

Enchanted Circle Theater, Hitchcock Center for the Environment and Holyoke Public Schools present:

WEATHER:
An Integrated ARTS AND SCIENCE UNIT
for Grade 5



Developed collaboratively by Priscilla Kane Hellweg (Enchanted Circle Theater, teaching artist), Ted Watt (Hitchcock Center for the Environment, teacher/naturalist), and Dr. Helen L. Gibson (Holyoke Public School, science curriculum director).

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Weather: An Integrated Arts and Science Unit for Grades 3 - 5

"Science will...produce the data...,but never the full meaning. For perceiving real significance, we shall need...most of all the brains of poets (and) also those of artists, musicians, philosophers, historians, writers in general."

~ Lewis Thomas, Scientist.

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Post Assessment Questions on Weather Content

Theme #1: How Weather Impacts Our Lives

SUMMARY:

In this section, students will explore weather through the discipline of theater, using their own personal experiences as the reference point. They will participate in theater arts explorations where they "act out" weather related situations, discuss the impact of weather on their lives, and write a group poem about their experiences.

Objectives: Students will

- understand a variety of forms of weather
- be able to communicate with their bodies how weather impacts our lives, displaying self-control and expressiveness
- be able to communicate with words how weather impacts their daily lives

SCIENCE STANDARDS:

ES# 6, 7, 8, 9, 10, 11

ARTS STANDARDS:

1.9, 1.10, 1.11, 1.12, 1.13

3.6

5.5, 5.6, 5.7, 5.8, 5.9, 5.10

EXPERIENCING WEATHER: A Theater Arts WARM-UP

Notes:

This game helps students experience the effects of weather in the classroom through imagination and physical. It is a fun and easily engaging "acting" exercise that anyone can play. The game is based on the non-verbal, physical expression principals of pantomime.

Object of the game:

To explore different weather environments and walk through imaginary weather elements *as if* you are really there, showing how your body adjusts to changing situations.

Skills Development:

- ✚ Imagination and Expression
- ✚ Physical Discipline/Self Control
- ✚ Spatial Awareness
- ✚ Following Directions
- ✚ Non-Verbal Communication
- ✚ Observation
- ✚ Self Awareness within a Group

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Time Needed: 10-15 minutes

Room Set Up: Sitting/Standing in a Circle

How To Play:

This game can be played with all sorts of imaginative prompts, and can be played in a circle format. A circle is a contained space, which offers enough room to explore each walking pattern, and mini performance opportunities for participants to observe each other.

Have the group count off by fours so that they will take turns in their number group- ones will move as a group, and so on. Ask participants to walk across the circle, one group at a time, acting out what it's like to walk during different weather conditions. After crossing the circle, they take a spot on the other side. Before each group walks, suggest a different dramatic weather condition to walk through.

- ✚ Ask participants to explore walking through weather as if they are walking:
 - in a blustery snowstorm
 - on very slippery ice
 - through a scorching hot desert
 - in the pouring rain
 - in a windstorm at the beach, etc.

Coaching Hint: Ask students to walk across the circle with their groups starting at the same time, so they can respond to each other in the moment. To help them, say 1-2-3 GO.

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- ✚ If you'd like to extend the game, ask participants to experience walking on different surfaces:
 - on a hot sidewalk with bare feet
 - on a log in water
 - on pavement that's covered with worms after a rain, etc.

Be sure to come back together to discuss the experience. Some guiding questions might include:

- What did you have to do to be able to succeed at this exercise?
- Were some dramatic walk activities more challenging than others? Why?
- Were you able to use a memory to know what it's like to walk on ice, or did you need to invent the experience?
- Which of these activities have actually happened to you? Name other weather related conditions.
- Did you notice any of your friends acting skills? Who did something that was really convincing? What did they do?

