

Weather Watch Activity Guide

Groundhog Day



Shadow Puppets

Weather Myths

Natural Weather Stations



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“Wildlife Profile: Groundhogs,” N.C. Wildlife Resources Commission

Groundhog Day Related Literature

- Children's Books
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Museum Connections

Body Clock

Grades: K-3

Skills Practiced

Fine motor coordination
Observing

Concepts explored

Concepts of planetary
movement

Objective

To learn how the movement of the earth affects shadows created by the sun.

Background

Sundials can be used to tell time and they can also show the way the sun moves across the horizon. Shadows change in both length and direction during the day. In this activity, we will be looking at those changes.

Materials

Chalk (colored is better but white is okay).

Teacher Preparation

This activity must be done on a sunny, dry day. Select an open area with a hard top surface where your students can spread out. This should be a place away from traffic that you can visit about once an hour throughout the day. Divide your students into teams of two.

Activity

1. Ask your students if they know what a sundial is. If they do, ask them how it works. Tell them that you are going to make a human sundial.
2. Go outside to your pre-selected area and have your student teams spread out. Each team will need its own space.
3. One partner chooses a place to stand with his/her feet together while the other traces the outline of his/her feet.
4. Then he/she should trace the outline of the standing student's shadow, and write the exact time at the top of the shadow.
5. The standing student should then step out of his/her shadow and write his/her name in the outline of his/her feet.

6. Reverse roles and repeat.

7. Ask the students to predict what will happen to their shadows over the course of the day. Have them make a chalk line where they think the top of their shadow will be in one hour (or whenever you will return to the activity).
8. Throughout the day go back to the exact spot and have the students trace the shadow again. How has it changed?

Extensions

Note changes in the earth's position over time by punching a small hole in an index card and taping it into a south window. Place a large sheet of paper on the floor in front of the window, and mark the position of the spot of sunlight at noon. Repeat this every day for a month and see how the sun's position in our sky has changed.

Build or purchase a simple sundial to place on your school grounds. Have your students write instructions for how to read it. Laminate the instructions and leave them out for other classes.

Groundhog Shadow Puppets

Grades: K-3

Vocabulary

Opaque

Transparent

Skills Practiced

Creative writing

Fine motor coordination

Public speaking

Research

Objective

To learn more about groundhogs. To present information to the class.

Background

Shadow puppets are thought to be the oldest type of puppet. They are made from a dense material such as cardboard and held against a thin screen of cotton. A bright light behind the puppets makes them cast a shadow on the screen. The audience sits on the other side and watches.

Shadow puppets provide a unique way to tell a story because the form of the figure and the movements provided by the puppeteer are more important than the color of the figure.

Materials

- Slide or overhead projector with bright light
- White sheet and a way to suspend it in front of the projector
- Research materials or stories about groundhogs
- Thin cardboard
- Sticks such as Popsicle sticks or paint stirrers. The thinner the better.
- Paper fasteners (for advanced students)

Teacher Preparation

Find a good location to hang the white sheet. This is best done in a darkened classroom.

Activity

1. In teams, have students research groundhogs.
2. Based on their new knowledge, have students write a short play about groundhogs. Encourage the students to get in some groundhog facts. (Younger students might choose to do a pre-existing story. See the reference list for ideas.)
3. Have the students make shadow puppets for the characters in the play. They can also

make a shadow “set” such as plants or trees. To do this, draw the outline of the figure on white paper as a pattern (see next page for groundhog template).

4. Cut out and trace onto lightweight cardboard. Cut out cardboard and place paint stirrer or Popsicle stick on the bottom. (Note: More advanced students can make the legs jointed by using paper fasteners to attach arms and legs. You will need skinny sticks to move the arms and legs.)
5. Students should rehearse with teammates in front of white sheet with bright projector behind. They might need to practice staying out of the light.
6. Have each team present their play to the class.

Extensions

Try adding color to your shadow puppets by using transparent colored cellophane for certain features such as hair.

Try putting cellophane on the projector to project different colors of light. How is the mood of the performance affected?

Perform the plays for another class.

Groundhog Shadow Puppets



Why Do We Celebrate Groundhog Day?

Grades: K-8

Skills Practiced
Creative writing

Objective

To examine some of the folklore surrounding Groundhog Day.

Background

Many people are familiar with the folklore surrounding our holidays. We know Halloween comes from All Hallows Eve and the Fourth of July celebrates the Declaration of Independence. But why do we celebrate Groundhog Day?

Materials

- Origins of Groundhog Day sheet (see next page)
- Writing Paper
- Pictures of groundhogs

Teacher Preparation

Gather groundhog photos and other reference material.

Activity

1. Ask your students if they know when Groundhog Day occurs. Ask them if they know what is supposed to happen on that day.
2. In teams, have students brainstorm reasons why we might celebrate Groundhog Day. Teachers with younger students may want to facilitate this discussion.
3. After they have brainstormed, have students write their own stories about why we celebrate Groundhog Day.
4. Share the stories, and then share the folklore associated with groundhogs.

