Q405: Saturday Science
Lesson Plan

Lesson Topic: Weather **Grade: 5th and 6th**

Instructor Names:

Desired Results	
Overarching Focus Question for the Session (*the phenomenon being explored across the 3-weeks***)** ● **How can we use data to predict weather?**	
Central Focus/Topic for today: Students will understand: ● How weather is measured ● Different types of weather ● How to gather different types of data ● How to interpret data in different ways (graphs, charts, journal) Therefore, the guiding question for today's learning is: ● Why is taking data an important part in determining weather?	**Relationship that this central focus has to the overarching big idea/question for the unit** ● How can meteorologists predict the weather for the upcoming days/weeks?
● **5-ESS1-2.**	**Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and**

night, and the seasonal appearance of some stars in the night sky. [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [*Assessment Boundary: Assessment does not include causes of seasons.*]

Timeline of Activities for the Day
**Provide a breakdown of how long each activity will take, who will lead the segments of the activities, when breaks will occur or other transition points, etc.* **Identify by highlighting in blue the portion of the lesson you team wants video-recorded each week. This should be ~45 mins* (10 minutes)- Discussion: types of weather, ways to measure weather (5 minutes)- Create weather journal (10-15 minutes)- create anemometer and acquire labquests (5 minutes)- demonstrate how to use labquests (5 minutes)- bathroom break (1 hour)- Go outside and explore: use anemometers and lab quests to record data, record in weather journals (5 minute)- bathroom break (15 minutes)- (Go back inside) discussion about data, the best place to take the data, why? *(10 minute)- sneak break somewhere*

Learning Plan (First three E's of the 5E model)

Any of these phases can be repeated should you have more than one activity to describe OR a complex activity with multiple iterations of some phases.

ENGAGE

- Discuss about different types of weather: rain, wind, snow, hail
- Discuss different ways you can measure weather: Temperature and Wind Speed (slow, medium, fast)
- Create weather journal (10-15 minutes)
- Create their own anemometer to measure the wind speed (20 minutes)

EXPLORE

- Use labquest probes to take temperature of outside (do this in 3 different locations to test how data can differ in different places due to obstructions, tree cover, etc.) (1 hour)
  - Woods by Herman B Wells Statue
  - Open Field
  - Behind Ed Building between Spruce and Ed Building
- Briefly discuss what they observed and the data they recorded, and record in weather journals

EXPLAIN

- Discuss how data varied in different places and why that could be. Find averages of each place, discuss best place to record accurate data.

ELABORATING/EXTENDING Understanding

- If time permits, introduce how to graph the groups data. What is another way we could show this information?

Assessment Evidence (*This is the Evaluation Phase of the 5E approach)

Performance Task(s):	**Other Evidence:**
• Using their anemometer and labquest to take and record data	

	• Being able to explain why the location you take the weather readings matter.
Materials + Quantity: • **Anemometer: - 5 dixie cups (small paper cups), 1 pencil, a thumbtack, 2 straws (x14 for all materials)** • **Labquests + thermometer probe (x4)** • **Weather Journals- colored paper, pencils, markers (enough for one per student)**	
Required Accommodations/Modifications: • Working with a partner/ in a group	
Additional Modifications for Individual Students: N/A	

Q405: Saturday Science

Lesson Plan Template- WEEK 2

Lesson Topic: Extreme Weather and Collecting Data

Grade level(s): 5th and 6th grade

Instructor Names:

Desired Results

Overarching Focus Question for the Session (*the phenomenon being explored across the 3-weeks***)**

- **How can we use data to predict weather?**

Central Focus/Topic for today:
Students will understand:

- Collecting and graphing data is important to show patterns over a period of time
- Patterns in weather data can help us predict future weather
- Patterns in data can help us understand that some weather can lead to severe weather

Therefore, the guiding question for today's learning is:

- How can weather patterns show us which types of severe weather could happen in the future?

Relationship that this central focus has to the overarching big idea/question for the unit

- Our central focus for this week relates a lot to our overarching big idea. First, it relates because this week we will be discussing the data we collected last week and why it is important for making predictions in general. It is also relevant because we are moving into talking about severe weather so making sure students know that meteorologists can predict severe weather coming by using data patterns is important.