ESSENTIAL QUESTIONS
about WEATHER -
A Group Writing Activity

A Step by Step Process

Facilitation Notes:

*You can write group poems with your students **WITHOUT TELLING THEM THEY ARE WRITING A POEM!** They will be amazed by what they've written when you read it back to them as if at a poetry reading. They'll take great pleasure from hearing their words, and their friends' words, read in a performed manner. More often than not, the reading will trigger responses such as. "Wow, that's good! We wrote that???"*

*Group poems are also a way of **assessing** what your students know, and what they are thinking about a subject. You can write a group poem at the start and the end of a unit, as a creative application of pre-and post assessment.*

*The process is simple- **AND** there are a few important key points to pay attention to.*

1. Set up flip chart paper and tell your students you'd like to interview them about what they know about "Weather". Tell them you're going to ask them a series of essential questions and write down their answers, to record their thoughts, so you want them to think about what they are saying!
2. Ask them "What is Weather? Tell me what you know about what causes weather to happen". Write down their responses, leaving a space at the top for the title of the poem (to be decided later!). Elicit *about 5* responses to the first question... AND if

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- you get a particularly thoughtful, evocative, or poetic response, move on to the next question.
3. Ask the question... "How does weather affect our earth? Does weather cause any temporary or permanent changes to the earth itself?" Write down their responses. If they need prompting, you can consider feeding them one idea. "What about mudslides?" Elicit about 5 responses to this question... AND if/when you get a particularly thoughtful, evocative, or poetic response, move on to the next question.
 4. Ask the question... "How does weather affect us? Can weather impact our personal lives in any temporary or permanent way?" Write down their responses. Elicit about 5 responses to this first question... and when you get a particularly thoughtful, evocative, or poetic response, move on to the final question.
 5. Ask them, "Who cares? Why should we care about weather??" Write down about 3 of their responses. Listen for a particularly strong, humorous, or poignant phrase that can be the final line of the poem.
 6. Once you feel you've come to the end of the writing portion of the activity- tell them you're going to recite their poem aloud to them. The set up for this is important. Change your seating, or stand up in front of them. Take a deep breath. Let them know you are taking their writing seriously. Having done that, recite their poem as if at a poetry reading performance, with focus, poise, presence and dramatic flair.
 7. Then ask them what they thought of their poem!
 8. Choosing a title can be done as a brainstorm activity. Ask students to collectively come up with 10 title choices, and then take a vote on which they like best. Allow each student to have three choices. Tally up the hands with each choice, and the one with the most votes wins.
 9. Finally, type it up and post it in your classroom, send it into the school newsletter, send it home to parents in a class letter, or turn it into note cards with their original artwork.

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The following is an example of a group poem written by 5th grade students in Holyoke. Notice the personal connections.

WEATHER HAPPENS - WHETHER YOU LIKE IT OR NOT

Rain, hail, snow, and slush
Terrible, miserable heat.
Windstorms, and sand storms,
heat waves, and lightening,
weather is a part of our lives.

It's always changing.
No two days are alike.
And it's different in different parts of the world.

Weather happens when the wind patters shift.
A cold front meets a warm front.
Clouds fill with water.
The seasons change.
Weather happens, whether you like it or not.

Weather hurts when it changes the land.
Mudslides down a mountain,
Cities ruined by floods,
farmer's crops dry when the rain disappears.

And people can be hurt too.
Hurricanes, Tornadoes, Tsunami Waves hit hard.
Pay attention. Read the news. Be prepared.
Weather happens, whether you like it or not.

WEATHER PANTOMIMES & SCENARIOS

Brief Description: In this lesson students pantomime how different forms of weather impact their lives. The student audience tries to guess what is happening in the skits and what kind of weather is involved.

Pantomime is a physical theater performance form, which to do well, takes years of training in precision movement. It is often taught at beginning acting classes, because it's a very accessible technique for developing self and spatial awareness. The absence of verbalization enables beginning actors to focus inwardly, enhancing their ability to concentrate on an external task. It can be practiced alone, with a partner, or in small groups.

