



LEARN OUTSIDE GUIDE LESSONS

as listed in the 2025
WinterKids Winter
Games PLAYBook

“WEATHER”
EDITION





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Thank you for playing along with the WinterKids Winter Games!

Twice a week throughout the Games, we incorporate a specific lesson from the WinterKids Learn Outside Guide. We have provided those excerpts from the Guide in the pages to follow.

CONTENTS:

- Week 1, Activity 2: The “Great” Heat Escape
- Week 2, Activity 2: Al the Snowman
- Week 2, Activity 4: Measure Me
- Week 3, Activity 2: Experiencing the Outdoors Through Art
- Week 3, Activity 4: Stick to North
- Week 4, Activity 2: Making a Weather Report
- Week 4: Activity 4: I Think

If your students enjoy these activities, they will love all of the activities in the WINTERKIDS LEARN OUTSIDE GUIDE!



**SCAN THIS CODE
FOR MORE INFO!**





The “Great” Heat Escape

Grades 6–8

Lesson Summary

In a fun outdoor activity, students will model the greenhouse effect and explore the impact that a thickening layer of greenhouse gases has on the amount of heat trapped within the Earth’s atmosphere. This activity can be done on a sports field or open green space, with or without snow.

Objectives

Students will:

- * Recreate and model the greenhouse effect.
- * Describe how greenhouse gases behave.
- * Hypothesize what can be done to lessen the amount of greenhouse gases we emit.

Materials

- * Playing field or open space outside

Background

Carbon dioxide (CO₂), methane, and water vapor are greenhouse gases. These gases act as insulation for the planet. The sun heats up the Earth as each hemisphere faces it during that part of the Earth’s day. As each hemisphere rotates out of the sunlight and into its night, the heat of the day is released out into space. We need greenhouse gases working as a blanket to trap some of that heat, otherwise it would all escape every night and temperatures would drop too low for life to survive.

When we burn fossil fuels like oil, coal, and natural gas, we are releasing the carbon trapped within them and adding carbon dioxide to our atmosphere. The more CO₂ we add to the atmosphere, the more it insulates the planet and holds in the escaping heat (like how the thicker your blanket, the more of your body heat it traps and the warmer you get).

We do need the greenhouse effect, but as more CO₂ is released into the atmosphere, the Earth’s average temperature is rising, and we’re seeing it happen now. As the Earth’s temperature rises, the climate changes. This impacts precipitation amounts, ice coverage, ocean currents, and many of Earth’s other systems that affect the resources needed to sustain the planet’s populations of plants and animals (including humans).

Procedures

Inside:

1. Discuss the greenhouse effect, its causes, and its consequences.

Outside:

1. Designate an outdoor area as the “atmosphere” play area. One side will represent the surface of the Earth and the opposite side will represent outer space.
2. A third of the students will be “Carbon Dioxide (CO₂) Molecules”. The remaining students will be “Heat.”
3. The “CO₂ Molecules” will stand approximately halfway between the surface of the Earth and outer space. They should choose their location wisely because once they have a spot, they must stay put.
4. The “Heat” will line up on the “Earth’s Surface” end of the area.
5. The “Heat” students will try to walk, jog, or run (depending on the teacher’s preference) to outer space to escape the Earth’s atmosphere. If the “Heat” are tagged by the stationary “CO₂ Molecules,” they are trapped in the Earth’s atmosphere and will join the “CO₂ Molecules” in the next round.
6. The “Heat” students who made it to outer space will return to the surface of the Earth for the next round while the “Heat” students who were tagged are now playing as “CO₂ Molecules.”
7. Repeat the activity again with the remaining “Heat” students. Each round should get more difficult for the “Heat” to escape the atmosphere, just as more CO₂ in the atmosphere insulates the Earth and traps more of the escaping heat.
8. Continue playing as many rounds as necessary to get one student – or zero students – left as “Heat” trying to escape.