Extensions

Groundhog Day falls on the same day as many other celebrations, including the Aztec New Year. Explore other celebrations and the legends surrounding them. This could be a great multicultural event.

Have your students choose another event they would like to celebrate: the first monarch of the season? the first snowfall?

Would it be more appropriate to choose another animal to indicate the arrival of spring? Have students describe why they think another animal would be better and how they would celebrate their “new” event.

Origins of Groundhog Day

Where did the celebration of Groundhog Day come from? No one knows for sure, but it does appear to be linked with ancient celebrations of the coming of spring. Groundhog day occurs at the midpoint of winter, halfway between the winter solstice and the spring equinox, so although it is often still cold, groundhog day marks the return of light and longer days. In ancient times, groundhog day marked the festival of Imbloc, a day to celebrate the first stirrings of spring from the depths of winter.

Groundhog day is also 40 days after the birth of Jesus. According to what was then Jewish belief, the mother and son had to go to the temple 40 days after Jesus was born. February 2 became the feast of Candlemas, a festival celebrating Mary and the infant Jesus, celebrated at the midpoint between winter and spring. This festival was celebrated with candles that were brought to church. These candles were blessed and thought to protect the household.

The myth about the groundhog emerging from his burrow to predict the coming of spring seems to be rooted in an ancient myth from early European beaver and bear cults. They believed that the life cycle of hibernating animals was a metaphor for human spiritual journeys—with winter and autumn symbolizing death and spring and summer rebirth and life. Shadows represented the dark side of humans, and if an animal emerged from hibernation with its shadow, it was said to have not fully slept the sleep of death, and had to go back into the earth until its shadow no longer remained. Settlers arriving in America adapted the groundhog to this old myth.

(Elliott, Doug. *Wildwoods Wisdom: Encounters with the Natural World*. New York: Paragon House. 1992.)

On Candlemas it is said that the groundhog appears from his burrow to look for his shadow. If he sees it he will go back into hibernation for six weeks. If he doesn't, spring is on its way. Candlemas is associated with the sowing of crops: sunny weather forebodes harsh days and poor planting. In various countries, other animals have been used to foretell the weather: the badger in Germany, and the bear in France and England.

It is easy to see how the following rhymes translated into our version of Groundhog Day predicting, "If the groundhog sees its shadow, there will be six more weeks of winter."

Scottish couplet:

If Candlemas day is bright and clear,
There'll be two winters in the year.

English rhyme:

Half your wood and half your hay,
You should have on Candlemas day.

An old English song:

If Candlemas be fair and bright,
Come, winter, have another flight.
If Candlemas brings clouds and rain,
Go, winter, and not come again.

Winter Survival Strategies

Grades: 3-12

Vocabulary

Hibernate

Torpor

Migrate

Skills Practiced

Drawing

Research

Objective

To learn about how animals cope with winter weather.

Background

Even though North Carolina is a southern state, it does experience winter weather.

Record lows at the top of Mount Mitchell are 34 degrees below zero, and even the coast gets snow occasionally. Animals have to adapt to this cold weather in a variety of ways.

Materials

- Research materials
- Animals in Winter field guide sheet (see next page)

Teacher Preparation

1. Write name of each animal on a square of paper. Place in container such as a hat.

Suggested animals to research:

Monarch Butterfly

Marbled Salamander

Great Horned Owl

Yellow Bellied Slider (turtle)

Groundhog

Mink

Copperhead

Black Bear

Bat

2. Divide your students into teams of four.

Activity

1. Go outside with your students and ask them to record any animal signs they can find on their school grounds. Ask them, "Where are all the animals?"

2. Let each team draw the name of one North Carolina animal from a hat. This is the animal that they are going to research. As part of their research they will develop a page about their animal (template enclosed) for a field guide.
3. Provide lots of reference materials for the students and have them research their animal. The media center can probably help them find good books and web sites to use in their research.
4. When students have finished researching their animal, they need to write up a description for the Animals in Winter field guide.

Extensions

Prepare a bulletin board background with some simple paper to represent the ground and the sky. Have the students make a paper representative of their animal doing what it does in winter. They should place it on the board in the right location. To incorporate math, have them try and make it to scale.

Make multiple copies of the completed "Animals in Winter Field Guide" and distribute them to other classes. Have the other classes go outside see if they can find the animals.

Take a field trip to a local state park in winter. Ask the interpreter there if she can help you see or find evidence of animals in winter.

Animals in Winter

School Grounds Field Guide

Common name(s) _____

Scientific name _____

Sketch your animal



Describe the animal:

How does the animal survive the winter?

One “fun fact” (something you would like others to know about this species)

Weather Myths

Grades: K-8

Vocabulary

Myth
Reality
Forecast

Concepts explored

Evaluating folklore

Skills Practiced

Reading comprehension
Observing
Predicting outcome

Objective

Discuss folklore surrounding weather forecasts.

