bGrade 4	**Lesson: Water Cycle 1 Evaporation**	Reference to English Interconnections Lesson Cycles: Patterns of the Earth pg. 13
Science Standard(s): Standard 1 objective 1		
Content Objective(s):		**Language Objective(s):**
Students will be able to identify the process of evaporation and demonstrate locations where it is likely to occur by participating in an activity with a small group. ***I can show the process of evaporation and select places where evaporation is likely to take place by doing an activity with a small group.***		Students will be able to state what evaporation is and where it is most likely to occur quickly and slowly by using sentence frames in an activity with a partner and with a small group. ***I can tell what evaporation is and tell where is happens quickly and slowly by using sentence frames in an activity with a partner and a small group.***
Essential Questions: How does water change as it collects on Earth?		**Required Academic Vocabulary for Word Wall:** **Listen: energy source** Zuhören: die Energiequelle **Speak:** energy source, sun, evaporation, water vapor, change, liquid, gas Sprechen: die Energiequelle, die Sonne, die Verdunstung, der Wasserdampf, die Veränderung/verändern, die Flüssigkeit/flüssig, das Gas **Read:**

	Write: evaporation, quickly, slowly, energy source, sun, water vapor, liquid, gas Schreiben: die Verdunstung, schnell, langsam, die Energiequelle, die Sonne, der Wasserdampf, die Flüssigkeit/flüssig, das Gas **Sentence Frames:** What is evaporation? Evaporation is _____. What is the process of evaporation? The process of evaporation is _____. The water will evaporate fastest in the _____ because _____. I agree or disagree because _____. (from previous lesson) We predict that the paper towel in/on the _____(location) will be ____ (dry/wet) because _____. **Satzbau:** Was ist Verdunstung? Verdunstung ist____. Was passiert beim Verdunsten? Der Prozess der Verdunstung ist___. Das Wasser verdunst am schnellsten in ____, weil____.

	Ich stimme zu oder ich stimme nicht zu, weil___. (from previous lesson) Wir nehmen an, dass die Küchenrolle in/auf____ (trocken/nass) sein wird, weil____.
Materials: ● Science Journals ● Butcher paper—about 4 or 5 feet long ● Paintbrush ● Water ● Picture Vocabulary Card for Evaporation and the Sun (as an Energy Source) (see attached sheet) ● Paper towels Teacher Demonstration Sets ● 2 Paper Cups—draw a line half-way up the side and fill to that line with water. Use it to fill the plates and Ziploc bags when the same amount of water as well. ● 2 Paper plate—1/2 the paper cup of water on each	**Additional Lesson Vocabulary:** atmosphere **die Atmosphäre**

• 2 Ziploc bags—1/2 the paper cup of water in each	

Lesson:	**Instructional Time: 40 Min.**

Opening: (5 minutes)

(This portion of the lesson can be done in two ways. You can either take the kids outside to use the blacktop for the evaporation writing, or you can just put a large piece of butcher paper on the whiteboard. Both work great. Just ensure that all of the students can see what you are writing.)

T: Use a wet paintbrush to write the word EVAPORATION in very large letters across the paper/ground. (Do not soak the paper, but make sure that the students can tell that you are writing a word.) Have the students observe that the word is disappearing as your write it. **"When I say 'Go' turn to your partners and tell them why does the word disappear? Go!"**

S: Various Answers. They may say that the word is evaporating. They may say it is disappearing because it is warm.

- Have a student or two share out with the class.

T: "When I say 'Go' turn to your partners and tell them where is the water going? Go!"

S: Into the Air.

- Have a student or two share out with the class.

T: "The water is evaporating off the paper and into the air." Hold up your vocabulary card for Evaporation. **"EVAPORATION is the process of liquid water changing to water vapor."**

- When you say this definition, do a hand signal to represent liquid water and water vapor. You can begin by making an ocean wave motion for liquid water and then wiggling the fingers on the same

hand as you move them upward to represent vapor moving into the air. Do this action each time you say the word EVAPORATION.

T: "Repeat with me the word EVAPORATION."

S: Evaporation

T: "Now move your hands and repeat the definition with me. Evaporation is when…

S: Together with the students, move your hands again slowly and say '*liquid water changes to a water vapor'* with the students.