Student objectives (outcomes):

Students will be able to:

- 5-ESS1-2- Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

To connect our lesson to this standard, we want our students to know how to graph data and how to find patterns within that data that could help us to determine the weather.

Timeline of Activities for the Day

9:30-9:35 : Students will come in and get settled and we will start having a class discussion about data (what we did last week).

9:35-10:05 : Students will go to computer lab to use Inspire Data program to graph a data set provided by us.

10:05-10:15 : We will break down the different types of severe weather and what they are. (tornadoes, hurricanes, thunderstorms, & blizzards)

10:15 (all) : Class will be put into 4 groups of 3 students. (move to same tables)

10:20-30 (all) : BATHROOM BREAK/SNACK (bring outside)

10:30-10:45 (all): Students will go outside and record what outside could be affected by their specific severe weather that they were assigned.

*10:45-11:15 (all): Come back inside go back to computer lab and research their specific severe weather (worksheet will be provided with 6 different boxes to answer all these questions) ******

11:15-11:40 (all): Students will create a poster in their groups about the research they have done on their severe weather.

11:40-11:50 (all): Students will go on a gallery walk of their peers work and write down one fact about each others' severe weather.

11:50-12 (all): Wrap up discussion about what what we did today (share projects with each other) & introduction to next week's topic.

Learning Plan (First three E's of the 5E model)

Any of these phases can be repeated should you have more than one activity to describe OR a complex activity with multiple iterations of some phases.

ENGAGE

First Activity:

- We will have a whole class discussion about last weeks data collection and why collecting data is important. The teachers will be leading the discussion by asking prompting questions like:
  - What data did we collect last week?
  - What did this data tell us?
  - Why is collecting data about weather important?
  - Why do meteorologists need to collect data to do their job?

  During this activity the students will be sitting at their table group discussing these questions as a group, and potentially writing their ideas on a whiteboard. Then the students will share their ideas with the class.
- We will then go to the computer lab as a class to use the program 'Inspire Data.' We will give the students a set of data to work with. This data will be weather from Bloomington for the past week (Friday-Friday), and will be given in a form of a table, so that the students can graph. The students will then use the program to graph the data given. The students will think about

- Why is graphing data important?
- Is this data easy to read now that it in graph form? How are we able to read it? Can you identify the different patterns?
- Will predictions always be accurate? Yes or no? Why or why not?
- Are patterns or trends always accurate? Why or why not?
- 1. What kind of graph will help us best understand our data.... what do we want to know about this set of data by putting into graph. What kind of graph should we use to show this (so bar for categorical, line for linear/ over time patterns, etc)

  Have the kids decide for themselves! But have them then share the kind of graph they select and what it tells us about the data. Does it match with what we said we wanted to know. See if you can guide them to a consensus to the best format, which I expect you are thinking linear.
- 2. Then building from your own questions bring the discussion back to why graphs are important for scientists to communicate their results, and how different types of graphs help us to visualize different kinds of data.

- We will then have another discussion about the activity we just did. The teachers will lead the discussion and the students will respond to these questions verbally using the following prompts:
  - Can collect data over a period of time help us forecast future weather? How?
  - What are some kinds of severe weather you can think of? What have you heard about them? (tornadoes, hurricanes, blizzards, thunderstorms)

EXPLORE

Second Activity (Outside):

- Pairs of 3 (4 groups) will each be assigned an extreme weather (tornadoes, hurricanes, blizzards, thunderstorms).
- Each teacher and one helper will be assigned to each group. With their paired teacher, students will go outside to the arboretum area. They will record what could be affected in the community if that extreme weather were to occur.
    - What do you see that could be affected by your extreme weather?
    - How could the community be affected? What would happen to the structures? What does this mean for the community? How would you feel if this happened?

Third Activity:

- Class will come back inside and go back to computer lab and research their specific severe weather with their group (3 students to each group and one teacher). The teachers will provide a worksheet with 6 different boxes to answer specific questions. As the students are working, the teacher will walk around and help groups that they may need help using the computer or researching their weather. Students will answer the questions on their worksheet:
    - Causes/How it is formed?
    - Aftermath/Effects?
    - Location: Where does it most likely occur?
    - What does it look like? (draw picture)
    - The most recent occurrence of their specific weather: Where and When?
    - Category levels

- In their groups, students will create a poster including all the information they found by answering the questions above.

