ITQ ARTS AND SCIENCE INTEGRATION
GRADE 5
THEATRE AND EARTH SCIENCE

Help! I have the vapors, the water vapors!
Earth Science: Water Planet, Investigation 3 and 5
Lesson #2

CONTENT STANDARDS

Theatre Grade 5

1.1 Use the vocabulary of theatre, such as sense memory, script, cue, monologue, dialogue, protagonist, and antagonist, to describe theatrical experiences.

2.3 Collaborate as an actor, director, scriptwriter or technical artist in creating formal or informal theatrical performances.

Earth Science Grade 5

ES3b Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.

ES3c Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.

ESSENTIAL QUESTIONS *(Questions students might ask about the topic)*

- What do actors and directors do?
- What is water vapor and how does it change and move?
- What are the stages in the water cycle?
- How do actors and directors use a script?
- What happens to liquid water as the temperature changes?
- How does water move from place to place on Earth and in the atmosphere?

OBJECTIVES & STUDENT OUTCOMES *(Students will be able to…..)*

- create character and convey setting through gesture, posture and vocal expression.
- use voice to create mood.
- articulate how water can change from liquid to a vapor and back again.

ASSESSMENT (*Various strategies to evaluate effectiveness of instruction and student learning)*

- **Feedback for Teacher**
  - Scene Observation
  - Video of Classwork
  - Audio Tape
  - Readers Theatre Script with Student Stage Directions Marked
- **Feedback for Student**
  - Student/Teacher responses
  - Video of Classwork
  - Audio Tape

WORDS TO KNOW

Theatre Grade 5

- **Actor:** A person, male or female, who performs a role in a play or an entertainment.
- **Audience:** People who watch, listen and respond to live theatre.
- **Character:** The personality of part an actor recreates.
- **Characterization:** Portrayal of a personality through thought, action, dialogue, costuming, etc.
- **Director:** The person who oversees the entire process of staging a production.

- **Reader's Theatre:** A performance where actors read a script rather than working from memory.
- **Rehearsal:** Practice sessions where actors and technicians prepare for public performance.
- **Run-Through:** A rehearsal moving from start to finish without stopping for corrections.

Earth Science Grade 5

- **Cloud:** Tiny droplets of water, usually high in the air.
- **Cold Front:** The contact zone where a cold air mass overtakes a mass of warm, moist air.
- **Condensation:** The process by which water vapor changes into liquid water, usually on a surface.
- **Evaporate:** To change from liquid to gas.
- **Evaporation:** The process by which a liquid becomes a gas.
- **Fog:** Water droplets that condense from the air close to the ground.
- **Frost:** Frozen condensation.
- **Hurricane:** A severe tropical storm or moving wind system that rotates around an eye or center of low atmospheric pressure.
- **Ice:** The solid form of water.
- **Snow:** Precipitation in the form of ice crystals grouped together as snowflakes.
- **Thunderstorm:** Severe weather that results from cold air flowing under a warm, humid air mass over the land.
- **Tornado:** A rapidly rotating column of air that extends from a thunderstorm to the ground. Wind speeds can reach more than 400 kilometers per hour (250 mph) in a tornado.
- **Variable**:
- **Warm Front:** The contact zone where a warm air mass overtakes a cold air mass.
- **Water Cycle:** The global water-recycling system. Water evaporates from Earth's surface, goes into the atmosphere and condenses. It returns to Earth's surface as precipitation in a new location.
- **Water Vapor:** Water in its gas form.
- **Wind:** Air in motion.

MATERIALS

- "The Water Cycle Readers Theatre Script" (included)
- "Readers' Theater Script: Water Cycle Adventure" (included)
- "Readers' Theater Script: Water Cycle Adventure/Teacher Annotated Version" (included)
- Science notebooks (1 per student)