Background

Groundhog Day is part of America's folklore, but how accurate is the groundhog's prediction? How accurate are any weather sayings? In this activity, students should realize that sayings based on atmospheric observations are more likely to be true than ones based on animal behavior or other events.

Materials

Weather Sayings sheet (see next page)

Activity

1. Ask the students if they have heard any weather sayings. Get the students to share them. Ask the kids to indicate if they think are true or false.
2. Hand out the Weather Sayings sheet. Ask your students to mark them true or false. Ask them how they could check the sayings.
3. On Groundhog Day, mark a calendar with the prediction from the groundhog. Is the prediction for six more weeks of winter or is spring on the way? Every day have a different student record the weather (high and low temperature, precipitation etc.). At the end of the six weeks, give the students the results and ask them if they think the groundhog was accurate or not.
4. Choose a few other statements you might like to test. It is probably easiest to assign one statement to a team of students and ask them to report back their observations as they occur over one week total or weekly throughout a month.

Extensions

Ask students to make their own weather observations and write their own sayings.

Contact your local meteorologist and ask him/her to give a presentation to your class on weather forecasting.

Establish a weather center with a least a max/min thermometer and a rain gauge on your school grounds. Record daily observations. These observations can be graphed as part of a math lesson.

Weather Sayings

- ___ 1. When a cow bellows three times with out stopping, a storm will come hopping.
- ___ 2. When you see a beaver carrying sticks in its mouth, it will be a hard winter—you'd better go south.
- ___ 3. When the rooster crows at night, he tells you that rain's in sight.
- ___ 4. When ants travel in a straight line, expect rain; when they scatter, expect fair weather.
- ___ 5. If the groundhog sees its shadow on Groundhog Day, there will be six more weeks of winter.
- ___ 6. The wider the black bands on a woolly bear caterpillar, the colder the winter will be.
- ___ 7. Flies will swarm before a storm.
- ___ 8. Halos around the moon or sun mean that rain will surely come.
- ___ 9. When forest murmurs and mountain roars, close your windows and shut your doors.
- ___ 10. Moss dry, sunny sky; moss wet, rain you'll get.
- ___ 11. When smoke descends, good weather ends.
- ___ 12. Red sky in the morning, sailors take warning.
Red sky at night, sailors delight.
Red sky at noon, rain very soon.
- ___ 13. When bees stay near the hive, rain is close by.
- ___ 14. Sea gulls sitting in sand mean that rain is surely close at hand.
- ___ 15. A cow's tail to the west is weather coming at its best. A cow's tail to the east is weather coming at its least.
- ___ 16. Lightning in the southern sky brings little else but dry.
- ___ 17. Crows gathered around the ground: a sign that rain will soon come down.
- ___ 18. Hurricanes:
June too soon,
July stand by,
August look out,
September you'll remember,
October it's all over.
- ___ 19. When clouds appear like rocks and towers, soon the ground is refreshed with showers.
- ___ 20. The higher hornets build their nests, the higher winter snow will be.
- ___ 21. Small snowflakes mean a long snow, large snowflakes show the snow won't last.
- ___ 22. A robin is a sign that spring has surely come.

Weather Answers

The list of 22 sayings includes some that sometimes can be true, and others that are false. None of them are true all the time.

1. **False.** Cows bellow for many reasons, not just for storms.
2. **False.** Beavers repair dams all the time. They cannot predict a hard winter.
3. **False.** Roosters crow at night with or without “rain in sight.” They tend to crow in response to light, and can be heard crowing anytime, particularly when streetlights are burning.
4. **False.** Ants travel in straight lines or they scatter for many reasons besides the weather.
5. **Sometimes true.** Bright sunny days are associated with colder temperatures in the winter. If the groundhog sees his shadow it could be colder weather has arrived, but there is no way to extend that prediction for 6 weeks.
6. **False.** Black bands on woolly bear caterpillar do not indicate a bad winter.
7. **False.** Flies swarm for many reasons.
8. **Sometimes true.** If a halo can be seen around the moon or sun, that means there are thin, high clouds. Clouds such as that are frequently indicate that a storm is approaching.
9. **Sometimes true.** If you can hear sounds more clearly, and if there is a great deal of air movement (the forest “murmuring”), there could be high humidity in the air and a front coming in. This can mean bad weather.
10. **Sometimes true.** If moss is dry, that means the air is very dry. If moss is wet, that indicates high humidity and the chance for a rainstorm.
11. **False.** Smoke rises and sinks due to differences in air density. The temperature and the amount of humidity in the air can affect this.
12. **Sometimes true.** If you see a red sky in the morning, that means that there is a storm in the west. In general storms move west to east, so a red sky in the morning could mean the arrival of a storm. Likewise if you see a red sky at night the storm is in the east, and that system should be beyond you.
13. **Sometimes true.** Bees do not fly in wet weather. They stay close to the hive in cloudy or overcast weather, which might indicate a front is arriving.
14. **False.** Seagulls sit in the sand all the time. This behavior has nothing to do with rain.
15. **Sometimes true.** If a cow’s tail is pointing to the west, it means the wind is coming from the east, suggesting good weather. If a cow’s tail is pointing east, it means the wind is coming from the west. Most of our storms come from west to east, so a tail pointing east could mean bad weather.
16. **Sometimes true.** In the United States, storms tend to move from southwest to northeast. If you can see lightning in the south, that usually means that the storm will move east and miss your area.
17. **False.** Crows will gather to get food and water.
18. **Sometimes true.** This rhyme is very accurate when we look at the frequency of hurricanes. The first week of September is when the most hurricanes form. It is unusual to have hurricanes in June or into late October.
19. **Often true.** If clouds are building up “like rocks and towers,” there is probably enough vertical motion to create a thunderstorm.
20. **False.** Hornets choose where to build their nest for a variety of reasons.
21. **Sometimes true.** In general, large snow-flakes form when the air is just below freezing. These “large flakes” are really smaller snow crystals that clump together. Smaller snowflakes are seen when the air is very cold. Those flakes usually do not clump. The colder temperature means that it could snow for a longer period.
22. **False.** Robins spend the winter in North Carolina. We can see them year-round.

