Science Lesson Plan
Date: 10/12/21

Grade: 5th

Subject: Environmental Science + Life Science

Materials: Whiteboards, markers, paper

Technology Needed: Smartboard

Instructional Strategies:

- ☐ Direct instruction
- ☐ Guided practice
- ☐ Socratic Seminar
- ☐ Learning Centers
- ☐ Lecture
- ☐ Technology integration
- ☐ Other (list)
- ☐ Peer teaching/collaboration/ cooperative learning
- ☐ Visuals/Graphic organizers
- ☐ PBL
- ☐ Discussion/Debate
- ☐ Modeling

Guided Practices and Concrete Application:

- ☐ Large group activity
- ☐ Independent activity
- ☐ Pairing/collaboration
- ☐ Simulations/Scenarios
- ☐ Other (list)
- ☐ Hands-on
- ☐ Technology integration
- ☐ Imitation/Repeat/Mimic

Explain:
Students will do a large group activity with me, as I will be teaching them as a whole group. Students will then collaborate on the lesson by discussing ways to prevent the amount of methane in the atmosphere. Finally, technology will be integrated into the lesson with the students watching a short video on how cows burping produces methane.

Standard(s)

5-LS-2: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

5-ESS-2: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

Objective(s)

By the end of the lesson, students will be able to collaborate and discuss with their peers about how the biosphere and the atmosphere interact by modeling their understanding of how a cow's diet can affect the climate.

Bloom's Taxonomy Cognitive Level:

Creating – Students will collaborate with one another to discuss how a cow's diet can affect the climate, as well as how burps affect humans, and will be able to collaborate to identify what ways we can

Understanding – Students will be able to model their understanding of how cows can affect the atmosphere by drawing a picture

Creating – Students will be able to create a picture that will depict how methane can damage the atmosphere, as well as how methane is produced in cows.

Differentiation

Below Proficiency: Students who are below proficiency may struggle with their ability to understand how methane can affect the atmosphere, as well as what climate is and how cows can affect these things. In order to make sure they succeed; students will be placed into a discussion group that includes students who are above proficiency and who are approaching proficiency. By hearing a peer talk about it, it may help the student to better understand the material at hand.

Above Proficiency: Students who are above proficiency will be able to understand how methane can affect the atmosphere, as well as what climate is and how cows can affect these things. If some students don't understand these concepts, the students who are above proficient can help them to better understand these concepts when they are working during their collaboration time.

Approaching/Emerging Proficiency: Students who are approaching proficiency should be able to understand how methane can affect the atmosphere, as well as what climate is and how cows can affect these things. If they understand, they will do the same as those who are above proficiency; if they don't, then they may need to do the same as those who are below proficiency. They will be placed in a discussion group that includes both those that are above and below proficiency.

Modalities/Learning Preferences:

- **Visual:** Students will be able to *see* in the video how methane is produced by cows, and how that can damage the atmosphere.
- **Auditory:** Students will be able to *hear* how methane damages the atmosphere, as well as how methane is produced by cows during my lesson, as well as during the video.
- **Kinesthetic:** Students will be able to *draw* how methane is produced by cows, and how that methane damages the atmosphere.

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	• **Tactile:** Students will be able to *touch* the pictures that either they created or that their peers created in order to understand how methane is produced by cows, and how that methane damages the atmosphere.
Classroom Management- (grouping(s), movement/transitions, etc.) For this lesson, students will be placed into groups where they are able to work calmly, as well as with students who may be above or below their understanding of science. This will be done in order to make sure that ALL learners will be able to understand the lesson, as well as making sure that the students are working with a group that they may not have chosen on their own. As for movement, the students will only need to move when they are going into their groups. Students will be able to move their desks if they please, but they may need to go to another area of the classroom if more of their peers are on the opposite side. Finally, transitions will be done at the beginning, middle, and end of the lesson. At the beginning of the lesson, students will be transitioned from their Daily 5 time – I will use the phrase "Class, class" to which they will respond with "Yes, yes". Students will then transition their focus to me and put their Daily 5 things away. After that, students will then focus on science. In the middle of the lesson, students will be transitioned from group time to teacher time. At the end of the lesson, students will be transitioned from science to getting ready to go home for the day.	**Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)** During the lesson, students will be expected to behave as if Mrs. Miller was teaching. Students will be expected to be at a voice level of 0 when I am teaching and/or talking. During collaboration time, students will be expected to remain at a voice level of 2. Additionally, students will also be watching a video during this lesson. While the video is playing, students are expected to be at a voice level of 0 in order to make sure that they comprehend the material that is in the video.

