
<th>compacting</th>
<th>grouping</th>
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</thead>
<tbody>
<tr>
<td>seating</td>
<td>visual, auditory, kinesthetic activities</td>
<td>scaffolding</td>
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<tr>
<td>real world meaning</td>
<td>interests</td>
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</tbody>
</table>

Pre-teaching of vocabulary words
Hands-on Activities
Think-Pair-Share
Peer tutoring
Choice Board for culminating activity
Scaffolding of notes/activities
Real world meaning of actual temperatures of area students live in
Leveled reading instruction for weather books
Decision 8: Unit Calendar

Determine the most viable sequence for the experiences, activities, and lesson and create a timeline.

Week 1-4: Teach weather patterns
Week 1-2: Teach weather tools
Week 3-4: Teach sun’s energy
**Decision 9: Resources and Research**

Provide graphic organizers, links, book titles, websites, etc. that provide support for teaching this unit.

[www.weatherwhizkids.com/weatherinstruments.htm](http://www.weatherwhizkids.com/weatherinstruments.htm)

**Foss Kit**

Use of local weatherman to visit

**Weather Words** By: Gail Gibbons

**501 Science Experiments** book

[www.scholastic.com](http://www.scholastic.com)

[www.weather.com/weatherbug.com](http://www.weather.com/weatherbug.com)

**The Snowflake: A Water Cycle Story** By: Neil Waldman

[www.smores.com/z4qs](http://www.smores.com/z4qs)

**Temperature Probes**

**Hands On Children’s Museum visit**

Provide ideas about how to integrate Big 6 or Super 3 research framework.

Culminating activity (Decision #6) includes ideas for integration of Super 3.
**Unit Designers:**

**Date:**  1/22/2013

<table>
<thead>
<tr>
<th>Name</th>
<th>School</th>
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<tbody>
<tr>
<td>Angie King</td>
<td>EDN</td>
</tr>
<tr>
<td>Stephanie English</td>
<td>MAR</td>
</tr>
<tr>
<td>Kim Tipton</td>
<td>ETO</td>
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<tr>
<td>Lisa Arsenault</td>
<td>ATK</td>
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<tr>
<td>Sabrina Hayes</td>
<td>UPW</td>
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<tr>
<td>Lisa Hoffman</td>
<td>MR</td>
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<tr>
<td>Kathy McCusker</td>
<td>ATK</td>
</tr>
<tr>
<td>Caterine Fares (Trini)</td>
<td>HIL</td>
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<tr>
<td>Chelsea Lambert</td>
<td>FLE</td>
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