Going Further

1. Students can research what they can do to help cut back on the emission of greenhouse gases.
2. Students can calculate their own greenhouse gas emissions.

Special Needs Students

Some students may need the help of a teacher assistant or peer helper.



"Al" the Snowman

Grades 3–5

Lesson Summary

Students will build snow people and use them to explore the albedo effect, or how the Earth's reflective surfaces play a role in our planet's climate. This is a multi-day activity where students keep a log of the condition of their snow creations.

Objectives

Students will:

- * Hypothesize about the effect that different colored coverings for their snow people will have on their snow people.
- * Make daily observations.
- * Understand the albedo effect and how it plays a role in our planet's climate.

Materials

- * Black (or dark-colored) trash bags
- * White (or clear) trash bags
- * Notebook or data sheet on clipboard
- * Pens/pencils
- * Tape measure, ruler, and/or yardstick
- * Digital camera or phone camera
- * Accessories for decorating snow people (optional)

Background

Albedo is the amount of solar radiation reflected off a surface. The scale ranges from no reflection at all (black surfaces) to complete reflection (white surfaces). Albedo plays a role in the temperature balance of our atmosphere. Areas of the Earth where snow and ice cover the surface reflect the sun's energy, whereas areas of the Earth with darker surfaces absorb more of the sun's energy. As climate change causes more of the Earth's ice to melt, the darker ground beneath the ice that is exposed absorbs more of the sun's energy, which contributes to the heating of the atmosphere and the rising temperature of the Earth.

We've all walked across an asphalt driveway or street barefoot in the summer. That dark surface absorbs a lot of heat. Not only do ice and snow play a factor in surface albedo, but other factors can contribute to heat buildup as well, like more of the Earth's surface being covered in asphalt and dark roofing material rather than vegetation. The types of surfaces and the albedo of those surfaces covering our planet all contribute to the overall climate.

Procedure

Outside:

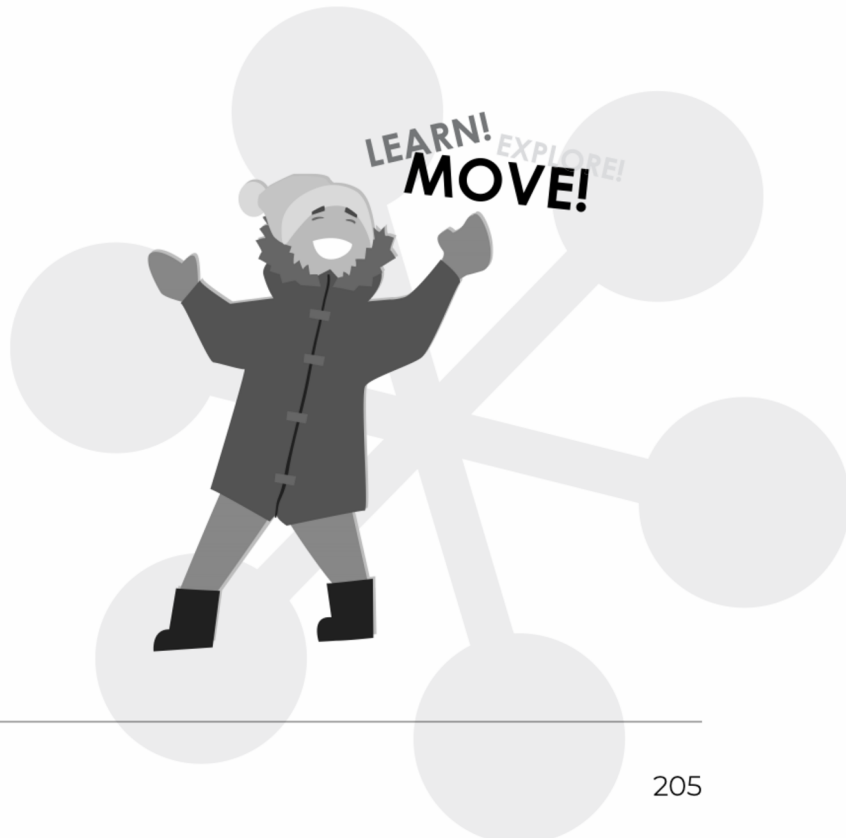
1. Break the class into groups of two to four students. In their groups, students will build two snow people.
2. Students will measure the height and circumference of their snow people and record those measurements. Students could take a digital photo of their snow people for comparison later.
3. Each group will cover one snowperson with a black trash bag and the other with a white trash bag. Secure trash bags for wind and other weather conditions by using snow, rocks, or other heavy items.
4. After a few hours, students will check in on their snow people by carefully removing the trash bags. They should record any changes observed of each snowperson from their original creation. Be sure to re-secure the trash bags after students make their observations.
5. Students will check in on their snow people once a day for several days, and record how they are changing over time, noting the differences in the changes between those under the dark cover versus the light cover.
6. Students will then hypothesize reasons for the differences in the changes of their snow people over time.