Minutes	Procedures

5	**Set-up/Prep**
	• Students will be doing their Daily 5 time *before* science
	  ○ They will receive a 5 minute warning and a 1 minute warning before transitioning
	  ▪ **"Class, class (wait for students to respond), you have 1/5 minute(s) left before we move into science, so start to wrap up what you're doing."**
	• They will also be told that at the time, all they will not to have anything out on their desk.
	https://www.washingtonpost.com/climate-solutions/2020/11/27/climate-solutions-seaweed-methane/?arc404=true&fbclid=IwAR052Jw0Bg83CpMK_G0b_ayQIzssi4ZIZJYAa4qYXFKgDwEiGQwkFerUKQE

2	**Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)**
	• To engage the students, I will begin by saying this to them
	  ○ **"I read a very interesting article this morning. I want to show it to you guys. Before we dig into the material, let's just look at the title."**
	• The tagline of the article is "An unusual snack for cows, a powerful fix for the climate. Feeding them seaweed slashes the amount of methane in the atmosphere."
	• Some potential student questions that may arise include "What is methane?" "How can eating seaweed effect burps?" or even the question "Wait, cows burp like we do?"
	• I will then pose this question to the students
	  ○ **"In what ways do humans depend on cows?"**

8	**Explain: (concepts, procedures, vocabulary, etc.)**
	• We will then begin to discuss what methane is, as well as how it can affect the earth's atmosphere.
	  ○ **"Methane is a gas that is used to produce heat and electricity around the world. It is also something that can significantly damage the atmosphere, which can affect the climate of the earth. It is produced by cows when they burp, and humans produce it when from leaks in pipelines or extractions of natural resources."**
	  ▪ Then, I will explain what climate is. I will say
	  • **"Weather is the current or short-term conditions, while climate is the weather of a specific region over a long period of time."**
	  ○ **Then we will discuss some of the negative effects of methane on the atmosphere**
	  ▪ I would say to the class
	  • **"When methane reaches the atmosphere, it is then trapped in. It then traps heats into the atmosphere, which then causes our atmosphere to increase the climate of our earth."**
	  ○ **Students will then watch a video on how cows burping produces methane, as well as how methane is produced in cows.**

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	• Once we finish discussing those things, I will then have the students form a group, and they will then get together and help to brainstorm some ideas to help prevent this. I will say to them
	  ○ **"Okay class, we know that seaweed can help reduce the amount of methane in the atmosphere. What are some other ways that we can prevent methane from harming the atmosphere?"**
	• Once the students have had some time to discuss, I will then transition the students back to their desks. I will get their attention by saying "Class, class", once I have their attention, I will then say to the students
	  ○ **"Okay class, you will now need to grab a sheet a paper, their markers, and once everyone is settled, I will explain what we are doing next."**

10	**Explore: (independent, concreate practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)** • Once students are at their seats, I will then say to them ○ **"Okay class, now it is your turn to apply the knowledge. You are going to draw a model of cows burping, and how that affects the atmosphere. You can draw the atmosphere as a dome, a semi-circle, or anything that you feels will represent the atmosphere."** • Students will continue to do this until the it is time to wrap up the lesson.
5	**Review (wrap up and transition to next activity):** • As a wrap up, we will discuss as a class that *all* things that humans and animals have an effect on either the biosphere and/or the atmosphere. • After we finish this brief discussion, students will then be transitioned into heading home for the day.

