WEATHER IN THE WOODS

Second Grade –Rahr Memorial School Forest

ENDURING UNDERSTANDING

Changes in weather cause living things to adapt to their environment.

ASSESSMENT

Students will demonstrate their understanding by listing reasons why it important to know what the weather is/will be, describing how the weather affect living things (both plants and animals), and explaining ways to predict the weather.

WISCONSIN MODEL ACADEMIC STANDARDS

Math: D.4.1, D.4.3, D.4.4, E.4.1
Science: A.4.1, A.4.3, C.4.1, C.4.2, C.4.4, C.4.6, F.4.2, F.4.4
Social Studies: A.4.4, A.4.6
Environmental Education: A.4.1, A.4.2, A.4.3, A.4.4, B.4.6

CLASS OUTLINE

I. Set-up
II. Sample schedule
III. Introduction
IV. Plants and weather – **Hemlock Forest**
V. Humans and weather - **Beach**
VI. Evidence of weather – **Sand Dunes**
VII. Animals and weather – **Forest/Turkey Trail**
VIII. Conclusion
IX. Clean-up
Safety
Weather Words
Optional/Rainy Day Activities
Winter Weather Day Activities
Resources
School Forest Map

MATERIALS

Clipboards (1/student)
Data sheets (1/student)
Pencils (1/student)

Hemlock Forest

- photos of plants
- The Story of a Tree
- thermometers
- wind catchers
- pin wheel
- white board, marker, & eraser

Beach

- dial thermometers
- pin wheel
- wind catchers
- shipwrecks map
- white board, marker, & eraser
- Ships and Storms game materials

Sand Dunes

- "Cloud Dance" storybook
- bubbles
- compass
- thermometers
- pin wheel
- wind catchers
- rulers
- white board, marker, & eraser

Forest/Turkey Trail

- photos of animals
- thermometers
- pin wheel
- wind catchers
- animal pictures
- white board, marker, & eraser

CLASS PROCEDURES

I. Set-up

After reserving a date with the School Forest coordinator, teachers are also responsible for filling out and turning in a field trip request form. Teachers should also schedule a time when the School Forest Coordinator can meet with them at school to discuss the visit. Teachers will be asked to teach or co-teach one of the activities while the student groups rotate through the stations during the day. The School Forest coordinator may also help teach. Preparation time will be needed to review the activity.

All of the class materials needed for this day can be set-up at the School Forest. Please notify the School Forest Coordinator to have the materials prepared for you. Teachers will need to bring a few additional things from school: first aid kits, emergency contact information, extra clothing, and any additional activities they feel necessary for the class. Students will need to bring a bag lunch (with a drink and nothing that needs a microwave) and adequate clothing for the day.

II. Sample Schedule:

9:00	Depart from school
9:30	Arrive at School Forest
9:30 – 9:50	Welcome and introduction
9:50 – 10:45	rotation 1
10:50 – 11:45	rotation 2
11:45- 12:20	Lunch
12:20- 1:15	rotation 3
1:20 – 2:10	rotation 4
2:15 – 2:25	Conclusion
2:30	Depart from school forest
3:00	Arrive at school

III. Introduction

Explain an overview of the day for the students. Discuss guidelines for classes at the School Forest. Give a brief introduction to each of the classes and details about the data sheet that will be used throughout the day. Pass out the data sheets, clipboards, and pencils.

IV. Plants and Weather - Hemlock Forest

A. Hike and brainstorming

Take students to the hemlock forest. Ask them to pay attention to changes in the weather as they enter the forest. Does it get cooler or warmer? Is the hemlock forest darker than the other forests? Why? (thicker overstory)

B. Plants

Use the provided photos of plants to discuss how they change due to the weather.
Possible discussion questions:

How do plants change when the weather changes? Are there some plants that do not change? Why do some trees lose their leaves? (Because it would take too much energy to keep their leaves from freezing during the winter.)

Quietly listen to the forest. What do you hear? Can you hear the wind? Look at the tops of the trees. Is the wind different up there than down here? Why?

C. Be a tree

Ask the students to stand up and spread out. Instruct them to pretend they are a tree and act out its life as your read "The Story of a Tree." Once done, review how plants are affected by the weather.

D. Sun seekers scavenger hunt

Plants look for sun and now we are going to do a Sun Seekers Scavenger Hunt. Divide the students into small groups. Pass out a scavenger hunt card to each group. Discuss what the students find on their scavenger hunt. (You may want to skip this activity if it is not a sunny day.)

