Introduction

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Dr. Lorrie Stoops Verplaetse
FLA 518
July, 2015
Water Cycle Unit Intro

1. **The Water Cycle Unit**
2. **Grade 3 Science**
3. **Content Based ESL Class**
4. **Source of Written materials:**

Cole, J., & Degen, B. (1986). The magic school bus at the waterworks. New York, NY: Scholastic

Friedl, S. (n.d.). The Distribution of Water on Earth - Video & Lesson Transcript. Retrieved July, 2015, from http://study.com/academy/lesson/the-distribution-of-water-on-earth.html#lesson

Naik, A. (2010, April 16). The Water Cycle Diagram. Retrieved June, 2015, from http://www.buzzle.com/articles/water-cycle-diagram.html

McDaniel, Melissa, (n.d.). National Geographic: Conservation: Water. Retrieved July, 2015, from http://education.nationalgeographic.com/encyclopedia/conservation/

The Water Cycle Animation Video for Kids. (2013, July 13). Retrieved June, 2015, from https://www.youtube.com/watch?v=Z0ymnkj8N-U.

Vogt, M., & Echevarria, J. (2008). 99 Ideas and Activities for Teaching English Learners with the SIOP Model. Boston, MA: Pearson Allyn and Bacon.

Water Cycle Word/Vocabulary Wall. Retrieved June, 2015, from https://www.teacherspayteachers.com/Product/Water-Cycle-Word-Vocabulary-Wall-1637806

5. **Source of Lesson:**

Wilder, A. et al. Water Cycle and Weather Unit. Retrieved June, 2015, from http://learning-in-action.williams.edu/opportunities/elementary-outreach/science-lessons/3rd-grade-weather-unit/.

6. **Overarching Unit Learning Goals**

I want my students to know…

- The different locations and forms of water on our earth
- And describe the water cycle stages
- The importance of the water cycle and water conservation

Lesson 1

Lesson 1 Objectives and Performance Indicators

Content Objectives:	**Language Objectives:**
1) Predict how the water cycle works 2) Record observation to generate and describe conclusions about how water moves through the water cycle 3) Identify each water cycle form (solid, gas, liquid) within the water cycle phases	1) Before observations, will orally discuss in pairs, and then write at least 1 sentence stating their predictions 2) Following observations, will orally discuss in pairs, and then write at least 1 sentence about their observations and conclusions 3) After paired discussion, use their conclusions to independently write about the different forms of water within the water cycle.

Task	**5 Nearly fluent**	**4 Intermediate**	**3 Speech emergent**	**2 Early production**	**1 Preproduction**
Reading & Writing: predictions and verifications	Write predictions and conclusions about how water form will change in the different water phases by writing complete sentences independently	Write predictions and conclusions about how water form will change in the different water phases by using open ended sentence starters independently	Write predictions and conclusions about how water form will change in the different water phases by using word banks with pictures to complete cloze sentences while in pairs with paraprofessional monitoring	Write predictions and conclusions about how water form will change in the different water phases by choosing the correct multiple choice word option to complete cloze sentences while in pairs with paraprofessional monitoring	Write predictions and conclusions about how water form will change in the different water phases by circling the correct picture and sentence combination while in small group and with teacher support.
Speaking & listening: Predict and verify	Will orally share and listen to peer predictions before and after observation while paired with level 4 students	Will orally share and listen to peer predictions before and after observation while paired with level 5 students	Will orally share and listen to peer predictions before and after observation while paired with level 2 students, and paraprofessional monitoring	Will orally share and listen to peer predictions before and after observation while paired with level 3 students, and paraprofessional monitoring	Will orally share and listen to peer predictions before and after observation by repeating, while in pairs, and with teacher support
Reading & Writing: to identify:	Write to identify the different water forms within different water cycle stages by writing a paragraph	Write to identify the different water forms within different water cycle stages by completing open ended sentences starters	Write to identify the different water forms within different water cycle stages by using word banks with pictures to complete cloze sentences describing each phase	Write to identify the different water forms within different water cycle stages by choosing the correct picture and sentence to show each phase	Write to identify the different water forms within different water cycle stages by circling the correct picture and sentence combination for each phase.

Functional Language Charts

Level 4, **(5/mainstream no sentences)** *Underlined text= blanks for students					
Function	Situation	Mohan's Knowledge Framework	Expressions	Words	Grammar
Predict	What will happen to the water?	Knowledge structure: principles/choice	(1)I think the water is going to evaporate from a liquid to a gas when it boils.* (2)I think the steam is going to condense from a gas to a liquid when it cools.	(1)Evaporate Liquid Gas boils (2)Condense gas Liquid Cools	Present progressive When clause Nouns
Generate/ Describe	What did I notice? What happened to the water?	Knowledge structure: description	(3) I noticed the water was a liquid, but when the water boiled it changed into a gas. This is the process of evaporation. (4) I noticed the steam was a gas, but when the ice cooled, it changed into a liquid. This is the process of condensation.	(3)Liquid Gas Evaporation (4)gas liquid Condensation	Past tense Connecting words When clause
Identify	What are the different forms of water in each phase?	Knowledge structure: description	(5) Water can travel as a liquid, a solid, or a gas during the water cycle process. In the evaporation phase, the water changes from a liquid to a gas. In the condensation phase, water changes from a gas to a liquid. In the precipitation phase, water falls to the earth as a solid or liquid. In the collection phase, the water comes together into a body of water and sits as a solid or liquid.	(5)gas Liquid Solid Evaporation Condensation Precipitation collection	Auxiliary Present tense Definite articles

Level 2-3 *Underlined text= blanks for students					
Function	Situation	Mohan's Knowledge Framework	Expressions	Words	Grammar
Predict	What will happen to the water?	Knowledge structure: principles/choice	(1) I think the water will change into a gas when it boils. (2) I think the steam will change into a liquid when it cools.	(1)Gas evaporation (2) Liquid condensation	Simple tenses Nouns Conditional clause Auxiliary
Generate/ Describe	What did I notice? What happened to the water?	Knowledge structure: description	(3) In the evaporation phase, first the water was a liquid. Then, it changed to a gas when it boiled. (4) In the condensation phase, first the steam was a gas. Then, it changed to a liquid when it cooled.	(3) Gas Liquid evaporation (4) gas Liquid condensation	Past tense Sequencing words When clause
Identify	What are the different forms of water in each phase?	Knowledge structure: description	(5) Water can travel as a liquid, a solid, or a gas during the water cycle process. In the evaporation phase, the water changes from a liquid to a gas. In the condensation phase, the water changes from a gas to a liquid. In the precipitation phase, the water falls to the earth as a solid or liquid. In the collection phase, the water comes together into a body of water and sits as a solid or liquid.	(5)gas Liquid Solid Evaporation Condensation Precipitation collection	Auxiliary Present tense Definite articles

Level 1 *Underlined text= blanks for students					
Function	Situation	Mohan's Knowledge Framework	Expressions	Words	Grammar
Predict	What will happen to the water?	Knowledge structure: principles/choice	(1) When water boils, it will change to a gas. (2) When steam cools, it will change to a liquid.	(1) Gas (2) Liquid	Simple tenses Nouns Auxiliary Conditional
Generate/ Describe	What did I notice? What happened to the water?	Knowledge structure: description	(3) First, the water was a liquid. Then, it changed to a gas. This is the evaporation phase. (4) First, the steam was a gas. Then, it changed to a liquid. This is the condensation phase.	(3) Gas Liquid evaporation (4) gas Liquid condensation	Past tense Sequencing words When clause
Identify	What are the different forms of water in each phase?	Knowledge structure: description	(5) The water changes from a liquid to a gas in the evaporation phase. The water changes from a gas to a liquid in the condensation phase. The water falls as a solid or liquid in the precipitation phase. The water sits together as a solid or liquid in the collection phase.	(5) Evaporation, condensation, precipitation, collection	Preset tense Definite articles

Water Cycle
Lesson #1

***Bolded print indicates additions or revisions from original lesson.**

Time Frame: 60 minutes

Resources and Materials: Science notebooks, Plastic aquarium, Potting Soil, Small plastic container, Water ,Plastic toys, Rocks from outside ,Saran wrap, Masking tape, Heat lamp, Bag of ice ,Hot plate, Metal pan, Ice cubes Tongs, Glass beaker, Water cycle diagram student copies, student journals, computers with internet, word wall vocabulary cards, The Water Cycle Diagram text

Vocabulary: Discuss terms before starting activity. ***Introduce by showing visual word wall card pictures (unknown, 2015) (see materials pages 7-8), providing accompanied visual gestures, and have students repeat the vocabulary terms and conduct the gestures simultaneously. Explain each term, pointing out root words, provide examples, and add large printed words to word wall while students write the words into their own word wall books.**

Evaporation: water changes from a liquid to a gas; occurs more rapidly at warmer temperature **(motion arms going upward, with hands moving from closer together to outward, like steam moving)**

Condensation: water changes from a gas to a liquid; occurs when water vapor gets cold **(motion hands (motion hands going downward, with hands moving from outward to inward, like in a cloud shape)**

Precipitation: water falling to the earth in the form of rain, hail, mist, sleet, or snow **(move arms downward, with fingers tapping in the air, like rain falling)**

Collection: water that falls as precipitation comes together in bodies of water such as oceans, rivers, lakes, and streams, or underground (**point downward while moving arm in circles, like an ocean shape)**

Review Vocabulary:

Water as a Gas-vapor in the air, cannot see it, although can see it as it begins to cool as steam, may notice when it is really humid outside

Atmosphere: the gases that surround the earth

Solid water-when water freezes, it the molecules move apart, less dense than fluid water ice, hard, use ice to make our drinks colds

Liquid water-water is wet and fluid, use to wash our hands, drink, etc.

1) Focus Activity: **Ask students to write anything they know and want to know about water in their KWL charts (Vogt & Echevarria, 2008). Students will have various charts based on proficiency levels (see materials pages 9-12). Compile a list on the board of both.** During conversation, have them name things in nature that are made of water. Ask students to volunteer answers in order to compile a class list. The list may include oceans, rivers, streams, ponds, lakes, clouds, underground water, and water used and disposed of by humans.

2) Introduction: **Play video https://www.youtube.com/watch?v=Z0ymnkj8N-U from the start up to until 1:09 only. Ask students if they ever wondered the same question as the boy in the video or about where our water comes from. Tell the students that water moves from location to location. Discuss how the weather is related to water as discussed in previous lessons and units. Guide students to think about some forms of weather precipitation such as rain, snow, hail, etc. Ask students if they remember why yesterday we stayed inside for recess. When it rained, where did this water come from?** Ask the students to think about when the ground becomes wet after it rains and where does that water go? **Be sure to use differentiated questioning strategies for various proficiency levels including yes/no questions, multiple choice questions, open ended questions, and analytical questions (e.g. L5&4: why or how do you think he rain started? L3: it began to rain because? L2: did it rain because the clouds were full of water or because sky was dry? L1: do you think the clouds had too much water in them and burst?).**Explain that water from the clouds drops on the ground and then gets taken in (absorbed) by the ground. This is part of something called the water cycle**, which we will learn more about today. Point to the "L" section of the KWL chart. Tell them this will help us to know and understand where our water comes from and how it gets to these places, which today we will orally discuss with partners, and independently write our conclusions about the water cycle.**

3) **Have students read the informational text "The Water Cycle" (Naik, 2010). Students will have different reading passages based on proficiency levels (see materials pages 13-16). After reading, discuss in whole group the 4 stages of the water cycle, the order, and what is happening to the water in each one, and why this is happening to the water. Discuss the benefits of the water cycle such as it helps clean our water, helps keep us alive, and impacts our weather (Differentiate questioning. L5&4: What do you think could happen if the water cycle stopped? L3: if the water cycle stopped, then? L2: Do you think nothing would change or our drinking water could change if the water cycle stopped? L1: do you think our water would be clean if the water cycle stopped?). To get students thinking about**

future lessons, guide the discussion to touch on the water could change. How do you think the water cycle is cleaning our water? Is it evaporating dirt or just water?

4) In large group, place a plastic aquarium in front of the room. Fill a plastic container with water to show a lake basin and place inside the aquarium. Ask for student volunteers to help you **arrange realia (Vogt & Echevarria, 2008) into the aquarium such as soil, small trees, sticks, leaves, rocks, etc. to make mountains, hills, to surround the lake basin.** Cover the entire container tightly with plastic wrap and tape down the edges.
5) Evaporation and condensation should occur naturally but can be sped up by placing a bag of ice outside of the aquarium at one end and a heat lamp at the other end.
6) **In pairs, ask students to generate and discuss their predictions about what will happen inside of the container. Students should write their thoughts and make a drawing of their predictions in their student journal inserts (Vogt & Echevarria, 2008). Students will have various differentiated journal inserts for various student proficiency levels as some students will be choosing from multiple choice, word banks, and responding to open ended questions (see materials pages 17-20).** It may help to review the idea of water changing from one state of matter to another during evaporation and condensation.
7) While students are waiting for evaporation and condensation to occur in the aquarium, present another model of the water cycle. Boil some water in a glass beaker on a hot plate. **Ask the students to first form predictions about what may happen in their student journals** and to then observe what happens to the water. What makes the water evaporate or boil? **Following observation, have students discuss and write their observations.**
Frame Main idea: When the water boils, it evaporates and becomes steam. Steam is the gaseous form of water, which has more heat energy than liquid water. Gas is less dense than liquid, so it rises.
8) **Ask students to form predictions about the steam going into the pan over boiling water in their student science journals.** Then hold the metal pan with ice cubes above the boiling water and ask students to watch what happens to the bottom of the pan. Why do water droplets collect on the bottom of the pan? Why does the steam turn back into a liquid on the metal plate? **Following observation, have students discuss and write their observations.**
Frame Main idea: Ice is the solid form of water, and it has a low level of heat energy, so it cools down the pan. When steam hits the pan, it cools down and loses heat energy, and it becomes a liquid in the form of water droplets. The process by which steam cools to become water is called condensation.
9) When the water starts to fall off the pan and back down into the beaker, explain that this is called precipitation. Watch for condensation on the top of the container and have students observe precipitation as the water falls to the ground or in a container, explain that this is called collection. Ask the students to think about where the water from the sky is coming from. **Review/share results of this experiment and student predictions. Draw a diagram on the board to help explain.**
10) **Complete the video at https://www.youtube.com/watch?v=Z0ymnkj8N-U, and have students recognize the different phases to help check for understanding. Pace your speech and enunciate key information. Guide them to recognize and match the phases from their experiment.**
11) Have students complete the graphic organizer handout to label where evaporation, condensation, precipitation, and collection occur. **Students should also write to describe how water moves on earth's surface and atmosphere. Students will have differentiated written portions based on proficiency levels (see materials pages 21-25). Be sure to have the word wall cards when completing this, so levels 1 and 2 can easily access these words aside from on their worksheet.**

Closure: Discuss the following questions as a class: **Where is the water coming from? Are we ever adding more water? Are we reusing the water? Why do you think the water cycle is important to us? Is it important so we can play in the water or conserve water? Is it important for our weather?** Does water in the ground end up in the atmosphere again? How? How does water change states in the water cycle? **Again, be sure to ask various proficiency level questions including yes/no, multiple choice, open ended, and analytical (e.g. L5&4: why do you think the water cycle is important for us?, L3: the water cycle is important because?, L2: do you think the water cycle important because we play in the water or because it is related to our weather? L1: do you think the water cycle important for our weather?).**

Assessment: **student journal responses**, predictions, participation in class discussions, **students identify phases, students write about the water cycle process**

Materials

Water Cycle

The continuous movement of water on above and below the surface of the Earth

Condensation

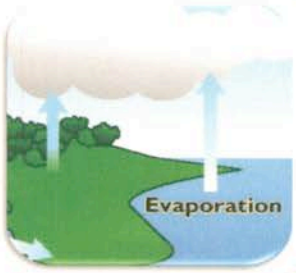
Water vapor in the air gets cold and changes back into liquid, forming clouds.

Precipitation

Precipitation occurs when so much water has condensed that the air cannot hold it anymore. The clouds get heavy and water falls back to the earth in the form of rain, hail, sleet or snow.

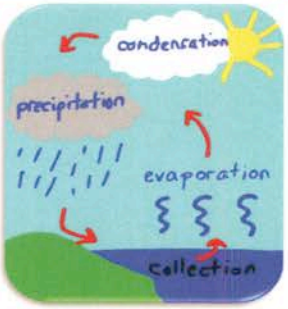
Evaporation

When the sun heats up water in rivers, lakes or the ocean and turns it into vapor or steam. The water vapor or steam leaves the river, lake or ocean and goes into the air.



Collection

When water falls back to earth as precipitation, it may fall back in the oceans, lakes or rivers or it may end up on land.



Level 5

K	W	L
What I **know** about	What I **want** to know about	What I have **learned** about

Level 4

K	W	L
What I **know** about	What I **want** to know about	What I have **learned** about
I use water to _____. I see water in _____. _____.	I want to know _____ _____ _____.	I learned _____ _____ _____.

Level 3

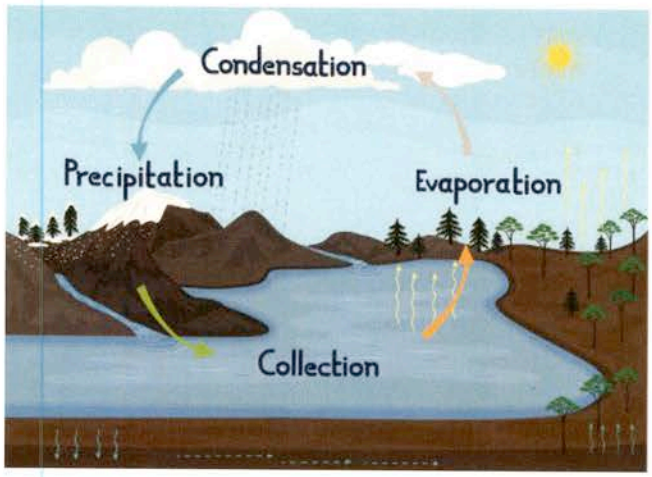
K	W	L
What I **know** about	What I **want** to know about	What I have **learned** about
I see **water** _____. I use **water** to _____. I use **water** to _____.  Drink  wash  Ocean  sleep	I want to know ...(draw picture)	I learner...(draw picture)

Level 1-2

K	W	L
What I **know** about	What I **want** to know about	What I have **learned** about
I use **water** to _____.  drink  sleep I use **water** to _____.  wash  sit I see **water** _____.  In the ocean  on the dry land	I want to know... (draw picture)	I learner...(draw picture)

Level 5

The Water Cycle Diagram



Written by: Abhijit Naik

The water cycle, also referred to as the hydrological cycle, is basically the movement of water on the planet. It involves movement of water ... on the surface of the Earth (surface flow)... above the surface of the Earth (evaporation and precipitation)... beneath the surface of the Earth (ground water flow).

The amount of water on the planet is basically stable, but it is in continuous cyclic movement and hence, is referred to as the water cycle. Water evaporates from various water bodies by becoming water vapor. This water vapor continues to soar in the sky, until it reaches the point wherein it condenses and forms clouds. The clouds then precipitate to send the water back to the surface of the planet and the same process is initiated all over again. This may seem a bit confusing, but a look at the diagram provided below, which highlights each step of the water cycle, will make things pretty clear.

Evaporation is the process wherein any liquid (water) turns to a gaseous state (water vapor) due to an underlying factor acting upon it, and gradually disappears in the atmosphere. This is one of the most important steps of the water cycle. In this case, the underlying factor is the Sun, which heats the water in various water bodies on the planet, like oceans, rivers, lakes, or wells. Even a bucket of water kept outdoors is subjected to evaporation. As the water turns to water vapor, its starts ascending in the atmosphere.