Object of the Game: To communicate a physical action or activity by using gesture, expression, and movement, and without using words or props.

Skills Development:

- Observation and spatial awareness
- Focus and concentration
- Analysis of a physical action
- Creative thinking
- Imagination
- Non-verbal communication
- Cooperation

How to Lead the Activity:

1. Initiate a discussion with your students about the weather and why it's important. How does the weather affect our lives directly?

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2. Explain to students that they will work in groups to create a pantomime performance showing how we behave in different weather conditions and situations.
3. Divide your students into groups of 3 or 4.
4. Give student groups the pantomime scenario prompts that they are to act out.
5. Give students 15 minutes to create and rehearse their skits.
6. Gather the class together and organize presentations.
7. Have the student audience guess that is happening in the skits and emphasize that students are to hold their guesses until the skit is finished.

Weather impact skit prompts:

(See attached. Hand out one prompt per group.)

- Making a snowman when a blizzard starts
- Packing up a picnic when a downpour hits
- Standing in line in 95 degree heat waiting to get into Six Flags Water Park
- Driving your new car into a hail storm
- Working in the garden when a thunder and lightning storm hits.

(A RAINSTORM)

You're on a picnic with your friends and a *light drizzle* starts to happen. You decide it's not too bad, and continue eating. The *light drizzle* begins to turn into a *rain shower*. You decide to start packing up your picnic and it begins to *downpour* and a *heavy rainstorm* starts. You quickly throw together your things and run for cover!



(A HEATWAVE)

You are standing in line with your friends waiting to get into Six Flags Water Park. It's the middle of August and it's 94° outside. You're thirsty. The line is moving very slowly. Finally, you make it to the front of the line and get in!



(A HAIL STORM)

You are riding home in your Mom's new car.

The sky grows dark and *small hailstones*, the size of pebbles, begin to fall. It doesn't seem to be damaging your new car. Suddenly, the *wind begins to blow harder*, and *big hailstones*, the size of golf balls, start to pound the hood of the car. You come to a bridge and park the car under it to wait out the storm.



(A BLIZZARD)

You go outside with your friends to build a snowman. *Light snow flurries* are happening. As you are working on your snowman, the *temperature drops*, and the *wind kicks up*. A *blizzard* begins. You gather your things, and run inside, running into the wind! When you get inside you slam the door against the wind.



(A THUNDER & LIGHTNING STORM)

A group of friends are working outside in a garden. Someone is digging with a shovel and turning over the dirt. Someone is planting seeds. Someone is weeding and someone is watering. Suddenly the sky grows dark, a bolt of lightning is seen, and a loud clap of thunder is heard not too far away. You decide to hurry up and finish your work, before the storm reaches you. Then, there is another bolt of lightning and a loud clap of thunder. You all run for cover!



Theme #2: How Scientists Measure Weather

SUMMARY:

In this section, students will learn about several different weather instruments and various ways of measuring weather. They will participate in theater arts integration activities where they "act out" weather instruments, and practice using their bodies to communicate with self-control and expression.

Objectives: Students will

- understand that a variety of instruments exist to measure different weather conditions,
- be able to explain what the instruments are called and how they work in both words and physical expression,
- begin to relate the weather instruments to weather patterns locally.

SCIENCE STANDARDS:

ES# 6. 7. 8. 9. 10, 11

ARTS STANDARDS:

1.9, 1.10, 1.11, 1.12. 1.13

3.6

5.5, 5.6, 5.7, 5.8, 5.9, 5.10

LAST TREE STANDING

A theater arts warm-up or closing activity

Notes:

This game can be played it two ways. The first is really a challenge of self-control, and the other is a study of extremes while exploring the Beaufort Chart of Wind Force. Students love the physical challenge this game provides. This game works wonders for those youth who are noticeably in need of physical activity and engagement!

Object of the Game:

[Style A: The Warm-up.] To stand motionless to an observing eye for an agreed upon period of time, one to five minutes, in the position of a tree standing tall against the wind.