E. Data collection
Gather and record data on the log sheets.

V. Humans and Weather - Beach

A. Hike and brainstorming
Hike to the beach. Before reaching the beach, discuss behavior expectations (no touching the water, no throwing rocks, and everyone must stay together). Once at the beach, as a group, brainstorm how the weather might be different than other places at the School Forest. If it is too windy to talk with the students, move back up the trail into the shelter of the trees.
Possible discussion questions:
How do you know the wind is/was here? Look at the beach. How did the rocks get here? Look at the trees. Why are some bent? What if you were on a sailboat today? Would you feel safe? How about a smaller boat like a fishing boat? Or the car ferry?
Key observations to make are the waves, patterns in the sand, cast-up debris, and rock shapes.

B. Shipwrecks
Many ships have been lost in big lakes like Lake Michigan. Show the students the map of the shipwrecks in this area. Have a discussion of why wrecks might be there.

C. Ships and Storms game
Materials: 1 large distress flag, 36 small orange flags, 26 blue strips of material & possibly a whistle and/or small orange cones or items to mark the perimeter of the game area
*Good to use after showing the shipwreck map and/or discussing the Christmas tree ship book.
Some possible ideas for doing this activity ~please change as needed.
1. Introduce the large 3 foot by 3 foot aerial distress flag (in Ziploc) for boaters.
2. Discuss the word "distress" and what that might mean. Why it's the color (bright orange) that it is, why the real one would be made of plastic, etc.

Explain the game directions for Ships& Storms. {a modified version of freeze tag}
***VERY IMPORTANT: Tell the students the specific area where they will only be allowed to play this game. Put a large object (drift wood, parent volunteer, etc.) on the edges of the perimeter (specifically away from any water).

A. Tell the students the name of the game (Ships & Storms).
B. Show them the smaller, orange distress flags and pass them out to almost all the students. (They could 1st be passed out to those who like to go fishing, then those who enjoy going boating, anyone who would like to go sailing, etc. until all but maybe one or two have a distress flag. (Explain to them that they will also have an important job.)
The flag gets tucked in the student's back pocket –somewhere visible to others.
C. Hold up a blue strip of cloth and ask what this might represent in the game. (Yes, these students will be your Lake Michigan storms.)

D. ~The game starts with all the ships *walking around—like they were out on the water enjoying the beautiful weather and nature.

E. ~Next, let the "storm" students (with the blue cloth tucked into their pants

pocket or jacket pocket) begin their job. The storms try to tag the ships.

> If a storm tags A ship > it must stop (& freeze like ice) & holds its distress flag above its head with 1 or 2 hands
>
> For A ship to sail again ~another ship (Example: any other ship –we'll call 'B Ship' for direction purposes) needs to come and tag it. A ship then has to give B ship his/her distress flag (so now ship B may have 2 distress flags).
>
> If a storm tags A ship again > it must stop & freeze like ice BUT without a distress flag to hold up . . . it must SINK (sit down= if possible -right where the storm tagged it).

F. The game continues for a designated amount of time by the adult.

G. Gather the students back together and discuss what important ideas about humans & weather on/near Lake Michigan they can remember about this activity.

*Options: Play again. The students who were storms switch with a student who was a ship.
Another variation: Add more "fast" storms and discuss the results.

D. Us and weather
Discuss how weather affects our lives. What are you wearing today? Why? How did you know what to wear today? Would you wear the same thing if you came here in six months? Why not? What are some things you like to do that are affected by weather?

E. Data collection
Gather and record data on the log sheets using the equipment provided.

VI. Evidence of Weather - Sand Dunes

A. Evidence of Weather
Start inside and read "Cloud Dance" to the students. Then lead a discussion about evidence of weather. How can we tell what the weather is like by looking out the window? Once we are outside, what can we look for to tell us what the weather has been like?

B. The Story of the School Forest Dunes
Hike to the sand dunes. Discuss how the weather has changed this area into what it is today. Tell the story of the School Forest Sand Dunes.

A long time ago, a farmer owned the area that we now call the Sand Dunes. The farmer wanted to raise sheep but there were trees growing in the area. What do sheep eat? Grass. How could the farmer raise sheep in an area without grass? He can't, so the farmer cut down the trees so the grass would grow. As the sheep ate the plants, the ground was left exposed. As time went by, the wind blew the sandy soil and made the large dunes that we now have.

As plants have slowly begun growing back into the dunes, the forest may start to close in on it again. What may keep the plants from growing? Groups of people using the area have kept parts of the dunes free of grasses and shrubs. Think about how weather has affected this area.