Going Further

1. Students can list Earth's surface types that are more reflective of heat, and surface types that absorb more heat.
2. Students can research what can be done to combat the loss of reflective surfaces such as ice and snow on the Earth's surface.

Special Needs Students

Some students may need the help of a teaching assistant or peer helper.





Measure Me!

Grades K–2

Lesson Summary

Students explore the attributes of measurement by reading and comparing measurements. In the first activity, students will guess their height in inches and then will go outside to determine their actual heights using snow angels. In the second activity, the students become units of measurement and learn to determine the difference between two measurements.

This is a great lesson for employing the help of parent volunteers with additional tape measures and yardsticks in hand. The more help taking measurements the students have, the faster the results can be gathered.

Objectives

Students will:

- * Correctly measure the length or height of objects.
- * Directly compare the length or height of two objects.
- * Predict their height and then compare to their actual height.
- * Use teamwork and critical thinking to successfully perform tasks.

Materials

- | | |
|-----------------|--------------|
| * Height chart | * Clipboards |
| * Rulers | * Paper |
| * Yardsticks | * Crayons |
| * Tape measures | * Pencils |

Common Core Standards

Mathematics

CCSS.MATH.CONTENT.K.MD.A.2

Directly compare two objects with a measurable attribute in common to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.

CCSS.MATH.CONTENT.1.MD.A.1

Order three objects by length; compare the lengths of two objects indirectly by using a third object.

CCSS.MATH.CONTENT.2.MD.A.4

Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard-length unit.





Procedure

Activity 1

Outside:

1. Gather the class. Discuss the concept of measurement in general. Discuss the concepts of height and length, and explain that they will be explored in the activity.
2. Remind students that when it comes to people, height is not a competition. It's just another attribute like eye color or singing ability.
3. To give students a basis for comparison, show them a yard stick and remind them that it is 36 inches long. If you like, you could also share your own height in inches as a second basis for comparison.
4. Have students predict their own height in inches. Record student predictions for use back inside the classroom.
5. **Option 1:** If you have an available snowy place, have each student make a snow angel. Have students stay with their angel, doing leg lifts while they wait their turn, until each angel can be measured. To measure, lay a yardstick at the feet of the snow angel and hold the tape measure perpendicular to the middle of the yardstick. Have the student measure by pulling the tape to the top of the snow angel's head and then coming back to the bottom of the snow angel to read the measurement on the tape. Record results in inches for easy comparison.
Option 2: If there is no available snow, hang a height chart in an accessible place, and have students line up a short distance away. One student at a time will then run to the chart and have their height measured and recorded by the teacher. While the teacher is measuring one student, the others could do five jumping jacks, clap their hands, or any other safe exercise. Record measurements in inches. After being measured, each student will then run to the end of the line.