RESOURCES

- VAPA Core Learnings: http://www.sandi.net/204510720114515653/site/default.asp
- VAPA Grade 3 and 5 Theatre Lessons: http://tinyurl.com/theatrelessons
- *FOSS Kit California Edition Grade 5,* "Water Planet," Investigations 3 and 5
- Online improvisation lesson videos: http://www.ehow.com/video_4949233_improv-yes-lets.html
- The benefits of improv in addressing multiple intelligences web article. http://www.improvwarrior.com/benefits.html
- *Theatre Games for the Classroom*, Viola Spolin (available on Google Books at http://tinyurl.com/spolinbook)
- *Unscripted Learning, Using Improv Activites Across the K – 8 Curriculum,* Carrie Lobman and Matthew Lundquist
- *Structuring Drama Work, A Handbook of Available Forms in Theatre and Drama,* Jonothan Neelands and Tony Goode
- *An Usborne Introduction Acting and Theatre,* C. Evans and L. Smith
- Aaron Shepard's Readers Theatre Website: http://www.aaronshep.com/
- www.EnchantedLearning.com
- www.RosalindFlynn.com
- Video Camera

PREPARATION

- Review with the students the **actor's** three tools, voice, body, imagination.
- Remind students that **actors** need to warm-up their tools before rehearsing or performing. Lead actor's warm up from Lesson One.

WARM UP *(Engage students, access prior learning, review, hook or activity to focus the student for learning)*

(10 minutes)

- Assign each table grouping or student group of four a number one through nine.
- Tell students that each table/group is a **character** in a play that we are going to read aloud.
- *Say: Our class is going to perform a radio play. How is radio different from TV and film*? [the **audience** will not see it, they will only hear it] *Since the audience will not see the actors, it is important for actors to use their voices to create meaning and mood. Let's practice.*
- Have the students say the following words in a neutral tone:
  - Cold
  - Excited
  - Sad
  - Amazed
- Have students repeat the words in way that demonstrates the meaning of the word.
- Project "The **Water Cycle Readers Theatre** Script" on the overhead/screen so that all students can see it.
- *Say: **Actors** don't just jump into a performance. First they read through a script, research it and rehearse it. This is a script about something from your science studies, the **water cycle.** You've already researched the **water cycle** so let's read through this script and have a **rehearsal**. I'm going to be the **director** and organize how we perform this play.*
- Have students read the script aloud in a neutral way with each table/group reading the lines that correspond with their assigned number. Teacher reads aloud the stage directions and has students create the sound effects.
- Students read the play aloud a second time using appropriate vocal expression and sound effects.
- Remind students that they changed one of the **variables** of performance, their vocal quality. This change resulted in an entirely different feeling for the radio play.
- If time permits, read through the script a third time encouraging the students to add as much emotional emphasis to the dialogue as possible.
- Note: If possible, make an audio tape of both versions and play it back at a future time to the group for feedback/reflection.

MODELING *(Presentation of new material, demonstration of the process, direct instruction)*

(25 minutes)

- *Say: Today we are going to explore another script that is related to science. A script is a tool that **actors**, **directors** and other theatre professionals use to create a live performance. It is a procedural text. We are going to read a script out loud and analyze it the way an **actor** or **director** would.*
- Assign students to each role according to the cast list in "Readers' Theater Script: **Water Cycle** Adventure." The script is separated into three scenes. Each scene should have a different cast of actors.
- Project the script on the screen/overhead and have the student actors read through the script out loud while seated. This is called a first read-through.
  - As students read through the script refer to the Teacher Annotated script for guided questioning. During this portion of the lesson, students will be applying their science knowledge to the script. In theatre this called dramaturgy.

GUIDED PRACTICE *(Application of knowledge, problem solving, corrective feedback)*

(10 minutes)

- Tell students that they have just gone through the same process that professional **actors** go through

on the first day of **rehearsal**. Now they are going to explore the script a little more on their own while adding posture and gesture to help convey/show who their character is and how their character moves.

- Students sit in their scene grouping and read the script out loud. This time each **actor** stands up when they have a line. Encourage students to use appropriate vocal expression, posture and gestures.

DEBRIEF AND EVALUATE *(Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet outcomes?)*
(5 minutes)

- Tell students that today they learned about both theatre and science. They practiced their skills as **actors** and explored what they know about the **water cycle** in two different scripts.
- *Ask:*
  - *What happens to water so that it can float in the air?*
  - *What is **water vapor**?*
  - *What happens when **water vapor** gets cold?*
  - *How did the water in the play travel so far?*
  - *What does an **actor** do to prepare to put on a play?*
- Have students respond to the following prompt in their science notebooks:
  - *Explain how reading through the script in character help me understand the water cycle.*

The Water Cycle Readers Theatre Script
Developed with Dr. Rosalind M. Flynn by Mrs. Mowery's Class
Douglass High School * Oklahoma City, Oklahoma