Condensation is the process wherein any matter in the gaseous state (water vapor) turns to a liquid state (droplets of water), as the molecules in it lose heat energy necessary to move around. In case of water cycle, evaporation takes water vapor to a certain height, wherein the molecules in it lose the energy to move around and condense to form a cloud with the help of dust or smoke particles suspending in the atmosphere.

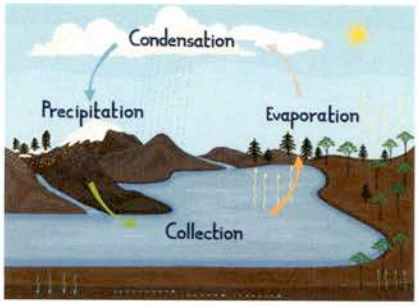
As you can see in the diagram above, the next step of the process is precipitation, wherein the condensed water vapor comes down to the surface of the Earth in various forms. Precipitation occurs when the accumulation of water in the cloud exceeds its actual capacity and the clouds can no longer hold the water. Though there are quite a few forms of precipitation, rainfall and snowfall are the most common forms, and both have a few sub-types of their own.

In this step of water cycle, all the water which comes down in the form of precipitation is collected into different water bodies, from which it eventually evaporates. If the precipitation occurs over any water body, such as the oceans, rivers, or lakes, the water is directly accumulated into it. However, if precipitation occurs over land, the water either runs over the surface, or percolates into the ground. Water flow on the surface is referred to as surface run-off, while the flow beneath the ground is referred to as ground water flow. In either case, the water makes its way to some water body, from where it is eventually evaporated, and the whole cycle begins all over again.

This process, involving the movement of water by evaporation, condensation, precipitation, and collection, has been occurring since millions of years and plays a crucial role in making Earth the only planet with life. Among the several benefits of water cycle, the most important one is natural water filtration, wherein the contaminated water on the planet is converted to fresh water as all the contaminants in it are left behind during the process of evaporation.

Level 4

The Water Cycle Diagram



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Precipitation:

As you can see in the diagram above, the next step of the process is precipitation, wherein the condensed water vapor comes down to the surface of the Earth in various forms. Precipitation occurs when the accumulation of water in the cloud exceeds its actual capacity and the clouds can no longer hold the water. Though there are quite a few forms of precipitation, rainfall and snowfall are the most common forms, and both have a few sub-types of their own.

Collection:

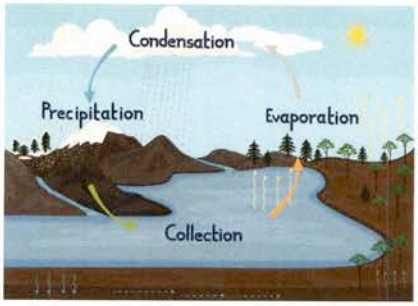
In this step of water cycle, all the water which comes down in the form of precipitation is collected into different water bodies, from which it eventually evaporates. If the precipitation occurs over any water body, such as the oceans, rivers, or lakes, the water is directly accumulated into it. However, if precipitation occurs over land, the water either runs over the surface, or percolates into the ground. Water flow on the surface is referred to as surface run-off, while the flow beneath the ground is referred to as ground water flow. In either case, the water makes its way to some water body, from where it is eventually evaporated, and the whole cycle begins all over again.

Summary:

This process, involving the movement of water by evaporation, condensation, precipitation, and collection, has been occurring since millions of years and plays a crucial role in making Earth the only planet with life. Among the several benefits of water cycle, the most important one is natural water filtration, wherein the contaminated water on the planet is converted to fresh water as all the contaminants in it are left behind during the process of evaporation.

Level 3

The Water Cycle Diagram



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Summary:
This process, involving the movement of water by evaporation, condensation, precipitation, and collection, has been occurring since millions of years and plays a crucial role in making Earth the only planet with life. Among the several benefits of water cycle, the most important one is natural water filtration, wherein the contaminated water on the planet is converted to fresh water as all the contaminants in it are left behind during the process of evaporation.

The water cycle keeps moving all the time through evaporation, condensation, precipitation, and collection.

Evaporation happens when water changes from a liquid to a gas. The sun heats up the water in various water bodies. The water evaporates and goes up into the atmosphere.

Condensation happens when water changes from a gas to a liquid. When in the air, the water condenses and makes a cloud.

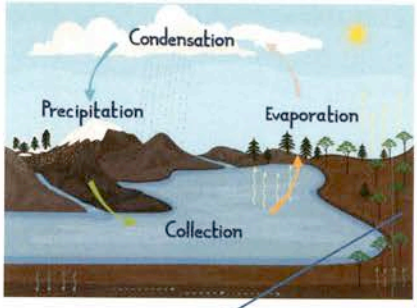
Precipitation happens when water fills the cloud and falls out. The water falls down to the earth as precipitation such as rain or snow.

Collection happens when water goes to comes together in oceans, lakes, rivers, wells, or buckets of water. The water sits there until it evaporates again.

The water cycle is helpful to us because it helps clean our water, helps keep us alive, and changes our weather

Level 2-1

The Water Cycle Diagram



Written by: Abhijit Naik

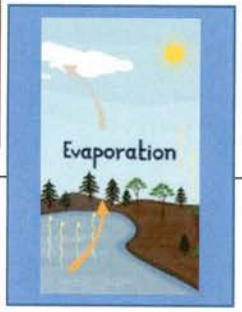
The water cycle is moving water on Earth.

1- Evaporation:

Evaporation = water turns **liquid to gas.**

The sun heats the water in oceans or rivers.

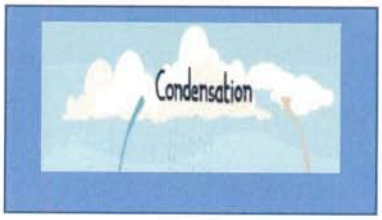
It **goes up** into the air.



2- Condensation:

Condensation = water turns **gas to liquid**

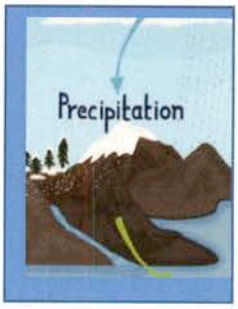
It makes a **cloud in the air.**



3- Precipitation:

Precipitation = water turns to **rain, snow, sleet, hail**

It **falls** to the Earth.



4- Collection:

Collection = water **sits in oceans, lakes, and rivers.**

It sits until **it evaporates.**

The water cycle:

- helps clean water
- helps plants and animals grow
- helps change our weather

Level 5

Prediction 1: Observation 1:
Prediction 2: Observation 2:

Level 4

Prediction 1: I think the water is going to Observation 1: I noticed This is
Prediction 2: I think the steam is going to Observation 2: I noticed This is

Level 3

Word Bank

liquid 

solid 

gas 

precipitation 

evaporation 

condensation 

collection 

Prediction 1:
I think the **water** will change into a _____ when it boils.

Observation 1:
In the _____phase, first the **water** was a _____,

Then, it changed to a _____when it boiled.

Prediction 2:
I think the **steam** will change into a _____ when it cools.

Observation 2:
In the _____phase, first the **steam** was _____.

Then, it changed to a _____when it cooled.

Level 2

Prediction 1:
I think the **water** will change into a _____ when it boils.
Liquid gas solid



Observation 1:
In the _____phase, first the **water** was a _____,
evaporation condensation liquid solid




Then, it changed to a _____when it boiled.
solid gas


Prediction 2:
I think the **steam** will change into a _____ when it cools.
liquid gas solid



Observation 2:
In the _____phase, first the **steam** was _____.
evaporation condensation gas solid


Then, it changed to a _____when it cooled.
solid liquid


Level 1

Prediction 1:

When **water** boils, it will change to a _____.
solid gas



or


Observation 1:

First, the **water** was a _____. Then, it changed to a _____.
liquid solid liquid gas



or


or


This is the _____ phase.
precipitation evaporation


or


Prediction 2:

When steam cools, it will change to a _____.
liquid gas


or


Observation 2:

First, the **steam** was a_____. Then, it changed to a_____.
liquid gas solid liquid



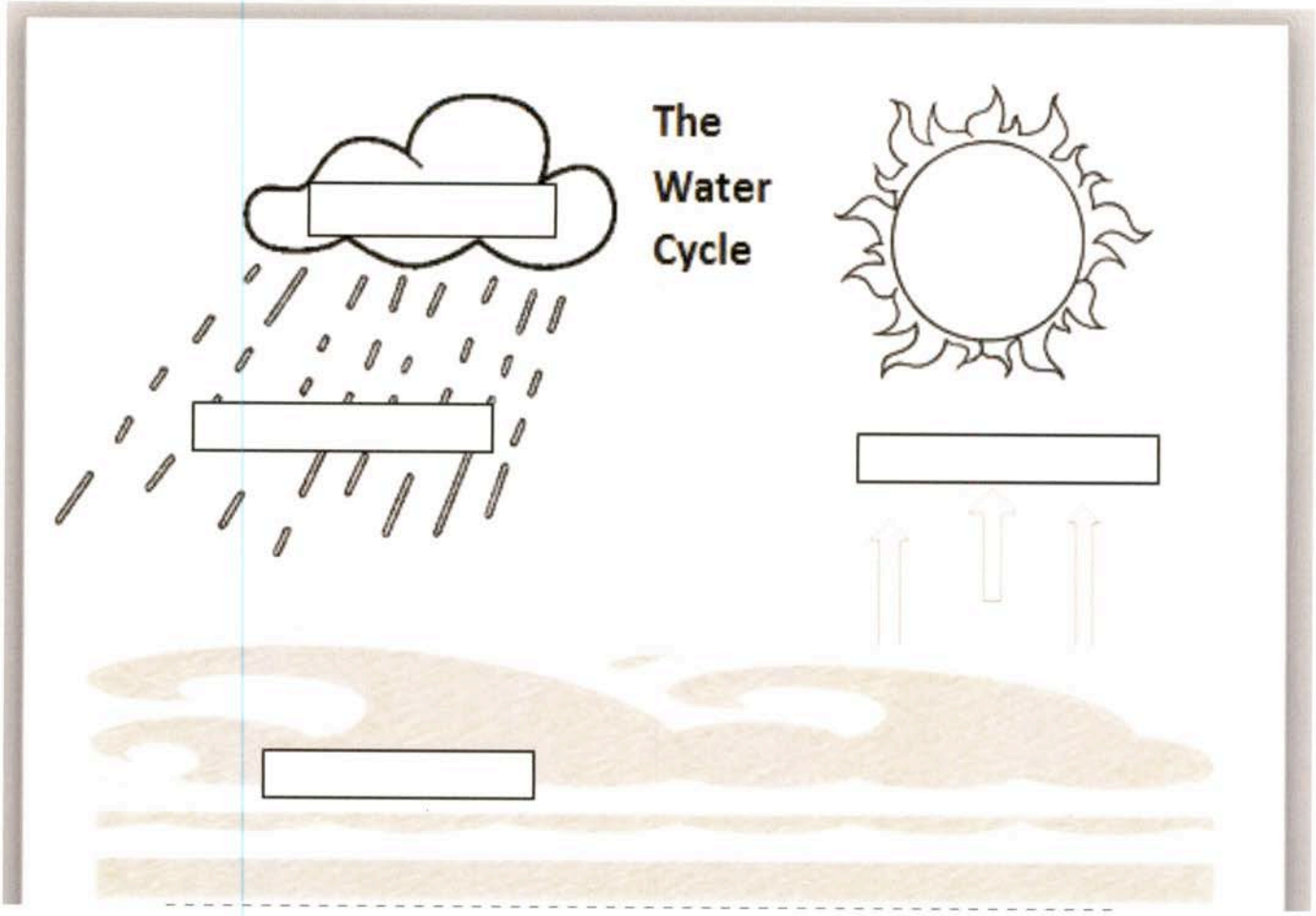
or


or


This is the _____ phase.
condensation evaporation

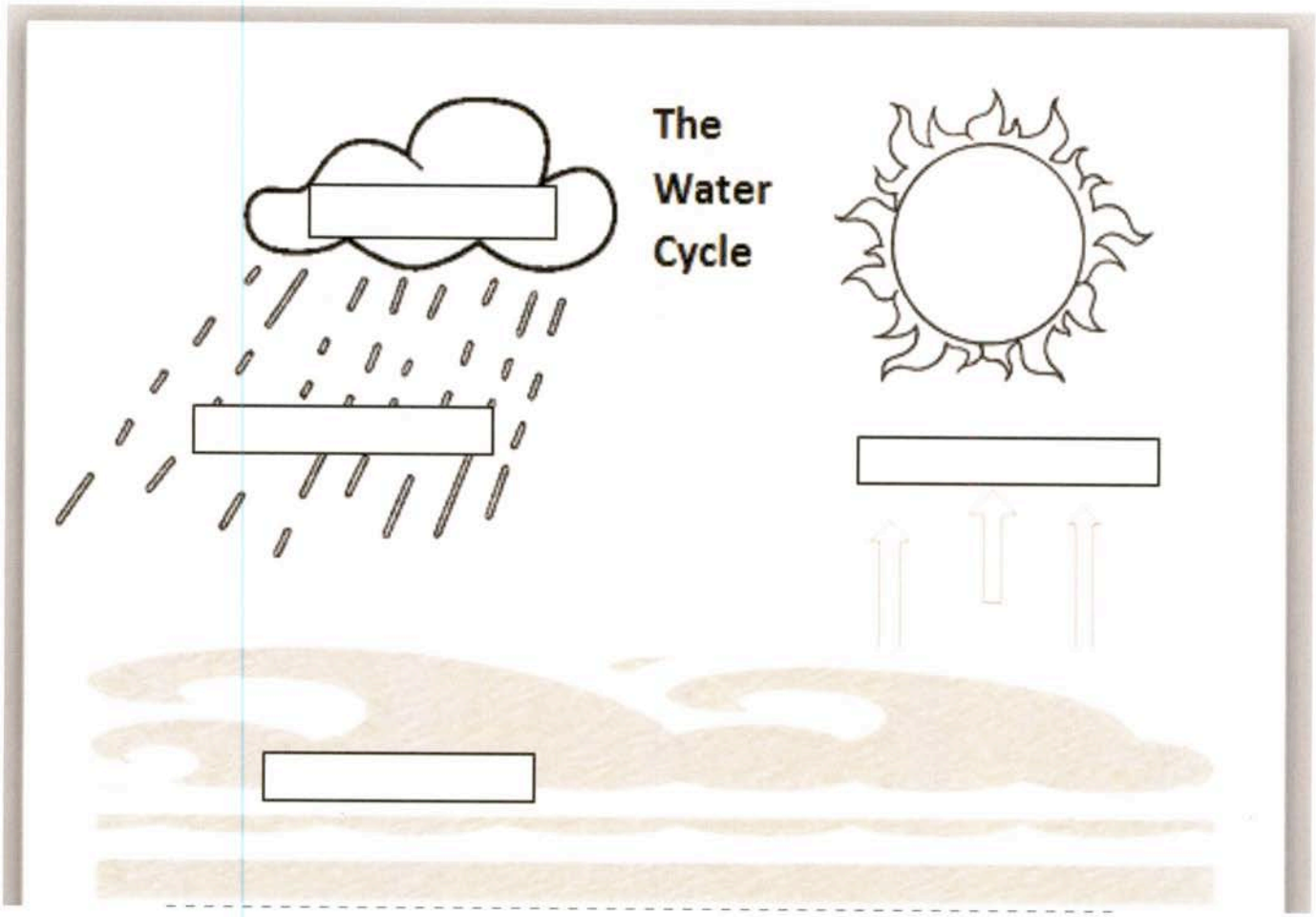

or


Level 5



1. **Label and write what you learned about the different forms of water in each water cycle.**

Levels 4



1. **Label and write what you learned about the different forms of water and how they travel in each water cycle stage.**

Water can travel as a

_____.

In the _____ phase,

_____.

In the _____ phase,

_____.

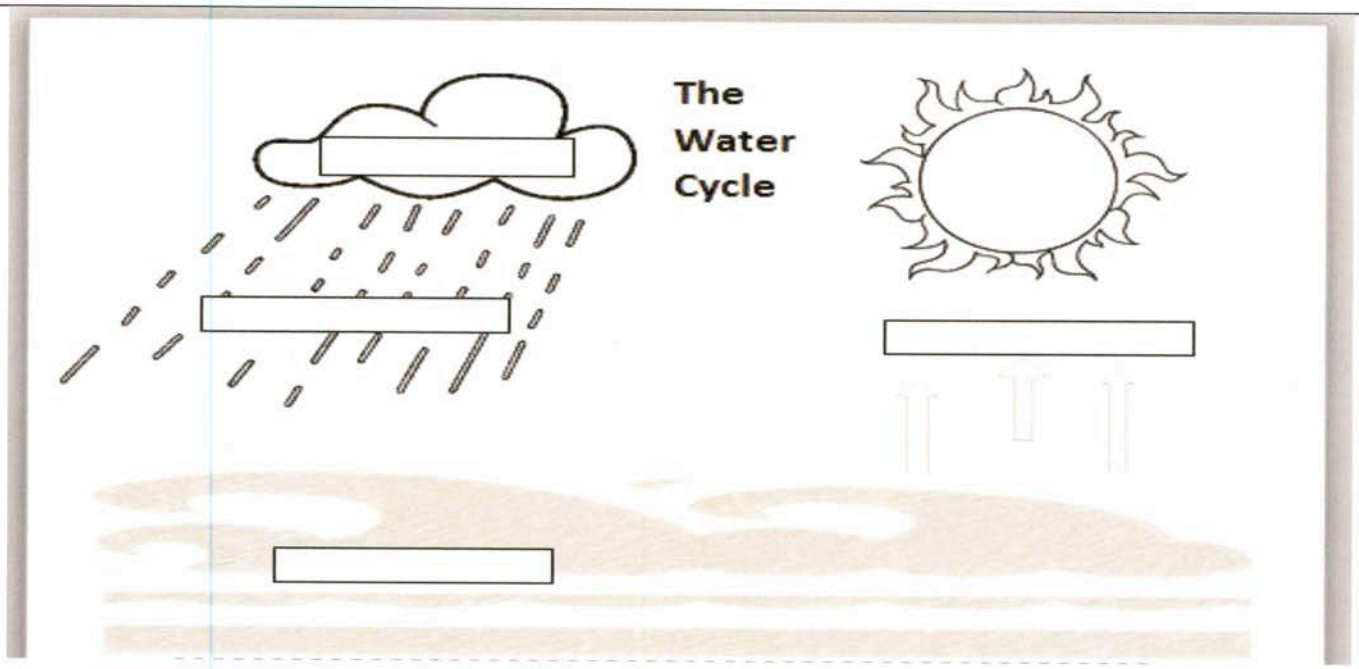
In the _____ phase,

_____.

In the _____ phase,

_____.

Level 3



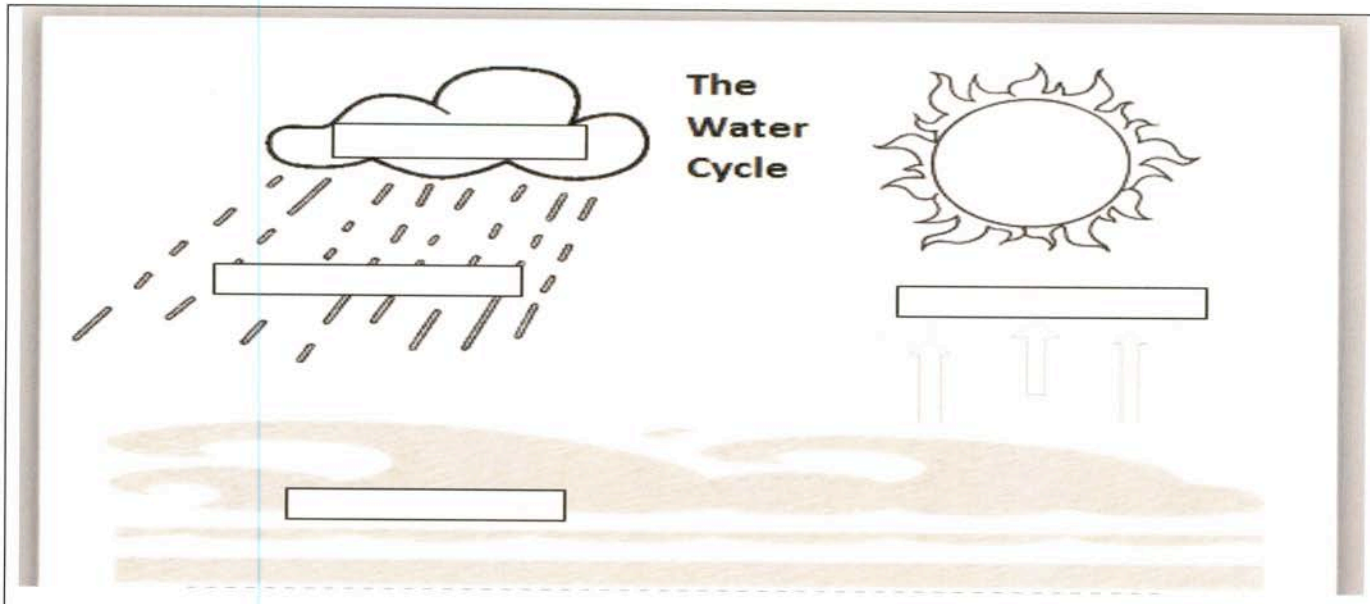
Word Bank

liquid | solid | gas | precipitation | evaporation | condensation | collection

1. **Label and write what you learned about the different forms of water and how they travel in each water cycle stage.**

Water can travel as a _____ during the water cycle process.
In the _____ phase, the water changes from a _____.
In the _____ phase, the water changes from a _____.
In the _____ phase, the water changes falls to the earth as a _____.
In the _____ phase, the water comes together into a body of water and sits as a _____.