Inside:

1. Reveal your students' predictions and heights.
2. Have students solve and discuss the differences between their predictions and their actual heights.

Going Further

For homework, assign your students the task of measuring the heights of their family members, or their families' snow angels, including pets.

Activity 2

Outside:

1. Break your entire class into three groups, one small (Group A), one medium (Group B), and one large (Group C). Record the number of students in each group. Be sure that the size differential in each group is distinct, for comparison purposes.



2. Explain that the students will be the actual units of measurement in the activity. Have the three groups form three parallel lines facing you. Students will form three lines by standing one behind the other with their hands on the shoulders of the person in front of them.
3. Ask students which lines are longer or shorter than the others. Ask how much longer or shorter one line is than another, and how they know. Discuss the number of students in each line and how we can use numbers to compare the length or height of objects.

Inside:

1. Create a bar graph using the data from the lines that your students formed outside.
2. Use the graph to discuss longer and shorter and how to compute the difference between two heights or lengths.

Special Needs Students

Modifications may include the help of an assistant, a student being assigned a role as Teacher Helper to call other students up for their turn, or a student being assigned a role as Data Collector.

LEARN! EXPLORE!
MOVE!





Experiencing the Outdoors Through Art

Grade K–2

Lesson Summary

Students will spend half an hour outdoors in the winter. Back inside, they will create a work of art that reflects the ideas and feelings they experienced while outside.

Objectives

Students will:

- * Communicate ideas and feelings generated by the outdoor experience through art by creating a drawing or painting.

Materials

- * Warm outdoor clothing
- * Drawing/painting paper
- * Drawing materials
- * Painting materials
- * Lined paper

Procedure

Outside:

Make sure students are properly dressed for the outside work. Sending a letter home to parents a week prior to the outside class will help.

1. Have students dress for their winter outdoor experience. Make sure students are properly dressed in boots, mittens, and hats.
2. Once outside, take students for a winter hike around the school campus. If your school has nature trails, be sure to take advantage of them.
3. While hiking, lead a class discussion about what it is like to be outside during the winter. Ask students to share how they feel, what they like most about being outside in the winter, and what winter looks like. Ask questions, such as "What are your favorite outside winter activities?," "How does your face feel right now?," and "How are the woods different in the winter than they are in the summer?" to help generate dialogue between students. Encourage students to be quiet for a period of time and listen to winter sounds. Ask students, "How do winter sounds differ from summer sounds?"

Inside:

1. Have students draw or paint about their outdoor experience. Explain that art is a form of expression and communication. Their goal is to tell others about being outside in the winter through visuals rather than words. Encourage students to tell a story through their drawing or painting.

Special Needs Students:

Students with physical disabilities may be pulled in a sled, for example, to participate in the outdoor portion of this lesson. For the inside portion, supply large crayons and paint brushes for students with fine motor issues. The optional writing activity could be modified or omitted.

Lesson Extension for Language Arts (optional)**Objectives*****Students will:***

- * Write about their outdoor experience including a beginning, middle, and ending.
- * Orally share ideas and opinions of the different forms of communication (art vs. writing).

Procedure

1. Have students write a journal entry about their experience outside. The length of the entry will vary depending on grade level and ability.
2. Once completed, have a classroom discussion comparing and contrasting strengths of writing vs. drawing/painting as forms of communication.

Common Core Standards

English Language Arts

Writing – Text Types and Purposes

Kindergarten:

W.K.3. Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.

Grade Two:

W.2.3. Write narratives in which they recount a well elaborated event or short sequence of events, include details to describe actions, thoughts and feelings, use temporal words to signal event, order, and provide a sense of closure.



Stick to North

Grades 3–5

Lesson Summary

Simply figuring out which direction is north is sometimes the most important thing you can do when you're lost. With a stick, some rocks, and enough sunlight to cast a shadow, students will determine which way is north, south, east, and west.

This activity must be done on a sunny day and works best well before or after noontime when shadows are longer.

