

Week 1

Driving Question for the unit: How can I explain to Grandpa the importance of the weather to our climate?

Specific Lesson Question: How can we use temperature to look at weather patterns?

Overview		
For lesson 1, what is the scenario/problem you are using to launch the unit? <ul style="list-style-type: none">Grandpa has been around for 70 years now and we have been around for 21 years. How many years have you been around? When Grandpa was your age the weather was different because it was a lot colder than today. What is causing this?		
Disciplinary Core Idea Addressed in lesson: ESS2.D: Weather and Climate -Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) -Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2) Explain this idea (in your own words---not the internet) AND its importance to answering the driving question for the unit. When looking at the weather across various times, days, and areas scientists have to collect a lot of data like the temperature to make predictions and patterns. This connects to our unit because collecting data and seeing patterns can help see the climate's patterns over time.	Science and Engineering Practices Addressed in Lesson: <i>Analyzing and Interpreting Data</i> Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. <ul style="list-style-type: none">Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that	Cross-Cutting Concepts Addressed in Lesson: Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2).

	<p>indicate relationships. (3-ESS2-1)</p> <p><i>Obtaining, Evaluating, and Communicating Information</i></p> <p>Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.</p> <ul style="list-style-type: none"> ● Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2) 	
--	---	--

Will another discipline of STEM (other than science) be included in this lesson? [highlight your response]

Yes

No

*If yes, be sure to CLEARLY state in the Learning Plan below **when and how** STEM will be infused.*

Students will use computers to use the app “wordcloud” in order to answer questions about what they know about weather.

Additionally, students will use math to calculate differences in age between themselves and the grandpa, the teachers and the grandpa, and the students and the teachers.

When they make the thermometer they will be learning non-standard and standard measures as well as scales on the thermometer.

Learning objectives (outcomes):

What do you want students to be able to explain/state in response to the specific lesson question?

Students will be able to explain/state **[USE KIDS’ WORDS]**:

- We can use the thermometer that we made to collect the temperature outside during each weather pattern.

Learning Plan
(using the 5E model--Meredith will explain as needed)

In person

ENGAGE

(Grandpa scenario, wordcloud discussion-include weather terms below)

- We will start by saying that Grandpa is 70 years old. How old are you?
- The kids will find out how much older Grandpa is compared to the teachers; also how much older Grandpa is compared to each student. We can talk about the difference of ages.
- The kids will be told that **“my Grandpa thinks that it does not snow a lot here in Indiana compared to how much he saw as a kid.”** The kids will make observations about if they think it snows a lot here or not. What is causing this difference from when Grandpa was a kid to now?
 - Do we still get rain? Is it still sunny?
 - Have the types of weather changed?
- We will pull up a word cloud so they can write down their weather terms to explain their observations.
 - Snow, Rain, Hot, Cold, Windy, Foggy, Cloudy, Sunny, etc.
 - <https://app.sli.do/event/udejam8l/embed/polls/99f1f317-cc28-4672-946d-ad64d5948927>
 - Slido Number: #42259

EXPLORE

- We will start by having the students each pull out their piece of paper and pencil. Ask what they think are the different weather types? Do we notice all of them in Indiana? What about in Florida? Do you think Alaska would have all of these weather patterns?
- Each student will split up the paper into six boxes. Each box will be labeled: Sunny, Cloudy, Raining, Snowing, Windy, Foggy (one term in each box). These are words that we came up with in our discussion.
- The kids will then draw and/or write what they know about each weather pattern.

Adaptations for Online
(as needed by phase)

ENGAGE

[SAME AS IN PERSON]

**The teachers will share the word cloud via the Zoom chat box

EXPLORE

[SAME AS IN PERSON]

**The student will hold up their six boxes and explain what they wrote down in each.
**They can do this digitally on a google word doc.

EXPLAIN

[SAME AS IN PERSON]

- Example: for Sunny they can draw a sun with the word “hot” in the box.
- Once they are finished each student is going to predict what the temperature would be like during each weather type. For example: Sunny - Temperature: 70-90 degrees. Why do you think the temperature is important for weather? What could we use to accurately know the temperature?
- The students will start to build their own thermometer to take how and collect the temperature data each day.
 - They will start by taking their straw, ruler and sharpie marker to mark on the straw at $\frac{1}{2}$ cm intervals.
 - Make a flatten ball of clay and press the straw through it. Remove any clay stuck in the straw.
 - Pour rubbing alcohol into the bottle about $\frac{1}{3}$ to $\frac{1}{2}$ full.
 - Add food coloring and mix well. Fill the dropper with the solution and set aside.
 - Put the straw in the bottle and press clay down so the straw does not move.
 - Take the dropper filled with solution and pour it into the straw.
Why does the liquid build up in the straw?
- Place the thermometer in the cold water. Place the thermometer back on the table. Place the thermometer in the warm water. Record your thoughts/readings on the back of your paper.

EXPLAIN

- We will continue to elaborate on the meaning of the thermometer that we just created. We will be sure to ask the questions:
 - What happens to the liquid in the straw?
 - Why does this happen?
- Discussion Questions:
 - How did the temperature change when you put the thermometer in the cold water?
 - How did the temperature change when the thermometer was sitting on the table?

- What does this tell you about the temperature in the air?
- We will return to our predictions that we made earlier and the data that we just collected. How did you know to predict that? What is a way that we could find out if you are correct or not? (use the thermometer)
- The teachers will make sure to ask the question: How can we use the thermometer to show Grandpa data about weather?
- Additionally, we will join back with the other groups to elaborate on our explorations we made during the lesson.

<https://www.teachervision.com/weather/how-can-you-make-thermometer>
<https://youtu.be/rtsq-IOAxbY>

ELABORATING/EXTENDING Understanding

(WHOLE CLASS -- last 30mins together -- building your class Content Storyline)

- An in person teacher will pull out the big graphic organizer so we can all collaborate on the thoughts we came up with during this lesson.
- At the top will be “Types of Weather and Tools”
- The teacher will be sure to ask “What tool did we use to discuss temperature?” (thermometer) “Can someone explain to me what this is and how we read it?”
- At the bottom will be six boxes labeled: Snow, Rain, Hot, Cold, Windy, Foggy, Cloudy, Sunny
 - We will discuss what they wrote/drew in each box and why they wrote/drew down what they did.
- At the very bottom we will come up with an idea on how we can use these terms and tools to collect data to show Grandpa that importance of the weather relationship to temperature.
- We will finally discuss that they are going to take home and keep their thermometer. Each day for the next week they are going to take it outside and read what the temperature is for that day. They are going to be given a worksheet to collect their data on (will be shared in the Zoom chat). They will need to come back to Saturday Science with their data and their thermometer.