Follow the Groundhog's Prediction!

Grades: K-8

Skills Practiced

Graphing
Predicting
Observing

Objective

To learn about variations in temperature over time.

Background

For more than 100 years, weather in North Carolina has been recorded, including the high and low temperatures for every day. These measurements are used to calculate the mean temperature (or average temperature) for each day. According to legend, we will have six more weeks of winter if the groundhog sees his shadow. Most people assume that means that the weather will be colder than average.

One way to check the accuracy of Sir Walter Wally's prediction is to compare the weekly temperature in 2006 to the average temperature. The National Climatic Data Center creates maps that show "departure from normal" or how the temperatures for 2006 vary from the average temperature for that week. (Check the Museum Web site for a link to the National Climatic Data Center Web site.) If it is colder than normal, it will be a negative number. If it is warmer than normal, it will be a positive number. If it is zero, that means that the temperature did not deviate at all, so it is exactly average.

Materials

- Average weekly temperature map for 2006 from the link on the Museum Web site
- Graph paper

Teacher Preparation

Print out the average temperature map from <http://www.ncdc.noaa.gov/oa/climate/research/2006/weekly/us-weekly.html>.

Activity

1. Help students make a graph with 0 degrees at the midpoint. (See chart)
2. Find your state and region on the map. Ask students to determine if your area's temperature for this week is colder or warmer than normal. Make a graph showing the variation in degrees.
3. Keep track of temperature variations over the six weeks following Groundhog Day. What does your graph tell you? Was it warmer or colder than normal?

Extensions

Young children may do this activity as a class.

Cloudy Creations

Grades: 3+

Skills Practiced

Scientific observation

Classification

Objective

To learn how to predict the weather by observing cloud formations.

Background

Most of us notice whether the sky each day is bright, dark, cloudy, or clear. We may even be fascinated by a cloud that looks like a funny face or animal. Most people pay less attention, however, to specific types of cloud formations and what they mean. Clouds form whenever droplets of water or ice crystals accumulate in the lower atmosphere. By recognizing and identifying the different types of clouds, you can learn to predict approaching fronts (places where warm and cool air masses collide) and precipitation.

Clouds are classified by their shapes and altitude. Clouds form at three different levels in the troposphere, which is the lowest part of the Earth's atmosphere (between the ground and about 7 miles up). Low-level clouds are no more than 6,500 feet above the ground. The names of these clouds come from Latin words that describe how the clouds look to an observer on the ground—cumulus (heaped or piled) and stratus (layered or stratified). The prefix “alto” distinguishes mid-level clouds, which exist between elevations of 6,500 and 20,000 feet. The prefix “cirr” describes upper-level clouds, which exceed elevations of 20,000 feet. “Cirrus,” Latin for “curl of hair,” describes upper-level clouds that look curly or wispy. These terms are combined to give cloud formations their names. For example, a mid-level cloud that looks heaped is an altocumulus cloud.

Materials

- Cloud ID cards with cloud description, picture, and forecast
- Cotton candy or cotton balls

Teacher Preparation

Go over the basics of cloud naming before beginning the activity.

Activity

1. Separate students into pairs or small groups.
2. Give each group a cloud ID card (if you wish, you can separate groups of students by three types of clouds—“fair weather clouds,” “precipitation clouds,” and “precipitation-indicator clouds”).
3. Ask the students to mold the cloud described on the ID card using cotton candy/cotton balls.
4. Let the students create their clouds.
5. Have the students present their clouds to the other groups when everyone is finished.
6. If you use cotton candy, let the students eat their lesson afterward!

Extensions

Have students take photographs of cloud formations and identify them.