Objectives

Students will:

- * Work cooperatively in groups.
- * Learn how to determine north in almost any situation.

Materials

- * 1 stick, stake, or short pole for each group
- * 3-5 rocks or other items that can be placed on the ground as markers
- * North, south, east, and west markers for each group
- * Compass (optional)

Background

Although we all may be more familiar with using the Earth's magnetic field or GPS satellites to determine direction, there are many simple ways to figure out where north lies. All you need to figure out compass directions is the sun and monitoring a shadow.



Procedures

1. In groups of two or three, students will gather a stick, stake, or short pole and three to five rocks or other items that can be placed on the ground to mark the path of a shadow.
2. Groups will stand their sticks upright into the snow or dirt somewhere with enough sunlight to cast a shadow.
3. Have students place a rock at the tip of each stick's shadow. This rock will be the marker for West. *The sun moves East to West so the shadow that it creates moves West to East.*
4. Every five minutes, have students place a rock at the new location of the tip of their stick's shadow until there is a line of a minimum of three, but preferably five, rocks. The final rock will be the marker for East.
5. Have students draw a line in the snow or dirt connecting the rocks (this line indicates East and West), and a perpendicular line from the base of the stick that intersects with the first line (this line indicates North and South). These two lines create a compass rose.
6. Have students label the four points of their compass rose, with the upright stick marking south (in the northern hemisphere – it is opposite in the southern hemisphere). Students can now determine their direction.

Going Further

1. Students can bring a compass outside with them to see how close their rose came to actual north.
2. Students can research other methods of identifying north out in the woods without a compass (or cell phone of course).

Special Needs Students

Some students may need the help of a teacher assistant or peer helper.





Making A Weather Report

Grades 3–5

Lesson Summary

Students gather individual weather conditions (including temperature, humidity, wind speed/ direction, and barometric pressure) at stations that have been set up at each corner of a playground or sports field. The students will read and record the information and then compute the wind chill temperature.

This lesson requires a facilitator at each of the four stations, and is a great opportunity to encourage friends and family to join the exploration as volunteers.

Objectives

Students will:

- * Describe the current weather using accurate weather terminology and measurements.
- * Identify and explain the tools and instruments used to gather weather data.
- * Use the data gathered to calculate the wind chill temperatures.
- * Make an individual data-based poster showing current weather conditions.

Materials

- * Index cards
- * Small pencils
- * Thermometer
- * Hygrometer
- * Anemometer
- * Barometer
- * Wind Chill Chart (<https://www.weather.gov/media/safety/windchillchart3.pdf>)
- * Poster board, crayons, markers, construction paper, scissors, and glue (for students to make posters indicating weather conditions)
- * Whistle

Background

Prior to this activity, introduce to the students the instruments used to take weather observations and explain how these instruments work. Be sure students understand the definitions of temperature, humidity, wind speed/direction, barometric pressure, and wind chill.



Preparation

1. Set up four weather instruments (thermometer, hygrometer, anemometer, barometer) outside, one at each corner of a playground or sports field.
2. Download and print a wind chill chart to help students calculate the wind chill. Laminate the chart or glue it to poster board for durability. Set this up as the final station.

Procedure

Outside:

1. The students will begin by taking a notecard and pencil and writing down the sky condition (e.g. sunny, mostly sunny, cloudy, etc.).
2. Divide the students into four groups and start each group at a different station – temperature, humidity, wind speed/direction, or barometric pressure. All groups will progress through each station clockwise to complete the course. Blow your whistle only when all groups are ready to move on to the next station. Facilitators at each station will keep students who are waiting active by leading them in exercises (e.g., stretching, jumping jacks, etc.).
3. Students will begin at one of the four stations and record that instrument's data on their notecards.
4. Once students have recorded the data from their first station, blow your whistle. Students will run to the next station and record that instrument's data on their notecards.
5. After students have recorded the data from their second station, blow your whistle. Students will skip to the next station and record that instrument's data on their notecards.
6. After students have recorded the data from their third station, blow your whistle. Students will run sideways to the next station and record that instrument's data on their notecards.
7. Once every group has recorded data from each station, all students will take giant steps to the wind chill chart at the final station. Students will use the chart to calculate the wind chill temperature.
8. Students will gather and describe the weather conditions they observed.
9. Finally, students will use the information on their cards to make their own weather page of the current conditions.