What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?

- Graphic organizer - “Types of Weather and Tools” Everyone will collaborate on what they have learned so far
- We will also have a group discussion over everything they have learned

Individual Student Accomodations

Required Accommodations/Modifications:

- If the student is having trouble spelling or typing the teacher can be able to type in the word cloud for them as the student(s) discuss their individual ideas.
- Having students draw in the six box graphic organizer allows for students to express their understanding if they are having trouble with writing and spelling. They will be able to clearly put their thoughts into their work.

Additional Modifications for Individual Students:

- Unknown at this time.
- Will watch with how students are able to follow instructions, and the guided prompts in the drawings, to see if additional supports might be needed for individual students in future weeks.

Materials

REMEMBER to include Quantity. Also differentiate any materials for in person VS online.

These need to be emailed (philland@iu.edu) to Andrea each Wednesday by 5:00pm)

In person (per person)

- Big sheet of paper (1 - for teacher to write on)
- Individual piece of paper (printer) and pencil for each student
- For Thermometer activity (for each student)
 - Clear drinking straw (1 - per person)
 - Permanent markers (1 - per person)
 - Ruler (1 - per person)
 - 1 Plastic water bottle
 - ¼ cup Rubbing alcohol
 - Food coloring (few drops)

Online (per person)

- Computers
- Individual piece of (printer) paper and pencil for each student
- For Thermometer activity (for each student)
 - Clear drinking straw (1 - per person)
 - Permanent markers (1 - per person)
 - Ruler (1 per person)
 - Plastic water bottle (1)
 - Rubbing alcohol (¼ cup)
 - Food coloring (few drops)
 - Modeling clay (bouncy ball size - per person)
 - Dropper (1)
 - Small bowl with ¼ cup water and ice
- Printed Worksheet (1 per person)

<ul style="list-style-type: none">○ Modeling clay (bouncy ball size - per person)○ Dropper (1- per person)○ Small bowl with ¼ cup water and ice● Printed Worksheet (1 per person)	
--	--

Week 2

Grade level: 3rd Grade

Driving Question for the unit: What is the importance of the weather to our climate?

Specific Lesson Question: How can data that we collected day to day help us form graphs that give us insight about weather patterns?

Overview
<p>For lesson 2, how will you contribute to answering your overarching unit question?</p> <ul style="list-style-type: none">● We are conducting a lesson where the teacher will explain the importance of reading a graph about the data of temperature. As a class, we will make graphs from the data to have supporting evidence to prove that grandpa is wrong in the statement: “Grandpa thinks that it does not snow a lot here in Indiana compared to how much he saw as a kid because the weather is changing.”

<p>Disciplinary Core Idea Addressed in lesson: ESS2.D: Weather and Climate</p> <p>-Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) -Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)</p> <p>Explain this idea (in your own words---not the internet) AND its importance to answering the driving question for the unit.</p> <p>The scientists record patterns across different times and places. In this lesson we are recording day to day patterns of temperatures in order to be able to look at, and study.</p>	<p>Science and Engineering Practices Addressed in Lesson:</p> <p><i>Analyzing and Interpreting Data</i></p> <p>Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.</p> <ul style="list-style-type: none"> • Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) <p><i>Obtaining, Evaluating, and Communicating Information</i></p> <p>Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.</p> <ul style="list-style-type: none"> • Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2) 	<p>Cross-Cutting Concepts Addressed in Lesson:</p> <p>Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2).</p>
---	--	---

Will another discipline of STEM (other than science) be included in this lesson? [highlight your response]

Yes

No

If yes, be sure to CLEARLY state in the Learning Plan below **when and how** STEM will be infused.

Math- The students will be creating graphs with the data they collected during the week on the temperatures and types of weather they observed. As a class, they will explore the components of the graphs before they can formulate one. At the end of the explore part, they will help the teacher formulate two graphs.

Learning objectives (outcomes):

What do you want students to be able to explain/state in response to the specific lesson question?

Students will be able to explain/state [USE KIDS' WORDS]:

- We can gather data of the temperatures outside to enter into graphs we made.

Learning Plan
(using the 5E model--Meredith will explain as needed)

In person (ONLINE)

ENGAGE

- First we are going to remind them of grandpa scenario;
 - Can you remind me of how old my grandpa is?
 - What does my grandpa think about how the weather has changed?
 - What other information about weather could be helpful for you to know?
- Each student will pull out a piece of paper. Have them make three columns (two lines). On the top write Know, Want to Know, Learned.
 - Know: Explain that they will write down what they *know* about temperature, weather, and Grandpa

Adaptations for Online

(as needed by phase)

ENGAGE

Same as In Person

EXPLORE

Same as In Person

EXPLAIN

Same as In Person

- Want to Know: Each student will write out some ideas about what they want to know about weather, temperature, data, etc.
- Learned: They will come back to this activity in the whole group meeting

EXPLORE

- Ask to see if they completed their temperature recording chart. Have each student have it easily accessible.
 - ***If all students have their charts filled out then we will compare all data. If not then we will focus more on the data the teachers collected.
- **They are going to have a piece of paper and a pencil out to write down their thoughts. We will essentially ask a question, they will write down a response, then we will discuss and/or explore the concept further.
- Question: **What are your experiences with graphs??**
 - Students will write their ideas down then we will share out our thoughts.
 - Sub Questions: **What kind of graphs are there? What are graphs used for?**
 - *Go over the different types of graphs and what they are used for.*
- Question: **What does the data that you collected show us?**
 - Students will write their ideas down then we will share out our thoughts.
 - Sub Questions: **Do you see any patterns? What do you notice about your observations; does it affect the temperature?**
- Question: **What are the differences between the high temperatures and the low temperatures?**