[Style B: The Closing Activity.] To stand strong as a tree, which can bend in the wind with its roots intact, as the intensity of wind gusts go from mild to extreme.

Skills Development:

- Concentration and focus
- Self control
- Imagination
- Intentionality
- Patience

Time Needed: 10 minutes

Materials Needed: A stop watch.

How To Play: Style A

- ✚ Invite the students to find a place to stand in the room where they will not be in close proximity to anyone else, but still be in clear view of you.
- ✚ Ask them to choose a type of tree that they like: a tall oak, a weeping willow, an old apple tree. *(In urban areas, you may need to describe the tree shapes or bring in pictures to give students an actual image to work with.)*
- ✚ Explain to them that you have a challenge for them - a really hard challenge. You're going to ask them to stay absolutely still, frozen in place for a full minute, which is probably longer than they're going to be comfortable with. *(The challenge part of this set up is really important. The more you challenge them, the more you'll motivate them to want to do it!)*
- ✚ You're going to ask them to take the shape of a tree. They should imagine they have roots that dig deep into the ground, and branches that reach up high into the sky.
- ✚ Let them know that you're going to time them with your stopwatch, and that anyone who moves during the timed minute will be asked to sit down. Set up the ground rules. Laughing = moving. Turning their heads to see where you are in the room = moving. Challenge

them to try this. *"Who has self-control? Who will be the last tree standing?"*

- ✚ Then begin by instruct them to get into the position of their tree. Encourage them to take a position they'll be able to hold- so they will set themselves up to succeed.
- ✚ Count backwards from five: 5-4-3-2-1 - start.
- ✚ Give them markers along the way, as you walk around the room, watching the standing trees. *"You've just completed 15 seconds. You have 45 to go."* Try to speak in a calming, supportive voice. *"... 35 seconds. You have 25 to go."* Encourage them to breathe. *"... 15 more seconds. 10-9-8-7-6-5-4-3-2-relax!"*
- ✚ The release in the room when they let down their arms and relax will be palpable. Give them a minute to enjoy their accomplishments—and then discuss what the experience was like.
- ✚ The first time you try this it will most likely be necessary to tap a few students on the shoulder, gently but firmly, to ask them to sit down. That's alright. It's important for them to be accountable.
- ✚ The conversation that follows is sure to be rich. I am always asked by students , *"Can we do this again? Let's do 2 minutes?"* I've seen whole classes of middle school students standing still for 5 minutes at a time.

They feel tremendous pride with this accomplishment, and rightly so.

Style B:

- ✚ Tell your students that you are going to call out the levels of wind force on the Beaufort Wind Scale (see attached) and that you want them to “show” the amount of force of the wind on them as trees.
- ✚ Explain to them that they can bend, but will not break (in our imaginary world), and that their feet must remain grounded as if rooted to the earth. Remind them that **YOUR VOICE** and the sound of the rattle are the only sounds you want to hear in the room. One of their challenges is to remain **SILENT!** In fact, the moment they laugh, or speak, they will be out of the game.
- ✚ Using a shakeree or rattle to simulate the sound of wind, call out the numbers from 1 - 9, giving them the mph, and a description of the force of the wind. Encourage them to remain a tree through the entire exercise.
- ✚ After 9... let them relax and talk them through the rest. Congratulate the Last Trees Standing and discuss the experience.

ARTS INTEGRATION ADAPTATION.

This game also works very well as a Predator and Prey game!