C. Which way is the wind blowing
Have the students blow bubbles to see which way the wind is going. Use a compass to determine if it is going north, east, south, or west.

D. Evidence and predictions
Look around you. What evidence of weather do you see?

Lay on your backs and look at the clouds. Describe the clouds. Are they moving? Which way? What colors are the clouds? What types of clouds are they?

Now that we have studied the weather, can you make a prediction of what the weather will be like tomorrow?

E. Data collection
Gather and record data on the log sheets about the weather in this area of the School Forest.

VII. **Animals and Weather - Forest/Turkey Trail** (south of Lodge)

A. Animal's perspective
Use the photos of different animals in a discussion about how animals deal with the cold. To give the students a new perspective on how an animal lives, ask the students to lie on their stomachs for a rabbit's view. Now, ask them to sit for a fox's perspective. And then, stand for a deer's view of the world. Which animal would they rather be when it is cold? Rainy? Snowing? Windy? Hot and sunny?

B. Animal charades
This activity focuses on things different animals do because of the weather.

Divide the class into small groups. Hand each group an Animal Card. Now the students need to plan a charade they can do for the group. They should not say what their animal is called, just act out the clues listed on the card for the group. Then the group can try to guess what type of animal they are acting out.

C. Data collection
Gather and record data on the log sheets about the weather in this area of the School Forest.

VIII. Conclusion

Discuss the day with the students. Talk about what they learned and found interesting. Did the weather change in different areas of the School Forest? Show a map of the School Forest and point out the different areas that the students took measurements.

IX. Clean-up

- Return supplies to building
- Take garbage out to dumpster
- Close windows, shut off all lights, turn off water, lock doors, shut driveway gate
- Give the School Forest Coordinator feedback on how to make this trip better in the future.

Safety

While at the School Forest, teachers should carry first aid kits. You can bring these from your school or use the ones at the School Forest. The first aid stations can be found in the Ehlert Lodge office and the upstairs of the Krejcarek Building. Please report any safety issues to the School Forest Coordinator.

Students should be supervised at all times. If you decide to go off trail, go in a clear area where branches cannot swing back and hit someone. Be aware of the plants you are traveling around so as not to pass by thorn covered plants.

Weather Words

Animal	Forest	Plants	Temperature
Balloon	Frozen	Pond	Thermometer
Beach	Ground	Raccoon	Tracks
Bird	Gusts	Rainy	Waves
Branches	Hibernate	Sand dunes	Warm
Breeze	Higher	Shelter	Weather
Burrow	Icy	Smooth	Windy
Cold	Layers	Spring	Winter
Deer	Lower	Squirrel	Woodchuck
Degrees	Migrate	Summer	
Fall	Patterns	Sunny	

Optional Activities

Rain measurements: use cups to collect the rain in different areas. Measure the amount of rain collected using graduated cylinders. Compare the amount of rain collected in the different areas. Make a bar graph of the data.

Winter Weather Day - Additions and Changes

If it is very cold, start your class indoors and then go outside to collect the weather data. If the trails have deep snow on them the stations can be set-up indoors and then travel to the teaching areas. If desired, the actual weather data could be collected at one station and the other stations can concentrate on their topic of study.

Additional materials: winter weed books, bowls, magnifying glasses, black (laminated) paper, white paper, crayons

Hemlock Forest (Plants and weather)

Trees – deciduous vs. evergreen

Winter is a wonderful time to discuss the difference between deciduous and evergreen trees. The deciduous trees have lost all (or most) of their leaves because it would take too much energy to keep them from freezing. The evergreen trees are able to keep their needles on because they have oils in their sap, which do not freeze like the water in the deciduous tree sap.

Winter weeds

Use the winter weed books to identify weeds along the trail. Ask the students to make sketches of the drawings in their data sheets. If you are unable to identify the weed species, spend time making observations about the structure of the plant.

Beach (Humans and weather)

Dressing for winter

Compare the different types of clothing we wear during winter in order to stay warm. It is best to dress in many layers of clothing so that you can stay warm or get cooler by taking off a layer. Compare this way of dressing to the structure of an onion with many layers.

Winter activities

How do humans enjoy winter? Brainstorm ways that humans enjoy winter outdoors. Spend some time outside playing in the snow. Make snowmen, castle, or angels.

Sand Dunes (Evidence of weather)

Snow gauge

Have pairs of students go outside and fill bowls to the top with snow. Then bring the bowls inside and let the snow melt while you go out hiking. Before you leave, spend time making predictions about what will happen to the snow. When you return, compare the amount of water left by the melting snow.