- Students will write their ideas down then we will share out our thoughts.
- Sub Questions: **Why are there high and low temperatures in a day? What causes this?**
- Question: **Looking at the different types of graphs, which do you think work the best for our data of the weather/temperature?**
 - Students will write their ideas down then we will share out our thoughts.
 - Sub Questions: **Will a *pie* graph show how the temperature changes over time? What about a *bar* graph? Why don't these work? Why does a *line* graph work best?**
- Making the graph together:
 1. The teachers will pull up the link to make the graph as a whole mini group. <https://nces.ed.gov/nceskids/createagraph/>
 2. The teacher will ask the question: what do you know about the x-axis and y-axis? Which one is which? (horizontal = x; vertical = y) What goes on that line? (numbers)
 - a. They will take out a piece of blank paper and draw the "L" graph with us. The teacher will draw on a piece of paper with them as well.
 3. The teacher will make the statement: Looking at your paper, how can you tell what the lines are? Do you need to label it? What do you need to label?
 - a. Together we will label the graph: High Temperature over the Week
 - b. X-Axis: day of the week
 - c. Y-Axis: temperature
 4. The teacher will ask the question: What is a notation that mathematicians or scientists use to collapse the graph? (the squiggly line)

- a. Because we have big numbers, how can we make the graph shorter? Do we start with 0? Do we start with 1? Or can we start with 30? What's the best way to scale out the graph based on the numbers we have?
5. Together at the bottom of the page, we will write out the temperatures (data) we need to graph the points. One column for high, one for low.
6. The teacher will share the screen with the online graphing tool. The students will help the teacher out with what they need on the graph and the numbers to write in on the graph.
 - a. Teacher will make one graph for the low temperature and one graph for the high temperature.
 - b. Once the teacher creates both of the graphs, you can screen shot both of them and pull them up side by side.

EXPLAIN

- Students will **compare and contrast** side by side the differences between the high and low temperature graphs.
- The teacher will then ask the students: **what does the graph show us?**
- We will then discuss: **How can graphing be a helpful tool for grandpa?**

ELABORATING/EXTENDING Understanding

(WHOLE CLASS -- last 30mins together -- building your class Content Storyline)

1. We will start by reintroducing the focus question for this specific lesson plan - **“How can data that we collected day to day help us form graphs that give us insight about weather patterns?”**
2. One or two students from each group will share out what they have learned throughout the lesson to be sure that all groups have met

answering the specific focus question for this lesson plan. This will guide our group discussion.

3. After we had a few students share out we will begin our overall discussion for the lesson. We will discuss what the students have learned from lesson by asking these questions:
 - a. What did we observe about the data that we collected and analyzed?
 - b. What did we learn about graphs?
 - c. How does this information relate to the Grandpa scenario?
4. After, each student will pull out their KWL chart from the beginning of the lesson and write down some concepts that they have *learned* from today's lesson.

Formative Assessment Evidence

What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?

- As an assessment, students will revisit their KWL charts and fill out the “Learned” column. They will be writing down answers to questions they wrote in the “Want to Learn” column and recording any other new information they learned throughout the lesson. Teachers will read student’s responses and reflect on their teaching and make necessary adjustments for next week’s lesson.
- We will have whole group discussions throughout the lesson in order to assess what the students are thinking.

Individual Student Accomodations

Required Accommodations/Modifications:

- If students did not complete the worksheet, talk about how to make the graph instead or use our data.
- If the student is having trouble spelling or typing the students can be able to draw a picture of their understanding of the given question instead of writing out their ideas in word form.

Additional Modifications for Individual Students:

- For(ENL/Bilingual student), if she is having a hard time understanding the given question, rephrasing it by using more common, “easier” vocabulary will help her be able to answer the question. Also giving her more time to process the question will help her thought process.

Materials

REMEMBER to include Quantity. Also differentiate any materials for in person VS online.

**In person
N/A**

**Online
-None**

Week 3

Driving Question for the unit: What is the importance of the weather to our climate?

Specific Lesson Question: How do the different precipitation types help you understand the weather?

Overview

How does this lesson contribute to your overarching unit question?

- This lesson goes more into depth about the different types of weather patterns we see outside today. Precipitation helps students to understand how the different water types influence our environment and our climate in the long run.

Disciplinary Core Idea Addressed in lesson:

ESS2.D: Weather and Climate

-Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1)

-Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)

Explain this idea (in your own words---not the internet) AND its importance to answering the driving question for the unit.

Scientists collect and analyze different types of weather patterns at different points of times. This connects to our lesson because we are looking at the different precipitation at various temperatures. We are also looking and analysing the different effects it has on weather and climate.

Science and Engineering Practices Addressed in Lesson:

Analyzing and Interpreting Data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1)

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

- Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2)

Cross-Cutting Concepts Addressed in Lesson:

Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2).

Will another discipline of STEM (other than science) be included in this lesson? [highlight your response]

Yes

No

If yes, be sure to CLEARLY state in the Learning Plan below when and how STEM will be infused.

Learning objectives (outcomes):

What do you want students to be able to explain/state in response to the specific lesson question?

Students will be able to explain/state [USE KIDS' WORDS]:

- We will be able to use the rain gauge to be able to measure the amount of rain we get here in a certain amount of time.
- Explain that they can tell the difference between the different types of precipitation and that it is related to the temperature in the air.

Learning Plan
(using the 5E model--Meredith will explain as needed)

In person

ENGAGE (9:55-10:15) - (WHOLE CLASS) - Claire

- We will start off the activity by introducing the video about sleet, rain, snow, and hail.
 - <https://youtu.be/fSkK288YCbw>
- Once they have watched the video they will share out the answer to these questions:
 - What did you hear?
 - What did you see?
 - What is precipitation?
 - Rain and Mist
 - Snow and Sleet
 - Hail
 - Where does precipitation come from?

**Adaptations for
Online**

(as needed by phase)

ENGAGE

- Same as in person

EXPLORE

- Same as in person

EXPLAIN

- Same as in person

- Evaporation, condensation (clouds)
- How does it affect us?
 - Floods, staying inside, gives plants and animals water, snow days, rain days, playing outside
- Does precipitation change depending on the temperature?
 - Yes, when it snows the air has to be below 32 degrees, etc.

