

5E Lesson Plan

Teacher: Dave Nowak
Date: April 25/26, 2016 (Block day)
Subject / grade level: Science / 7th grade
Materials: Student: Weather and Climate textbook, science spiral, writing utensil Teacher: Computer, projector, SmartBoard, presenter mouse, students should have: a copy of the air masses and fronts worksheet on their table, whiteboard, dry erase marker
Essential Standards and Clarifying Objectives Earth Systems (Weather & Climate) #7: Identify weather conditions associated with cold fronts and warm fronts. 5.2.F.c
Lesson objective(s): The student demonstrates an understanding of: Identify weather conditions associated with cold fronts and warm fronts by.... <ul style="list-style-type: none">● Identifying the characteristics of air masses; continental versus maritime and tropical versus polar.● Identifying the characteristics of a specific location before, during and after a cold front passes; precipitation, temperature, humidity.● Identifying the characteristics of a specific location before, during and after a warm front passes; precipitation, temperature, humidity.
Differentiation strategies to meet diverse learner needs: The lesson will encompass basic and proficient level formative questions throughout. The responses by the students will help guide the level of re-teaching that will occur. Students will end each class completing their three journal questions: What do I know..., What do I need to practice..., I suggest the following 4 steps for me to take in order to learn the content.... Students who feel they have mastered the proficient side of: Identifying weather conditions associated with cold fronts and warm fronts, may ask to show their understanding on the district benchmark quiz at any point. Students who score proficient are encouraged to continue to pursue their understanding of the concept at an advanced level by: becoming a peer tutor and helping a student reach proficiency or demonstrating an understanding of an area of their interest that incorporates the original learning target by recognizing how it connects to previous learning targets. Students are allowed to present their advanced understanding in the format of their choice, not limited to: oral class presentation, PowerPoint, research paper, scientific lab results, or video.
ENGAGEMENT <ul style="list-style-type: none">● Describe how the teacher will capture students' interest.● What kind of questions should the students ask themselves after the engagement?

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Students will begin class by following the class entry routine. This allows me to interact with each student 1 on 1 prior to the student entering the classroom. I use this as an opportunity to ask review questions and to triage with each individual student. During the 1 on 1 encounter students will answer an air mass question to determine their understanding from the previous day's lesson. Maritime - forms from water/humid, Continental - forms on land/dry, Tropical - forms in the south/warm, Polar - forms in the north/cold.

Students then follow steps 2-6 of the routine. Students copy down the daily agenda and prepare their desk for the first activity.

Students will prepare for \$25,000 Pyramid by partnering with a student, one chair will face the SmartBoard, and one chair will face away. Students should have their notes with the vocabulary terms, however, student are encouraged to only use their notes if necessary. \$25,000 Pyramid will help students practice basic vocabulary terms by asking the student who's facing the board to use the vocabulary term in a sentence or by defining the word to get their partner to say the term. This is a basic level review that encourages communication and helps the student identify which terms need to be reviewed. Each partner has 90 seconds to get through all 10 vocabulary terms. At the end of the 90 seconds the students switch seats.

After the 2nd rotation each student will return to their seats and journal in their science spiral about their successes and areas of needed practice. What do I know..., What do I need to practice...

EXPLANATION

- Student explanations should precede introduction of terms or explanations by the teacher. What questions or techniques will the teacher use to help students connect their exploration to the concept under examination?
- List higher order thinking questions which teachers will use to solicit *student* explanations and help them to justify their explanations.

Students will get out the air masses and fronts worksheet that is on their table. (Each worksheet should have a page protector already on it) Students should complete the top section by naming each of the air masses. Students will have 3 minutes to complete. Prior to going over the answers we will review the vocabulary terms of air masses: Maritime, Continental, Polar, and Tropical. I will use the random name generator to identify 8 students. These students will define 1 of the 4 words or describe the weather condition associated with them. These 8 students will be used to verbally review their vocabulary term they have if a student struggles with the correct answer to the air masses. Now that we have our student helpers I will use the random name generator to call on students to answer the name and weather conditions associated with each air mass.

Students will then have 3 minutes to fill in the bottom section of the worksheet. Students will draw in a warm front, cold front and dry line for the 3 air masses that affect Independence. After the 3 minutes students will compare their answers within their neighborhood (tables). I will walk around between neighborhoods and listen to the students' discussions and step in only if needed.

Students will journal in their science spiral about their successes and areas of needed practice. What do I know..., What do I need to practice...