Inside:

1. Back in the classroom, students may use their weather page to make individual posters about the weather conditions at the school yard. If time and resources allow, posters can then be the backdrop for a video weather report created by the students.



Going Further

Go outside one hour later and re-do the exercise. Have students note what has changed in the past hour. With two sets of observations, they may now explain the trend of each measurement. This is the first step toward making a weather forecast.

Special Needs Students

Some students may need the assistance of a peer team or an adult, particularly when identifying and using equipment, calculating the wind chill, and making the poster. Keep directions simple and allow students with fine and gross motor issues to move between stations using their best locomotion skill pattern, e.g., walk, speed walk, or jog. If possible, use larger weather reporting equipment and larger recording charts.





I Think

Grade 3–5

Lesson Summary

Students will use technology to research a ski area and write an opinion about how that ski area affects the economy of the town in which it is located. Using at least one fact from their research, students will design a poster about the ski area they researched and will produce three fact cards to accompany the poster. Students will then present their posters, and the fact cards will be used in a review challenge.

Objectives

Students will:

- * Use technology and other resources to research a topic.
- * Use three sources of information, including two websites.
- * Write a one-page opinion essay.
- * Use appropriate writing conventions and cite their sources.
- * Create a poster and fact cards.

Materials

- * Poster board
- * Markers or colored pencils
- * Construction paper
- * Index cards
- * Large paper clips

Teacher Notes

1. Students will work in pairs or groups of three. You may wish to determine partners or groups ahead of time.
2. Prepare a list of ski areas. Either assign each pair/group a ski area to research or cut the list into strips for students to draw at random.
3. Find and post websites that may help students with their research.

Common Core Standards

English Language Arts

CCSS.ELA-LITERACY.L.3.2, 4.2, 5.2

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

CCSS.ELA-LITERACY.W.3.1, 4.1, 5.1

Write opinion pieces on topics or texts, supporting a point of view with reasons.

CCSS.ELA-LITERACY.W.3.7, 4.7, 5.7

Conduct short research projects that build knowledge about a topic.



Procedure

Inside:

1. Either have each pair/group draw a ski area at random or inform each pair/group which ski area they will be researching.
2. As a class, brainstorm ideas for researching unfamiliar topics.
3. Provide time for students to do online research to find the following information:
 - a. History of the ski area
 - b. Number of skiers at the ski area for the past three years
 - c. Number of people employed by the ski area
 - d. The ski area's earnings per year for three years
 - e. Advantages and/or disadvantages of the ski area to the community
4. Be sure students use three sources, including two websites, for their research.
5. Review the process of writing an opinion piece.
6. Have each student write an essay about why the ski area they researched is or is not important to the community in which it is located.
7. Have each pair/group create a poster about their researched ski area that highlights one fact. For example, if the ski area has a new ski lift, students may include that in their poster.
8. Have students create and clearly print three fact cards about their ski area using index cards.
9. Have students present their poster and facts to the class orally.

Outside

1. Hang posters outside far enough away from the start location to make for an active game. Attach a large paper clip to each poster.
2. Collect all fact cards and place in a container.
3. Have each student draw a fact card. Once everyone has a card, have the students run or snowshoe to the posters and match the fact card to the correct ski area poster by fastening it with the paper clip.
4. When all cards have been attached to the posters, have students determine if the cards match the correct poster.
5. Discuss results.

Special Needs Students

Some students may need the help of an assistant.