Level 2



1. **Label and write what you learned about the different forms of water and how they travel in each water cycle stage o complete your KWL chart.**

Water can travel as a liquid, solid, or gas during the water cycle process.

In the _____ phase, the water changes from a **liquid to** a _____.
precipitation evaporation solid gas

 or   or 

In the _____ phase, the water changes from a **gas to** a _____.
precipitation evaporation solid liquid

 or   or 

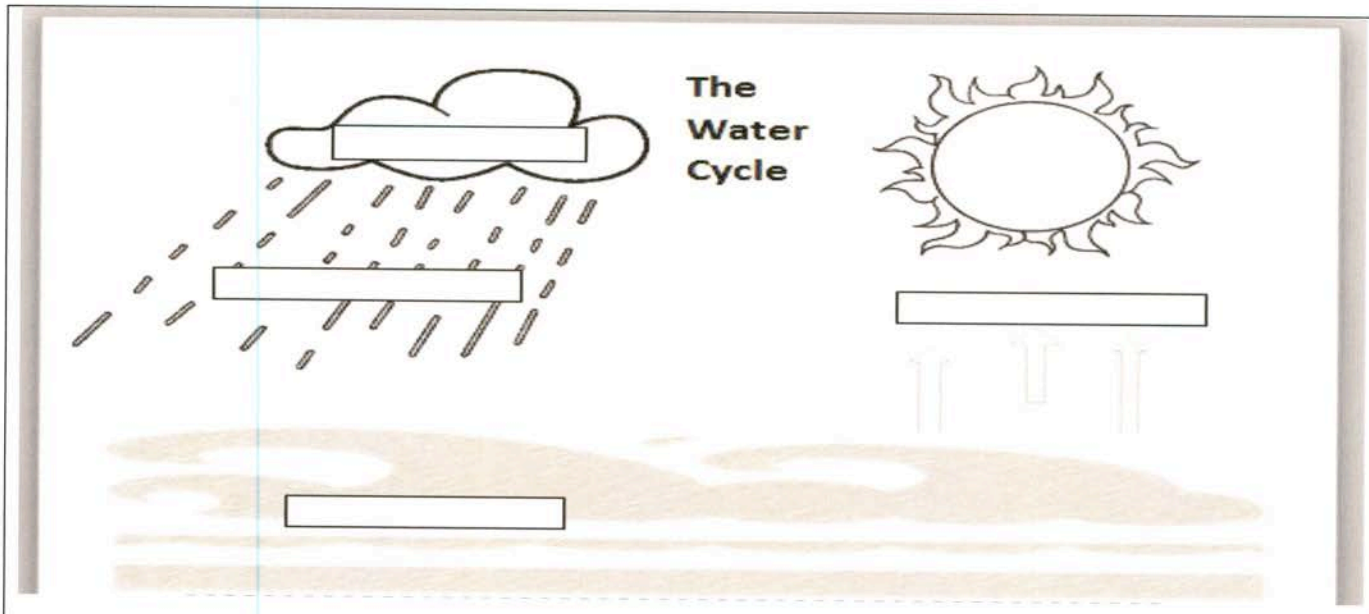
In the _____ phase, the **water falls** to the earth as a _____.
condensation collection liquid gas

 or   or 

In the _____ phase, the **water comes together into a body of water and** sits as a _____.
condensation collection solid liquid

 or   or 

Level 1



1. **Write what you learned about the different forms of water and how they travel in each water cycle stage o complete your KWL chart.**

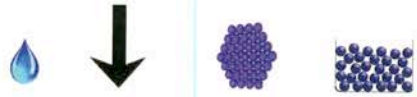
The water changes from a liquid to a gas in the _____ phase.

precipitation  or evaporation 

The water changes from a gas to a liquid in the _____ phase.

precipitation  or evaporation 

The water falls as a solid or liquid in the _____ phase.



precipitation  or collection 

The water sits together as a solid or liquid in the _____ phase.

precipitation  or collection 

Narrative

Due to the high levels of vocabulary used within this lesson, and the abstractness of the vocabulary within the water cycle process, many revisions were made to help contextualize this lesson using sheltered instructional strategies that were differentiated for a variety of English proficiency levels. The initial revision to help students understand the vocabulary terms within the water cycle process includes adding a classroom science word wall with word wall cards that include pictures allowing students the ability to easily access the meaning of the terms at all times. These vocabulary terms are also introduced to students while showing them gestures to model the terms. For example, gestures to mimic the motion of evaporation and rain are used to give students the visual, auditory, and kinesthetic aspect for the vocabulary, as students were also prompted to repeat the words and the gestures. This will allow students to better understand and also retain the learned vocabulary. Terms were further contextualized by noting the root words within the vocabulary. For instance, teachers should point out the word "condense" in condensation to help explain the water molecules coming together. Realia is also incorporated into the lessons using items such as rocks, sticks, leaves, and soil to help make the lesson comprehensible and allow students to build a better understanding of the process being modeled to them.

In aims to assist students in building upon previously learned knowledge, a brief review process of previously learned vocabulary regarding states of matter was also added to the lesson. Students are also prompted to build on their background knowledge by completing a KWL chart. KWL charts are also differentiated based on student proficiency levels. These strategies help activate students' schema and prepare them to begin thinking about and connect their knowledge to the water cycle process. In efforts to help increase student engagement, a multimedia aspect was added to supplement this lesson as well. The video was incorporated both to allow students relate to the student in the video and the questions he is asking and help students build a more meaningful platform for learning about the topic. The video also leads students to a better understanding of the water cycle process by watching it following their experiment, allowing a self-reflection component to recognize their learning.

Students are provided with additional writing, reading, listening, and speaking opportunities at differentiated levels based on their proficiency levels. For example, the addition of the text "The Water Cycle Diagram", while was added to provide students with more specific information about the water cycle process, was modified so that all students could easily access the information within it. For instance, while level five students used the original text, level 4 students were supported with bolded and underlined headings, level three students were provided with marked text with paragraph summaries, level two and one students are provided with picture cues, shortened text, and bolded and underlined terms to provide them with the essential information. The journal inserts and written summaries are also differentiated for students so that they were able to complete them, and share them appropriately. While level five students have a completely open ended written task, level four students are required to form phrases using sentence starters, level three students use a picture word bank to complete cloze sentences, level two and one students are choosing from multiple choice options, with level one students being provided with additional picture cues. These modification allow students to complete the given task at a level that is appropriate and yet challenging, hence within their zone of proximal development. Similarly, notes to differentiate questioning are also added throughout the lesson. The teacher asks a variety of yes/no questions, option responses, cloze sentence questions, open ended questions, as well as higher order analytical thinking questions based on student proficiency levels.

With the revisions made to this lesson, students are increasing their opportunity to negotiate meaning from their learning. Students are specifically paired with either similar or different leveled peers to support their learning. For example, having lower proficiency students receive support from the teacher along with their same leveled peers allows those students to feel comfortable at their levels and be appropriately challenged by the teacher. At the same time, having the higher proficiency level students within level five help support level four students allows the level five students to further their learning by peer assisting and checking others, while the level four students are seeing an appropriate model, being supported, and are challenged at the appropriate level.

These strategies together make input comprehensible for students and allow students to contextualize information being presented to them. While the language piece is controlled for their specific level, students can focus on the content, while practicing their English proficiency in a scaffolded manner, which is one of the most important aspects within the ELL learning process.

Lesson 2

Lesson 2 Objectives and Performance Indicators

Content Objectives:	**Language Objectives:**
1) Identify the main locations we can find water around the world. 2) Compare and contrast the different places we can find water around the world	1) Following whole group discussion, students will independently write sentences to identify the main locations of water 2) a. Students will write similarities and differences to compare and contrast two locations of water b. Students will orally share their written comparisons with a peer

Task	5 Nearly fluent	4 Intermediate	3 Speech emergent	2 Early production	1 Preproduction
Reading & Writing: to identify	Write to identify the different water locations on the earth by writing a complete detailed sentence identifying at least 5 different locations (oceans, glaciers, air, and 2 liquid freshwater location)	Write to identify the different water locations on the earth by writing complete short sentences using a sentence starter identifying at least 5 different locations (oceans, glaciers, air, and 2 liquid freshwater locations)	Write to identify the different water locations on the earth by completing a sentence starter using a word bank, identifying at least 4 different locations (oceans, glaciers, air, and a liquid freshwater location).	Write to identify the different water locations on the earth by completing the cloze sentence using a picture word bank, identifying at least 3 different locations (oceans, glaciers, and a liquid freshwater location).	Write to identify the different water locations on the earth by circling the correct picture, identifying at least 3 different locations (oceans, glaciers, and a liquid freshwater location)
Reading & Writing: compare and contrast	Independently complete a Venn diagram to help write a paragraph describing at least 1 similarity and 1 difference between 2 water locations using complete detailed sentences	Independently complete a Venn diagram to help write a paragraph describing at least 1 similarity and 1 difference between 2 water locations using short complete sentences	Independently complete a Venn diagram to write a paragraph describing at least1 similarity and 1 difference between 2 water locations using sentence starters with paraprofessional monitoring	Independently complete a Venn diagram to write a paragraph describing at 1 similarity and 1 difference between 2 water locations using word banks to complete cloze sentences with paraprofessional monitoring	Independently complete a Venn diagram to write a paragraph describing at least 1 similarity and 1 difference between 2 water locations choosing the correct multiple choice option with paraprofessional monitoring.
Speaking & listening:	Will orally share using complete and detailed sentences and listen to peer comparisons while paired with level 4 students	Will orally share using short sentences and listen to peer comparisons while paired with level 5 students	Will orally share using phrases and listen to peer comparisons while paired with level 2 students, and paraprofessional monitoring	Will orally share using 2-3 word responses and listen to peer comparisons while paired with level 3 students, and paraprofessional monitoring	Will orally share and listen to peer comparisons by pointing to the correct location when prompted with a question, and repeating the name of that location while in pairs, and with teacher support

Functional Language Chart

Function	Situation	Mohan's Knowledge Framework	Expressions	Words	Grammar
Identify	Where can the different forms of water be found on our earth?	Knowledge structure: description	Water can be found on Earth in __(1)___.	(1) glaciers, the oceans, the air, ponds, lakes rivers	Auxiliary Present tense preposition
Compare and contrast	How are these locations the same? How are they different?	Knowledge structure: description	Water in ___(2)___ is similar to water in __(2)___. Water in __(2)__ is different than water in __(2)__. It is the same because water in __(2)__ and __(2)__ is both __(3)___. It is different because water in _(2)_ is ___(3)__ but water in ___(2)___ is _____(3)___.	(2) Glaciers Oceans The air Ponds Lakes Rivers (3) Salty Fresh Liquid Solid Gas Collection Water form	Nouns Adjectives Connecting words/ conjunctions prepositions

Water Cycle
Lesson #2

***Bolded print indicates additions or revisions from original lesson.**
Time Frame: 60 minutes

Resources and Materials: Plastic or air blown up globe of the earth), internet access, **listening guide worksheet, word wall vocabulary cards, Venn diagram and summary worksheet,** Ziti in bags (with 2 red and 1 green ziti

Review Vocabulary: Review in the focus activity by showing visual word wall card pictures (unknown, 2015) (see materials pages 7-8 of lesson 1), providing accompanied visual gestures, and have students repeat the vocabulary terms and conduct the gestures simultaneously throughout the KWL review. Have students briefly explain each term, pointing out root words, providing examples. Differentiate questioning to allow all students to participate in this review (L5&4: can you help explain what happens during evaporation? L3: during the condensation stage of the water cycle,...?, L2: does water sit in the ocean during the condensation stage or the collection stage?, L1: Is sleet a form of precipitation or collection?).

- **Evaporation: water changes from a liquid to a gas; occurs more rapidly at warmer temperature (motion arms going upward, with hands moving from closer together to outward, like steam moving)**
- **Condensation: water changes from a gas to a liquid; occurs when water vapor gets cold (motion hands (motion hands going downward, with hands moving from outward to inward, like in a cloud shape)**
- **Precipitation: water falling to the earth in the form of rain, hail, mist, sleet, or snow (move arms downward, with fingers tapping in the air, like rain falling)**
- **Collection: water that falls as precipitation comes together in bodies of water such as oceans, rivers, lakes, and streams, or underground (point downward while moving arm in circles, like an ocean shape)**
- **Water as a Gas-vapor in the air, cannot see it, although can see it as it begins to cool as steam, may notice when it is really humid outside**
- **Atmosphere: the gases that surround the earth**
- **Solid water-when water freezes, the molecules move apart, less dense than fluid water ice, hard, use ice to make our drinks colds**
- **Liquid water-water is wet and fluid, use to wash our hands, drink, etc.**

1) Focus Activity: **Refer to a student's KWL chart "learned" section from yesterday to help review and check for understanding about the water cycle stages and vocabulary terms, to allow students to share. Then, refer back to the "know" or "want" to know sections from yesterday ask students what were some of those things they already knew or wanted to know about water to guide them towards a discussion about where water is located (if they did not, ask them since it was mentioned briefly in yesterday's lesson).**

2) Introduction: Show students the plastic or blown up air globe of the earth. Ask a student to identify **(point and/or orally tell)** where they live **or where they are from, or even somewhere they have been on the globe. Then, ask students if they remember what color water usually is on maps (blue) and what color land usually is (brown, green, etc).** Have students toss the globe around the room to a few more students having them catch the ball and **telling if their right thumb lands on water or land**. If it lands on water, draw a tally for water on the board, and if it lands on land, draw a tally for land on the board. **When a student lands on water that is an ocean, put a (S) next to the tally. If a student lands on water that is a lake or river, put an (F) next to the tally (this will be explained later).** To ensure that every student gets a chance to participate, ask students to sit after they have caught the ball once. Do this enough times so that you can demonstrate that most of the earth is made up of ocean water. **Explain that 70% of the Earth is actually made up of water. Draw on the board a pie graph to show 70% water and 30% land, as practiced in previous math content.** Then let students know we will explore where the 70% or all of the water on earth is mainly found, and discuss how the water is similar and different at each location.

3) **Tell students we will be learning about the water locations from a teacher friend today, Mrs. Friedl. Prepare students to listen carefully to the various places water can be found on Earth and to take notes. Hand out the differentiated listening guides for levels 1-5 (see materials, pages34-38), and have them fold the page to complete the top portion only. Show the video on http://study.com/academy/lesson/the-distribution-of-water-on-earth.html to begin. Use verbal and visual cues to alert students to critical parts of the video (e.g. call on particular L5 students to watch this next part closely about particular abstract components, and call on particular L1 students to watch closely when video indicates the essential gist components).Pause after essential components are mentioned (the locations, the percentages of each water location, etc.) in attempts to somewhat pace teacher's speech, and allow students to take accurate notes.**

4) **Have students pair and share notes they took. Then, in whole group, ask students why they think you put an (S) or an (F) next to the different water tallies on the board from the previous activity with the globe, or why they think there are two different types of water. Ask them if the water at the beach is the same or different from water that we shower or wash in. Show realia (a clear cup of water and model adding salt to it to make salt water), and guide them to the conclusion that the ocean water is salt water, while the water in lakes, rivers, and ponds is freshwater (show them another clear cup of water with no salt in it). Draw a triple "T" chart on the board labelling one section "ocean" and a quick picture and one section "lakes, rivers, and ponds" with a quick picture, and leave the third blank. Ask if students wrote those 2 locations in their listening guides. Discuss the two water types, having students share the percentages to add to the chart of characteristics (e.g. oceans= 97%, lakes, rivers, and ponds =1%).**

5) **Ask students what percentage is left over (2%) and if they know where else they can find freshwater. If they missed this from the video guide them to think about the solid form of water by showing them realia or adding ice to the freshwater cup. Prompt them to think about the glaciers, and discuss. Ask students if they think glaciers are made of fresh or salt water. Refer to the cup, and use ice as an example to think about if glaciers have salt in them. Be sure students understand that the salt does not freeze into the ice or glaciers. Add the characteristics to the triple "T" chart (solid form of water, freshwater, cold, etc.).**

6) **In whole group, show on the overhead projector the empty pie chart, and fill out the percentages of water in each location together. Have students complete the one on their sheet as they follow along with you to gain a visual understanding of how much water exists in each location discussed.**

7) While students should remember from the water cycle that some water is underground and some is in the atmosphere, explain that since there is such a tiny amount of water in the air compared to other places (.001%), we did not include it in the pie graph activity, **but that you will use it as an example to compare and contrast the different water locations. Model using a Venn diagram on the overhead to compare and contrast the water location of air with the water location of the ocean. Ask students differentiated questions about each location of water, while also using previously learned vocabulary (L5&4: describe the water within the condensation stage of the water cycle, L3: the water in the evaporation stage is...?L2: Is the water in the air or the precipitation stage a gas, a solid, or both? L1: Is the water in the collection stage a liquid when it is in the ocean? Is it a liquid in glaciers?). Model the oral and written language by saying and writing the language on the board using complete sentences, to compare and contrast the two water locations (e.g. "Water in the air is the same as water in the ocean. It is the same because both are forms of water within the water cycle. Water in the air is different from water in the ocean because water in the air is a gas and water in the ocean is a liquid" or "water is different because water in the air is fresh and water in the ocean is salty"). Also, relate the locations back to the water cycle process. Ask students what form the water in that location is and what stage of the water cycle it relates to (e.g. water in the air can be related to more than one. It is a gas and correlates back to the evaporation cycle, or it is liquid when it is in the condensation or precipitation stage). When using the different adjectives, use gestures and pictures to enhance understanding.**

8) **Handout the differentiated student Venn diagram for levels 1-5 handouts and have students "think" or discuss with a partner before completing their Venn diagram to help them think about the 2 locations they will choose and to brainstorm ideas about the similarities and differences based on what they have learned (see materials pages 39-43). Have them refer to the sentence models on the board to practice.**

9) **Have students independently complete their Venn diagrams and write a summary about their comparison. When complete, have students "pair and share" their summaries within differentiated pairings (L5&4 mixed, L3& 2 mixed, L1 mixed into pairs).**

Closure: **After students share their summaries with partners, ask for a few volunteers to share in whole group. Check for understanding by asking the group about the various locations of water on Earth (use differentiated questioning:L5&4: tell me about the different places we can find water. L3: We can find water...? L2: Is water mainly in the ocean or in the desert? L1: Is water found in glaciers?,etc.).** Discuss the following questions as a class to get students thinking about the next lesson. Why is it important to conserve freshwater? What happens if a river or a lake becomes polluted? Can it still be used as a source of freshwater? Why do you think it is important to keep our sources of freshwater clean? Why is it important to only use water that is needed? Is it possible that we could run out of freshwater? What are some things you can do to help save water (only use what is needed)? What other types of living things besides people need fresh water to survive?