EXPLORATION

- Describe what hands-on/minds-on activities students will be doing.
- List "big idea" conceptual questions the teacher will use to encourage and/or focus students' exploration

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Students will write on the first available left hand page of their spiral the following questions:

- What are the characteristics of a location before, during and after a cold front passes? Include precipitation, temperature, and humidity.
- What are the characteristics of a location before, during and after a warm front passes? Include precipitation, temperature, and humidity.

Students will use their maps that they have created to answer the questions on their own. I will walk between neighborhoods and view student responses. I will help students who are struggling by reviewing the concepts of air masses, prevailing westerlies and low air pressure. If at any time I notice numerous errors, misconceptions, or difficulties I will use the “catch and release” method by pausing the class, reviewing as a whole the missing skills and then release the students back to finishing the questions.

Students will journal in their science spiral about their successes and areas of needed practice. What do I know..., What do I need to practice...

ELABORATION

- Describe how students will develop a more sophisticated understanding of the concept.
- What vocabulary will be introduced and how will it connect to students' observations?
- How is this knowledge applied in our daily lives?

With severe weather risks today being enhanced the National Weather Service's Storm Prediction Center tweeted out it would be holding a TweetChat this afternoon from 1-2pm to answer questions about today's severe weather potential. They will use #askSPC for the chat. With this unique opportunity to ask meteorologists direct questions about severe weather, I will use this as a chance to allow students to ask questions about severe weather in class. My goal is to answer as many student questions as I can and allow students to voice any misconceptions about severe weather. I also want all classes to participate even though hours 5 and 7 are the only classes that will actually be in session during the TweetChat. Any question I am unsure of we will tweet out the question to #askSPC Students can also see just our questions by checking out our class hashtag #nowakscience which we will also include with every question. Students are also encouraged to view them tonight and see which questions were answered. If a question is not answered or they think of a new question they are encouraged to try again or tweet out a local meteorologist.

We will then work toward making inferences about where the cold front and warm front are in relation to Independence based on the Storm Prediction Center's forecast for today. Students can use the bottom of the worksheet to draw in their inference. Students will then collaborate within their neighborhoods to provide their reasoning.

Students will then compare their own/groups inferences to the actual weather map. The class will use the interactive map from Weather Underground.

EVALUATION

- How will students demonstrate that they have achieved the lesson objective?
- This should be embedded throughout the lesson as well as at the end of the lesson

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Students will make predictions for the weather conditions: before, during and after a front passes by using their knowledge of air masses. Students should be able to create their own inferences to make predictions about our own weather for this week based on these concepts.

I will restate the learning target, which we covered in class today:

Weather and Climate #7: The student demonstrates an understanding of: Identify weather conditions associated with cold fronts and warm fronts by....

- Identifying the characteristics of air masses; continental versus maritime and tropical versus polar.
- Identifying the characteristics of a specific location before, during and after a cold front passes; precipitation, temperature, humidity.
- Identifying the characteristics of a specific location before, during and after a warm front passes; precipitation, temperature, humidity.

Students will end class by revisiting their science journals and completing all 3 questions: What do I know..., What do I need to practice..., I suggest the following 4 steps for me to take in order to learn the content.... Students should follow their own suggestions as their homework assignment tonight.

Students can access the online textbook, class notes and class practice PowerPoint from the class website.

Class website: <http://sites.isdschools.org/dnowak>

Learning Target rubric:

<http://sites.isdschools.org/dnowak/useruploads/course-information/EarthSystems7ProficiencyRubric.docx.pdf>

Learning Target notes:

<http://sites.isdschools.org/dnowak/useruploads/course-information/W&C%207%20Notes.pdf>

Learning Target practice:

<http://sites.isdschools.org/dnowak/useruploads/course-information/WC7%20Practice.pdf>

Class Routines: <http://sites.isdschools.org/dnowak/useruploads/index/Class%20Routines%202014%202015.pdf>

Twitter account: <https://twitter.com/dnowak77>

Class hashtag on Twitter: #nowakscience

<https://twitter.com/hashtag/nowakscience>

National Weather Service Storm Prediction Center: <http://www.spc.noaa.gov/>

Weather Underground interactive weather map: <https://www.wunderground.com/wundermap>

Student worksheet on tables: To review air masses, cold fronts, warm fronts, stationary fronts, (dry line) and make predictions for the weather conditions: before, during and after a front passes. Students will also use this to make predictions on our weather based on these concepts.

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North American Air Masses