Have students observe the weather/sky on a given morning/afternoon, write a weather forecast, then compare their forecast with the evening news.

Ask students to create a “recipe” for a thunderstorm, ice storm, etc., that describes the key ingredients of the recipe and why each

Cloud Identification



Cumulus* — Low-level; puffy. Not usually associated with precipitation.



Cumulus congestus* — Can extend from low to high levels; puffy and tall with flat base. Can produce moderate to heavy showers and can grow into cumulonimbus clouds.



Cumulonimbus* — Can extend from low to high levels; often anvil-shaped at top (called “thunderheads”). Can create heavy showers with hail, lightning, and high winds.



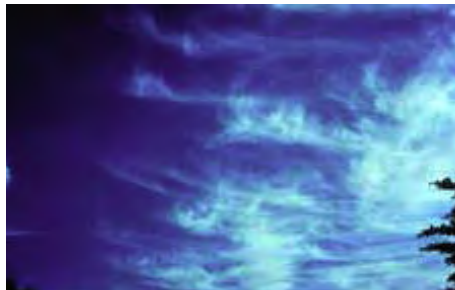
Stratus — Low-level; white or gray layers. Not typically associated with precipitation or oncoming precipitation.



Nimbostratus — Low-level; dark-gray layers. Associated with rain and/or snow.



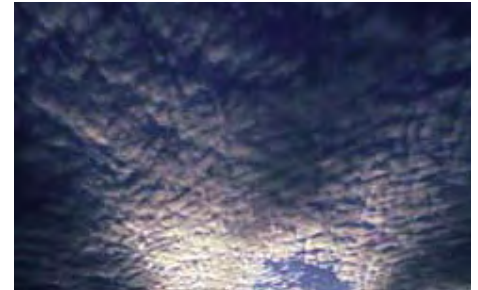
Stratocumulus* — Low-level with a jagged top and flat base. Not usually an indicator of precipitation.



Cirrus* — High-level; wispy. May indicate a dissipated thunderstorm or approaching frontal system.



Cirrostratus — Even layer of high-level cirrus clouds covering the sky. Thickening may indicate approaching frontal



Cirrocumulus — High-level, puffy. Thickening may indicate approaching frontal system.



Altostratus* — Mid-level; broad and sweeping with no definitive base or top. Can cause wide areas of snow/rain.



Altocumulus — Mid-level; puffy. Enlargement during the day a sign of approaching frontal system.

Natural Weather Station

Grades: K-8

Skills Practiced

Quantitative
Data Collection
Observation

Vocabulary

Temperature
Wind
Relative Humidity
Frontal Systems
Barometric Pressure

Objective

To examine how natural phenomena react to changes in weather and use those observations to predict weather.

Background

Throughout history, people have looked for signs in nature to help forecast the weather. Because plants and animals must be able to adapt to varying weather conditions, the changes they exhibit can be very telling.

Materials

- Wool and/or pine cones (students also will observe their own hair)
- Crickets (may already exist on school grounds; if not, purchase from bait shop)
- Rhododendron (planted outside)
- Chickweed or morning glory (in the ground or in a pot)
- Beaufort Wind Scale (see following pages)
- Compass
- Cloud Identification Cards (see “Cloudy Creations” activity)
- Natural Weather Indicator Cards (see following pages)
- Notebooks
- Pencils

Teacher Preparation

Place or locate all the natural materials outside at least one day prior to observation. On the day of the activity, spread everything out in a small area, placing like items together in “stations” (all barometric pressure indicators together, all temperature indicators together, compass and Beaufort Wind Scale together, etc.). Explain elements of weather forecasting (relative humidity, barometric pressure, temperature, wind, frontal systems).

Activity

1. Ask students how and why animals and plants might be indicators of oncoming weather. Have them list some adaptations

that plants and animals use to deal with changing weather conditions.

2. Divide students into small groups and have them visit each station.
3. Ask students to discuss and record their observations about each of the following elements.

Barometric Pressure — Have students observe the leaves of the chickweed plant or blooms of the morning glory, then estimate barometric pressure.

Temperature — Have students count the number of cricket chirps and/or observe the rhododendron leaves, then estimate the air temperature.

Wind — Have students observe trees and bushes, then use the Beaufort Wind Scale and compass to estimate wind speed and direction.

Clouds — Have students use cloud references to identify current cloud formations and what they convey about the weather.

Relative Humidity — Have students observe wool, hair, and/or pine cones to estimate relative humidity.

4. Ask students to predict the weather based on the factors they have observed.

Extensions

Compare modern and natural weather stations.

Have students make their predictions for the day (including current conditions as well as a prediction for the next 24 hours) and perform a weather forecast.