Formative Assessment: (linked to objectives, during learning) • **Progress monitoring throughout lesson (how can you document your student's learning?)** Students will be assessed while learning by being asked multiple questions throughout the lesson. I will monitor over discussions between the kids, making sure that they are staying on topic *as well as* understanding the topic. Students will share out all their ideas during some of the overall class discussions. They will be asked some comprehension questions during the lesson.	**Summative Assessment (linked back to objectives, END of learning)** Students will create a model that demonstrates how methane goes into the atmosphere – which in turn causes damage to our atmosphere – which affects the climate. This model will be a drawing that depicts methane going from cows into the atmosphere, and then show how the methane can affect the atmosphere (it destroys the atmosphere, so drawing a dome or something with cracks in it could show the damage).

Reflection (What went well? What did the students learn? How do you know? What changes would you make?):
Overall, this lesson was not one of my best lessons. To start off, one of the positives of the lesson was that the students were very interactive and engaging a lot with the lesson. The students were asking a lot of questions about the material – some of the questions were things that I couldn't even answer. I was very surprised at the amount of high-level questions that the students were asking me. This was one aspect of the lesson that went really well, as the students loved learning about this material. Another aspect of the lesson that went really well was the collaboration in the science. When the students gathered into their groups, they were able to come up with very good solutions for the cow/methane problem. The students were able to learn more about what methane is, how it is produced, and how to prevent it. I know this because of the end of the lesson conversation we had as a class, as well as with their drawings that they did. With this lesson, there are a lot of changes that I would make. The biggest change that I would make is that I need to define to the students what the atmosphere is, and why it is so important to the earth. Since it is part of the standard, there should have been more of a focus on it during the lesson. However, I did not bring it up during the lesson, which made the lesson not as informative. Another aspect of the lesson I would change is that I would give the students more time to explore on the topic of cows burping, as the students found it very intriguing. I think that if they had some more time to learn about it and understand what they look and sound like, it would make the lesson a lot more interesting for them. Additionally, I also felt like the lesson felt too much like a lecture. While there are times where direct instruction is necessary, I felt like there was way too much direct instruction within this lesson. As I said in the beginning, this was not one of my best lessons. I feel like I could have done a lot better with this lesson, but I was not able to make it successful. Due to this lesson, it caused me to see some flaws in my teaching and it helped me to fix what needed to be fixed in order to be a better teacher.

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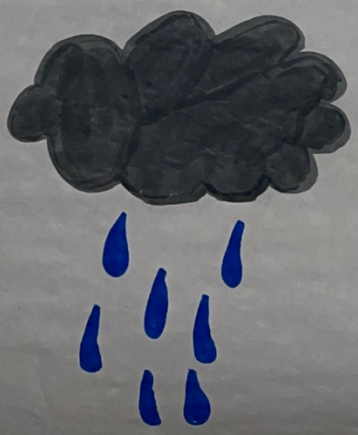
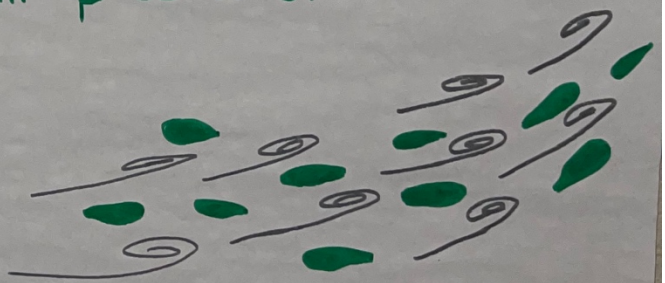
What is climate?
What is weather?

Climate	Weather
- The weather of a specific region over a long period of time. - What you expect - Includes the averages of rain fall, sunshine, or even wind.	- The current or short term conditions - What you get - This includes all of the daily weather conditions which can include rain, wind, or even the air pressure.





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What is methane? (CH_4)

- Methane is a gas that is used to produce heat and electricity around the world.
- It can damage the atmosphere
- Produced by cows through their burps
- Produced by humans when pipelines leak, as well as through the extraction of natural resources.