T: "We are going to play a quick evaporation game." I am going to write EVAPORATION (do the hand action) **on the paper again, and we will see how many seconds it takes for it to disappear. Everyone make a guess right now in their heads. Now turn to your partners and tell them your guess of how many seconds it will take for it to disappear. Go!"**

Students turn to partners and whisper how many seconds it will take for the word to disappear.

T: "Now watch and we'll start counting as soon as I start writing the word and we'll stop counting when the last letter disappears."

- Write the word on the paper again and count out loud with students to keep their counting pace regular and consistent.

T: "Who had a guess that was close, raise your hand? Who had a guess that was far off, raise your hand? It disappeared quickly, didn't it?" **(**Take the students inside if you did the activity outside.)

T: "Let's look at how this activity helps us with our learning objective today." Point and refer to the objective on the board I will describe the how the sun causes water to evaporate, or change from a liquid to a vapor on my own and with a small group. **"In your partnership, I want one of you to be partner 1 and one of you to be partner 2. Take 5 seconds to decide."**

Students turn to their neighbors and decide who is partner 1 and who is partner 2.

T: "Partner 1, when I say "go" you will read the objective on the board. When Partner 1 finishes, Partner 2 will tell Partner 1 one

thing we will learn and be able to do today. Go." Give the class 1-2 minutes.
S1reads the objective.
S2states one thing the class will learn and be able to do today.

- Call on one student in the class to read the objective and another student to tell the class one thing we will learn and be able to do today.

Introduction to New Material (Direct Instruction): (5 minutes)
T: During our last science lesson, you watched water in a pot start to boil. Turn to your partners and tell them what made the water boil? Go!"
S: The burner/hot pot/ we made it hot.
Students talk with their partners.

- Have a student or two share out with the class.

T: "The burner or hot pot was our energy source." Stress the word energy source. "**We need energy to make something warm up. Can anyone remember what they saw yesterday? You can look at what you wrote in your science journal if you need to."**
S: Have someone read or tell what they wrote or saw in the previous lesson.
T: "Class, remember when the water boiled, you saw the vapor coming from the pot. What was happening to the water? Turn to your partners and tell them what was happening to the water? Go!"
S: It was evaporating.
Students talk with their partners.

- Have a student or two share out with the class.

T: "During our evaporation activity, we didn't have a gigantic burner or a hot pot. Turn to your partners and tell them what was making the liquid water turn into a vapor?" (Do the hand motion.)

S: It was warm in here/outside. Some students might mention the heater or the sun.

Students talk with their partners.

- Have a student or two share out with the class.

T: The Energy Source that makes the water on earth evaporate (Do the hand motion) **is the sun.** Hold up a picture of the sun labeled as Energy Source. **"Turn to your partners and tell them what made the water outside evaporate** (Do the hand motion) **class?"**

S: The Sun.

Students talk with their partners.

- Have the whole class answer the question together.

T: "Raise your hand if you have ever been swimming."

S: Students raise their hands

T: "When you first get out of the pool and lie down on the grass, you are wet. If you stay there long enough, you will eventually be dry. Turn to your partners and tell them what is causing the water on your body to evaporate (Do the hand motion)**?**

S: The sun is heating the water and evaporating it.

Students talk with their partners.

- Have a student or two share out with the class.

T: "Perfect, so let's summarize the important things we talked about. Let's look at our definition of evaporation: Evaporation is liquid water changing into a water vapor." Write definition on the board or post a pre-written definition. **"Let's describe the process of evaporation. 1. A liquid is heated by an energy source such as the sun. 2. The liquid leaves the Earth's surface and goes into the air (or atmosphere) in the form of vapor."** Write the process on the board or post a pre-written poster of the process.

Guided Practice: (11 minutes)

- Post your sentence frames on the board.

Use the modeling cycle:

Teacher Does:

T: "When I say 'Go!' Partner 1 will ask, 'What is evaporation?' Partner 2 will answer in his/her own words, but may use the definition on the board to help him/her answer the question. Next Partner 2 will ask, 'What is the process of evaporation?' and Partner 1 will describe the two-part process in his/her own words, but may use the process on the board to help him/her answer the question. I am Partner 1 and this is my imaginary Partner 2 (you could also use a puppet, stuffed animal or other object to represent partner 2). Then they will switch. Partner 2 will ask for the definition and Partner 1 will ask about the process."

- Refer to the sentence frames throughout the modeling cycle.

