

Snowball Fight

Objective

Students will learn how snow helps crops grow and play a game using facts and words about snow.

Background

Weather is the condition of the air that surrounds the earth. The air that surrounds the earth is called the atmosphere. So weather is the condition of the atmosphere. The atmosphere contains the gases of nitrogen, oxygen and small amounts of other gases. The atmosphere also contains water vapor and particles of dust. The lowest layer of the atmosphere is called the troposphere. The troposphere is where most of the weather occurs. The troposphere begins at the surface of the earth and extends to 6-10 miles from the surface. The weather conditions in the troposphere and surface of the earth depend upon temperature, air pressure, wind and moisture.

Precipitation occurs when the cooling of the air causes moisture to fall in the form of rain, snow, sleet or hail. Rain will fall when the clouds formed by drops of water become so heavy that the air cannot hold it up any longer. Ice crystals form when the temperature of the clouds is below freezing. If the air temperature near the ground is about 37 degrees F., the ice crystals can turn to snow. The crystals will change to sleet if the air temperature is between 37 degrees F. and 39 degrees F.

Weather conditions have a huge impact on agriculture. Producers need clear weather to plant and harvest crops. The crops need sunlight and rain to grow. A frost or storm can damage and/or kill some of a crop. But some kinds of cold weather are good for certain kinds of crops. Snow can help protect the soil and plants from severe freezing and heaving (expansion that causes the soil to buckle and crack). In some cases, the gradual thawing of snow improves the soil's texture.

Oklahoma's number one crop is winter wheat. Winter wheat is planted in the fall and sprouts and grows until winter weather sets in. It lies dormant (stops growing) through the winter, matures in the spring, and is harvested early in the summer.

The weather can affect winter wheat in many ways. If the weather is too wet in the fall, farmers have trouble getting the wheat planted. Wet weather at flowering or harvest can also cause problems. Hail can beat the wheat down. But snow can be good for winter wheat. Snow helps protect winter wheat from a major enemy: fluctuating temperatures.

When the thermometer shifts above and below freezing, the ground expands and contracts, dislodging the roots from the soil. That won't happen if there is a nice blanket of snow.

Some scientists also believe snow that falls late in the spring can help fertilize crops. Snow contains nitrogen and other nutrients plants need. It also

Standards

GRADE 3

P.A.S.S.

Music—2.1

Visual Art—4.1,2

Science Process—3.1,3.3

COMMON CORE

Math Process—MD 4

Math Content—3.MD.2

Language Arts—3.L.3;
3.W.4

GRADE 4

P.A.S.S.

Music—2.1

Visual Art—4.2,3

Science Process—3.1,3

COMMON CORE

Math Process—MD.4

Math Content—3.MD.2

Language Arts—3.L.3;
3.W.4

GRADE 5

P.A.S.S.

Visual Art—4.2,3

Science Process—1.1,2;
4.3,4

Earth Science—3.2

COMMON CORE

Math Process—MD4

Math Content—5.MD.1

Writing—5.W.1; 5.W.2a

has quite a bit of moisture. If it falls on ground that is not frozen, the nutrients and moisture in the snow can penetrate the soil.

Language Arts

1. Read and discuss background material and provide books about snow for students to read.
 - Hand out white sheets of paper.
 - Each student will write one word or fact about snow, either from the discussion of background or from their own research.
2. Play “Snowball Fight.”
 - Students will wad up their sheets of paper with facts about snow.
 - Turn on music.
 - Students will toss (not throw) their paper wads from student to student, in no particular order.
 - After a few minutes, stop the music.
 - Each student will smooth out the “snowball” he or she is holding, write another word or fact, and wad the paper up again.
 - Start the music, and repeat two or three times.
3. Each student will write a story, using all the words or facts on the last snowball caught. Students may also work together in groups to write their stories.

Science

1. Use this experiment to show students how raindrops form:
 - Pour just enough water into a quart jar to cover the bottom.
 - Turn the jar lid upside down, and set it over the mouth of the jar. Place 3-4 ice cubes inside the lid.
 - Students will observe the underside of the lid for 10 minutes. The lid will look wet, and finally water drops will form on the underside of the lid. That is because some of the liquid water in the bottom of the jar evaporates. The water vapor condenses and then changes back to a liquid when it hits the cool underside of the lid. As the amount of liquid increases, drops form on the underside of the lid. In nature, liquid water evaporates from open areas such as streams, lakes and oceans. This vapor rises and condenses as it hits the cooler upper air.
2. On a rainy day, students will collect raindrops in a bowl that contains about 1/2 cup of flour. The raindrops will form floured beads. Take the raindrops into the classroom and carefully spoon them onto a wire strainer. Very gently shake the strainer to remove loose flour from the droplets. The beads that are left are floured raindrops. Help the students record the size and shape of the drops on a piece of paper.
3. Fill a quart jar about half full with water. Place a strip of masking tape to mark the water level. Put the jar in the freezer overnight.
 - Students will look at the jar and report their observations. (Note: If you are using a glass jar, make sure you do NOT cap it.)

Materials

assorted books about snow

white paper

pencils

tape or CD player with appropriate music CD or audiotape for playing “Musical Chairs” type game

Food and Fun

On a snowy day, make Snow Ice Cream. (Go to “Food and Fun” on the website)

Math

Is five centimeters of snow the same as five centimeters of rain? Ask students, and graph the results. Measure two inches from the bottom on a container and mark. Place snow in the container up to the mark. After the snow has melted, measure again.

Visual Art

Cut snowflakes from white paper and display them in the hallway.

Extra Reading

Branley, Franklin M., *Sunshine Makes the Seasons*, Collins, 2005.

Lackey, Jennifer D.B., *The Biography of Wheat*, Crabtree, 2007.

Locker, Thomas, *Water Dance*, Sandpiper, 2002.

McKneally, Ranida, and Grace Lin, *Our Seasons*, Charlesbridge, 2007.

Paulsen, Gary, *Winter Room*, Scholastic, 2009.

Randall, Alison L., and Bill Farnsworth, *The Wheat Doll*, Peachtree, 2008.

Yolen, Jane, and Greg Shed, *Harvest Home*, Harcourt, 2002.

Vocabulary

air—the invisible mixture of odorless tasteless gases (as nitrogen and oxygen) that surrounds the earth

atmosphere—the whole mass of air surrounding the earth

dormant—having growth or other biological activity much reduced or suspended

nitrogen—a colorless tasteless odorless element that occurs as a gas which makes up 78 percent of the atmosphere and that forms a part of all living tissues

oxygen—a colorless tasteless odorless gaseous element that constitutes 21 percent of the atmosphere and is found in water, in most rocks and minerals, and in numerous organic compounds

precipitation—water or the amount of water that falls to the earth as hail, mist, rain, sleet, or snow

rain—water falling in drops from clouds

snow—small white ice crystals formed directly from the water vapor of the air.

troposphere—the portion of the atmosphere which extends from the earth's surface to the bottom of the stratosphere and in which temperature generally decreases rapidly with altitude

weather—the state of the atmosphere in regard to heat or cold, wetness or dryness, calm or storm, clearness or cloudiness