BEAUFORT WIND SCALE:

Beaufort*	Avg Miles per Hour	Knots	Surroundings
0 calm		0-1	Smoke rises vertically and the sea is mirror smooth
1 light air	1.2 - 3.0	1 - 3	Smoke moves slightly with breeze and shows direction of wind
2 light breeze	3.7 - 7.5	4 - 6	You can feel the breeze on your face and hear the leaves start to rustle
3 gentle breeze	8.0 - 12.5	7 - 10	Smoke will move horizontally and small branches start to sway. Wind extends a light flag
4 moderate	13.0 - 18.6	11 - 16	Loose dust or sand on the ground will move and larger branches will sway, loose paper blows
5 fresh breeze	19.3 - 25.0	17 - 21	Surface waves form of water and small trees sway
6 strong breeze	25.5 - 31.0	22 - 27	Trees begin to bend with the force of the wind and causes whistling in telephone wires. Some spray on the sea surface
7 moderate gale	32.0 - 38.0	28 - 33	Large trees sway. Moderate sea spray
8 fresh gale	39.0 - 46.0	34 - 40	Twigs break from trees, and long streaks of foam appear on the ocean
9 strong gale	47.0 - 55.0	41 - 47	Branches break from trees
10 whole gale	56.0 - 64.0	48 - 55	Trees are uprooted and the sea takes on a white appearance
11 storm	65.0 - 74.0	56 - 63	Widespread damage
12 hurricane	75+	64 +	Structural damage on land, and storm waves at sea

WEATHER INSTRUMENT INFORMATION

For Weather Instrument Charades

THERMOMETER

What it does: A thermometer measures something that we can't see but can definitely feel – how hot or cold something is, usually the air.

How it works: Thermometers use a temperature sensitive liquid (like mercury or alcohol) that expands when it's heated, and contracts when it's cooled, moving up and down inside a glass or plastic tube connected to a numeric scale. A thermometer can also work digitally with numeric readout windows. Temperature is measured in degrees and there are two commonly used scales: Fahrenheit and Celsius. 32° on the Fahrenheit scale is the same as 0° on the Celsius.

RAIN GAUGE

What it does: A rain gauge measures something that we can see - rain!

How it works: A rain gauge collects the rain in a tube. The tube has a scale that measures the depth of the rain that collects in the tube and it is measured in inches. If the tube is not a true cylinder then the scale needs to be adjusted to the shape of the tube. A rain gauge in our country measures rain in inches.

Five inches of rain is an extreme rain event for our region. A rain gauge is not very good at measuring snow because snow blows around so much.

ANEMOMETER

What it does: An anemometer measures something that we can't see but we can feel. It measures how fast the wind is blowing.

How it works: Part of the anemometer is exposed to the force of the wind. A scale translates the movement of the anemometer into numbers that tell you how fast the wind is blowing. Anemometers usually have little cups that twirl at a speed determined by the wind. Wind speed is measured in miles per hour.

WIND VANE

What it is: A wind vane is important in predicting weather because it tells what direction the wind is blowing and that tells you what direction the weather is coming from.

How it works: Wind vanes usually have an arrow that points to where the wind is coming FROM not TO. A well-made wind vane pivots on a vertical axis, with both sides of the arrow of equal weight but the tail of the arrow of greater surface area. Wind vanes usually have the directions of the compass at the base and that tells observers where North, South, East and West are. Wind direction is measured in degrees of the compass from 0 – 360.

ANEROID BAROMETER

What it does: This weather instrument measures something that we can't see: air pressure.

How it works: Air can be heavier at times and then lighter at other times. Big masses of air have the same pressure. Cold air means higher pressure and warm air means lower pressure. High pressure usually means good weather and low pressure often means rain or storms. When big air masses of different pressures collide, there is often a lot of wind and precipitation.

The barometer is operated by a metal cell that contains a very small amount of air inside it. Increased air pressure causes the sides of the cell to bend closer together. One side is fixed to the base of the instrument while the other is connected to a rotating pointer that moves over a number scale on the face of the instrument. This pointer is usually black. Air pressure is measured in units called atmospheres.

WEATHER INSTRUMENT CHARADES

Brief Description: In this lesson students learn information about various weather instruments and then work in groups to portray their instrument through narrated skit. Classmates in the audience will try and guess what the different instruments are and what they are designed to measure.