EXPLORE (10:15-11:00) - (BREAKOUT ROOMS)

- We will start the explore section by explaining that the students will be participating in a stations activity about the four types of precipitation that we saw in the intro video (sleet, rain, snow, and hail)
- Students will be given a “Precipitation Four Square Graphic Organizer” handout
- The teachers will explain that we will show a passage about each type of precipitation that they will read and write details about each type on the graphic organizer.
- After each passage is read, students will have a few moments to jot down their thoughts, then we will have students share out the things they found to be important.

- We will have the students make their own rain gauge. (20 minutes)
- This activity of creating their own rain gauge infuses engineering skills into our lesson by having the students practice problem solving and creating a tool they can use to collect data to support or disprove grandpa’s claim about the weather. Additionally, this section of the lesson also infuses math skills like measurement and being able to read the gauge to be able to use that information as data.
 - Explain to students that one way to gauge how much rain an area gets is to catch the rain and keep track of daily changes.
 - Explain that you can record changes daily and make a graph just like with what we did with temperatures.

- Cut the bottle just under the wide part where the bottle begins to narrow
- Place a small handful of gravel (or a big rock) in the bottom of the bottle
- Turn the part that was cut off upside down and place it in the larger part of the bottle. This will act as a funnel.
- Line up and then tape the cut sections together
- Put a long vertical piece of tape down the bottle to use as a measuring tool.
- Use a marker to draw a line on the bottom of the tape, just above the top of the pebbles. This will be 0.
- Use a ruler to measure and mark every quarter inch up the tape (or cm)
- Pour water into your gauge until it reaches the zero on your line.
- Tell students that after we are done they can set them outside to collect rain for an established amount of time. Make sure they are on a level surface.
- We have a recording sheet for the students, for if it rains and they would like to record their data over the week.

EXPLAIN (11:00-11:10) - (BREAKOUT ROOMS)

The teacher will ask the students the following questions and discuss:

- What kind of data does a rain gauge collect?
- How is a rain gauge and a thermometer similar?
- Why is a rain gauge important for keeping data?
- How can a rain gauge be a helpful tool for grandpa?

ELABORATING/EXTENDING Understanding (11:10-11:30) - Olivia

(WHOLE CLASS -- last 30mins together -- building your class Content Storyline)

- We will take a few minutes to discuss the following questions:

- How can a rain gauge be a helpful tool for grandpa?
- If rain, sleet, hail, and snow are all types of precipitation, what causes them to be so different from one another? What is so different about them?
- Next, we will move into having the students draw a picture of what they learned regarding the types of precipitation. They can choose to draw all four in different sections or one large picture of something else they thought was interesting. They will write a caption of the picture, and we will take turns sharing out.

Formative Assessment Evidence

What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?

- We will have whole group discussions throughout the lesson in order to assess what the students are thinking. We will make sure each student shares out at least one of their ideas when we are sharing our activities.
- Have the students draw a picture of what they have learned about precipitation and then write a sentence below to summarize. First offer drawing four boxes of the different types of precipitation, but if they are having trouble, just draw any picture of what they have learned.

Individual Student Accomodations

Required Accommodations/Modifications:

- If the student is having trouble spelling or typing the students can be able to draw a picture of their understanding of the given question instead of writing out their ideas in word form.

Additional Modifications for Individual Students:

- For (ENL/Bilingual student), if she is having a hard time understanding the given question, rephrasing it by using more common, “easier” vocabulary will help her be able to answer the question. Also giving her more time to process the question will help her thought process.

Materials

REMEMBER to include Quantity. Also differentiate any materials for in person VS online.

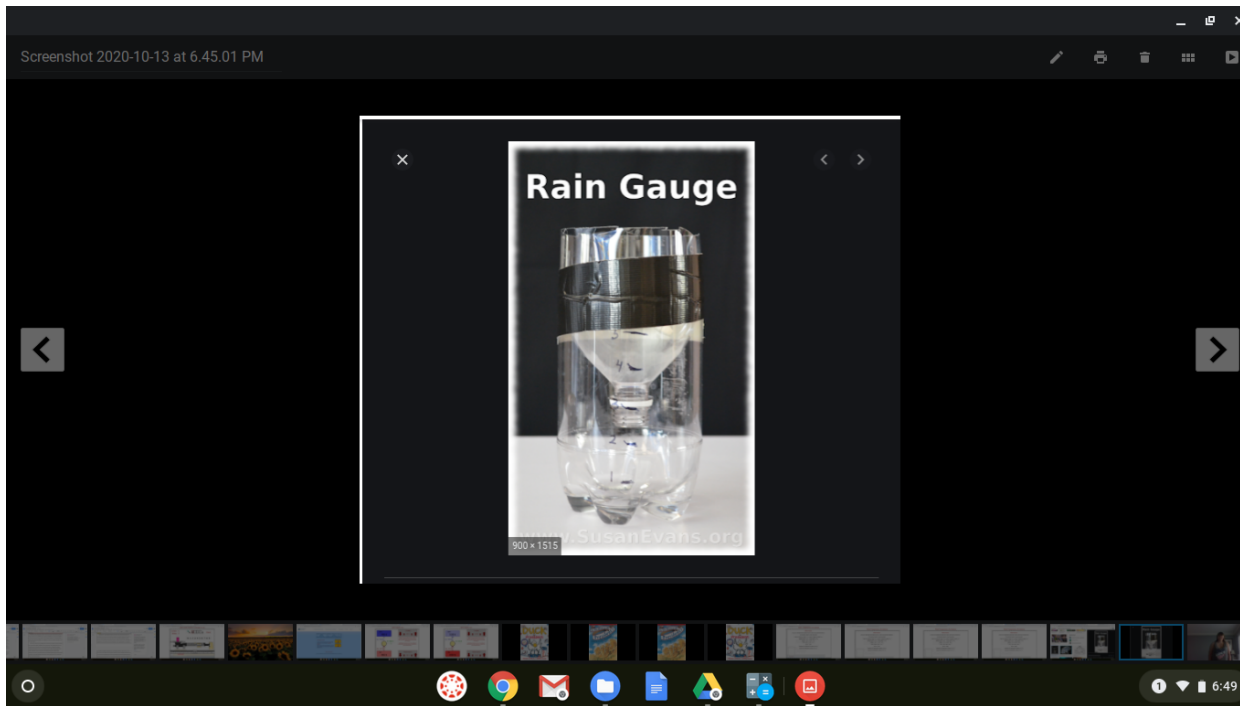
These need to be emailed (philland@iu.edu) to Andrea each Wednesday by 5:00pm)