Teachers will help groups plan their poster and walk around to help any groups if needed.

- If students want to and if time permits, they can create a song/rap or poem about their severe weather that they can present along with their poster. Teachers can help students with planning this and ideas on how to perform it.

EXPLAIN

Fourth Activity:

- Next, we will do a gallery walk of our posters. The posters will be put up around the classroom and the students will walk around group by group and look at each poster. The teachers will also be walking around with the students.
- Each student will write/draw one fact from each poster as they walk around the class and look at each groups posters.
- After the gallery walk, we will give the students the opportunity to present their rap or song if they want to.

ELABORATING/EXTENDING Understanding

Fifth Activity:

- As a wrap up activity, we will have a discussion about the day. The teachers will lead the discussion and ask the class some discussion questions:
    - What is one fact you learned from your classmates the poster?
    - Did you enjoy this activity? Is there anything you wish you did differently?
    - Why is it important to learn about severe weather? Are patterns of extreme weather happening more frequently? Is this good or bad? Why or why not?

- Finally, we will introduce next week's lesson about creating their own forecast. If time permits, teachers will allow

students to brianstorm prop ideas with their groups that they can bring to include in their forecast video.

Assessment Evidence (*This is the Evaluation Phase of the 5E approach)	
Performance Task(s): ● (Engage) Graphing a data set in the computer lab during our first activity. The students will think about: - Why is graphing data important? - Is this data easy to read now that it in graph form? How are we able to read it? Can you identify the different patterns? - Will predictions always be accurate? Yes or no? Why or why not? - Are patterns or trends always accurate? Why or why not? ● (Engage) They will have a discussion about last weeks' data and why data is important. Here we will	**Other Evidence:** ● (Engage) While doing their discussions with the prompting questions we give them, we will informally assess the students based off of participation and what they think. ● (Explore) Also, when going outside seeing if the students know what things outside that can be affected by their severe weather they get assigned. The questions we will ask and their responses to those questions can give us a good idea of what the students already know. These questions are: What do you see that could be affected by your extreme weather?

ask them some prompting questions like: - What data did we collect last week? - What did this data tell us? - Why is collecting data about weather important? - Why do meteorologists need to collect data to do their job? ● (Explore) Researching their severe weather and being able to identify: ○ Causes/How it is formed? ○ Aftermath/Effects? ○ Location: Where does it most likely occur? ○ What does it look like? (draw picture) ○ The most recent occurrence of their specific weather: Where and When? ○ Category levels They will be making a poster on their severe weather and we will check if all groups met the	- How could the community be affected? What would happen to the structures? What does this mean for the community? How would you feel if this happened? ● (Explain) The gallery walk is also an informal assessment due to them having to look and write down one interesting fact from each of the groups posters. ● [Explain](Students can present their poster to the class if they want to, and they can also come up with a song, movement, etc. about their severe weather if time permits)

criteria for what needs to be on their posters. ● (Elaborate) Having a wrap up discussion about the day and what they learned with these prompting questions: ○ What is one fact you learned from your classmates the poster? ○ Did you enjoy this activity? Is there anything you wish you did differently? ○ Why is it important to learn about severe weather? ○ Are patterns of extreme weather happening more frequently? Is this good or bad? Why or why not?	
Materials + Quantity: ● Poster Board (x4, one per group) ● Colored markers ● Tape	
Required Accommodations/Modifications: ● Working as a team: this is an accommodation that can help students work on their communication skills. Working as a	

team is a good opportunity to share ideas and help one another if someone in the group is struggling with the material or even the computer programs they are using.

- Making a poster: this is an accommodation for more visual learners. Instead of having our students write a research paper about their findings, we are allowing them to express their ideas in poster form. This allows them to be creative. This also allows for students who do not know English well to be able to draw pictures instead.

Gear up: To gear up this lesson, we will have students research additional information. We could ask them how likely is it for that extreme weather to happen in their hometown. Students can present their poster board if they choose too. Create either song, rap or poem about their extreme weather.