Assessment: participation in class discussions and activities, **listening guide worksheet, differentiated questioning throughout lesson, summaries on water location comparisons**

Extension: **As an extension activity,** give students a bag with ziti. Explain that there are 100 pieces of ziti and that they represent all of the water in the world (100%). Note: Each bag will contain two red ziti and one green ziti. Ask the students to think about percentages and discuss what the green and red ziti might represent. Discuss that the uncolored ziti represents all of the water that is in the oceans (97%). Show the students the globe again and refer to the ice caps on each pole and the mountains with snow. Explain that the red ziti represent all of the water in the ice found at the poles and in glaciers. Ask students what the final one green ziti represents. It represents all of the freshwater that is available for all of the plants, animals, and people on earth. Students can also go to the video website **http://study.com/academy/lesson/the-distribution-of-water-on-earth.html** and take a self-quiz about the learning from the video and lesson.

Materials

Listening Guides

Level 5

Name: _____

Directions: Listen and complete section1.

1). Use a complete sentence(s) to name at least 5 locations water can be found.

_____

_____

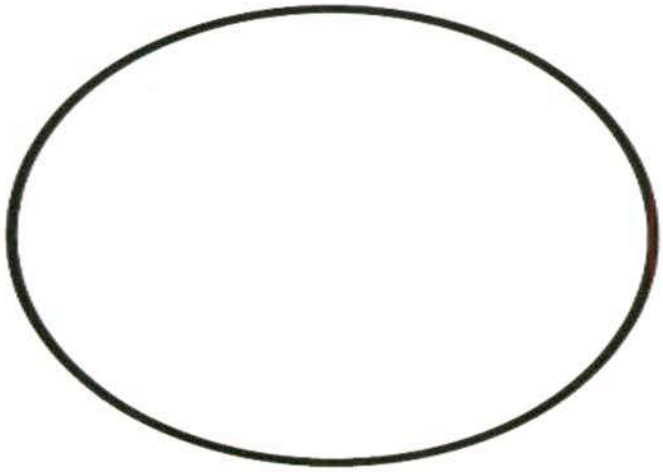
Salt water in oceans = _____%

Freshwater in Glaciers = _____%

Freshwater in lakes, rivers, and ponds = _____%

2.) Let's complete together.

All the Water on Earth



Graph Key

Level 4

Name: _____

Directions: Listen and complete section 1.

1). Write a short sentence(s) to name at least 4 locations water can be found.

Four water locations are

_____

_____

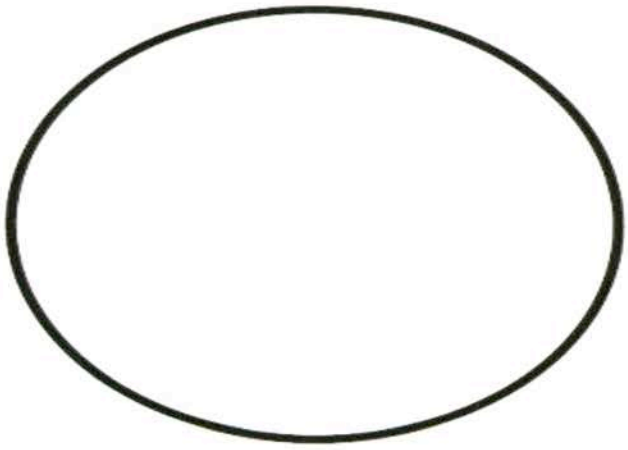
Salt water in **oceans** = _____%

Freshwater in **Glaciers** = _____%

Freshwater in **lakes, rivers, and ponds** = _____%

2.) Let's complete together.

All the Water on Earth



Graph Key

Level 3

Name: _____

Directions: Listen and complete section 1.

lakes	sneakers	rivers	deserts
oceans	glaciers	shirts	books

1). Complete the sentence to name at least 4 locations water can be found.

Water can be found in

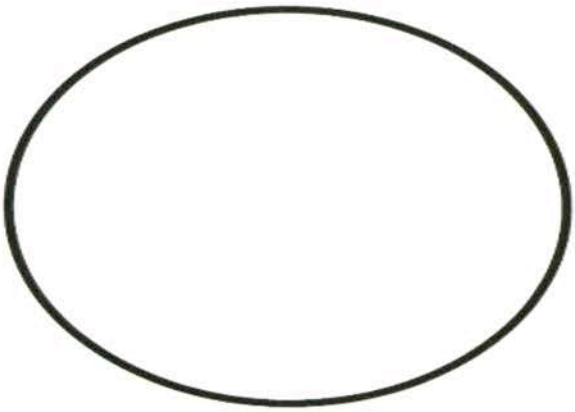
Salt water in **oceans** = _____%

Freshwater in **Glaciers** = _____%

Freshwater in **lakes, rivers, and ponds** = _____%

2). Let's do together.

All the Water on Earth



Graph Key

Level 2

Name: _____ Directions: Listen and complete section 1.


lakes


sneakers


rivers


deserts


oceans


glaciers


shirts


books

1). Use the word bank to complete the sentence to name where water can be found.

Water can be found in the _____ , in _____ , or in _____

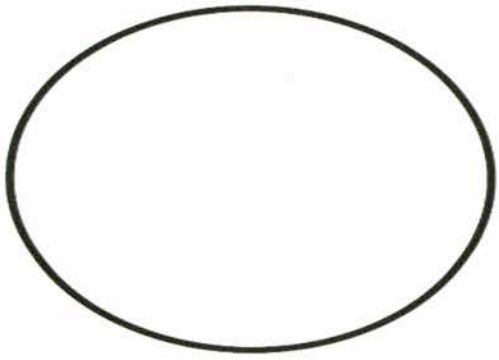

Salt water in **oceans** = _____%


Freshwater in **Glaciers** = _____%


Freshwater in **lakes, rivers, and ponds** = _____%

2). Let's do together.

All the Water on Earth



Graph Key

Level 1

Name: _____ Directions: Listen and complete 1 and 2.

1). Name the locations on Earth that water can be found.

Water can be found in _____


lakes or


deserts

Water can be found in _____


oceans or


books

Water can be found in _____


Sneakers or


glaciers

2.) Match the percentages to the correct water locations.


Salt water in **oceans** = 1%

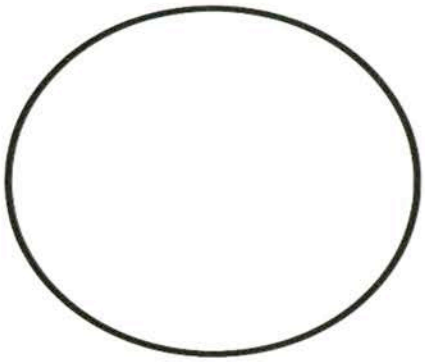

freshwater in **glaciers** = 97%


freshwater in **lakes, rivers, and ponds** = 2%

---

3). Let's do together.

All the Water on Earth



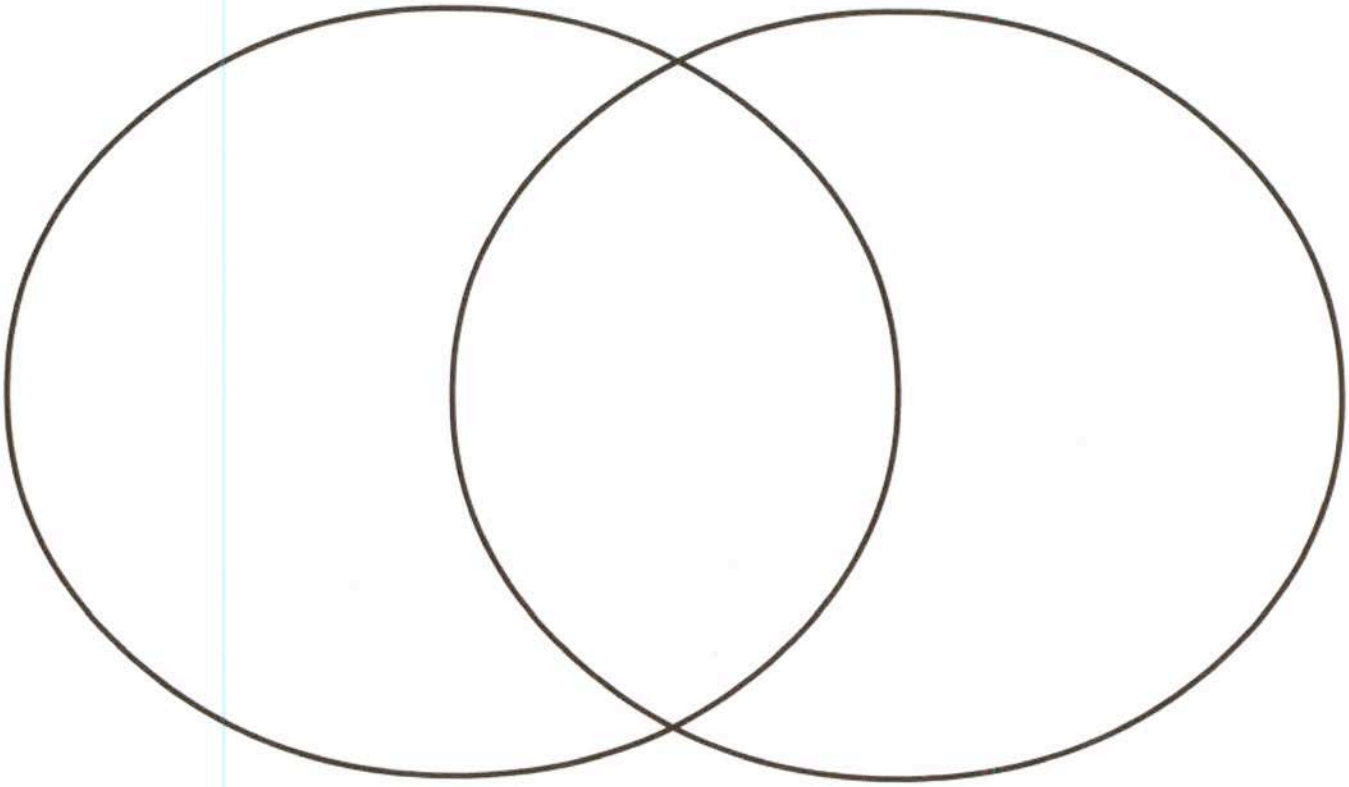
Graph Key

Venn Diagrams and Summary

Level 5

Name: _____

1.)Choose 2 water locations to compare and contrast. Include at least 1 similarity and 1 difference.



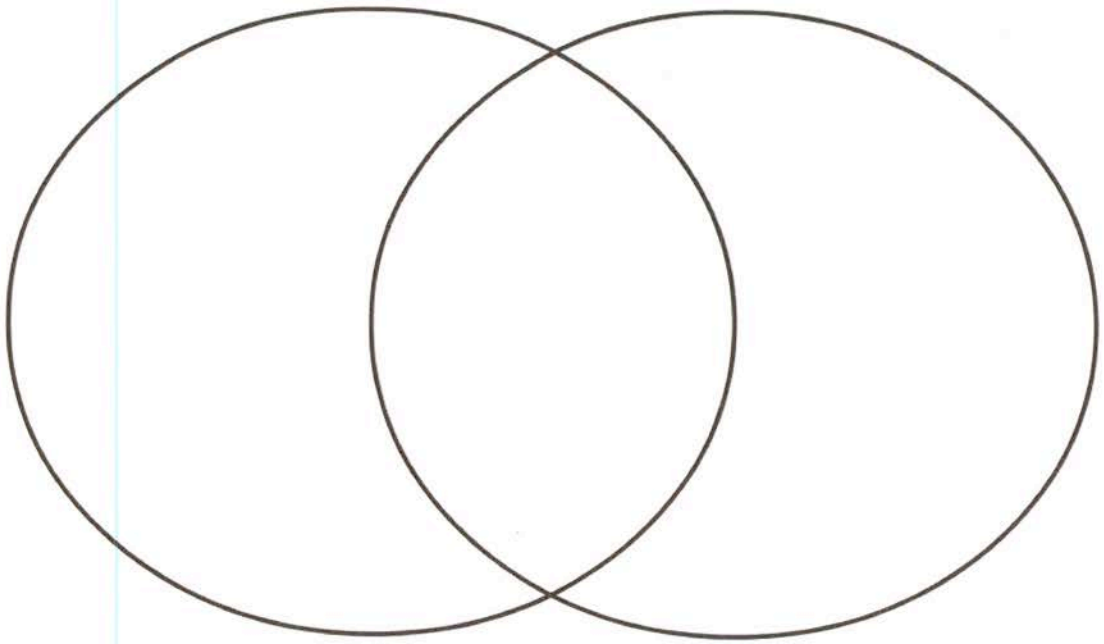
2.)Use complete detailed sentences to write a summary about your comparison.

Level 4

Name: _____

3.)Choose 2 water locations to compare and contrast. Include at least 1 similarity and 1 difference.

Glaciers	Ocean	air	lakes, rivers, ponds

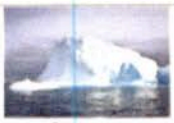


4.)Use short sentences to write a summary about your comparison.

Level 3

Name: _____

1.) **Choose** 2 water locations to compare and contrast.

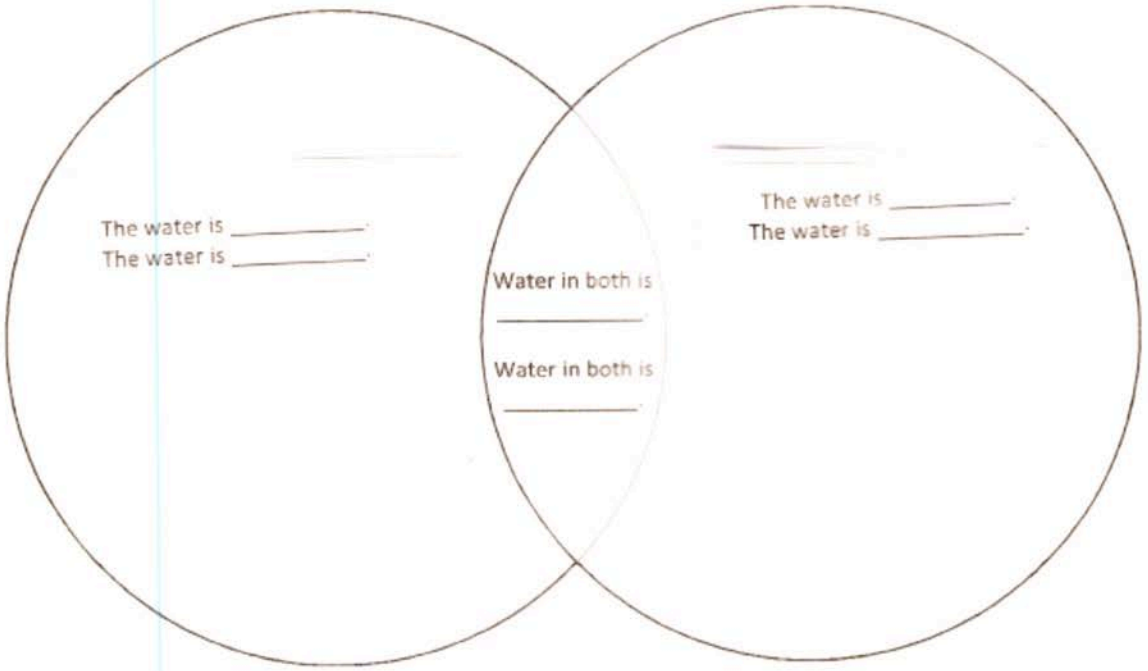

Glacier


Ocean


air


lakes, rivers, ponds

2.) Include at **least 1 similarity and 1 difference.**



3.) Use complete sentence to write a summary about your comparison above.

Water in _____ is similar to water in _____. It is the same because water in _____ _____.

It is different because water in _____ _____.

It is different because water in _____ _____.

Level 2

Name: _____

1.) **Choose 2** water locations to compare and contrast.


Glacier


Ocean


air


lakes, rivers, ponds

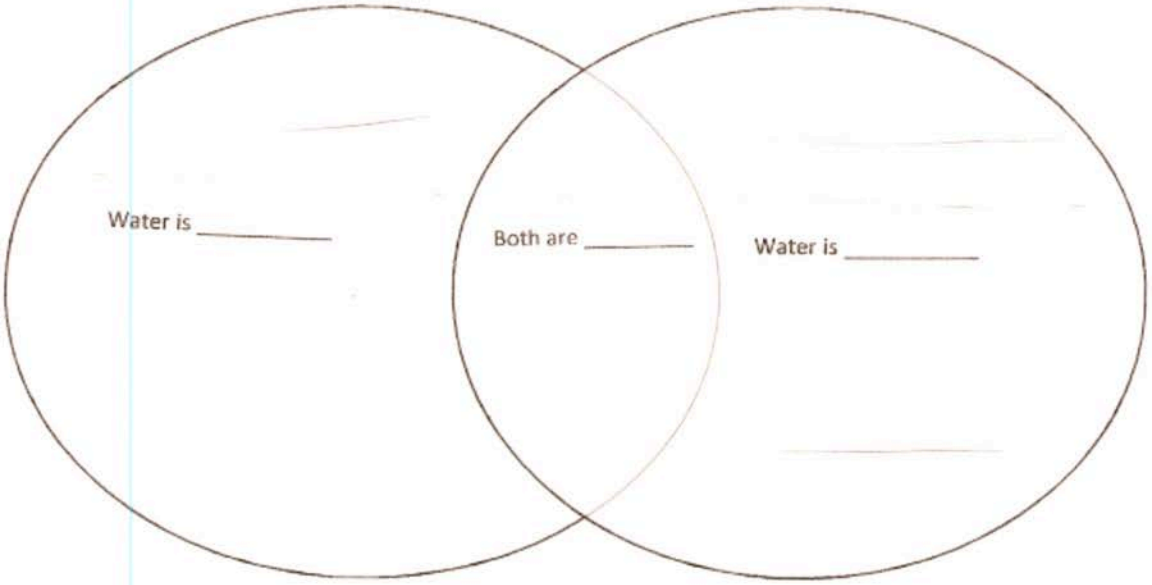
2.) Include at **least 1 similarity and 1 difference.**

Salty fresh a solid a liquid a gas water forms collection









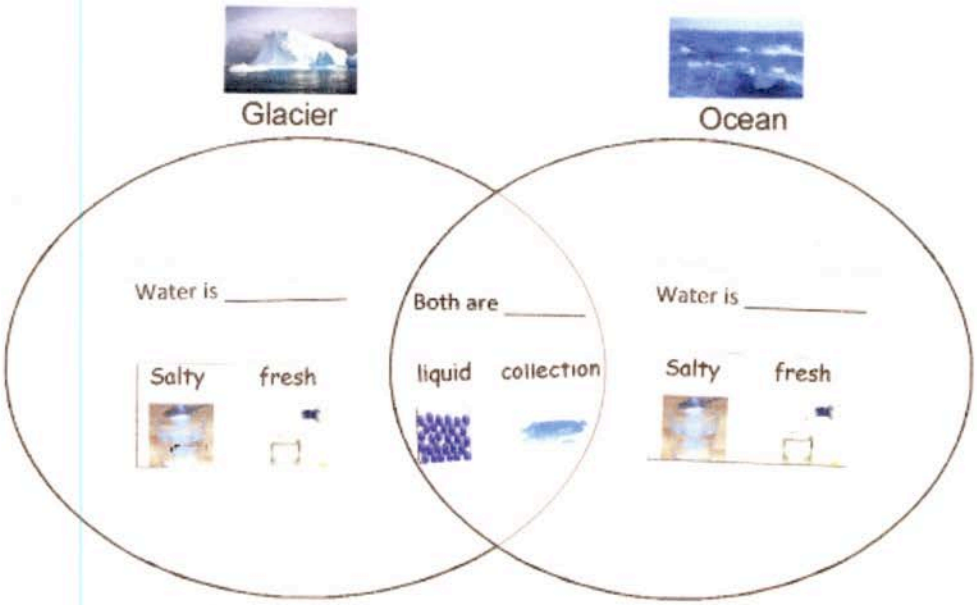
1.) Use the word banks above to write a summary about your comparison.