In person - One per person

- Plastic Water Bottle
- Sharpie or Pen
- Scissors
- Ruler or Tape Measurer
- Masking Tape or Tape
- Gravel or a Rock
- Stations Four Chart Organizer
- Precipitation Worksheet:
https://docs.google.com/document/d/1hxX5YN5GLemcC95E4P_PWpontA-69J0uWa9LCYadEtE/edit?usp=sharing
- Station Worksheet:
https://docs.google.com/document/d/1-rP-_5d2zRYrlcfjh9I3BySB80cAKYfWNaO37fLepGQ/edit?usp=sharing

Online - One per person

- Plastic Water Bottle
- Sharpie or Pen
- Scissors
- Ruler or Tape Measurer
- Masking Tape or Tape
- Gravel or a Rock
- Stations Four Chart Organizer
- Precipitation Worksheet:
https://docs.google.com/document/d/1hxX5YN5GLemcC95E4P_PWpontA-69J0uWa9LCYadEtE/edit?usp=sharing
- Station Worksheet:
https://docs.google.com/document/d/1-rP-_5d2zRYrlcfjh9I3BySB80cAKYfWNaO37fLepGQ/edit?usp=sharing



Week 4

Driving Question for the unit: How can I explain to Grandpa the importance of the weather to our climate?

Specific Lesson Question: How can I use data of different weather patterns over time to make conclusions about the changes in climate?

Overview

How does this lesson contribute to your overarching unit question?

- This lesson connects to our overarching unit question because it's requiring the students to look at data regarding the weather patterns we have discussed overtime to make conclusions about the changes in climate.

Disciplinary Core Idea Addressed in Lesson:	Science and Engineering Practices Addressed in Lesson:	Cross-Cutting Concepts Addressed in Lesson:
<p>ESS2.D: Weather and Climate</p> <p>-Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1)</p> <p>-Climate describes a range of an area’s typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)</p> <p>Explain this idea (in your own words---not the internet) AND its importance to answering the driving question for the unit.</p> <p>Meteorologists and scientists look at patterns from past records to make predictions about what kind of weather will happen. This will help them describe the changes in climate. This is important to answering our driving question for the unit because to be able to understand how to read the given data about temperature, and precipitation will help form a stance about snowfall over time.</p>	<p><i>Analyzing and Interpreting Data</i></p> <p>Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.</p> <ul style="list-style-type: none"> ● Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) <p><i>Obtaining, Evaluating, and Communicating Information</i></p> <p>Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.</p> <ul style="list-style-type: none"> ● Obtain and combine information from books and other reliable media to 	<p>Patterns of change can be used to make predictions.</p> <p>(3-ESS2-1),(3-ESS2-2).</p>

	<p>explain phenomena. (3-ESS2-2)</p>	
<p>Will another discipline of STEM (other than science) be included in this lesson? [highlight your response] Yes No <i>If yes, be sure to CLEARLY state in the Learning Plan below when and how STEM will be infused.</i></p>		
<p>Learning objectives (outcomes): <i>What do you want students to be able to explain/state in response to the specific lesson question?</i> Students will be able to explain/state [USE KIDS' WORDS]:</p> <ul style="list-style-type: none"> ● State the changes in temperature, snowfall, and precipitation from 1948 to 2016. ● Explain the patterns in changing temperature, snowfall, and precipitation. 		
<p>Learning Plan (using the 5E model--Meredith will explain as needed)</p>		
<p style="text-align: center;">In person</p> <p>ENGAGE (20 minutes 10:00-10:20)</p> <ul style="list-style-type: none"> ● We will begin this lesson by leading a discussion regarding day to day weather patterns and introduce the idea of looking at weather over a long period of time. ● The teacher can ask the following questions: <ul style="list-style-type: none"> ○ Can weather change hour by hour? Day to day? ○ What things about our weather can change by the hour? By the day? <ul style="list-style-type: none"> ■ Student answer: We anticipate students to discuss how they have seen varying weather conditions in the same day (rain in the morning and sunshine in the afternoon) and how they have seen weather conditions change day to day (rainy on Monday and sunny on Tuesday, etc.) ○ Does the precipitation change day to day or over a long period of time? <ul style="list-style-type: none"> ■ <i>How can we tell this?</i> 	<p style="text-align: center;">Adaptations for Online <i>(as needed by phase)</i></p> <p>ENGAGE</p> <ul style="list-style-type: none"> ● Same as in person <p>EXPLORE</p> <ul style="list-style-type: none"> ● Same as in person <p>EXPLAIN</p> <ul style="list-style-type: none"> ● Same as in person 	

- Student answer: We believe they will discuss how precipitation can vary day to day, but we don't believe they will understand how rain levels have changed due to the change in the climate. We hope they will discuss analyzing data over time to make conclusions about the changes we're experiencing.
 - **Can temperatures vary from day to day? Have the average temperatures of different places changed over a long period of time?**
 - *How do you think we could determine this?*
 - Student answer: We anticipate students to discuss experiences they have had where temperatures highly vary from day to day. The second question may bring up points about climate change and how weather severity has changed over a long period of time.