T(1): "What is evaporation?
T(2): "Evaporation is when a liquid turns to a gas."
T(2): "What is the process of evaporation?"
T(1): "The process of evaporation is when first a heat source heats up the liquid and second when the liquid leaves the surface of the Earth and turns into a vapor in the atmosphere."
T(2): "What is evaporation?"
T(1): "Evaporation is when a liquid like water goes into the air and turns to a gas."
T(1): "What is the process of evaporation?"
T(2): "The process of evaporation is when first a heat source like the sun makes a liquid hot enough it can secondly leave the Earth's surface and enter the atmosphere as vapor."

Teacher Does with a Student:

- Refer to the sentence frames throughout the modeling cycle.

T: "What is evaporation?

S: "Evaporation is when liquid water turns to water vapor."

S: "What is the process of evaporation?"

T: "The process of evaporation is when first a heat source heats up the liquid and second when the liquid leaves the surface of the Earth and turns into a vapor in the atmosphere."

S: "What is evaporation?"

T: "Evaporation is when a liquid like water goes into the air and turns to a gas."

T: "What is the process of evaporation?"

S: "The process of evaporation is when first a heat source like the sun makes a liquid hot enough it can secondly leave the Earth's surface and enter the atmosphere as vapor."

<u>Two Students Do:</u>

S1: "What is evaporation?

S2: "Evaporation is when liquid water turns to water vapor."

S2: "What is the process of evaporation?"

S1 "The process of evaporation is when first a heat source heats up the liquid and second when the liquid leaves the surface of the Earth and turns into vapor in the atmosphere."

S2: "What is evaporation?"

S1: "Evaporation is when a liquid like water goes into the air and turns to a gas."

S1: "What is the process of evaporation?"

S2: "The process of evaporation is when first a heat source like the sun makes a liquid hot enough it can secondly leave the Earth's surface and enter the atmosphere as vapor."

All Students Practice:

- Walk around the room observing and helping where needed. Ensure students are staying in the target language.

T: "Let's experiment with evaporation." (Do the hand motion.)
T: Water evaporates in places where it is warmer faster than places that are cold. We are going to put these sets of items in two places in the classroom.

- Show them the paper cups, paper plates, and the Ziplock bags. (one of each item in a set)

T: We want to put one set in a place where the water will evaporate quickly, and one where the water will evaporate slowly. "First, we will predict with our partners where the best places to put them are."

Use the modeling cycle:

Teacher Does:

T: "So, if I'm partner one, I'm going to think in my head, 'hmm…the heater is by my desk, and it is warm there so water should evaporate quickly.' When the teacher says 'Go!' I will say to my partner, "The water will evaporate fastest on _____ (my desk) because _____ (it is by the heater vent).'"

- Point to the sentence frame. Then, point to your imaginary partner

T: "My partner will say, 'I agree or disagree because _____.
T: "Then, my partner will tell me where he thinks the water will evaporate slowly and I will say if I agree or disagree.

Teacher Does with Student:

- Call up a student to help you model.

T: "Where do you think the water will evaporate the fastest?"

S: The water will evaporate fastest by the window because the sun is there.

T: "I agree because the sun heats the water. The water will evaporate slowly under the book shelf because it is dark. Do you agree?"

S: I agree because there is no sunlight.

T: "Now, let's have two of you show us how to do it." Call on two students to model the same process for the group. Help them refer to the sentence frames as they do it.

Two Students Do

S1: *The water will evaporate fastest by the windows because there is sunlight.*

S2: I agree because the sun is there. The water will evaporate slowest under the sink because there is not sunlight.

S1: I agree because there it is dark there.

T: "Now you will do it with a partner on your table. After 2 minutes, I will ask a couple of partners to share their predictions using the sentence frame. We will then decide, as a class, which places are most likely to evaporate quickly and slowly and we will place the items there and see if our predictions were correct. Any questions before we begin?" Wait 5 seconds. **"Go!"**

All Students Practice:

- Monitor the students as they make their predictions with their partners. Ensure students are staying in the target language and following the sentence frames.

T: Get the students' attention. **"I heard some great conversations and predictions. Let's have a couple of you share your predictions about evaporation (do the hand motion) and then we will decide where to put our experiment items."** Call on two or three partnerships and follow this procedure. **"Where did you decide evaporation** (make the hand motion) **would happen the fastest?"**
S: The will evaporate fastest by ____ (the windows).
T: "Great thinking! Where did you decide evaporation (make the hand motion) **would happen the slowest?"**
S: The will evaporate slowest by _____ (the sink).
T: "Great!"