How to Lead the Activity:

1. Begin the lesson with a discussion of how meteorologists are able to predict the weather.
2. How do they gather information about conditions in different areas?
3. Can students name any weather instruments?
4. Explain to students that today they will be learning about different weather instruments. They will work in groups to act out what the instruments look like and how they work. Each skit will have a narration that accompanies it.
5. Divide the class into working groups.
 - Choose roles for each member of the group:
 - a. Performers
 - b. Musician(s)/sound effects technician(s)
 - c. Narrator(s) - the only speaking role
 - d. Chart artist(s) - to create a visual representation
 - e. Decide if you will have one director or will develop the piece as a group.
6. Give them 10 minutes to study their information and learn about their instrument. Instruct them to:

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- READ their information sheet and UNDERLINE the most important information on the page, including:
 - a. What it does and how it works.
 - b. What are the different parts of the weather instrument
 - c. What is the beginning, middle and end of the action.

- 7. Then, give them another 20 minutes to develop their script and skit to show what their instrument does. Discuss the job descriptions for each role in the group before they begin.
 - a. NARRATOR(S) write the definition and other interesting information down on paper, and then read aloud to the audience. Their words should be in synch to the action of the performers.
 - b. CHART ARTIST(S) draw the image on the chart to be used as a visual background for the performance.
 - c. PERFORMERS/DIRECTOR create the movements and action of the weather instrument skit. They'll need to work together as one instrument and remember their movements so they can perform it for the class at the of the activity!
 - d. MUSICIAN(S)- watch the performers and create the sound effects they'll need to bring the action to life.

- 8. Gather the class and orchestrate the presentations. Remind the audience to hold their guesses until a skit has ended. Tell the students they are going to:
 - PERFORM your creation for the other groups, and be audience for theirs.
 - RESPOND to each other with *positive* observations about creative choices that were memorable, clever, and interesting to watch!

Weather Instrument Charades Worksheet

Names of people in your group: _____

On this page write down what you want your Narrator to say during your skit. Remember to give hints about what your weather instrument does, but don't give it away. The other students will be trying to guess what kind of weather instrument you are acting out.

People use me to:

How I work – including any action words that describe my process:

Some of the parts that help me to do my job are:

I am a

(DON'T SAY IT! MAKE 'EM GUESS!)

Theme #3: Weather Patterns & Cloud Formations

SUMMARY:

In this section, students will learn about several different weather patterns and cloud formations. They will “act out” clouds and weather patterns, and practice using their bodies to communicate content knowledge with self-control and expression.

Objectives: Students will:

- understand be able to name, and communicate content knowledge about some of the major North American weather patterns,
- understand and be able to communicate verbally and physically different cloud formations and functions,
- be able to describe what these weather makers do and how they contribute to our daily and seasonal weather.

SCIENCE STANDARDS:

ES# 6, 7, 8, 9, 10, 11

ARTS STANDARDS:

1.9, 1.10, 1.11, 1.12. 1.13

3.6

5.5, 5.6, 5.7, 5.8, 5.9, 5.10

MOVING CLOUDS - A Theater Arts Warm-Up

Facilitation Notes:

We developed this game to help students learn cloud vocabulary and viscerally understand the distinction between cloud types by physicalizing the concept of each cloud formation. It can be used as a way to review the unit vocabulary, or as a catalyst at the start of the unit to introduce the cloud types.