- We will then pull up our [PowerPoint](#) showing images of temperature change over three years. This will help show the students a visual representation of different patterns and change over time. This is part of our math stem infusion.
- the teacher can ask the following questions:
 - **Do you notice any differences between the years?**
 - *What changed from year to year?*
 - Student Answer: It was warmer in Florida in January in 2017.
 - **What do the colors mean?**
 - Scaffold so they understand what the key means.
 - *What does each color represent?*
 - Student Answer: Red means that it is hot, blue means that it is cold
 - Follow up Question: *What about the orange or light blue or light red? What do those show us?*
 - Student Answer: it means that it is cooler than hot red because dark colors mean the extreme

EXPLORE (40 minutes 10:20-11:00)

Have the students look at the graphs. <https://www.ncdc.noaa.gov/climateatlas/>

- The first graph will be in 1948.
- Look at the whole United States and have a discussion on the following:
 - What does the graph about rainfall show?
 - What does the graph about temperature show?
- **Then focus on Indiana and have the students decide on a key for rain, snow, and temperature.** Having the students create their own interpretation about the key for the graph is an engineering and math STEM infusion. This discipline will help students understand how patterns can give you a better understanding of the data for the weather.
 - The students will then use the key worksheet as well as the key they made to represent what the data shows about Indiana.
 - The students will use colored pencils to represent the data on their Indiana worksheets.
 - They will repeat this process for each month in 1948.
 - When looking at the different weather patterns, what are the differences across the months?
- The second graph will be in 2016.
 - The students will follow the steps that they completed for the graph of 1948 for the graph of 2016.

EXPLAIN (10 minutes 11:00-11:10)

- Now the students will have their worksheets side by side and compare the data between 1948 and 2016.
 - What are the differences in:
 - rainfall?
 - temperature?
- Why are there differences in the graphs?
- What can those patterns tell us?

ELABORATING/EXTENDING Understanding (11:10-11:30)

(WHOLE CLASS -- last 30mins together -- building your class Content Storyline)

<ul style="list-style-type: none"> ● We will come back as a whole class to share out our understanding of the patterns we noticed. ● The only teachers will share their screen of the T Chart Worksheet to collaborate on. ● We will combine the information from the years 1948 and 2016 to show how the years were different. <ul style="list-style-type: none"> ○ What did you notice about Temperature/Precipitation? ● We will finally discuss how we can use this information to help explain to my Grandpa how things were different when he was a child versus now. <ul style="list-style-type: none"> ○ What information can we use to inform Grandpa? ○ What data could we use to back our point up? ○ Why should we show these graphs to Grandpa? 	
Formative Assessment Evidence	
<p>What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?</p> <ul style="list-style-type: none"> ● We will have whole group discussions throughout the lesson in order to assess what the students are thinking. We will make sure each student shares out at least one of their ideas when we are sharing our activities. ● We will have a T-Chart at the end that will summarize the students’ ideas about how they compared and contrasted the 1948 and 2016 graphs. 	
Individual Student Accommodations	
<p>Required Accommodations/Modifications:</p> <ul style="list-style-type: none"> ● If the student is having trouble spelling or typing the students can be able to draw a picture of their understanding of the given question instead of writing out their ideas in word form. 	
<p>Additional Modifications for Individual Students:</p> <ul style="list-style-type: none"> ● For (ENL/Bilingual student), if she is having a hard time understanding the given question, rephrasing it by using more common, “easier” vocabulary will help her be able to answer the question. Also giving her more time to process the question will help her thought process. 	
<p>Materials</p> <p>REMEMBER to include Quantity. Also differentiate any materials for in person VS online.</p>	
<p>In person</p> <ul style="list-style-type: none"> ● Colored pencils 	<p>Online</p> <ul style="list-style-type: none"> ● Same as in person

<ul style="list-style-type: none"> • 2 copies of Indiana worksheet per person • Key worksheet 	
---	--

Week 5

Driving Question for the unit: What is the importance of the weather to our climate?

Specific Lesson Question: How do we describe different climate regions?

Overview		
<p>For lesson 5, how will you contribute to answering your overarching unit question?</p> <ul style="list-style-type: none"> • This lesson question is important to our driving question for the unit because it will help students understand that the weather patterns a specific place experiences determine what type of climate that place is classified under. 		
<p>Disciplinary Core Idea Addressed in lesson:</p> <p>ESS2.D: Weather and Climate</p> <p>-Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1)</p> <p>-Climate describes a range of an area’s typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)</p> <p>Explain this idea (in your own words---not the internet) AND its</p>	<p>Science and Engineering Practices Addressed in Lesson:</p> <p><i>Analyzing and Interpreting Data</i></p> <p>Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.</p> <ul style="list-style-type: none"> • Represent data in tables and various graphical displays (bar graphs and pictographs) to 	<p>Cross-Cutting Concepts Addressed in Lesson:</p> <p>Patterns of change can be used to make predictions.</p> <p>(3-ESS2-1),(3-ESS2-2).</p>

<p>importance to answering the driving question for the unit.</p> <p>By looking at different climate regions we are describing weather conditions over a span of different areas. This relates to our driving question because knowing the different climate regions helps us know the importance of weather to our climate.</p>	<p>reveal patterns that indicate relationships. (3-ESS2-1)</p> <p><i>Obtaining, Evaluating, and Communicating Information</i></p> <p>Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.</p> <ul style="list-style-type: none"> ● Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2) 	
<p>Will another discipline of STEM (other than science) be included in this lesson? [highlight your response]</p> <p>Yes</p> <p>No</p> <p><i>If yes, be sure to CLEARLY state in the Learning Plan below when and how STEM will be infused.</i></p>		
<p>Learning objectives (outcomes):</p> <p><i>What do you want students to be able to explain/state in response to the specific lesson question?</i></p> <p>Students will be able to explain/state [USE KIDS' WORDS]:</p> <ul style="list-style-type: none"> ● There are 5 different climates. There's tropical, dry, temperate, cold, and polar. Each climate zone has a different kind of weather pattern because of the shape (angle) of the Earth. 		
<p align="center">Learning Plan (using the 5E model--Meredith will explain as needed)</p>		

In person

ENGAGE

- Discussion
- The teacher will lead a discussion with the whole class about climate
 - Question: **What do you think is meant by the term climate?**
 - Student Answer: The students might say that it is weather over time but they may not bring up that it is also the typical weather conditions of a certain area. This is because we have focused more on time span than location.
 - Question: **How do we describe different climates zones?**
 - Student Answer: The students might be able to say that certain areas are hotter or colder than others/ may have more or less precipitation than others because we showed this in our lesson last week. The students may not have the background knowledge of the certain names for the different climates.
 - Question: **How might climate information for a place be useful for you?**
 - Student Answer: The students might say if they are planning a trip to an unfamiliar location.
 - Question: **Can you name one of the different types of climate zones?**
 - Student Answers: Tropical Climate, Dry Climates, Temperate Climate, Cold Climate, Polar Climate

EXPLORE

- creating the map
- After we have had our discussion about the different climates and seeing what the students know, we will move into the graphic organizer.
 - [Graphic Organizer](#)
 - [Map to color](#)
- The teacher will ask each student to take the graphic organizer out so we can fill it out.