Beaufort Wind Scale

FORCE	WIND (KNOTS)	WMO CLASSIFICATION	APPEARANCE OF WIND EFFECTS	
			ON THE WATER	ON LAND
0	less than 1	Calm	Sea surface smooth & mirror-like	Calm, smoke rises vertically
1	1–3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4–6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7–10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11–16	Moderate Breeze	Small waves 1–4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17–21	Fresh Breeze	Moderate waves 4–8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22–27	Strong Breeze	Larger waves 8–13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28–33	Near Gale	Sea heaps up, waves 13–20 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34–40	Gale	Moderately high (13–20 ft) waves of greater length, edges of crests foam blown in streaks	Whole trees in motion, resistance felt walking against wind
9	41–47	Strong Gale	High waves (20 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48–55	Storm	Very high waves (20–30 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, “considerable structural damage”
11	56–63	Violent Storm	Exceptionally high (30–45 ft) waves, foam patches cover sea, visibility more reduced	Widespread damage
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	Widespread structural damage

Weather Front Chart

Phenomenon	Warm Front		Cold Front		Occluded Front	
	Approach	Passage	Approach	Passage	Approach	Passage
Pressure	Falls steadily	Levels off or falls unsteadily	Falls slowly or rapidly	Rises sharply	Falls steadily	Rises
Wind	SE; speed increases	Veers to S	S; squalls common	Sharp veer to SW; gusty	E; may veer to SE; speed increases	Veers to SW; speed decreases
Clouds	Cirrus, cirrostratus, altostratus, nimbostratus, thickening	Stratocumulus	Cumulus or altocumulus; cumulonimbus	Cumulonimbus; Clearing trend	Cirrus, cirrostratus, altostratus, nimbostratus	Clears slowly
Precipitation	Steady	Tapers	None or showers	Showery	Steady	Tapers
Temperature	Increases slowly	Rises slightly	Changes little	Drops sharply	Rises slowly	Falls slowly
Humidity	Increases	Increases	Steady	Drops sharply	Increases slowly	Decreases slowly
Visibility	Poorer	Better	Fair-poor	Rises sharply	Poorer	Better

Source: Curtis, Rick. *The Backpackers Field Manual*. 1998. New York: Three Rivers Press.

Links

USA Today guide to the science of the atmosphere

<http://www.usatoday.com/weather/resources/basics/wwworks0.htm>

University of Illinois online guide to meteorology

[http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/af/](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/af/)

The Weather Channel glossary

<http://www.weather.com/glossary/>

Prediction Guide

Wind Direction	Air Pressure	Weather
W	Low and rising	Clearing and colder
S to SW	Low and rising slowly	Clearing soon and fair for several days
Going to N	Low and rising rapidly	Clearing and colder
SW to NW	High and steady	Fair and little temp change
E to NE	High and falling slowly	Summer: fair, winter: rain within 24 hours
S to SE	High and falling rapidly	High wind w/rain in 12-24 hours
SW to NW	High and falling slowly	Rain in 24-36 hours
E to NE	High and falling rapidly	Precipitation and strong winds
SE to NE	High and falling rapidly	High winds, precipitation

Natural Phenomenon Weather-Indicator Cards

RELATIVE HUMIDITY

Wool: If wool shrinks and curls, the air is dry. If wool swells and straightens, the air is humid, indicating rain.

Pine cones: Scales opened outward indicate dry weather. Closed scales indicate higher humidity, a sign of rain.

TEMPERATURE

Crickets: Count the number of chirps per minute, subtract 40, divide by 4, and add 50 to get degrees in Fahrenheit.

Rhododendron: At or above 60° F leaves are flat; at 40° F leaves are droopy; at 30° F edges of leaves are curled under; at 20° F whole leaf is tightly curled..

Trim along dotted lines and fold in half.

BAROMETRIC PRESSURE

Chickweed: Closed leaves indicate low pressure.

Morning glory: Wide-open blooms indicate high pressure.

Birds: Birds often roost when barometric pressure is low. It is harder for them to fly when air is less dense..

WIND

Leaves: Observe movement to calculate speed.

Compass: Use to determine direction.

Beaufort Wind Scale: Use to determine speed.