Water in _____ is similar to water in _____.
It is the same because water in _____ and _____ is both _____ and _____. It is different because water in _____ is _____, but water in _____ is _____. It is different because water in _____ is _____, but water in _____ is _____.

Level 1

Name: _____

1.) Compare and contrast. Circle the correct pictures to show 1 similarity and 1 difference.



2.)Choose the pictures to summarize your comparison above.

Water in glaciers is similar to water in oceans.

It is the same because the water is both _____.

collection liquid

or

It is different because water in glaciers is _____,

salty fresh

or

but water in oceans is _____.

salty fresh

Narrative

In attempts to build on prior knowledge, students are prompted to initially refer to their KWL charts they complete within the previous lesson. The outlined review helps to activate previous learning, and provides opportunity to review and reinforce learned vocabulary, which is also added to this lesson. This procedure is used to activate schemata and guide students to thinking about this particular lesson. Other simple additions to this lesson include supplementary visuals such as the air globe, and realia such as the water, ice, and salt materials, which help to contextualize meaning for students. Gestures are used when explaining the various adjectives to describe the different water locations. Quick drawings are used on the board for terms and concepts as well to enhance understanding. Another addition to this lesson includes the multimedia input with integrated differentiated cues to alert particular students to essential components in the video, which helps students to focus on the most important information.

Another important revision within this lesson includes the role of the pie chart to understand and visualize the percentage of various water locations. Rather than using this activity as the focus of the lesson, this activity is now a whole group activity before the main activity, used to help students to support their learning of the different proportions of water locations on Earth. This way students are learning some of the basic concepts to help prepare them for more abstract concepts such as comparing and contrasting the different water locations and forms of water. Hence, students use the additional Venn diagram, which is incorporated into the lesson in order for students to better conceptualize the similarities and differences of the various water locations. However, this is done following explicit modeling by the teacher, and is scaffolded through a modified type of "think, pair, and share" so students can affirm their thinking with their peers before writing, as well as share their writing, providing them with more opportunity to practice and apply their language skills.

Differentiated questioning and more higher level thinking questions are also used throughout the lesson. While I still included many higher level thinking questions regarding conservation of water since that will be the focus of future content, I chose to revise some of the closure questions to focus on the water locations and aspects, as opposed to using the questions regarding conservation of water. A heavier focus was set on building

an understanding of the previous and current content to scaffold information, to connect new information to the water cycle process, and to ensure understanding.

Finally, I chose to include the ziti activity as an extension activity to the lesson, rather than another main activity. Students may benefit more from spending more time focusing on the compare and contrast piece as opposed to the identifying locations of water, and building an understanding about the various components within each water location. The compare and contrast piece is often more difficult for students, and allows students to use more academic language, and promotes high level thinking. The identification of the water locations ziti activity can be used as a supplementary or review activity for students that demonstrate difficulty with understanding the pie chart in class. So while this is monitored throughout the lesson, the teacher can keep in mind any students that are having more difficulty with remembering the locations, and may especially benefit from the extra kinesthetic hands on practice.

Lesson 3

Lesson 3 Objectives and Performance Indicators

Content Objectives:	**Language Objectives:**
1) Classify forms of water waste and water conservation 2) Form, justify, and problem solve strategies to support their opinions about the issue of conserving water	1) Following a teacher read aloud and whole group discussion, students will orally classify and sort items into waste or conservation categories in small groups 2) a. Following small group discussion, students will independently write to sharing and justifying their opinion about conserving water, and propose problem solving strategies for this issue. b. orally share their written letters with a peer

Task	**5** **Nearly fluent**	**4** **Intermediate**	**3** **Speech emergent**	**2** **Early production**	**1** **Preproduction**
Speaking & listening: Classify/ identify	In small groups will identify and classify forms of water waste and water conservation by orally sharing generating complete and detailed sentences.	In small groups will identify and classify forms of water waste and water conservation by orally sharing generating complete short sentences.	In small groups will identify and classify forms of water waste and water conservation by orally sharing generating short sentences, using sentence starters provided and modeled on the board.	In small groups will identify and classify forms of water waste and water conservation by orally generating yes/no responses to paraprofessional prompting.	In small groups will identify and classify forms of water waste and water conservation by pointing to the correct category in response to teacher prompting.
Reading & Writing: form, justify, and problem solve opinions and issues of concern	State the importance of conserving water and ways to do that by writing at least 6 complete detailed sentences independently.	State the importance of conserving water and ways to do that by writing at least 5 complete short sentences independently.	State the importance of conserving water and ways to do that by writing at least 5 sentences by completing sentence starter frames.	State the importance of conserving water and 4 ways to do that by using a word bank to completing cloze sentences.	Share the importance of conserving water and 3 ways to do that by using pictures to complete sentences.

Functional Language Chart

Function	**Situation**	**Mohan's Knowledge Framework**	**Expressions**	**Words**	**Grammar**
Classify/ identify	Is this conserving or wasting water?	Knowledge framework: classification	This is ((1)) water.	(1) conserving wasting	Demonstrative pronouns
Form and justify opinions	Should we conserve water in our environment? Why or why not?	Knowledge structure: choice and evaluate	I believe we ((2)) help conserve water for our environment because ((3)).	(2) should should not (3) -we may run out -we need water to live -we can help our plants and animals -we can save energy by moving less water -we can save money	Negation Verbs Conjunctions Modals
Problem solve	How can we do this?	Knowledge structure: choice	We can help conserve water by ((4)).	(4) -turning off the water when brushing your teeth or washing your hands -taking a shower instead of a bath -flushing the toilet less -fixing leaks	Passives Verbs Present progressive

Water Cycle
Lesson #3

***Bolded print indicates additions or revisions from original lesson.**

Time Frame: 60 minutes

Resources and Materials: **The Magic School Bus at the Waterworks by Cole, J., & Degen, B. (1986), highlighters for students, brief National Geographic text "Conservation: Water" passage by Melissa McDaniel, water conservation sort activity, science notebooks,**

Vocabulary: Discuss supplementary terms informally, but explicitly before starting activity. Introduce by writing on the board, drawing a picture next to it, providing accompanied gestures, having the students repeat the word and conduct the gestures simultaneously. Explain each term, provide examples.

Conserve: to save, to protect (gesture: give yourself a hug and hold tight)

Leak: when water or liquid comes out when it is not supposed to (gestures, put finger tips together, and flick wrist from up to down to demonstrate water dripping, or if you have a sink in the room, just show the students the real thing)

1) Focus Activity: **Ask students to remind you of the water cycle stages along with the various locations and characteristics of water. Have students try to recognize them in the read aloud. Read The Magic School Bus at the Waterworks using animated gestures (see materials pages 51-52 for sample pages). Have students discuss how they identified the stages, etc., based on their previous learning to** review the processes that occur in the water cycle with the class. Ask and answer questions to check for understanding and provide feedback. **Guide discussion to have students think about the process of how water gets to our homes, as explained in the story. Ask students why they think Mrs. Frizzle tells her students to save water. Prompt them to think about what could happen if the water cycle stopped and there was no more precipitation. If there was no more rain, would we be able to collect freshwater? How would life be different without freshwater?**

2) Introduction: Explain that students **will learn about water conservation. They will discuss ways to conserve water and to waste water, and then write to share their opinion about conserving water with a friend, along with the reasons why we should or should not save water, and give them advice on how to help conserve water.**

3) **Assign students into small groups (group by proficiency levels). Tell students that like Mrs. Frizzle tells us there is only a certain amount of water available to us to use. Have them make predictions about how much water is actually available to us before reading to find out more about the availability of water by reading a short reading passage. Tell students that as they read, to highlight key information or main ideas in the text. Model on the board by writing the first sentence, reading and thinking out loud, and then highlighting just the words "water, remains the same" to remind them how to choose the essential information. Provide them with the differentiated text "Conservation: Water" (see materials pages 52-55). Have students read only the first 2 parts of the passage, taking turns reading in their groups.**

4) **After reading, make a class list of the ideas within the text. Have students from each group share information from the text regarding the problems with water (e.g. we have limited water, we need it to live, it can make plants and animals, or people sick if it is polluted, etc.). As you write the information on the board, draw quick pictures to support the concepts.**

5) **After all groups have shared, frame the main information (e.g. Idea should revolve around the statements that *There is only a limited amount of water available to people for things like drinking, cooking, washing, etc.* Be sure to slow down and enunciated speech when giving the essential information, including when using essential vocabulary.**

6) **Tell students you are going to make another list now, but this list is going to contain ideas on how to address the problem or prevent the problem of running out of water. Explain to students that since we use less water in showers than in bath tubs, (model and write) that "To help conserve water, we can take showers instead of baths". Have students repeat the statement after you model.**

7) **Have students think and share in their groups about possible ideas and thoughts they formed about water conservation using the sentence model on the board. They may use their science student journals to write or draw their ideas and thoughts. Have students read the final part of the text to see if their ideas match or if they learn new ideas to conserve water. Then call on volunteers to share their ideas or ideas from the text as you write them, and also draw quick pictures for the ideas.**

8) **To help check for understanding of water conservation versus water waste, have students stay in their small groups and complete the brief waste/conservation sorting activity (see materials pages 56-58). Provide them with an envelope of various words/pictures/sentences to classify into 2 groups (conserving and wasting water). Have them sort the items into the correct category. Monitor groups by walking around and assist as needed. When students are completed have volunteers come to the board to place an item into the correct category on the board.**

9) **Once everyone has a solid understanding of water conservation, prompt students to think about their personal thoughts about water conservation and the importance of it. Do not have them answer yet, but just think for a minute. Then, write on the board and model expressing your opinion by saying "I believe we should conserve water because it is important for our environment". Then demonstrate following the statement with a reason such as "It is important because plants, animals, and people all need water to live, so we do not want to run out of clean water. To help conserve water, we can fix leaks".**

10) **In their small groups, have students discuss whether they believe it is important to conserve water or not along with a list of reasons why or why not, referring to their text. They may also use their student science journals to write any or draw ideas and thoughts. Students should copy and use the model sentence as their guide. Go to each group to monitor (spending about 5 minutes with each group). Use instructional conversations techniques to encourage open conversation and to promote sharing students' idea. Use question and response strategies by simply affirming or repeating students' thoughts, and then facilitating turn taking by asking what other's think (e.g. So you think_____?, Do you mean_____? Tell me more about _____). Further questioning should also be differentiated based on the group level (e.g. L5&4: What do you think about water conservation and water waste?, L3: Tell me about how you think water pollution and water waste are similar. They both?, L2: Would you recommend we take shorter showers or longer showers?, L1: Show me something that could happen if we do not conserve water).**

11) **Once complete, have students contribute to a larger class list about their opinions while teacher writes them. Next to each concepts, draw quick pictures to enhance understanding.**

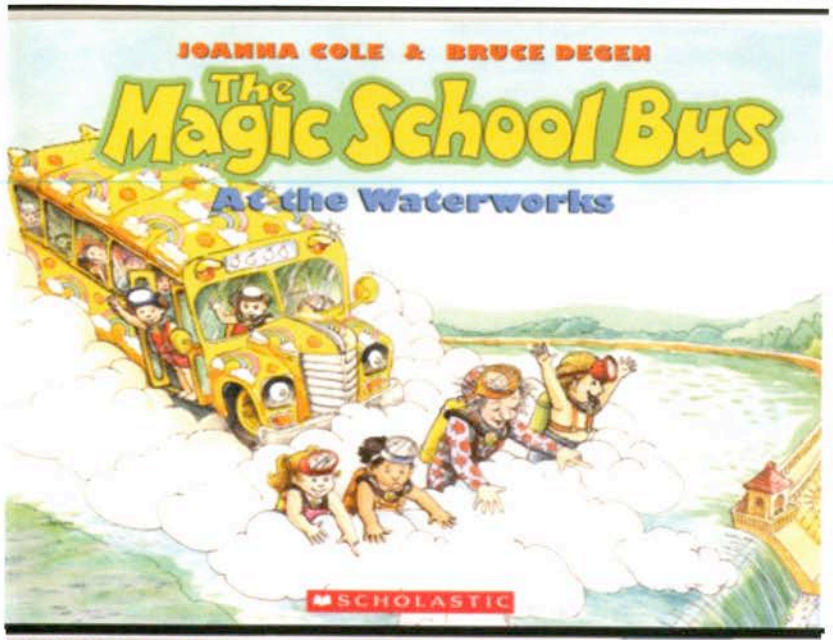
12) **Have students write their personal opinion about water conservation, providing reasons, and ideas to help conserve water using the organizers provided (see differentiated materials pages 59-63). Have students work independently, but continue to monitor and provide feedback as needed for writing assistance and error correction. When complete, have students share with a partner. Finally, in whole group have students volunteer to share their work with the class.**

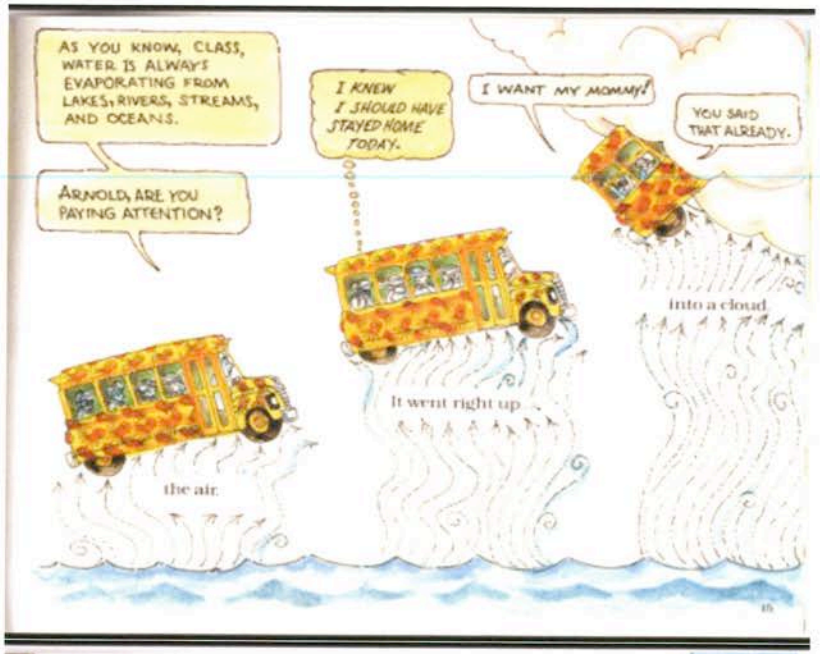
Closure: **Ask students to give a quick thumbs up or thumbs down to show if they agree with the last students' sharing about conserving water.** Ask how all the water on earth and in the atmosphere connected? **Be sure to refer back to the water cycle process and have students review how each cycle relates to how we save or use water (e.g. the collection stage allows us to store water).**

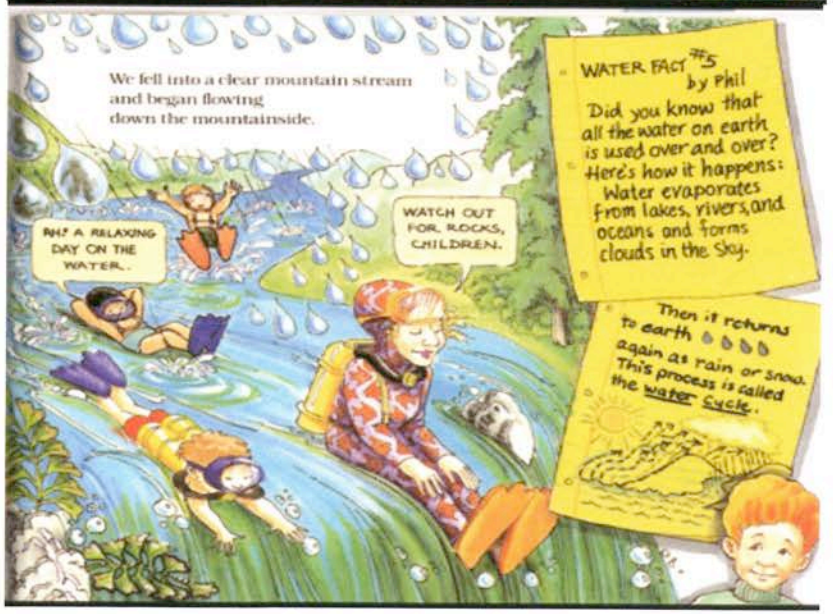
Assessment: Participation in class discussions and activities, **written opinion summary**

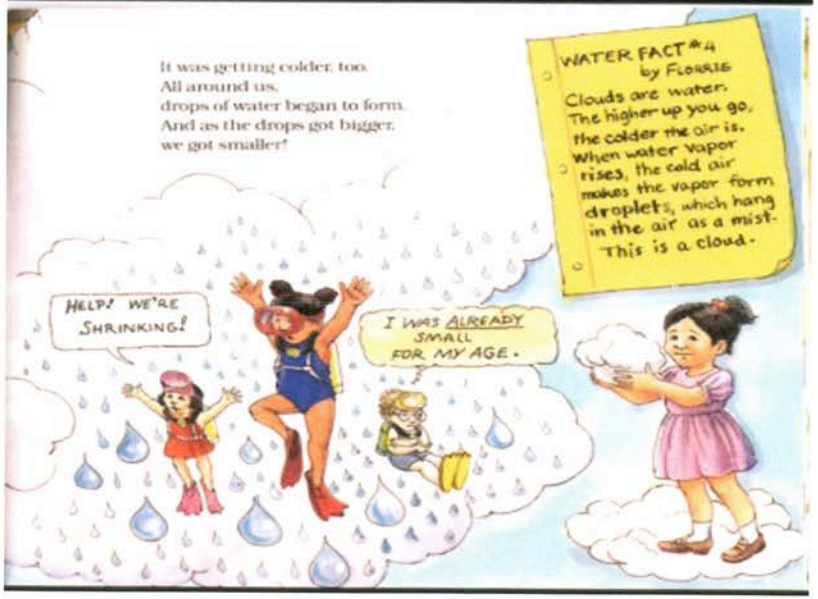
Extension: Have students write letters to their friends or family members to share their opinions using their organizers.