Adaptations for Online

(as needed by phase)

ENGAGE

- Same as in person

EXPLORE

- Same as in person

EXPLAIN

- Same as in person

- The teachers will display the powerpoint that has the [Climate Regions Data](#) cards that has the information about each of the different climates.
- The students will fill out each box of the organizer with the information about each climate as the teacher reads the information to them.
- Based on the information from their graphic organizers, the students will create their maps.
 - The teacher will have the students look at their graphic organizer and say what degrees latitude it says a climate is at. Then the teacher will announce what degree latitude a certain climate is at and then have them find that degree on the side.
 - For ex. “The Cold climate is at 40 degrees latitude. Can you find 40 degrees latitude on the side and then make a horizontal line all the way across?” Then ask what the other degree is for the cold climate. When they say 70 have them draw a horizontal line again and then color in between the two lines that they made. The students will then label this area “Cold Climate”
 - Continue this process for all of the climate regions.

EXPLAIN

- Journal entry:
- The students will write in their journal what they have learned today
- Give them these questions as ideas to write about:
 - How can we explain the different climates?
 - Write down different climates that we have discussed today
 - Make predictions about what climate region different places that you are familiar with would be included in (Bloomington, vacation spots, places where relatives live, etc.)

ELABORATING/EXTENDING Understanding

(WHOLE CLASS -- last 30mins together -- building your class Content Storyline)

- Discussion
- At the end of the lesson, the online and in-person groups will come together. During this time, we will discuss what the students have learned.

<ul style="list-style-type: none"> ● An online teacher will type the students’ ideas for everyone to see. <ul style="list-style-type: none"> ○ After today’s lesson, what is it meant by the term climate? <ul style="list-style-type: none"> ■ They may answer by saying something about the different types of climate or say weather over time and they may bring up that it is also the typical weather conditions of a certain area. ○ What are the different climate zones? <ul style="list-style-type: none"> ■ The students will answer with 1 or more of the 6 zones. ● After reviewing the lesson, the teacher will go back to the grandpa scenario. <ul style="list-style-type: none"> ○ Think about older people moving to Florida or someplace with a warmer climate during the winter. 	
Formative Assessment Evidence	
<p>What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?</p> <ul style="list-style-type: none"> ● We will have whole group discussions throughout the lesson in order to assess what the students are thinking. We will make sure each student shares out at least one of their ideas when we are sharing our activities. ● The students will write what they have learned in a journal entry and then each person will share one thing that they wrote. 	
Individual Student Accommodations	
<p>Required Accommodations/Modifications:</p> <ul style="list-style-type: none"> ● If the student is having trouble spelling or typing the students can be able to draw a picture of their understanding of the given question instead of writing out their ideas in word form. 	
<p>Additional Modifications for Individual Students:</p> <ul style="list-style-type: none"> ● For ENL/Bilingual student), if she is having a hard time understanding the given question, rephrasing it by using more common, “easier” vocabulary will help her be able to answer the question. Also giving her more time to process the question will help her thought process. 	
<p>Materials</p> <p>REMEMBER to include Quantity. Also, differentiate any materials for in person VS online.</p>	
<p>In-person:</p> <ul style="list-style-type: none"> - World Map activity worksheet - Charting the Data worksheet 	<p>Online</p> <ul style="list-style-type: none"> - Map activity worksheet - Charting the Data worksheet

- Colored pencils/crayons - Piece of paper	- Colored Pencils/crayons - Piece of paper
---	---

Week 6

Driving Question for the unit: What is the importance of the weather to our climate?

Specific Lesson Question: What are the differences between climate and weather?

Overview		
<p>For lesson 6, how will you contribute to answering your overarching unit question? This lesson contributes to our unit question because it addresses the key differences between weather and climate. Using the information from the past 5 weeks, students will be able to compile this information to answer the scenario about Grandpa.</p>		
<p>Disciplinary Core Idea Addressed in the lesson:</p> <p>ESS2.D: Weather and Climate</p> <p>-Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) -Climate describes a range of an area’s typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)</p> <p>Explain this idea (in your own words---not the internet) AND its importance in answering the driving question for the unit.</p>	<p>Science and Engineering Practices Addressed in Lesson:</p> <p><i>Analyzing and Interpreting Data</i></p> <p>Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.</p> <ul style="list-style-type: none"> ● Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) 	<p>Cross-Cutting Concepts Addressed in Lesson:</p> <p>Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2).</p>

<p>Students should be able to explain that climate is the weather describing an area's range over many years, and the weather is the day to day patterns across different (short) times. Considering this idea, it is important to answer our driving questions for the unit because it helps the students understand the differences between the weather and climate. Being able to explain to someone what the difference is to show their understanding of the information that they have learned over the past 6 weeks.</p>	<p><i>Obtaining, Evaluating, and Communicating Information</i></p> <p>Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.</p> <ul style="list-style-type: none"> ● Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2) 	
<p>Will another discipline of STEM (other than science) be included in this lesson? [highlight your response]</p> <p>Yes No</p> <p><i>If yes, be sure to CLEARLY state in the Learning Plan below when and how STEM will be infused.</i></p>		
<p>Learning objectives (outcomes): <i>What do you want students to be able to explain/state in response to the specific lesson question?</i></p> <p>Students will be able to explain/state [USE KIDS' WORDS]:</p> <ul style="list-style-type: none"> ● Weather is the change from day to day whereas climate is the change over several years as well as a certain area's typical weather condition. 		
<p>Learning Plan (using the 5E model--Meredith will explain as needed)</p>		
<p>In-person</p> <p>ENGAGE (10:00 - 10:20) Online and In-person</p> <ul style="list-style-type: none"> ● The online and in-person class will fill out the Review Chart together for each week to remind the students of what we wanted them to get out of each lesson. 	<p>Adaptations for Online <i>(as needed by phase)</i></p> <p>ENGAGE</p> <ul style="list-style-type: none"> ● Same as in person. <p>EXPLORE</p> <ul style="list-style-type: none"> ● Same as in person. 	