1 Coming soon to a theatre near you
All [sound effect—scary movie theme music]
The Water Cycle!
2 Watch as water goes from
All Liquid [sound effect]
to gas [sound effect]
3 The process known as
All Evaporation.
4 Experience the rain, snow, and sleet that is
All Precipitation!
2 [Scream!]
1 And evaporation's reverse
All Condensation! [gesture]
5 Resulting in…
6 [whispered] Run-off!
All Not run-off!
6 Run-off!
1 The surface water that runs into your
7 Oceans
8 Ponds
9 and Rivers.
2 And don't forget run-off's archenemy,
3 the treacherous
4-9 Ground water!
All [sound effect—Gasp!]
8 Starring Hydrogen and Oxygen,
9 the dynamic duo known as
All H2O!
6 a.k.a. "Water."
1 A Nourishing Life Film…
All "The Water Cycle!"
7 [sound effect—evil laugh]

EnchantedLearning.com

Readers' Theater Script: Water Cycle Adventure

This 10-minute readers' theater play traces water in its never-ending cycle. Students read the script as they perform the play. Neither props nor scenery is necessary. There are 19 characters, but in a small class, students can easily play more than one part. The students could even write their own water cycle adventure.

Cast:		
Sun (3 students)		River water 1
Ocean water drop 1	Snowflake 1	River water 2
Ocean water drop 2	Snowflake 2	Reservoir water 1
Ocean water drop 3	Glacier ice 1	Reservoir water 2
Ocean water drop 4	Glacier ice 2	Tap water 1
Water vapor 1	Stream water 1	Tap water 2
Water vapor 2	Stream water 2	Water in drain pipe (2 students)
Cloud		Sewage processing plant (2 students)

Scene 1

The Sun: Our story starts in the ocean. We are watching two drops of water.

Ocean water drop 1: It's getting hot here in the ocean - I don't think I can swim any more. I'm feeling light and airy! I think the Sun's doing it to me.

The Sun: I can't help it - I'm hot and full of energy. That's what I do, and I do it so well, don't I?

Ocean water drop 2: Yes, you do, but I think I'm getting dizzy and there isn't even a whirlpool here. I'm feeling so strange! I think I'll just float for a while - no more swimming for me.

Ocean water drop 1: Uh oh! You're not floating in the water anymore, you're floating in the air - you're not a drop of water either - you're water vapor now.

Water Vapor 1: What's water vapor?

Water Vapor 2: It's water, but it's a gas. You've evaporated and turned into a gas - and so have I. Let's fly up high!

Water Vapor 1: I feel like joining the others and forming a crowd.

Water Vapor 2: I think you mean a **cloud**, not a crowd. Okay, let's condense.

Water Vapor 1: What does that mean?

Water Vapor 2: Condensing means that we'll change back into a liquid (water, of course). Then we'll be part of a **cloud**.

Cloud: Okay, now we're a beautiful, fluffy cloud. Let's fly over the land and watch the goats. Take a look at those beautiful mountains! But now I'm feeling heavy and cold. I think I'm going to snow!

Snowflake 1: Hey, what's got six arms and there's nothing exactly like it in the whole world?

Snowflake 2: Me - I'm so special. You, too, of course. We're both snowflakes. Hey, where are you going now?

Snowflake 1: I can't stop falling - you're falling too. But where are we going?

Snowflake 2: Down.

Snowflake 1: Thanks - I knew that. It looks like we're taking a trip to the mountains. I hope you know how to ski.

Snowflake 2: Well, it looks like we're stuck on a glacier - I wonder why they're called rivers of ice.

Glacier Ice 1: I'm getting crushed here. Now I'm ice - this is NOT my favorite part of the water cycle.

Glacier Ice 2: We're only moving at about one foot a year. This is going to be soooooo boring - it's a long way to the bottom.

Glacier Ice 1: You'd better get used to it, we're stuck on this glacier for a while.

Scene 2

The Sun: A long, long, long time later, two very bored drops of water emerge from the bottom of the glacier. I haven't been much help to them lately.

Stream water 1: Wow, I've finally melted!

Stream water 2: Me too - I'm free at last. What a change, we were practically standing still, and now we're shooting the rapids.

Stream water 1: Watch out for that rock! And that waterfall!