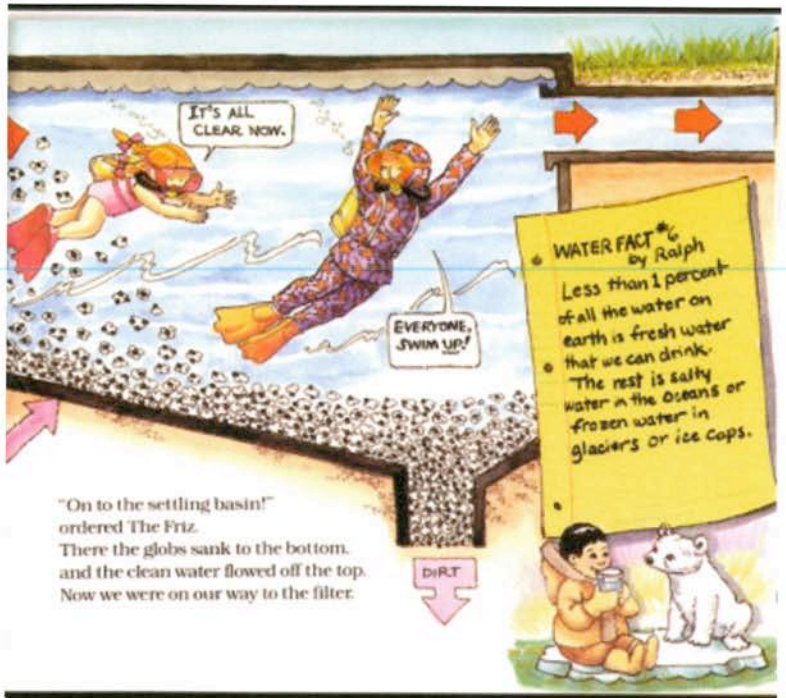
Teacher Read Aloud (No text modifications to book; add gestures, enunciation, and pointing, only)



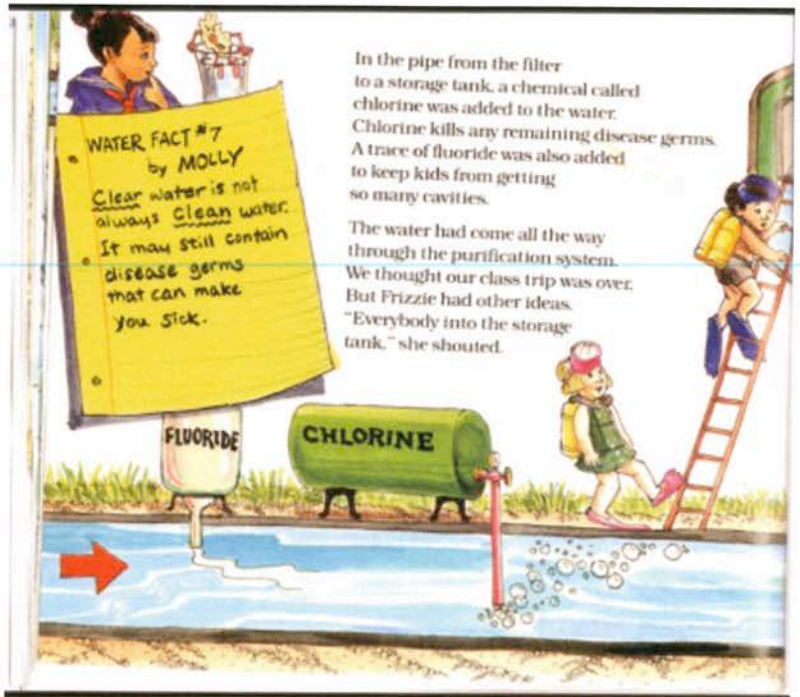






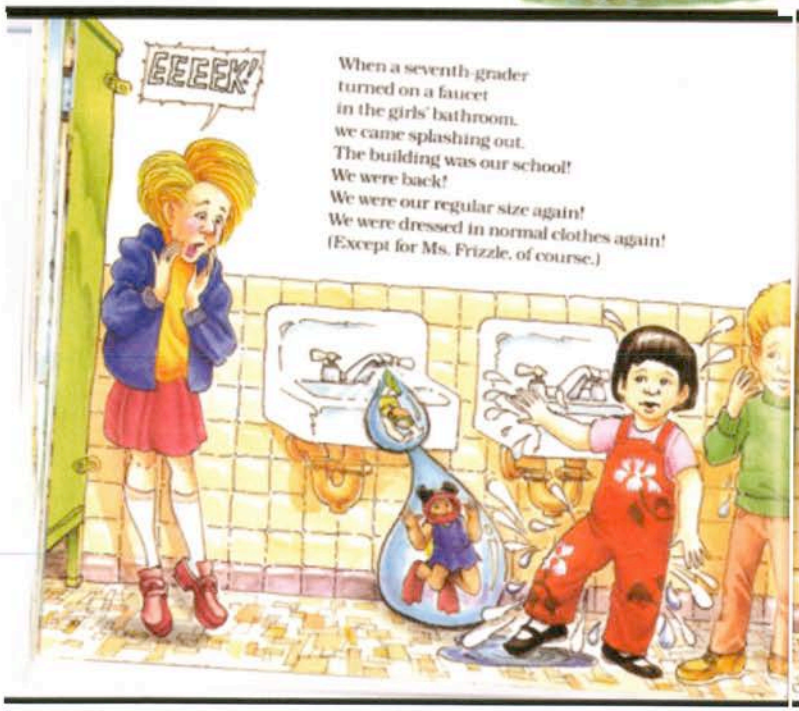


"On to the settling basin!" ordered The Friz. There the globs sank to the bottom, and the clean water flowed off the top. Now we were on our way to the filter.

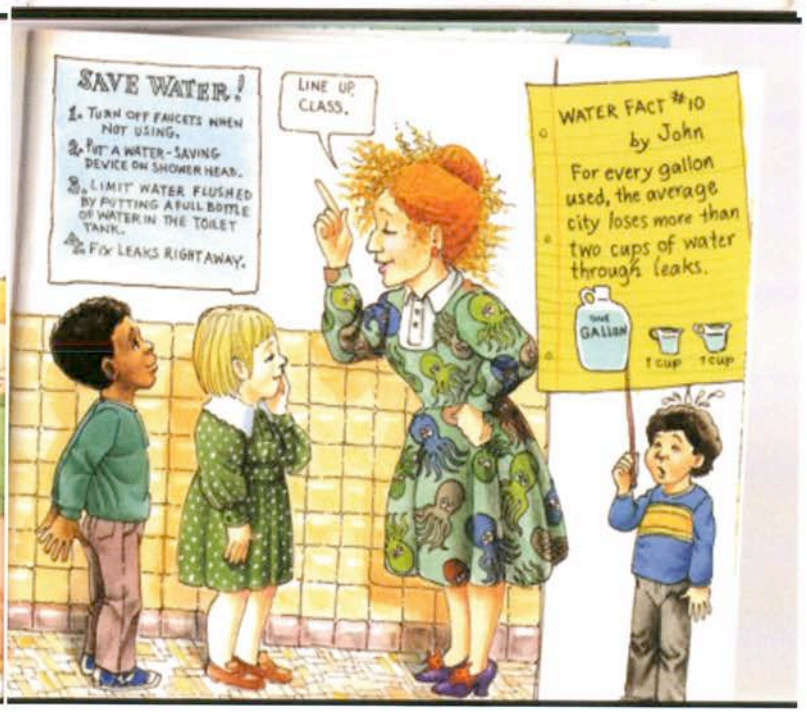


In the pipe from the filter to a storage tank, a chemical called chlorine was added to the water. Chlorine kills any remaining disease germs. A trace of fluoride was also added to keep kids from getting so many cavities.

The water had come all the way through the purification system. We thought our class trip was over. But Frizzie had other ideas. "Everybody into the storage tank," she shouted.



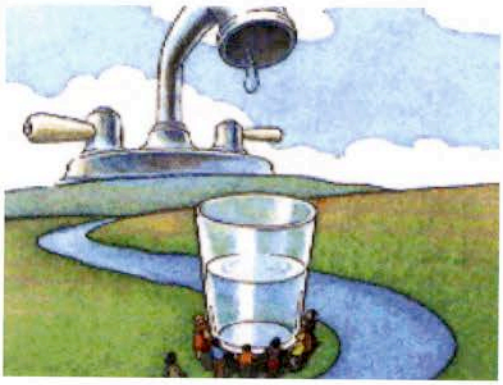
When a seventh-grader turned on a faucet in the girls' bathroom, we came splashing out. The building was our school! We were back! We were our regular size again! We were dressed in normal clothes again! (Except for Ms. Frizzle, of course.)



Level 5

National Geographic Conservation: Water

By: Melissa McDaniel



The amount of water on Earth always remains the same. However, most of the planet's water is unavailable for human use. While more than 70 percent of the Earth's surface is covered by water, only 2.5 percent of it is freshwater. Out of that freshwater, almost 70 percent is permanently frozen in the ice caps covering Antarctica and Greenland. Only about 1 percent of the freshwater on Earth is available for people to use for drinking, bathing, and irrigating crops.

People in many regions of the world suffer water shortages. These are caused by depletion of underground water sources known as aquifers, a lack of rainfall due to drought, or pollution of water supplies. The World Health Organization (WHO) estimates that 2.6 billion people lack adequate water sanitation. More than 5 million people die each year from diseases caused by using polluted water for drinking, cooking, or washing.

About one-third of Earth's population lives in areas that are experiencing water stress. Most of these areas are in developing countries.

Polluted water hurts the environment as well as people. For instance, agricultural runoff—the water that runs off of farmland—can contain fertilizers and pesticides. When this water gets into streams, rivers, and oceans, it can harm the organisms that live in or drink from those water sources.

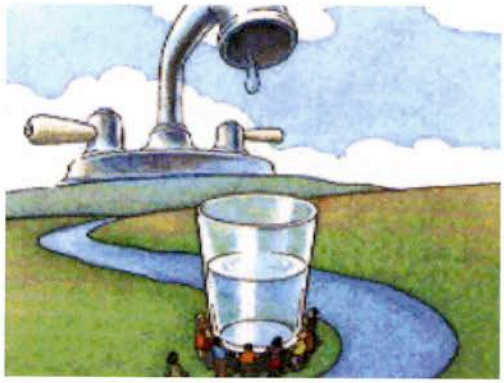
People can conserve and protect water supplies in many ways. Individuals can limit water use by fixing leaky faucets, taking shorter showers, planting drought-resistant plants, and buying low-water-use appliances. Governments, businesses, and nonprofit organizations can help developing countries build sanitation facilities.

Farmers can change some of their practices to reduce pollution. This includes limiting overgrazing, avoiding over-irrigation, and using alternatives to chemical pesticides whenever possible.

Level 4

National Geographic Conservation: Water

By: Melissa McDaniel



Our Water:

The amount of water on Earth always remains the same. However, most of the planet's water is unavailable for human use. While more than 70 percent of the Earth's surface is covered by water, only 2.5 percent of it is freshwater. Out of that freshwater, almost 70 percent is permanently frozen in the ice caps covering Antarctica and Greenland. Only about 1 percent of the freshwater on Earth is available for people to use for drinking, bathing, and irrigating crops.

Problems:

People in many regions of the world suffer water shortages. These are caused by depletion of underground water sources known as aquifers, a lack of rainfall due to drought, or pollution of water supplies. The World Health Organization (WHO) estimates that 2.6 billion people lack adequate water sanitation. More than 5 million people die each year from diseases caused by using polluted water for drinking, cooking, or washing.

About one-third of Earth's population lives in areas that are experiencing water stress. Most of these areas are in developing countries.

Polluted water hurts the environment as well as people. For instance, agricultural runoff—the water that runs off of farmland—can contain fertilizers and pesticides. When this water gets into streams, rivers, and oceans, it can harm the organisms that live in or drink from those water sources.

Ways We Can Help:

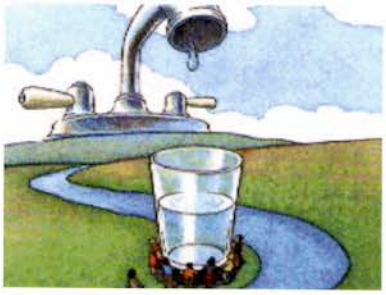
People can conserve and protect water supplies in many ways. Individuals can limit water use by fixing leaky faucets, taking shorter showers, planting drought-resistant plants, and buying low-water-use appliances. Governments, businesses, and nonprofit organizations can help developing countries build sanitation facilities.

Farmers can change some of their practices to reduce pollution. This includes limiting overgrazing, avoiding over-irrigation, and using alternatives to chemical pesticides whenever possible.

Level 3

National Geographic Conservation: Water

By: Melissa McDaniel



Our Water:
The amount of water on Earth always remains the same. However, most of the planet's water is unavailable for human use. While more than 70 percent of the Earth's surface is covered by water, only 2.5 percent of it is freshwater. Out of that freshwater, almost 70 percent is permanently frozen in the ice caps covering Antarctica and Greenland. Only about 1 percent of the freshwater on Earth is available for people to use for drinking, bathing, and irrigating crops.

Only 1 % of the freshwater is available for us to drink, wash in, and plant with.

The rest of the freshwater is frozen in Antarctica and Greenland.

Problems:
People in many regions of the world suffer water shortages. These are caused by depletion of underground water sources known as aquifers, a lack of rainfall due to drought, or pollution of water supplies. The World Health Organization (WHO) estimates that 2.6 billion people lack adequate water sanitation. More than 5 million people die each year from diseases caused by using polluted water for drinking, cooking, or washing.

About one-third of Earth's population lives in areas that are experiencing water stress. Most of these areas are in developing countries.

Polluted water hurts the environment as well as people. For instance, agricultural runoff—the water that runs off of farmland—can contain fertilizers and pesticides. When this water gets into streams, rivers, and oceans, it can harm the organisms that live in or drink from those water sources.

Some people do not have water because it is polluted, or because they do not have a lot of rainfall.
Over 5 million people die from using polluted water.

Polluted water can harm other organisms that live in our environment too, such as plants an animals.

Ways we Can Help:
People can conserve and protect water supplies in many ways. Individuals can limit water use by fixing leaky faucets, taking shorter showers, planting drought-resistant plants, and buying low-water-use appliances. Governments, businesses, and nonprofit organizations can help developing countries build sanitation facilities.

Farmers can change some of their practices to reduce pollution. This includes limiting overgrazing, avoiding over-irrigation, and using alternatives to chemical pesticides whenever possible.

We can conserve water by fixing leaky faucets or taking short showers.
Farmers can help by not using chemicals.

Level 2-1

National Geographic Conservation: Water

By: Melissa McDaniel

Water:

Freshwater for us to drink, wash in, and plant with =1%

Problems:

1) No rainfall  = no water

2) Some water is polluted

People get sick 

Plants get sick 

Animals get sick 

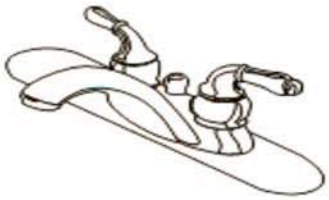
Help:

1) Fix leaks 

2) Shower fast 

Conserve

Sorting Activity Map (all levels)

 **Waste**	 **Conserve**

Sorting Cards

Level 4-5

I left the water running in the bath tub.	I left the water running while brushing my teeth.
I left the water running while looking in the mirror.	The water is running from the hose on the ground while dad washes the car.
The hose is leaking out and going on the ground.	I showered fast today.
I turned the water off while brushing teeth.	We fixed the leaking faucet.

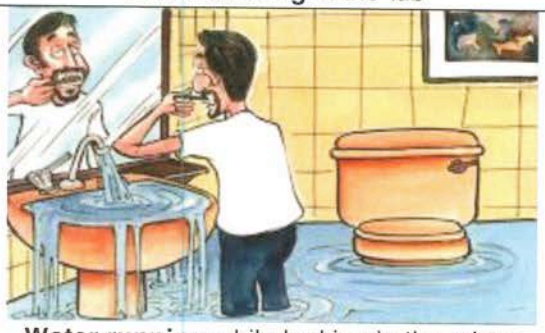
Level 3

Water running in the tub	Water running while brushing teeth
Water running while looking in the mirror	Water running from the hose
Hose leaking	Shower fast
Water off while brushing teeth	Fixing leaks

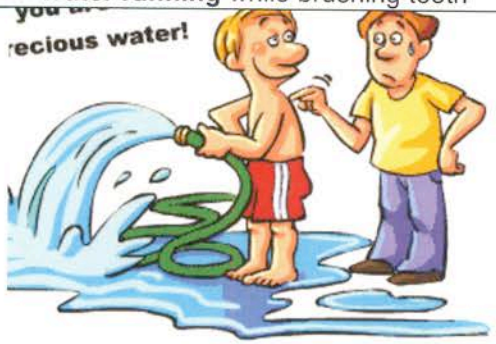
Level 1-2

Water running in the tub

Water running while brushing teeth



Water running while looking in the mirror



Water running from the hose

Hose **leaking**

Shower fast

Water off while brushing teeth

Fixing leaks

Level 4& 5

Write your opinion about the problem:	
Reasoning:	**Solutions:**

Level 3

Write your opinion about the problem:

We believe we _____.

Reasoning:	Solutions:
We believe we _____ _____ _____ because _____ _____ _____ _____ _____ _____ _____ _____	We can help to _____ by _____ _____ _____ _____ _____ _____ _____ _____

Level 2
Use the word bank on the attached page to help make your list.

Write your opinion about the problem:

We believe we should _____.

conserve water

not conserve water

Reasoning:

We believe we should _____

conserve water

not conserve water

because it is _____ for the environment.

good

bad

It is _____ because

good

bad

_____

_____

_____

_____

Solutions:

We can help to _____

conserve water

not conserve water

by _____

_____

_____

_____

Reasons Word Bank:		
We may run out of water	we can save energy	we will always have water
we do not need to help plants and animals	we can save money	we do not need to save money
We can help our plants and animals live	We need water to live	we do not need to save energy

Solutions word bank:		
Fixing leaky faucets	turning off water when brushing teeth	keeping water running when
Taking showers instead of baths	taking baths instead of showers	taking long showers
Taking short showers	flushing the toilet more	flushing the toilet less

Level 1

Opinion:

We believe we should _____.

conserve water not conserve water


Reasoning:

We believe we should _____

conserve water not conserve water


because it is _____ for the environment.

good bad

We may run out of _____.

gas water


We need clean _____ to live.

water dirt


We can save _____.

dirt money


Solutions:

We can help to _____.

conserve water not conserve water


We can _____.

turn water off leave water on


We can _____.

take showers take baths


We can _____.

keep leaks fix leaks


Narrative

The most evident change within this lesson was the focus. Rather than having students focus on writing a story about the water cycle, students were prompted to write a piece that prompted them to think about the importance of the water cycle. Since the previously revised lessons have been so dramatically revised to enhance the various components of the water cycle process and characteristics, I felt it was crucial to have students conceptualize and make their learning about the water cycle more meaningful by learning about the impacts of the water cycle on our environment and our survival. Therefore, the purpose of the lesson was to have students develop an opinion about water conservation, discussing forms of water conservation and suggestions to help conserve water.

However, with this revision, additional vocabulary terms were introduced, with various gestures, visuals, and examples. An additional reading passage was included as well. The additional reading passage, which was student text, was modified for proficiency levels. For example, the level one and two passages relied heavily on visuals to accompany text, and allow students to understand, while the level three passage used marked text to summarize each main paragraph for students. Level four text was more organized with headings, while level five text remained unrevised.