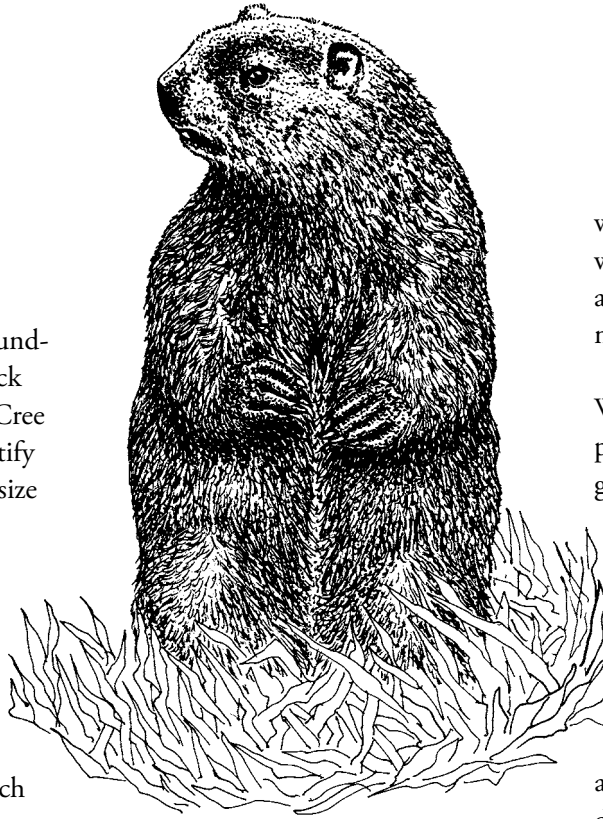
WOODCHUCK

Marmota monax

Sometimes colloquially called “groundhog” or “whistlepig,” the woodchuck receives its common name from a Cree Indian word, *wuchak*, used to identify several different animals of similar size and appearance and which denotes nothing about the woodchuck’s habits or habitat. Not until Europeans colonized North America did the woodchuck receive the honor of becoming the harbinger of spring. February 2, or Groundhog Day, is the day on which the woodchuck is supposed to wake up from hibernation and emerge from its bur-row to determine if winter has ended or will continue for several more weeks.

HISTORY AND STATUS

Although woodchucks are native to North Carolina, they have expanded their range in recent years. The woodchuck is classified as a nongame animal for which there is no closed hunting season or bag limit. It is hunted primarily for sport and to a lesser extent for food and fur. Though no data have been collected on woodchuck populations in North Carolina, populations appear to be either increasing or stable. Woodchucks have adapted well to human activities such as agriculture and urban development and are usually considered a pest species. Woodchuck burrows and dens provide homes for other wildlife species that use subterranean den sites.



DESCRIPTION

Woodchucks are large, heavy-bodied rodents attaining weights of 5 to 12 pounds and can be up to 2 feet long. They are covered with coarse hair ranging in color from brown to reddish yellow, usually tipped with silver. Their feet have five claw-bearing digits with thick, slightly curved claws. The head is short and broad. The legs are short and thickset. The tail is densely haired, slightly flattened and one-fifth to one-third of the animal’s total length. The ears are short, broad, rounded and well haired. The eyes are circular and small.

HABITAT AND HABITS

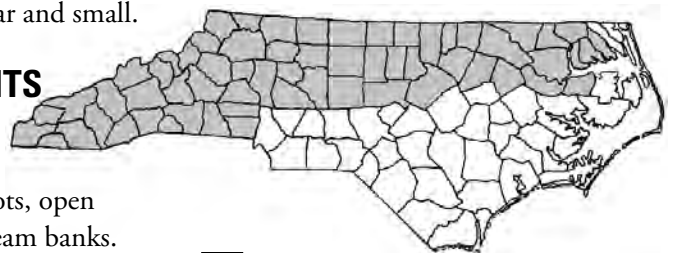
Woodchucks inhabit a variety of habitats such as pastures, brushy woodlots, open woods and areas along stream banks. Their primary requirement is an area where their burrows can be constructed

without being flooded or inundated with groundwater. They are diurnal animals, most active during the early morning and late afternoon hours.

Woodchucks are herbivorous and prefer the more tender parts of new growth from a variety of wild and cultivated plants. They hibernate during the winter from November until February. Mating occurs in March or April, and four to six young are produced after a 31- to 32-day gestation period. The young are born blind, helpless, toothless and almost naked. Young woodchucks disperse from the natal area after they are three months old.

RANGE AND DISTRIBUTION

Woodchucks are distributed from eastern Alaska across the southern half of Canada to the Atlantic Ocean and south in the eastern half of the United States to Arkansas, Mississippi, Alabama, Georgia, South Carolina and North Carolina. East of the Appalachian Mountains, North Carolina is the southernmost part of the woodchuck’s range. The woodchuck was historically confined to the Mountains



RANGE MAP:
Occupied range

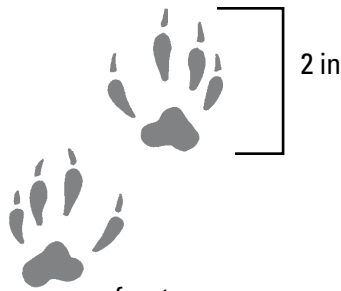


W I L D L I F E P R O F I L E S

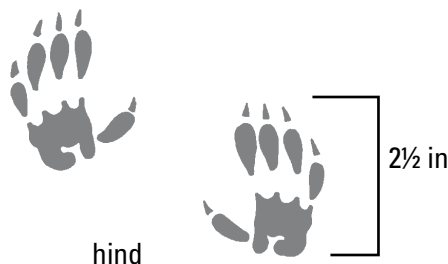
of western North Carolina but has recently expanded its range into the Piedmont and Coastal Plain regions.