Stream water 2: Ouch! I've had enough of this. Can we go home now?

Stream water 1: We don't have a home. At least we're out of the mountains. The water's getting deeper. What's going on here?

River water 1: You can slow down now - we're in a river. And we're getting warmer.

River water 2: I like this. Not too fast and not too slow.

River water 1: Let's go down this side stream - it looks clear and clean.

Reservoir water 1: Okay. We're in a reservoir now - we'll be flowing through huge pipes soon - I've been here before.

Reservoir water 2: Here they are. It's dark and spooky in these pipes. How do we get out of here?

Reservoir water 1: Just go with the flow.

Tapwater 1: There's a light at the end of the tap - we're in a sink. Eew - that kid is brushing her teeth!

Tapwater 2: I hope she doesn't drink us - it's really weird when that happens.

Tapwater 2: Whew, that was a close call. Looks like we're whirlpooling down the drain. Hold your nose!

Water in drain pipe: More dark pipes - but these pipes are really smelly. We must be in the sewer under the city. Boy do I need to take a bath.

Sewage processing plant: I heard that. I'm a sewage processing plant. You've come to the right place. I'm so amazing that I can even give bath water a bath! Now you're all filtered and clean - just take that pipe to the sea.

Scene 3

Ocean water drop 1: We're finally back in the ocean. You know, I've done this trip a million times, and every time it's different.

Ocean water drop 2: I was well water in Washington once.

Ocean water drop 3: I was in a typhoon in Thailand twice.

Ocean water drop 4: I was rain in Rwanda.

Ocean water drop 1: I was snow in Siberia.

Ocean water drop 2: We've all been snow in Siberia. But I was in a puddle in Pakistan.

Ocean water drop 3: I was in a lake in Louisiana.

Ocean water drop 4: I was in a swamp in Switzerland.

Ocean water drop 1: There are no swamps in Switzerland. But a long, long time ago, I was sleet that fell on the snout of a T. rex.

Ocean water drop 2: Showoff. I rained on a plain in Spain, and I seeped through the soil. and went into a cave, and was groundwater for 500 years.

Ocean water drop 3: Boooorrrrrring.

Sun: Hi there! It's me again. Did you miss me? I know you did.

Ocean water drop 1: I feel so hot and dizzy!

Ocean water drop 2: Oh no, it's starting all over again!

Ocean water drop 4: I wonder where we'll go this time?

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*The script has been modified to suit a larger class size.

Teacher Annotated Script

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Ocean water drop 2: Yes, you do, but I think I'm getting dizzy and there isn't even a whirlpool here. I'm feeling so strange! I think I'll just float for a while - no more swimming for me.

What causes water to turn to vapor? *[Heat energy transfers to the water molecules. The water molecules move faster and bang into one another harder and knock molecules free and enter the air water vapor.]*

Ocean water drop 1: Uh oh! You're not floating in the water anymore, you're floating in the air - you're not a drop of water either - you're water vapor now.

Water Vapor 1: What's water vapor?

Water Vapor 2: It's water, but it's a gas. You've evaporated and turned into a gas - and so have I. Let's fly up high!

How does the temperature in the air affect how much water vapor is in the air? *[Warm air can hold more water vapor then cold.]*

Water Vapor 1: I feel like joining the others and forming a crowd.

Water Vapor 2: I think you mean a **cloud**, not a crowd. Okay, let's condense.

Water Vapor 1: What does that mean?

Water Vapor 2: Condensing means that we'll change back into a liquid (water, of course). Then we'll be part of a **cloud**.

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What happens to water vapors when the air gets cold? *[Water molecules move slower and start to stick together and make water liquid}*
What is that called? *[Condensation]*

Snowflake 1: Hey, what's got six arms and there's nothing exactly like it in the whole world?

Snowflake 2: Me - I'm so special. You, too, of course. We're both snowflakes. Hey, where are you going now?

Besides snowflakes, what else can water vapors that condense form? *[Rain, sleet, hail]*

Snowflake 1: I can't stop falling - you're falling too. But where are we going?

Snowflake 2: Down.

Snowflake 1: Thanks - I knew that. It looks like we're taking a trip to the mountains. I hope you know how to ski.

Snowflake 2: Well, it looks like we're stuck on a glacier - I wonder why they're called rivers of ice.

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