A word sort activity was included in this lesson to help check for understanding the concept of water conservation before moving on to more abstract thinking activities. The word sort activity is also modified for students so that level one and two students can rely on picture cues to understand the concept, while level three students rely more on phrases to access the activity. Similarly, the final written task is also modified for students. Proficiency level one students again, rely on pictures to understand the text and generate responses, while level two students are supported with a word bank to generate their responses, and level three is utilizing sentence starters.

A major focus of this lesson, is the emphasis of student interaction. Interaction is evident through whole group, small group, and in partners. Each interaction activity however, is set up so that the teacher is modeling

and providing the language to students first so students can use the models during their interactions. Students are also allowed to share their ideas through an instructional conversation model. The teacher and paraprofessional both rotate meeting with groups for approximately five minutes to encourage discussion of student ideas and opinions. Here, the adults are simply affirming what students share, and assist to clarify student input by posing more questions. Higher level questioning is used frequently throughout the lesson to help students create their own understanding and meaning of the concepts discussed within the water cycle. Students are asked questions that do not necessarily have a right or wrong answer, which eliminates fear of responding incorrectly, and opens up discussion without risk taking. Questioning strategies are also differentiated for various leveled students as well, similarly to within previous lessons.

Checklists

Appendix A

Grammar Chart

Grammar	Lessons
Present progressive	1,3
Time clauses	1
Auxiliary verbs	1, 2
Present tense	1, 2
Past tense	1
prepositions	2
nouns	1, 2
adjectives	2
conjunctions	1, 2,3
definite articles	1
simple tenses	1
sequence words	1
demonstrative pronouns	3
negation	3
verbs	3
modals	3
passives	3

Language Function Chart

Functions	Lessons
Predict	1
Describe	1,2
Identify	1,2
Label	2
Sequence	2
Compare and Contrast	2
Classify	3
Form opinion	3
Justify	3
Problem solve	3

Sheltered ELL Strategies Checklist

SHELTERED STRATEGIES	Lesson 1	Lesson 2	Lesson 3
I. Contextualize Lesson			
I. A. Build and Activate Background Knowledge	5	31	48
I.B. Develop Vocabulary	5	31	48
I. C. Use extensive Visuals, Realia, Manipulatives, & Gestures	5, 6	31,32	48
I. D. Model (Instructions, Processes)	6	31,32	48
I. E. Create Opportunities To Negotiate Meaning	6	32	48, 49
II. Make Text Comprehensible			
II.A. Intentional Use of Graphic Organizers	6	31, 32	49
II.B. Modify Written Text	5, 6	31,32	48
II.C. Amplify Number of Activities per Text	6	X	48
III. Make Talk Comprehensible			
III.A. Pace Teacher's Speech	6	31	48
III.B. Use of Listening Guides	X	31	X
III.C. Use of Word Walls	5	31	X
III.D. Frame Main Ideas	6	32	48
III.E.. Check for Understanding	6	31, 32	48,49
IV. Change Traditional Classroom Talk			
IV.A. Use Teacher Question and Response Strategies	5,6	32	48,
IV.B. Practice Instructional Conversations	X	X	49
V. Engage at Appropriate Language Proficiency Levels			
V.A. Vary Question Techniques based on Student's Language Proficiency level-- in conversations, activities, and assessments	5,6	31	48,
VI. Give Students Voice			
VI. A. Challenge students to produce extended academic talk	X	32	48
VI. B. Model Language for Oral and Written Production	X	32	48
VI. C Use Group/Pr. Work to Elicit Student Talk; Students as Researchers	6	X	48
VI. D. Respond to Student's Voice – Writing and Error Correction	6	31	49

Original Lessons

Melissa Mazzaro
Dr. Lorrie Stoops Verplaetse
FLA 518
July, 2015
Unit: Original

1. **The Water Cycle-Original Unit**

2. **Grade 3 Science**

3. **Content Based ESL Class**

4: Source of written reading materials: Cole, J., & Degen, B. (1986). The magic school bus at the waterworks. New York, NY: Scholastic

5. **Source of lesson:** Ari Wilder et al. MA Elementary schools

6. **Overarching Unit Learning Goals**

I want my students to know…..

- the different forms of water on our earth
- the different locations of water
- and describe the water cycle stages
- the importance of the water cycle and water conservation

Water Cycle
Lesson #1: Introduction to the Water Cycle

Time Frame: 60 minutes
Student will be able to:

1) Explain how water moves through the water cycle.
2) Form predictions about how the water cycle works, record observations, and develop conclusions about the water cycle.

Resources and Materials: Science notebooks,Plastic aquarium,Potting Soil,Small plastic container,Water, Plastic toys,Rocks from outside, Saran wrap,Masking tape,Heat lamp,Bag of ice,Hot plate,Metal pan,Ice cubes,Tongs,Glass beaker,Water cycle diagram student copies,

Vocabulary: *Please go over these terms before starting the activity*

Evaporation: water changes from a liquid to a gas; occurs more rapidly at warmer temperatures
Atmosphere: the gases the surround the earth
Condensation: water changes from a gas to a liquid; occurs when water vapor gets cold
Precipitation: water falling to the earth in the form of rain, hail, mist, sleet, or snow
Collection: water that falls as precipitation comes together in bodies of water such as oceans, rivers, lakes, and streams, or underground

Focus Activity: Ask the students to answer the following prompt in their science notebooks: Name things in nature that is made of water. Ask students to volunteer answers in order to compile a class list. The list may include oceans, rivers, streams, ponds, lakes, clouds, underground water, and water used and disposed of by humans.

Introduction: Tell the students that water moves from location to location. Ask the students to think about how the ground becomes wet after it rains. Where does that water come from, and where does it go? Explain that water from the clouds drops on the ground and then gets taken in (absorbed) by the ground. This is part of something called the water cycle. Feel free to use hand gestures, movement, or song when introducing the stages of the water cycle, as a memory aid.

Activity:

1) Place a large glass or plastic aquarium in front of the room. Ask for student volunteers to help you arrange the soil in the containers to make mountains, hills, and a lake basin. Fill the plastic container with water, and put it in the area designated as the lake basin. Surround the cup with soil. Plastic trees, sticks, leaves, rocks, etc., can be included to make the model more interesting. Cover the entire container tightly with plastic wrap and tape down the edges.
2) Evaporation and condensation should occur naturally but can be sped up by placing a bag of ice outside of the aquarium at one end and a heat lamp at the other end.
3) Ask students to make predictions about what will happen inside of the container. Students should write or make a drawing of their predictions in their science notebooks. It may help to review the idea of water changing from one state of matter to another during evaporation and condensation.
4) While students are waiting for evaporation and condensation to occur in the aquarium, present another model of the water cycle. Boil some water in a glass beaker on a hot plate. Ask the students to observe what happens to the water. What makes the water evaporate or boil?

   Teacher Explanation: When the water boils, it evaporates and becomes steam. Steam is the gaseous form of water, which has more heat energy than liquid water. Gas is less dense than liquid, so it rises.

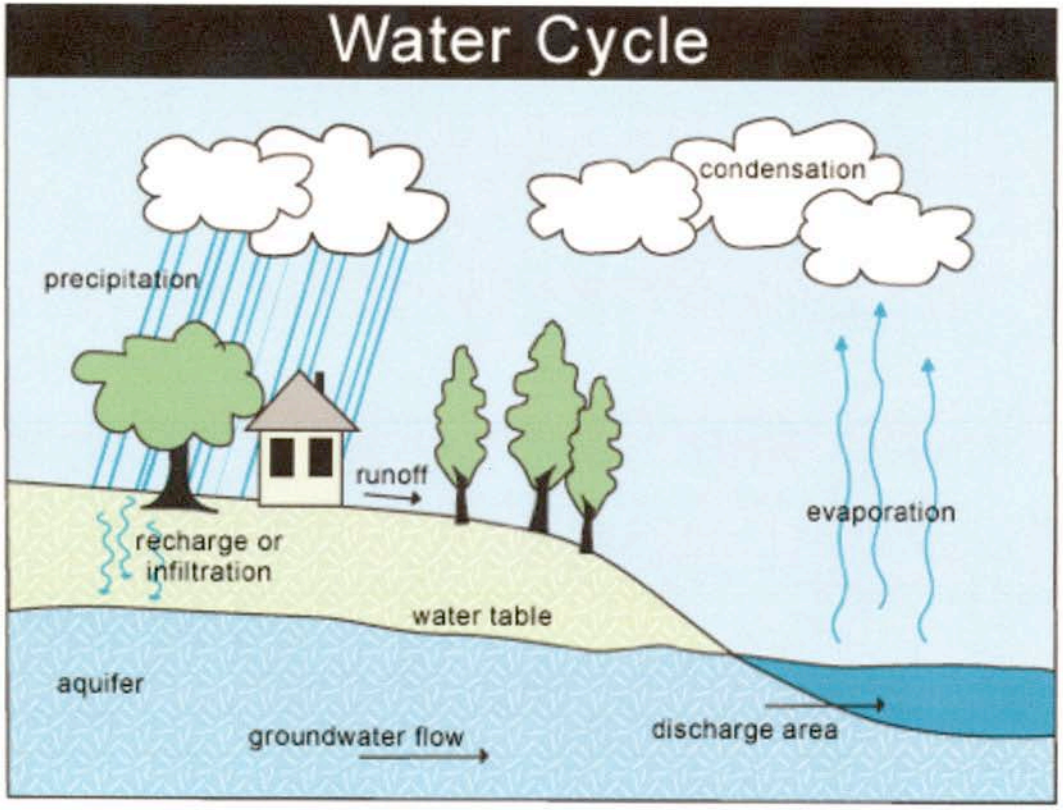
5) Hold a metal pan with ice cubes above the boiling water and ask students to watch what happens to the bottom of the pan. Why do water droplets collect on the bottom of the pan? Why does the steam turn back into a liquid on the metal plate?

   Teacher Explanation: Ice is the solid form of water, and it has a low level of heat energy, so it cools down the pan. When steam hits the pan, it cools down and loses heat energy, and it becomes a liquid in the form of water droplets. The process by which steam cools to become water is called condensation.

6) When the water starts to fall off the pan and back down into the beaker, explain that this is called precipitation. As time permits, draw a diagram of this model on the board and label the key parts and processes.
7) Watch for condensation on the top of the container and have students observe precipitation as the water falls to the ground. Ask the students to think about where the water from the sky is coming from. Review evaporation. Compare the results of this experiment with the student predictions.
8) Ask all of the students to make a drawing of the experiment with arrows showing the flow of the water in this set-up. For a more advanced diagram, students can label where evaporation, condensation, and precipitation occur in the experiment. Students should also write a few sentences describing how this model demonstrates how water moves on earth's surface and atmosphere. Use the color copies or overhead of the water cycle to discuss the water cycle in detail.

Closure: Discuss the following questions as a class: Does water in the ground end up in the atmosphere again? How? How does water change states in the water cycle?

Assessment: Science notebook responses, predictions, participation in class discussions


Water Cycle
condensation
precipitation
runoff
evaporation
recharge or
infiltration
water table
aquifer
groundwater flow
discharge area

Water Cycle
Lesson #2: Exploring the Water Cycle

Time Frame: 45-60 minutes
Student will be able to:

3) Explain how water moves through the water cycle.
4) Describe the processes and components of the water cycle including evaporation, condensation, precipitation, collection, run-off, infiltration (percolation), and ground water.

Resources and Materials: Science notebooks,Computers with internet

Vocabulary: *all students should know these terms from the previous lesson with the student teachers, but it is a good idea to review these before starting the activity*

Evaporation: water changes from a liquid to a gas; occurs more rapidly at warmer temperatures
Atmosphere: the gases the surround the earth
Condensation: water changes from a gas to a liquid; occurs when water vapor gets cold
Precipitation: water falling to the earth in the form of rain, hail, mist, sleet, or snow
Collection: water that falls as precipitation comes together in bodies of water such as oceans, rivers, lakes, and streams, or underground
Run-off: water that does not get absorbed by the ground
Infiltration (percolation): flow of water from the surface of the earth into the ground
Ground water: water under the surface of the ground, often in sand, soil, or gravel

Focus Activity: Ask students to draw or explain what happens to water when it gets hot and then when it gets colds in their science notebooks. Discuss these processes as a class and review the ideas of evaporation, condensation, and freezing.

Introduction: Review the features of the terrarium they made during the last class and discuss how the water in the pond evaporates, condenses at the top, and then falls back to the ground as precipitation. Explain that today the class will learn more about the water cycle using computers.

Activity:

1) Take the class to the computer lab or use computers in the classroom. This program will work on Macs or PCs. Use the following link to introduce the water cycle vocabulary with the students and talk about what it means for water to move in a cycle.

http://www.crickweb.co.uk/assets/resources/flash.php?&file=watercycle

2) Assist students in small groups or individually as needed while they learn about the water cycle. Reinforce the key concepts of evaporation, precipitation, condensation, and collection.

Closure: Discuss the water cycle as a class: What did students learn about the water cycle? How does the water move in a circle? What would happen to the water cycle if the sun stopped shining? Can humans run out of water? How?

Assessment: Science notebook responses, completion of the water cycle handout, participation in class discussions

Water Cycle
Lesson #3: Where is All the Water?

Time Frame: 45 minutes
Student will be able to:

5) Explain where all of the water in the world is found.
6) Discuss the importance of ground water and water conservation.

Resources and Materials: Science notebooks,Globe,Plastic globe ball of the earth,Ziti in bags (with 2 red and 1 green ziti),All the Water on Earth pie graph worksheet,

Focus Activity: Ask the students to answer the following prompt in their science notebooks: List all the ways you use freshwater every day. If students would like an example, ideas may include drinking, bathing, washing clothes and dishes, and watering plants and lawns.

Introduction: Show students the globe of the earth that is in their classroom. Ask a student to identify where they live on the globe. Then, play a game throwing the plastic globe ball around the room between the students. Students must catch the ball with both hands and then tell where their right thumb lands. If it lands on water, draw a tally for water on the board, and if it lands on land, draw a tally for land on the board. Do this enough times so that you can demonstrate that most of the earth is made up of ocean water. To ensure that every student gets a chance to participate, ask students to sit after they have caught the ball once. Tell students that today they will explore where all of the water on earth is found and how it can be used by humans.

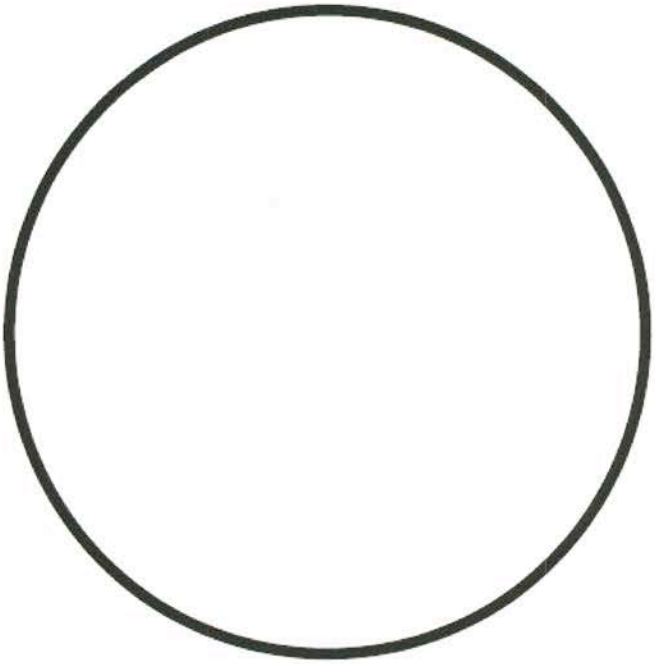
Activity:

1) Ask students if they know which bodies of water are saltwater and which are freshwater. Have they ever tasted saltwater?
2) Ask students if water is found in places other than on the surface of the globe. Students should remember from the water cycle that some water is underground and some is in the atmosphere. Explain that there is such a tiny amount of water in the air compared to other places that it will not be included in the following activity (0.001%).
3) Break the students up into small groups. Give each group a bag with ziti. Explain that there are 100 pieces of ziti and that they represent all of the water in the world (100%). Note: Each bag will contain two red ziti and one green ziti. Ask the students to think about percentages and discuss what the green and red ziti might represent. Discuss that the uncolored ziti represents all of the water that is in the oceans (97%). Show the students the globe again and refer to the ice caps on each pole and the mountains with snow. Explain that the red ziti represent all of the water in the ice found at the poles and in glaciers. Ask students what the final one green ziti represents. It represents all of the freshwater that is available for all of the plants, animals, and people on earth.
4) Lead a discussion about water conservation with the class. Why is it important to only use water that is needed? Is it possible that we could run out of freshwater? What are some things you can do to help save water (only use what is needed)? What other types of living things besides people need fresh water to survive?
5) As time permits, give each student a copy of the "All the Water on Earth" handout and explain that they will make a pie graph that represents all of the water in the world. Have the students construct, color, and label the graph (97% ocean, 2% glaciers and ice, and 1% fresh water).

Closure: Discuss the following questions as a class. Why is it important to conserve freshwater? What happens if a river or a lake becomes polluted? Can it still be used as a source of freshwater? Why is it important to keep our sources of freshwater clean?

Assessment: Science notebook responses, participation in class discussions and activities, All the Water on Earth pie graph worksheet

All the Water on Earth



Graph Key

- ☐ Salt water in oceans
- ☐ Fresh water in ice and glaciers
- ☐ Fresh water in the ground, lakes, rivers, and streams

Water Cycle
Lesson #4: Making a Terrarium

Time Frame: 45 minutes (and observations and discussions over time)
Student will be able to:

7) Design and construct an enclosed terrarium, make predictions, record results, and explain the processes that occur within the terrarium over time.

Resources and Materials: Science notebooks,Plastic 2 liter soda containers,Small gravel, Activated charcoal,Potting soil,Moss and/or other plants,Water,Clear packing tape,Terrarium kits,

Focus Activity: Ask students what a plant needs to survive. Students may write down their ideas in their science notebooks. Discuss the importance of sunlight, water, and air. Students may also talk about plants that need soil and nutrients.

Introduction: Explain that the students will all make a plant habitat, or a place for a plant to live with everything it needs to survive. This is called a terrarium, like an aquarium without water.

Activity:

1) Divide the students into pairs or groups of 3. Each group needs one 2-liter plastic soda bottle that can be sealed shut. Close the lid and cut off the top of the bottle (4-5 inches) so that students can access the inside. Tape the top of the bottle back on when the students are done making the terrarium.
2) Direct and assist the students to make their own terrariums. Explain all of the steps and procedure first and augment your explanation with a diagram on the board depicting what the completed terrarium (with all of the layers) should look like.
    a. Place ½ inch of small gravel on the bottom (for drainage).
    b. Sprinkle some activated charcoal on top of the gravel (aids with drainage).
    c. Add 2-3 inches of moistened potting soil (or more) depending on the size and type of plant being used. (Moss does not need much soil.) Add the moss or plants and leave plenty of room for them to grow. Add enough water to moisten the soil.
    d. Finally, students may add some sticks and rocks to the terrarium.
3) Assist the students in closing their terrariums. Use clear packing tape to attach the tops of the soda bottles back to the rest of the terrarium. Ask each pair of students to label their terrarium with their names and the date.
4) Ask the students to make a diagram of their terrarium in their science notebooks and make some predictions about what will happen over time. Ask the students to think about what a plant needs to survive and if the terrarium provides all of these things. Will the moss/plant need more water? What will happen to the moss/plant? (Note: If the soil gets too dry remove the top and water lightly. Often, a terrarium can be left for a month without watering.)
5) Place the terrariums in or near a window. Too much sun can kill the moss or plants. Observe the terrariums on a regular basis. Students can make diagrams in their science notebooks and discuss their observations and predictions with the class.
6) If time permits and if you choose, make another more complicated terrarium with the class as a demonstration. Terrarium and materials will come with set-up and care instructions.