- After you call on two or three partnerships, decide with the class where the best places to put the items would be. Suggest places that you heard the most frequently as they were discussing them with their partners. In each of the two spots, put 1 cup, 1 plate, and 1 Ziploc bag.

T: " We will keep these sets in these spots for a while and then check on them to see what is happening."

- AT THE END OF THE DAY, AND AGAIN THE NEXT DAY, TAKE 5 MINUTES TO CHECK YOUR SPOTS. BRIEFLY DISCUSS THE RESULTS. MAKE SURE YOU EVENTUALLY DISCUSS WHY THE WATER DOESN'T EVAPORATE FROM THE BAG.

Guided Exploration Part 1: (7 minutes)
Arrange students into groups.
T: "Now we are going to try an experiment with our groups. Remember that the sun is the energy source that turns the earth's water from a liquid to a vapor. When water is heated, it evaporates. It doesn't have to be boiling, just warmed. With your tables, you are going to decide on the best places outside to place 2 wet paper towels. You want 1 paper towel to dry quickly, and

one paper towel to stay as wet as possible. Let's make a list of several locations on the playground."

- Call on several students to generate a list and write it on the board.

S: grass, sidewalk, asphalt, under or on the playground slide, wood chips, sunny area, shaded area, etc.

T: "When I say 'Go' your group will decide where they want to put your wet paper towel outside so that it dries quickly. Everybody think… now talk to your group and make a decision, GO!"

- Give students 1 minute to talk in their groups.

T: "Great, now when I say 'Go' your group will decide where they want to put your other paper towel outside so that it stays as wet as possible. Everybody think… now talk in your group and make a decision, GO!"

- Give students 1 minute to talk in their groups.

T: "Great! Now that your group decided on the two places, you will use this new sentence frame" (refer to the sentence frame about the paper towels) **"to write your prediction in your science journals. Try to keep the location of your towel a secret from the other groups."**

Use the modeling cycle:

Teacher Does:

T: "With my group, I might decide that I want to put 1 paper towel below the slide to keep the water from evaporating in the sun, and 1 paper towel on top of the slide so that the water will evaporate quickly. In my journal, my group and I would each write, 'We predict that the paper towel in/on the _____(location) will be ____ (dry/wet) because _____.' *Write 2 predictions on the board.*

Teacher Does with student:

- Select a student to model with you.

T: "Where would you place a wet paper towel that you wanted to stay wet?" Point to the list of locations on the board.

S: In the shade.

T: "That sounds good. Where would you place a wet paper towel that you wanted to dry quickly?" Point to the list of locations on the board.

S: On the blacktop

T: "I like that idea. Let's write our prediction on the board for the others to see."

- Help that student write the two prediction sentences on the board.

"Thank you for your help. Now class, we will work with our groups for 3 minutes to write our predictions in our science journals. Any questions about these directions?" Wait 5 seconds or answer any questions. **"Go!"**

All Students Practice:

- Walk around the room observing and helping where needed. Ensure students are staying in the target language. As they are working, you need to give each table 2 paper towels. Make sure that they are all equally wet.

T: Get the students attention**. "For the next part of our experiment, you will need your science journals, a pencil, and your two paper towels. We are going to go outside and you are going to do two things. First, your group will quickly place your paper towels in your two locations on the playground. Then, we are all going to gather together at _____** (Pick a central location on your playground where your students can write comfortably for 5-10 minutes.) **to do a quick write in your journals. What do you need to take outside?"**

S: science journals, a pencil, and your two paper towels
T: "What will we do first?"
S: Quickly place our paper towels in our two locations on the playground.
T: "Then where will we meet?"
S:On the _____.
T: "Great! Let's quietly go outside at do our experiment."

- Take the students outside and then allow them to place their paper towels. Encourage them to go and gather back by you as quickly as possible. As you wait for the towels to dry, you will do the <u>independent practice</u> portion of the lesson.

Independent Practice: (6 minutes)
T: "To see if we met our objective, we're going to do some quick writes in our journal. We can't see the objective right now, but do you remember what it was?"
S: I will describe how the sun causes Earth's water to evaporate, or change from a liquid to a vapor with a small group and on my own.
T: "Great Memory! Now, open your journals and find the next blank page." Wait 5 seconds for the students to be ready to write.
"**First, I will give you 1 minute to write a definition of evaporation. This needs to be silent and on your own. You need to write 1 sentence. You have one minute. Go!"**
Students write in their journals.