PEOPLE INTERACTIONS

Unless you live and stay in the southern half of North Carolina from Mecklenburg County east, you have certainly seen woodchucks by the roadside in spring or early summer. Their habit of feeding on roadside vegetation causes many woodchucks to be killed by cars. Other than a few predators such as hawks, owls, foxes and coyotes, the major causes of mortality for woodchucks are vehicles on highways and hunters in pastures. Woodchuck hunting provides a service to the landowner whose crops suffer depredation from the rodent's feeding habits or whose livestock have been lamed by stepping into a woodchuck burrow. This sport also provides the opportunity for someone skilled with a rifle to practice this skill during a time of year when hunting seasons for game animals are closed. Even with increased numbers of highways and woodchuck hunters, this species continues to expand its range in North Carolina.



front



hind

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- Robinson, S.S., and D.S. Lee. "Recent Range Expansion of the Groundhog, *Marmota Monax*, in the Southeast." *Brimleyana* 3 (1980): 43-48.

CREDITS

Written by Perry Sumner.
Illustrated by J.T. Newman.
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WILD FACTS

WOODCHUCK

CLASSIFICATION

Class: Mammalia

Order: Rodentia

AVERAGE SIZE

Length: 20 to 27 in.

Weight: 5 to 12 lbs.

FOOD

Woodchucks are herbivorous and prefer succulent plants such as clover, alfalfa, and grasses.

BREEDING

Sexually mature at 1 year old. Males generally mate with one female from late February to April. Females breed only once per year, but males may remain with the female for some time after breeding.

YOUNG

Groundhog gestation period is 31 to 32 days. Litter size is four to six. At birth they weigh about 1 oz. and increase to about 2 oz. in one week. The young are born blind and hairless, are weaned in about 2 months, and disperse by 5 months. Groundhogs usually have two litters a year.

LIFE EXPECTANCY

Average 1 to 2 years. Few live longer than 4 years in the wild.

Groundhog Day Related Literature

Children's Books

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by Paul Rezendes
Camden House Publishing 1995

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by Mark S. Garland
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The Weather Classroom
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The Weather Wizard's Cloud Book
by Louis D. Rubin and Jim Duncan
Algonquin Books 1989

Wild About Weather: 50 Wet, Windy & Wonderful Activities
by Edward Brotak
Lark 2004

Museum Connections

To examine how natural phenomena react to changes in weather and use those observations to predict weather.

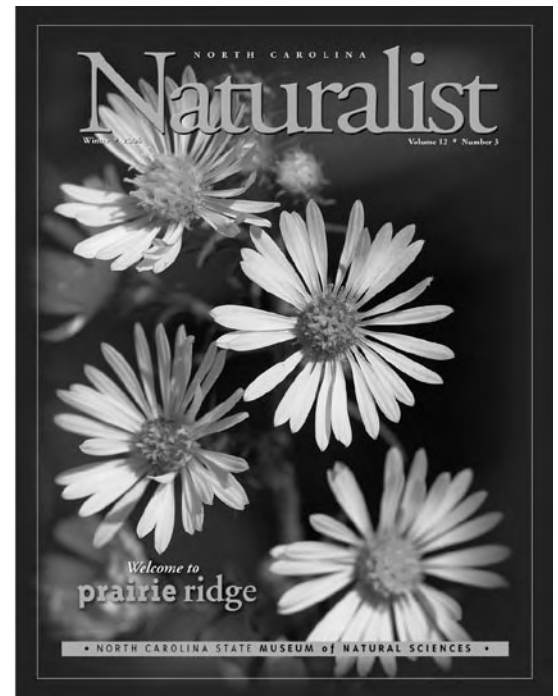
Educator's Guide

The Educator's Guide to Museum Services describes Museum programs for you and your students at the Museum, at your school, and on-line. The *Guide* is available at www.naturalsciences.org.

Join the Friends

Teachers who join Friends of the Museum receive regular membership benefits, plus special benefits reserved just for them.

The screenshot shows the website for the North Carolina Museum of Natural Sciences, specifically the Education page. The page features a navigation menu with categories like VISITOR INFO, PROGRAMS & EVENTS, EXHIBITS, EDUCATION, RESEARCH & COLLECTIONS, and MUSEUM STORE. The main content area is titled 'EDUCATION' and includes sections for 'Plan Your Field Trip', 'Online Adventures', and 'Educator Treks'. There are also links to 'Field Trip Information' and '2009-2010 Educator's Guide (PDF) NEW!'. The page is designed with a clean, professional layout and includes several images related to nature and education.



Membership Benefits

- Free admission to more than 240 science and nature museums
- 10% discount at the Museum Store
- Discounts and priority notice on classes, workshops, and trips
- Free educational programs
- Invitations to special events
- Free admission to the Museum's Special Exhibits Gallery
- Free subscription to the Museum's program calendar and magazine, the *North Carolina Naturalist*

Additional Teacher Benefits

- 15% discount on most Teacher Treks
- 15% discount at the Museum Store (additional 5% above regular membership)

Call the Friends office at 919.733.7450, ext. 350, for more information or for details on group memberships.

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