Gear down: To gear down this lesson, we will work with students to navigate the Inspire Data program. We will not expect them to do it alone, as they probably have never used the program before.

Additional Modifications for Individual Students:

Q405: Saturday Science (WEEK 3)
Lesson Plan Template

Lesson Topic: __Weather__ **Grade level(s):__5/6th__**

Instructor Names: _ **___**

Desired Results	
Overarching Focus Question for the Session (*the phenomenon being explored across the 3-weeks***)** **How can we use data to predict the weather?**	
Central Focus/Topic for today: Students will understand: ● How to use data to predict weather. ● Why it is important we learn about the different types of extreme weather. ● How to use evidence to predict weather. Therefore, the guiding question for today's learning is:	**Relationship that this central focus has to the overarching big idea/question for the unit** ● *We are using the things we have learned in previous Saturday science sessions about data and why that data is important to be able to predict severe weather that is coming. For example, if we collect data that shows snow and wind speed increasing in consecutive days, we can predict that if the wind continues to*

• How can we use weather data to predict potential severe weather forecasts?	*increase there could be a blizzard.*

Student objectives (outcomes):
Students will be able to:

- Use evidence based on their own data to make predictions about future weather.
- Use evidence to form arguments that will be used to predict the weather forecast.
- Students will obtain, evaluate and communicate information about weather through a weather forecast about severe weather.

Timeline of Activities for the Day

**Provide a breakdown of how long each activity will take, who will lead the segments of the activities, when breaks will occur or other transition points, etc.*
**Identify by highlighting in blue the portion of the lesson you team wants video-recorded each week. This should be ~45 mins*

9:30-9:40 (all)- go outside and collect the temperature for the day.

9:40-10:05 ( )- The students will then come inside and they will make a graph using a data set that is given.

10:05-10:10 (all)- Finishing up their posters with their groups on their specific severe weather.

10:10-10:15 (all)- Gallery walk for the posters. 1-2 minutes to look at each poster.

10:15-10:20 - Explain forecast activity.

10:20-10:30 (all)- Create backdrop

10:30-10:45 (all)- Brainstorm with specific teacher (each group gets a teacher)

10:45-11:00 (all) - Create script and assign roles for the broadcast. (cameraman, meteorologist, props person, bystander, interviewee)

11:10-11:35 (all)-Go back outside and record their forecast predictions about what will be affected by their severe weather.

11:35-11:55 (all)- Come back inside and record their forecast on their specific severe weather. (blizzard, hurricane, tornado)

11:55-12 ( )- Debrief, outro for the students and ask our leading question again.

Learning Plan (First three E's of the 5E model)

Any of these phases can be repeated should you have more than one activity to describe OR a complex activity with multiple iterations of some phases.

ENGAGE

Activity 1: Go Outside

For the first activity we are going to go outside as a group to measure and record the temperature for that day. The students will use the lab quest and the temperature probe to do this. The students will then write the temperature they recorded in their weather journals. While the students are doing this, the teachers will help students with lab questions and ask questions:

- Why does the area we take the temperature matter?
- Is the temperature higher, lower or the same as the temperature we recorded week 1?
- Why is temperature important? Do you think it plays a key role in extreme weather types?

Activity 2: Graph Data

Next we will come back inside and use large graph paper to create a graph. The students will do this individually. We will use the temperature the students took the first Saturday, the temperature they took this Saturday, and then the teachers will give the students the temperature data to fill in from the past 3 weeks. The teachers will work with the students to explain the parts of a graph, like the x and y axis, and how to plot the data. The students will then plot the data. After they plot the data, they will plot 5 extra points for the next 5 days. This will be what they predict the temperature to be for the next 5 days. Teachers will ask questions like:

- Why is graphing data important?

- What do graphs show us?
- What does this data show?
- Are there are any patterns that can help us predict what next weeks temperatures will be?

EXPLORE

Activity 3: Finish up Posters

After the students finish their graph, we will give them the opportunity to finish up their posters with their group from last week about severe weather. Teachers will walk around the room to make sure they are adding necessary details and ask if the students need help

- Is there anything else from the research worksheet you can add?
- Ask students which part they contributed to.