- As the students write, walk around and make sure they are all on task. After one minute, get their attention again.

T: "Now, Please write the two steps in the process of evaporation. I will give you 3 minutes. Ready? Go!"
Students write in their journals.

- As the students write, walk around and make sure they are all on task. After three minute, get their attention again.

T: "For the last one, I will give you two minutes to write 2 sentences telling me where water will evaporate quickly and where it will evaporate slowly. Ready? Go!"

S: Write in their journals. As they write, walk around and make sure they are all on task. After two minutes, get their attention again. Check for understanding. Take note of any students who may be having problems.

Guided Exploration Part 2: (4 minutes)

T: "Now, quickly send one person from your group to get your paper towels and come back here quickly."

S: They will select someone and return back Have them stand by you so that you can compare the towels.

T: "Let's look and see which towel is the driest." Identify the driest paper towel. **"Where did your group put this?"**

S: Tells the class where it was. Discuss their location and why it may have dried so quickly. For example, if they put it on the blacktop, you can talk about how dark colors absorb more light and get warmer.

T: "Class, turn to your partners and tell them why do you think this paper towel dried so well?"

S: It was the warmest place.

- Have a student or two share out with the class.

T: "Which paper towel is the wettest?" Identify the wettest one**. "Where did your group put this?"**

S: Tells the class where it was.

T: "Class, turn to your partners and tell them why do you think this paper towel stayed so wet?"

S: It was the shadiest place. Discuss the location and why it was a good place to keep the towel wet.

- Have a student or two share out with the class.

T: "The paper towel that was the wettest had the least amount of sunlight. The paper towel that was the driest had the most sunlight. The sun is the energy source that evaporates the Earth's water. Evaporation happens when water is heated by the sun and changes from a liquid to a vapor. Do the hand motion. **"Turn to your neighbor and tell them what evaporation is."**

S: When water is heated by the sun and changes from a liquid to a vapor.

T: "You all did a great job with your experiments today. Let's go back inside!"

Closing: (2 minutes)

T: "When I say 'Go' Partner 1 turn to Partner 2 and use the sentence frame to define Evaporation. Go!" Point to sentence frames.

All Partner 1's turn to their Partner 2's and define evaporation.

- Have a student or two share out with the class.

T: "When I say 'Go' Partner 2 turn to Partner 1 and use the sentence frames to explain the two parts of the process of evaporation. Go!" Point to sentence frames.

All Partner 2's turn to Partner 1's and define evaporation.

- Have a student or two share out with the class.

T: "Let's see if we met our objective. Partner 2, when I say "go" you will read the objective on the board. Go!"

All Partner 2's read the objective on the board.

T: "Now, Partner 1 will tell Partner 2 one thing we learned today. Go."

- Give Partner 1 one minute.

All Partner 1's tell Partner 2's one thing they learned today.

- Call on one student in the class to read the objective and another student to tell the class one thing we will learn and be able to do today.

T: "When I say 'Go' I want you all to give me either a thumbs up, thumbs down or thumbs in the middle to show me how well you think you met the objective today and learned about evaporation. If you know a lot about evaporation and feel you could teach it to someone else, give me a thumbs up. If you know some things about evaporation and feel you could tell me some things give me a thumbs in the middle. If you didn't learn a lot about evaporation and feel you need more help and practice, give me a thumbs down. Ready, Go!"

- Assess the class and their self-assessment and analysis of the understanding of the content.

T: "Great. We'll continue to practice and learn more about evaporation throughout the year. I want you to look around next time it rains and notice puddles of water and how long it takes them to evaporate into the atmosphere."

Assessment:

Informal assessment as you watch group and partner discussions.
Science Journal Quick Writes

Extra Ideas:

- Use an aluminum foil base, a pipette, and a cup of water to create several different sizes of puddles. Put them in different places in the classroom where they won't be disturbed. Measure how many drops

make each puddle. Predict which will evaporate first and tell why. Measure and record your results.

- Evaporation Art: Use food coloring in water to create colored ice cubes. Crush the cubes into smaller pieces Students put them on art paper and observe as they go through the different phases of water. When the paper is dry again (after a day or so) they can add details with crayons or colored pencils.

der Verdustung

die Sonne

(Energiequelle)