Object of the game:

To explore clouds through a physical exploration of cloud types and formations

Skills Development:

- ✚ Imagination and Expression
- ✚ Physical Discipline/Self Control
- ✚ Spatial Awareness
- ✚ Following Directions
- ✚ Language articulations
- ✚ Non-Verbal Communication
- ✚ Observation
- ✚ Self Awareness within a Group

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Time Needed: 10 minutes

Room Set Up: Sitting in a Circle

How To Play:

1. Begin with a brief discussion on Cloud Types. (Stratus - Cumulus - Cirrus - Cumulonimbus, etc.) Name them, chart them and discuss characteristics.
2. As students are describing the various qualities of cloud types, watch their hands. Most likely they'll use them as a visual aide. For instance, as they describe Cirrus clouds their hands might wiggle in the air or create wispy, feather-like movements. Encourage the students to "show" the characteristics in their arms and hands, and to try to put those movements into words. Ask them if there are any sounds they could add to show the qualities of Cirrus clouds.
3. Explain that you are now going to pass the clouds one type at a time, from person to person, adding sound effects and descriptive words to help create the cloud-like experience.

CLOUD REFERENCING TIPS:

STRATUS	Sheets or layers of low gray clouds that cover all or most of the sky. Stratus clouds are often followed by light rain, light snow, or drizzle.
CIRRUS	Whispy, thin, feathery white clouds that form at much higher elevations than other clouds and suggest fair weather when appearing.

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CUMULUS	Puffy, white clouds that bulge out in all directions and change shape as they move. Cumulus clouds indicate fair weather.
CUMULONIMBUS	Also known as 'thunderheads', these clouds start as low cumulus clouds and grow into dark, towering mountainous clouds. Winds blow violently up and down in the clouds, causing heavy rain, thunder and lightening.

4. Begin leading with Stratus clouds. Extend your arms out in front, and extend out to the person to your right, creating layers of parallel moving arms. Send that low, flat, layered cloud around the circle to the right. As the cloud passes around the circle, coach the students with descriptive language and vocabulary.
5. When it comes back to you, change to Cirrus clouds, and talk them through that, noting the thin, wispy, feathery qualities of the cloud. Remind them of the height of the clouds in the atmosphere, as compared to the stratus cloud.
6. When it comes back to you, transform into Cumulus clouds, and then Cumulonimbus. See if you can engage them in creating a controlled storm of arm clouds and sound effects.

Weather Pattern Skits

Brief Description: In this lesson students will study some of the major weather makers in North America and design narrated skits to teach their classmates about these phenomena.

Objectives: Students will

- understand and be able to name some of the major North American weather patterns.
- be able to describe what these weather makers do and how they contribute to our daily and seasonal weather.

How to Lead the Activity:

1. Begin the lesson with a discussion of some of the major weather patterns in our area and across North America.
2. Explain that in this activity students will work in groups to act out some of our major weather patterns.
3. Pass out cards that name the weather pattern and explain what it is and what it does.
4. Show the class what props and percussion instruments are available to support the skits. These can be shared among groups since skits will happen sequentially.
5. Explain also that there should be a written narration to accompany each skit and that someone in the group should read the narration.
6. Allow students approximately 10 minutes to work in groups to read and discuss their weather pattern.
7. Give the groups approximately 15 minutes to create skits that explain the weather pattern and to write the accompanying narration.

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8. Gather the class together and organize group presentations.
9. Be sure that the groups inform their audience what the name of their weather pattern is.
10. Be sure to save time at the end to discuss each skit. Ask students to highlight moments they really liked, choices that caught their eye, moments they thought the actors did an especially good job with. Help the class understand the connection between the weather maker content and the playfulness of the skits.

Materials:

Paper and pencils for writing narrations

Weather Maker Handouts:

- Jet Stream
- Gulf Stream
- El Nino
- Warm Front/Cold Front
- Lake Effect Snow

Suggested Props:

- Fabric sheets,
- streamers of different colors,
- cut up fabric cloth of different colors

Suggested Percussion Instruments:

- Bells,
- Rain Sticks,
- Thunder drums,
- Wind pipes,
- Shakerees or maracas, etc.

WEATHER MAKERS:
Information on What Makes Weather Happen

Gulf Stream

The Gulf Stream is an ocean current. It flows in the Atlantic Ocean from the equator north along the coast of North America towards Greenland and Europe. It brings warm water from the tropics and the Caribbean up into the temperate and arctic areas of the Atlantic Ocean.