Closure: Discuss the following questions throughout the observation and discussion of the terrariums: How did the water get on the lid and sides of the container? Where did this water come from? Why didn't we need to water the moss/plants? How did the terrarium demonstrate the water cycle? How did the terrarium function as a miniature model of what happens to water on earth and in the atmosphere?

Assessment: Science notebook responses, participation in class discussions and activities, observations, drawings, predictions, and conclusions about the terrariums

Water Cycle
Lesson #5: Creating a Water Cycle Story

Time Frame: 45-60 minutes
Student will be able to:

8) Create, describe, and diagram a story about a droplet of water going through the water cycle using appropriate vocabulary.

Resources and Materials: Science notebooks,Water cycle diagram, Water cycle story student copies,Colored pencils or markers, The Magic SchoolBus at the Waterworks by Cole, J., & Degen, B. (1986).

Vocabulary: evaporation, condensation, precipitation, run-off, infiltration (percolation), ground water

Focus Activity: Read The Magic SchoolBus at the Waterworks. Have students recognize the different water cycle stages within the story and discuss how they know. Refer to the color copies of the water cycle diagram from Lesson 1 of the Water Cycle unit. Review the processes that occur in the water cycle with the class. Ask questions to check for understanding and answer questions as necessary. Refer to the terrariums as mini-models of the water cycle.

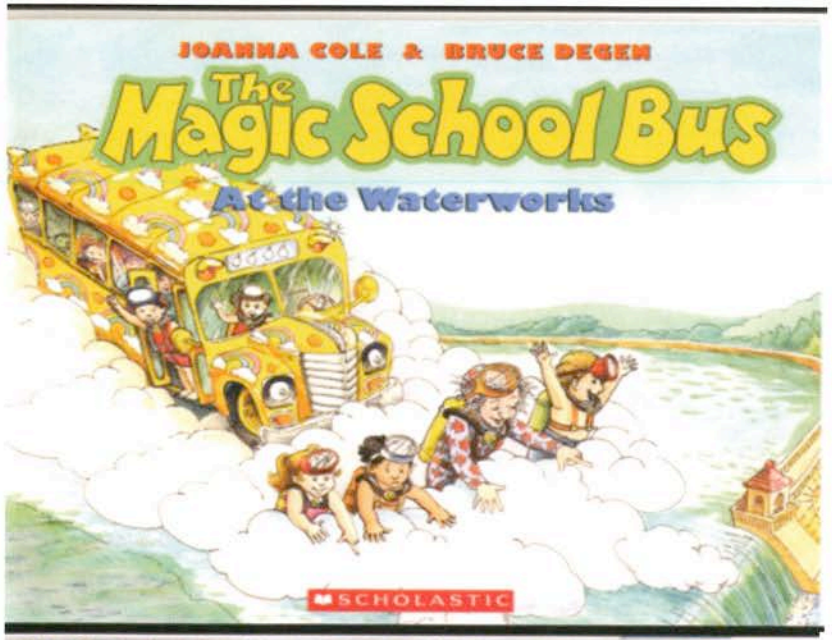
Introduction: Explain that students will imagine that they are a droplet of water in the water cycle. They will then write a story about their journey from one point in the water cycle through the entire cycle, using appropriate vocabulary, and color in a diagram demonstrating the path that the water droplet takes.

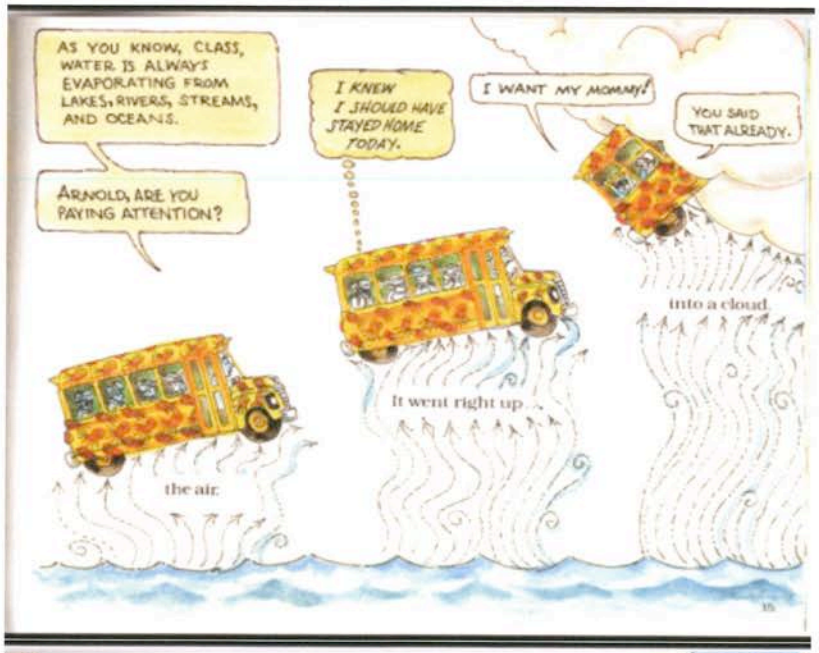
Activity:

1) Write the vocabulary listed above on the board and review the terms with the class. Provide definitions as necessary.
2) Give each student a water cycle story handout and review the directions for writing the story and completing the diagram.
3) Assist students when necessary as they choose a starting point for their water droplet and then describe at least three processes that take the water droplet to 3 other locations in the water cycle. Students will diagram, label, and number the path their water droplet takes using the picture of the water cycle on their handout.
4) Students who finish may make add more steps to the path of their water droplet or turn their story into a cartoon with specific diagrams for each step.

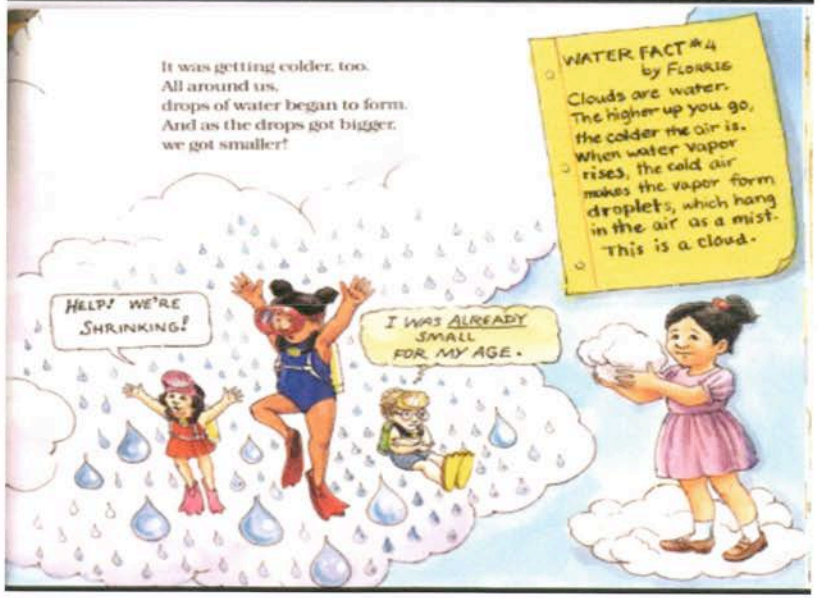
Closure: Ask students to show their water cycle stories with a partner and discuss the path of their water droplets. Discuss the following questions as a class: Does it matter that students chose to start in different places? Why or why not? Did most water droplets undergo similar processes? Why or why not? How is all the water on earth and in the atmosphere connected?

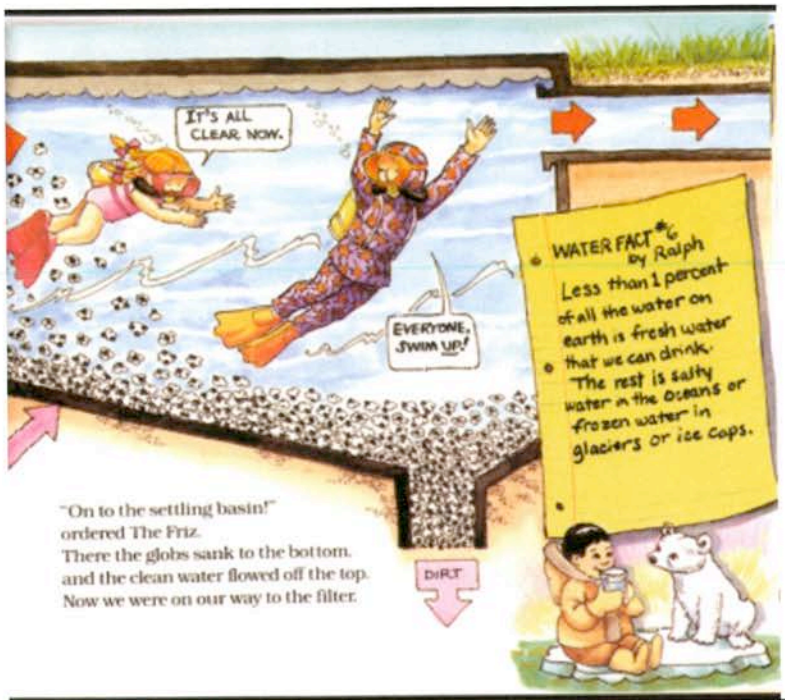
Assessment: Participation in class discussions and activities, completion of the water cycle story


JOANNA COLE & BRUCE DEGEN
The Magic School Bus
At the Waterworks
SCHOLASTIC

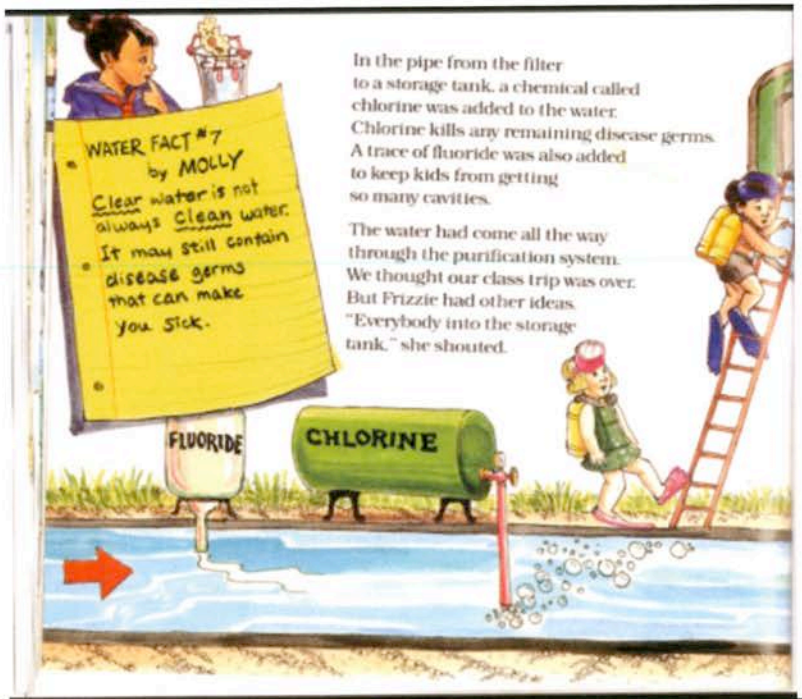

AS YOU KNOW, CLASS, WATER IS ALWAYS EVAPORATING FROM LAKES, RIVERS, STREAMS, AND OCEANS.
ARNOLD, ARE YOU PAYING ATTENTION?
I KNEW I SHOULD HAVE STAYED HOME TODAY.
I WANT MY MOMMY!
YOU SAID THAT ALREADY.
the air.
It went right up...
into a cloud.


We fell into a clear mountain stream and began flowing down the mountainside.
AH! A RELAXING DAY ON THE WATER.
WATCH OUT FOR ROCKS, CHILDREN.
WATER FACT #5 by Phil
Did you know that all the water on earth is used over and over? Here's how it happens: Water evaporates from lakes, rivers, and oceans and forms clouds in the sky.
Then it returns to earth again as rain or snow. This process is called the water cycle.


It was getting colder, too. All around us, drops of water began to form. And as the drops got bigger, we got smaller!
WATER FACT #4 by Florrie
Clouds are water. The higher up you go, the colder the air is. When water vapor rises, the cold air makes the vapor form droplets, which hang in the air as a mist. This is a cloud.
HELP! WE'RE SHRINKING!
I WAS ALREADY SMALL FOR MY AGE.



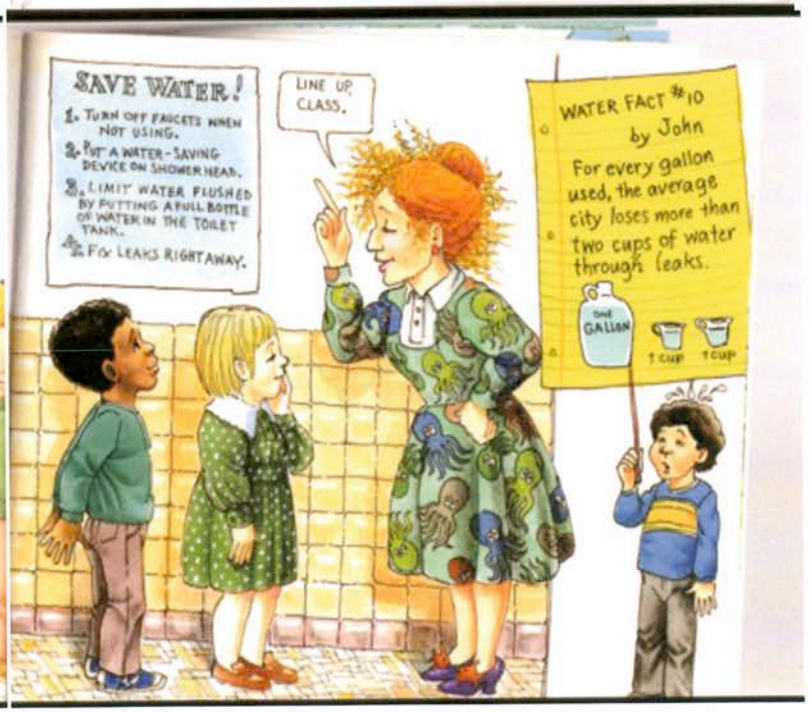
"On to the settling basin!" ordered The Friz.
There the globs sank to the bottom, and the clean water flowed off the top.
Now we were on our way to the filter.

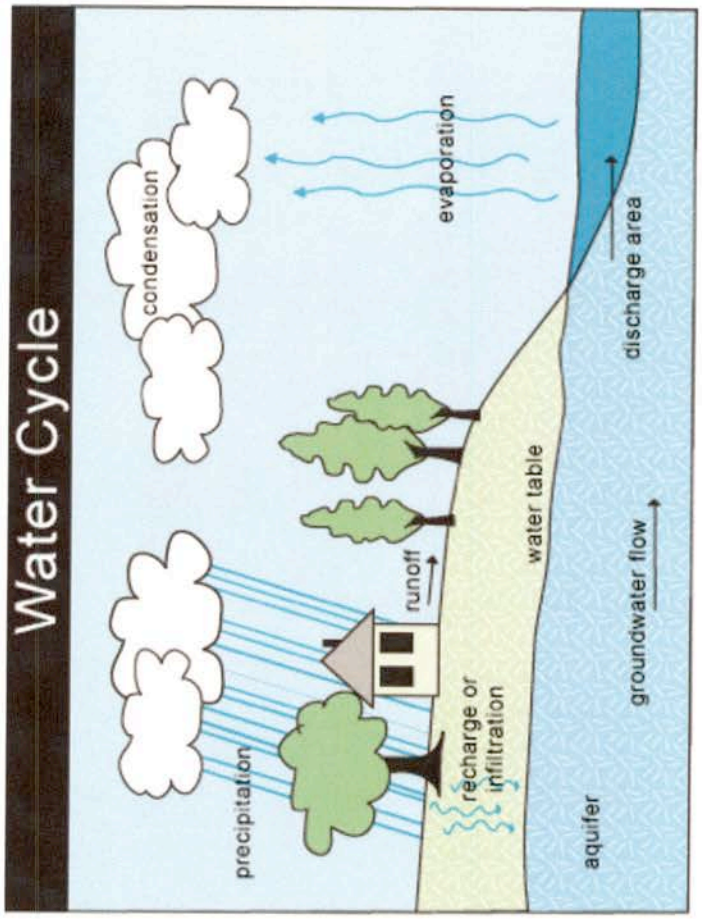


In the pipe from the filter to a storage tank, a chemical called chlorine was added to the water. Chlorine kills any remaining disease germs. A trace of fluoride was also added to keep kids from getting so many cavities.

The water had come all the way through the purification system. We thought our class trip was over. But Frizzie had other ideas. "Everybody into the storage tank," she shouted.

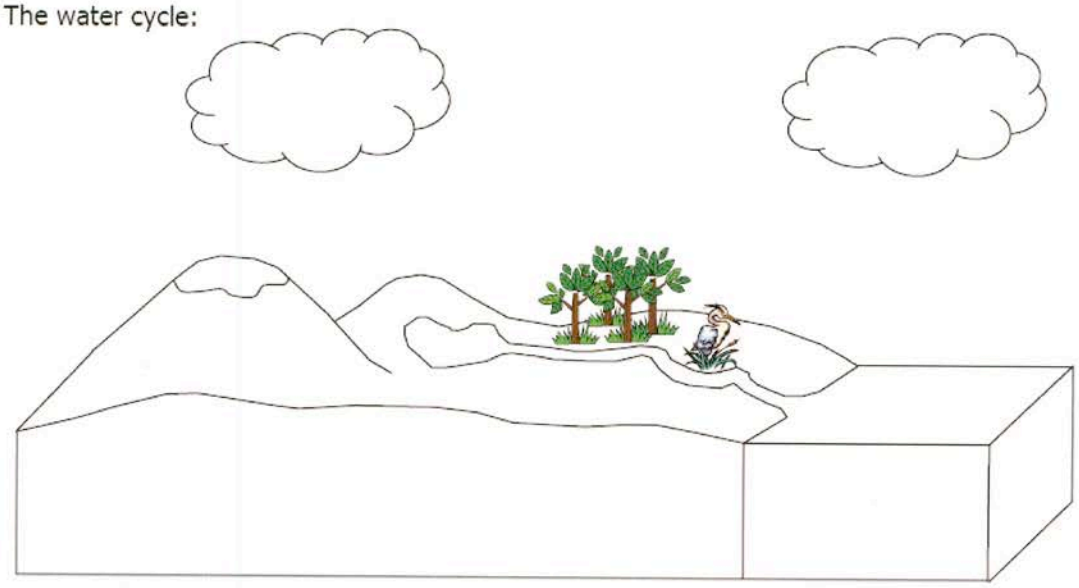
When a seventh-grader turned on a faucet in the girls' bathroom, we came splashing out.
The building was our school!
We were back!
We were our regular size again!
We were dressed in normal clothes again!
(Except for Ms. Frizzle, of course.)




Water Cycle
condensation
evaporation
precipitation
runoff
recharge or infiltration
water table
aquifer
groundwater flow
discharge area

The Water Cycle Story

The water cycle:



Vocabulary: water, solid, liquid, gas, evaporate (evaporation), condense (condensation), precipitation, collection, infiltration, ground water, run-off

Write a story about one droplet of water in the water cycle. Use the vocabulary words above. Your water droplet must go through at least 4 different locations. Then color, number, label, and add arrows to the diagram showing the path of your water droplet.

Start (#1): _____

Process: _____

_____

_____

Location #2: _____

Process: _____

_____

_____

Location #3: _____

Process: _____

_____

_____

End (#4): _____