Evidence of weather

Look for evidence of weather out the window before you leave and again while out on your hike. Notice drifts of snow and discuss the location of the drifts.

Use the black laminated paper and magnifying glasses to collect and examine snowflakes. Sketch snowflakes on data sheets. Discuss their shapes.

Forest/Turkey Trail (Animals and weather)

Subnivean air layer

There is a special place under the snow where there is a small air layer. In this air layer, small animals travel between food, water, and their homes. What would be the advantages of traveling under the snow for a small animal? It gives them warmth and protection from wind and predators. Look along the trail for small tunnels under the snow.

Hibernation, sleep, and migration

Every Wisconsin animal has a different way of coping with the cold weather. Some animals migrate south to warmer climates. Other animals hibernate or go into a deep sleep. There are also animals that take long naps, waking only to eat and get warm. Then there are animals that brave the elements. Discuss what the students know about various animals and how they deal with the cold. Draw and write about how different animals deal with the cold. Then the students can share their animal with the class. Walk by the bird feeders behind the Information Center and watch for birds as they try to gain energy in the cold.

Resources

Locker, Thomas. Cloud Dance. Silver Whistle Harcourt, Inc. San Diego, CA. 2000

Parrella, Deborah. Project Seasons. Shelburne Farms, Shelburne, VT. 1995

Lesson plan revised by Patty Brodeen Maher, School Forest Coordinator, Manitowoc Public School District, July 2008.
Ships and Storms game created by Patti Maala, Stangel, 2007

Be a Tree

- Curled up in a ball – "As a seed, you have found a nice place to start your life. You are waiting for the soil to become warm from the sun and for the spring rains to help you grow"
- Extend one leg out – "You now have started to grow your roots. Your roots are reaching out for food and water in the soil. These will help you grow into a tall, strong tree."
- Extend your other leg out and wiggle your toes – "You are starting to drink up the water and food in the soil."
- Put one arm up into the air – "You have started to grow up, out of the soil."
- Make your raised hand flat – "Your first leaves are starting to reach for the sun. The sunlight will help you grow into a tree."
- Stand up – "As the sun, water, and food in the soil help you grow, you grow."
- Extend your other arm out to the side – "You have done very well. Many of your other brother and sister seeds were eaten by animals or did not have a good home in the soil, like you, and they did not grow up. You are now a small, one year old tree and as the temperatures start to get colder again for the fall, you will continue to change."
- Stand up as tall as you can – "Now it spring time and you are ten years old."
- Sway from side to side – "As the wind blows you move from side to side."
- Shake your hands – "When it rains, your leaves shake."
- Wiggle toes – "After the rain, your roots soak up the water from the soil."

You can add additional actions. The students may have ideas of actions to add too.

Animal Cards

Animal: Deer

Clues:

- When it is cold outside, we sleep next to each other to stay warm.
- When it is raining or snowing, we lay under trees.
- The buck's antlers fall off in the winter.

Animal: Bear

Clues:

- When it is cold, we go to sleep in a den.
- When it gets warm, we come out and look for food.

Animal: Robin

Clues:

- After it rains, we eat worms that come out of the dirt.
- When it gets cold in the fall, we fly south.
- In the spring, we fly north.

Animal: Wood Frog

Clues:

- When it gets cold, we burrow under the leaf layer to spend the winter in the deep freeze.
- When the spring rains come, we thaw and begin hopping.

Animal: Beaver

Clues:

- We keep busy cutting trees down and storing branches underwater near our lodge.
- Once the pond is frozen, we stay warm and dry inside of our lodge.

Sun Seekers Scavenger Hunt

- □ Locate the sun with your eyes closed.
- □ Find two shadows that touch.
- □ Find something that does not cast a shadow.
- □ Find something warmed by the sun.
- □ Find something that looks a different color in the sun vs. in the shade.
- □ Find an animal hiding from the sun.
- □ Find a leaf that is hidden from the sun. (Look under rocks and logs) What color is it?
- □ Find something bleached by the sun.
- □ Find three signs of the season.

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Weather at the School Forest

Name _____

Predictions: Which location will be the warmest?

_____

Which location will have the strongest wind?

_____

Location: **Sand Dunes**
Temperature: _____
Wind: calm gentle breeze
moderate breeze
strong breeze

Location: **Beach**
Temperature: _____
Wind: calm gentle breeze
moderate breeze
strong breeze

Location:
Hemlock Forest
Temperature: _____

Wind:
calm gentle breeze
moderate breeze
strong breeze

Location: **Forest**
Temperature: _____
Wind: calm gentle breeze
moderate breeze
strong breeze