Since the Gulf Stream brings warmer water to the northern coasts of North America and Europe the weather in those areas is milder, too. If the Gulf Stream stopped flowing England, Iceland, Greenland and a lot of Canada could go into another ice age.

WEATHER MAKERS:
Information on What Makes Weather Happen

Jet Stream

The jet stream is a high elevation wind (almost 7 miles above the earth's surface). It moves like a big river of air. The air all moves in the same direction with very high winds, up to 250 miles per hour.

The jet stream doesn't blow directly on the surface of Earth, but it does affect which way the storms and air masses move closer to the Earth's surface. The jet stream blows from west to east across North America. The weather on Earth below the jet stream is controlled by where the jet stream is located. Parts of the jet stream bring cold air from the north down to warmer areas. Other parts of the jet stream bring warm air from the south up to colder areas.

WEATHER MAKERS:
Information on What Makes Weather Happen

La Niña and El Niño

La Nina is a weather cycle that happens in the Pacific Ocean between South America and Asia every 4 – 8 years. It includes both air and ocean currents. The winds usually blow from South America toward Asia. Winds push ocean water towards Asia making the water level slightly higher along the south Asia coasts than it is in South America. When the water is blown away from South America it causes cold water to flow up from the bottom of the Pacific off the coast of South America. *(This brings up nutrients from the deep Pacific and makes the waters healthy for lots of ocean creatures and fish.)*

Sometimes La Niña stops blowing and when this happens it is called El Niño. This changes the weather patterns all over the Pacific and even in North America. Asia receives less rain and South America receives more rain. The weather in North America is affected too with more rain and warmer weather when El Niño happens.

WEATHER MAKERS:
Information on What Makes Weather Happen

Warm Front/Cold Front

Air gathers in large masses, all of which is the same temperature and pressure. These masses of air move around the planet, sometimes slowly and sometimes quickly. When these air masses collide with each other, violent weather can occur. Since cold air is heavier than warm air, the cold air flows underneath the warm air and pushes the warm air up. Warm air holds more moisture than cold air. As the warm air is pushed up it starts to cool off and it can't hold as much water. The water drops out of the air as rain.

Thunder storms, lightning and tornadoes can all occur when air masses of different temperatures come together.

WEATHER MAKERS:
Information on What Makes Weather Happen

Lake Effect Snow

Big lakes can affect the weather of places around them. This happens especially in winter. Big lakes, such as the Great Lakes of North America, hold the heat better than the land around them. When winter winds blow across the lakes, the air picks up moisture from the lakes and carries it along to the land. When the air cools over the land, it drops the moisture over the land, usually in the form of snow.

Buffalo, Rochester, and other cities in New York and Pennsylvania can have a lot of snow because the wind usually blows across the Great Lakes toward these cities. One time a town near Buffalo, New York, received 466 inches of snow in one winter! That is over 38 feet of snow!!!

Weather Makers Worksheet

Name of your Weather Maker: _____

Names of people in your group: _____

On this page write down what you want your Narrator to say during your skit. This can be written as whole sentences or as single words that can be strung together like a poem.

DEFINITION

Action Words that describe what we do:

Ways that we affect weather:

Other interesting information:

We are:

PRE- AND POST ASSESSMENT:

Questions about Weather

- Name 3 different things that make up weather.
- Name 3 ways that weather affects the planet Earth.
- Name 3 ways that weather affects you.
- What do the following weather instruments measure?
 - Barometer:
 - Anemometer:
 - Thermometer:
 - Rain gauge:
 - Wind vane:
- What do the following terms mean and how does each affect our weather.
 - Jet Stream:
 - Gulf Stream:
 - El Nino/La Nina:
 - Warm Front/Cold Front:
 - Lake Effect Snow:
- What is the Beaufort Wind Scale and how does it work?
- How does theater in the classroom help you learn?