Activity 4: Gallery Walk

Students will hang their posters and get into their groups. Next, the students will walk around the room one poster at a time. While walking around, the students will write down something they learned from each extreme weather poster. Teachers will ask questions like:

- What did you learn? What was the most interesting thing you learned?
- Where you shocked by anything you read?
- Why is it important that we learn about extreme weather?

While the students are walking around, teachers will make sure students are being responsible and sensible while viewing posters and not messing around with peers.

Activity 5: Forecast Activity Prep

Students will have time to create a backdrop for the weather forecasting inside. Here they will be provided with poster paper and paint and draw what their severe weather looks like. They did this last week while creating their gallery walk posters.

Next, each group will get a cooperating teacher to brainstorm some ideas to talk about in their forecasting. We will prompt them by asking:

- What needs to happen in order for your severe weather to happen?
- What do you think will be affected by your severe weather?
- Does wind speed matter in predicting your forecast? What about temperature?

After brainstorming for 5-10 minutes students will be asked to create a script of what they will say on their 2 broadcasts. For the first broadcast they will talk about the patterns that are happening in the weather right now that could lead to potential severe weather in the upcoming days.

For the second broadcast, the students will talk about how they were right in predicting their severe weather and what components went into predicting that weather.

EXPLAIN

Activity 6: Forecast Activity

For this activity the students will go outside first and create their own forecasting segment. Here the students will have different roles like camera person, meteorologists (1-2), and props person. They will go off their scripts they wrote earlier and talk about the different patterns they have seen recently and predict what severe weather could occur. They will need to talk about the wind speed, temperature, precipitation levels, etc.

After filming outside the students will come back inside and film a segment on 'what is happening now.' They will use their backdrops that they made earlier and explain how/why they knew that their severe weather was going to happen. In this segment they will talk about why this severe weather is happening (wind speed, temperature, precipitation, etc.), and also touch on what will be affected during this severe weather.

- Will the trees be affected by this severe weather?
- What will happen to the cars, rivers, buildings?

ELABORATING/EXTENDING Understanding

Activity 7: Wrap Up Discussion

Students will be prompted with the initial question of:

- How can we use data to predict the weather?

After this we will reask some questions prompted in their activities:

- What needs to happen in order for your severe weather to happen?
- Why is it important that we learn about extreme weather?
- Why is graphing data important?
- What do graphs show us?
- Why is temperature important?

In this discussion students will be given whiteboards to write or draw down their ideas to these questions. The teachers will be walking around as well to ensure that all students are participating. After working in table groups for 1-2 minutes, we will bring the whole class together and ask some students to share their ideas with the class.

Assessment Evidence (*This is the Evaluation Phase of the 5E approach)

Performance Task(s):	**Other Evidence:**
• Severe Weather Posters- From this task we will know the students understanding of their specific severe weather topic from last week. We will be looking for the specific sections that we told them to research and if they have the correct reasoning as to why the severe weather formed. • Temperature Graph- From this task we will understand the students knowledge about how to graph a data set and how to predict future weather data. • The students weather forecast plan/ script- This will tell us what the students know about what will be affected by the severe weather and what components need to happen in order for a severe weather to occur.	• Responses to questions during discussion- Hearing students responses will help us gage what the students understand about their severe weather and knowledge they obtained from previous weeks.

Materials + Quantity:

- **Large graph paper (x14)**
- **Markers**
- **Poster Boards (x4)**
- **Paint (different colors)**
- **Labquests & temperature probes (x6)**
- **Cameras (x3)**

Required Accommodations/Modifications:

- Working as a team: this is an accommodation that can help students work on their communication skills. Working as a team is a good opportunity to share ideas and help one another if someone in the group is struggling with the material or even the computer programs they are using.

- Gear Up: To gear up the lesson we could have the students think of other graphs they could use the display the information. Would a bar chart work? A line graph? A scatter graph?
- Gear Down: To gear down the lesson we will help the students use the video cameras. The students will probably have never used them before, which is why it is necessary for us to give them some guidance before they use them individually. This will probably help speed up the process when they actually begin filming.

Additional Modifications for Individual Students:

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