- To start, tell the students that we are going to think all the way back to the first lesson.
 - Go through each lesson asking the question on the chart as well as follow up questions that will jog their memory such as bringing up activities that we did and what those activities showed us. (3-4 minutes per lesson discussion)
 - **Lesson 1: How can we use temperature to look at weather patterns?**
 - What activity did we do with temperature? What was the importance of the thermometer?
 - Anticipated Answers: Students will recall that we made thermometers and they are used for checking the temperature day to day.
 - **Lesson 2: How can data that we collected day to day help us form graphs that give us insight about weather patterns?**
 - Remember when we made graphs? Why do we look at weather data from day to day? What kind of graphs do we use for this type of data?
 - Anticipated Answers: Students may recall that it was a line graph, but may also forget. They have forgotten in the past. They may recall that day to day weather helps us know how to dress and prepare for the day. Graphs can help show us how the weather has changed over time.
 - **Lesson 3: How do the different precipitation types help you understand the weather?**
 - Remember when we looked at the precipitation cards?
 - What are the different precipitation types?
 - Anticipated Answers: Students will say rain, sleet, snow, and hail.
 - **Lesson 4: How can I use data of different weather patterns over time to make conclusions about the changes in climate?**
 - Remember when we looked at weather patterns from 1948 and then weather patterns from 2016? What did that show us?
 - What word can be used to show the change over time?

EXPLAIN

- Same as in person.

- **How do you describe what Climate is? How do you describe what the weather is?**
 - Teacher/Student Answer: Climate is the average weather condition of a particular region. Weather is the condition of a particular time and place.
- **What type of precipitation is there? Is precipitation weather or climate?**
 - Student Answer: sunny, windy, cloudy, snowy, rainy, sleet, hail - precipitation is weather.
- **How do we describe the seasons? Are they weather or climate?**
 - Student Answer: There are four seasons: fall, winter, summer, spring. It is our climate.
- **What are some keywords about climate? What are some keywords about the weather?**
 - Anticipated Answers:
 - Climate: seasons, per year, regions
 - Weather: daily, today, tomorrow, current, cloudy, foggy, hot, cold
- **How do you know if the temperature goes under the weather, climate, or both?**
 - Student Answer: we talked about the temperature in each lesson, so it will be in the middle (both).

*****Brain Break: If needed, the teacher can explain that we are going to be doing a brain break now. Have the students stand up and spin around the room for 1 minute.**

- After the students have filled out both the review chart over our past lessons and the Venn diagram they will be creating a **poster** to show Grandpa. (5 minutes for explanation)
 - We will first show each student an [example of a poster](#) that the teacher has created.

- The teacher will explain that they will now be creating their poster of all of the information that they have obtained about weather and climate.
 - Each student **can include**: key vocab words, images, weather/climate definitions.
 - Each student **will need to** make half of their page about weather and the other half about climate.
- The teacher will give the students roughly around **15 minutes** to create their posters.

EXPLAIN

(11:00-11:05) Individual

- We will use this section to **go over what the students will present** to Grandpa.
- They will have a chance to pick out which key point(s) they will explain to help Grandpa see the difference between climate and weather.
 - We will do this so not every student will say the same fact as another student.
 - The teacher will explain that Grandpa needs as much information as possible therefore, we cannot repeat facts,
- This time can also be used to answer any last-minute question a student may have.

*****Brain Break: If needed, the teacher can explain that we are going to be doing a brain break now. Have the students stand up and gallop around the room for 1 minute.**

ELABORATING/EXTENDING Understanding

(11:05 - 11:30) Online and In-Person

(WHOLE CLASS -- last 30mins together -- building your class Content Storyline)

- For this section, we will have students **present their posters** with information regarding weather and climate to Grandpa to help him see the differences.
- Grandpa will first state: “When I was little I think that it was a lot colder and snowed more than it does now because the weather is changing.”

- The teacher will explain that Grandpa is mixing up his words and we have to help change his mind.
- Students will take turns presenting what they created and what information they chose to include on the poster
- Students can also ask Grandpa questions to figure out why he believes the weather has changed
 - Student question: Where did Grandpa grow up and where does he live now?
 - Grandpa's answer: I've lived in a small town in Northern Indiana my whole life (Grandpa did not live in a different climate zone when he was a child).
- The students will engage in a conversation with Grandpa to help him understand that he is mistaking a change in climate as a change in weather.
- Grandpa will eventually start to see that the climate is changing but the weather he is experiencing is not

Formative Assessment Evidence

What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?

- We will have whole group discussions throughout the lesson in order to assess what the students are thinking. We will make sure each student shares out at least one of their ideas when we are sharing our activities.
- The students will be writing information/questions for grandpa on their poster which will then inform the teachers about how the students are grasping the concepts.

Individual Student Accommodations

Required Accommodations/Modifications:

- If the student is having trouble spelling or typing the students can be able to draw a picture of their understanding of the given question instead of writing out their ideas in word form.

Additional Modifications for Individual Students:

- For ENL/Bilingual student), if she is having a hard time understanding the given question, rephrasing it by using more common, "easier" vocabulary will help her be able to answer the question. Also giving her more time to process the question will help her thought process.

Materials

REMEMBER to include Quantity. Also, differentiate any materials for in-person VS online.

In-person

- **Markers/Crayons**
- **Printer Paper (1 per person)**
- **Graphic Organizer (1 per person)**
- **Venn Diagram (1 per person)**

Online

- **Markers/Crayons**
- **Printer Paper (1 per person)**
- **Graphic Organizer (1 per person)**
- **Venn Diagram (1 per person)**