Weather Around the Community, Country and World
Grades: 1st through 3rd
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The activities listed in this unit include various projects that address students' different learning styles and allow peer tutoring and cooperative learning. It would be impossible to list every conceivable accommodation that needs to be made for all possible learning. However, a list of possible accommodations for Special Needs Students has been included at the end of this unit. All of the lessons can be tailored to fit the educational needs of students, once the teacher has been able to meet the students and evaluate their abilities and language levels.

This unit includes many hands-on type activities and projects that are very beneficial to 2nd language learners and other students with different learning abilities. By integrating instruction across the curricula, language learning students are presented the instructional concepts in many different formats and in different styles. Included are the actual, detailed lesson plans for all of the lessons in this unit.

A partial reading list is included below, although there are copious books on weather related topics for various grade levels. The books listed below range in grade level from primary to 4th grade. All of these books should be available in the classroom.

It Looked Like Spilt Milk
Cloudy With A Chance of Meatballs
Pickles to Pittsburgh
The Magic School Bus- Weather
The Magic School Bus- Inside a Hurricane
The Adventure Of The Big Snow
One Snow Day
The Reason For A Flower
Snow Day
When The Wind Blows
Rainy Day Blues

Daily Weather Readings Lesson Plan

Introduction:
As part of the daily reading for class, the teacher should read aloud to the students. For the Weather Unit, students should be read stories and poems concerning weather and weather related stories. Any of the books listed on the reading list would be appropriate, as would any Haiku poetry. The reading should take place in a relaxed environment during the first 15 minutes of class.

Objectives/Outcomes:
The objectives of this lesson are to foster a love for reading, entertain, and expose the students to more information about the weather phenomena being studied in class. The students will, hopefully, enjoy the stories and participate in a Q & A session after each story is read. Classroom discussion should be encouraged.

Process:
At the beginning of each class, let the students find a comfortable sitting position (the floor for example) and begin the day's reading. Let students view any illustrations, ask questions, and make comments. At the end of the reading, lead a discussion about how weather influenced the story or poem.

Assessment:
The only assessment here is whether or not the students listen to the reading and participate in discussions.

Modifications/Accommodations by Disability:
Translation or re-reading may be necessary. Letting students discuss the reading together can also help those students who need extra help in processing the content.

Resources/Materials:
The books listed on the suggested reading list at the beginning of the unit are a good place to start. Haiku poetry (which is one of the requirements for the Poetry Cube lesson) would also be appropriate. Any other weather related stories or poems that the teacher may come across would also be appropriate.

Sounds of Weather Lesson Plan

Introduction:
The purpose of this lesson is to use the students sense of hearing to identify weather, and not rely directly on what they see. This exercise would be especially helpful for students who do not read or write very well.

Objectives/Outcomes:
Students will apply the knowledge they have gained about weather systems and formations to try and identify weather by sounds. The students will play a game, pitting two teams against each other, to try and identify the weather sounds first. Points will be awarded for the quickest, correct answer. The teams' points will tallied at the end to determine the winner. Teacher instructions for the game are included.

Process:
After dividing the class into teams, line the team members up. Instruct the team members that the first person to raise their hand when they can identify the weather sound will get to answer first. If answered correctly, their team will get a point. If answer is not correct, the other team gets a chance to answer. Put blindfold on the first person in line for each team. Play the first weather sound from the tape and let the game progress. After each sound, the next two people in line get the blindfolds and the next turn.

Assessment:
The team with the most points will win the game. When playing with younger children, go through the tape several times so that the sounds get reviewed and imprinted for each student.

Modifications/Accommodations by Disability:
The teacher can allow each contestant to confer with their teammates before giving an answer.

Resources/Materials:
The teacher will need to provide a cassette recording of weather sounds (i.e. rain, thunder, wind, hail, sunny day, flood, snowy day). Many of the sounds will have to be related to nature sounds or maybe the sounds of a holiday. Two blindfolds will also be needed and a method of keeping score. The students will then have to be broken into teams.

Teacher Instructions for Creating Weather Sounds Tape:
Although cassette tapes and CD's can be purchased that have the sounds of nature, creativity can be used to create a weather tape and save the money. Below are some examples of how sounds can be created. lf you think of others, use them!

Thunder - banging on any tin object, such as a cookie sheet or a saw, can create the desired effect. Experiment!
Rain - A sprayer off of a faucet or a hose can create this sound. Let the water fall on the cookie sheet from above.
Flood - Any rushing water will do. Try emptying a full bucket of water onto a slanted driveway with the cassette recorder at ground level, close to the water.
Wind - A hair dryer on low or a fan on high will do nicely.
Hail - Marbles or pebbles being dropped will create a similar sound.
Snowy Day - Be creative! use seasonal sounds like Christmas carols.
Sunny Day - Birds singing, crickets chirping, children playing.

The Weather Vocabulary Game Lesson Plan

Introduction:
This activity can be done whenever students have down time. It is a quick review and is played like the "Memory" card game. Any words related to weather could be used, and other added as you discover more. The game will work on basic vocabulary building as well as memory skills.

Objectives/Outcomes:
The objective of this game is a vocabulary review of weather terms. It could be used as a review before a vocabulary test. Students need to gather as many "matches" of cards as possible. Instructions are included for creation of the cards. The winner has the most matches. It is also good as a review exercise if a child finishes other assignments quickly.

Process:
Student will spread cards out on the floor, face down. Cards should be mixed up and out of order. Student will then turn one card face up and then attempt to upturn another card with the picture or vocabulary word that matches the one they turned up first. If the cards are a successful match, the cards are collected as a pair. If they are not a match, the cards are turned back down and the student tries again or another player gets a turn. The game can be played by one or more players. The object is to try to remember where the cards are and to gather as many pairs as possible.

Assessment:
There really is no assessment other than how many pairs are gathered or who wins the game.

Modifications/Accommodations by Disability:
The game can be played on teams, letting
team members help each other out, or it can be modified by letting a player turn over
more than one card.

Resources/Materials:
Game cards will have to be constructed. Index cards are easy to use. Pencil, pens, markers, or colored pencils will also be necessary to create the cards.

Teacher Instructions for Constructing Cards for Weather Vocabulary Memory Game:

1. Use index cards or cut squares of roughly the same size from construction paper. You will need enough cards for two times the number of vocabulary words.
2. Write the weather, vocabulary words on each card, one per card, on one side only. You should have half of the card left blank.
3. On the blank cards, draw a picture that portrays the weather event being described by the vocabulary words. You should have one picture for each word to match up in pairs.
4. Mix the cards, lay them out, and play the game.

Webbing Lesson Plan

Introduction:
This lesson is designed to introduce students to the concept of webbing, which will help students in all classes. It is designed to help them develop note-taking skills and begin understanding the concept of outlining. For the purposes of this exercise, students will choose a weather-related topic.

Objectives/Outcomes:
Students will create a web, focusing on a weather topic. It is a brainstorming activity that the students can do in groups. Ultimately, students will be able to create a web on their own. Teacher instructions are included in this unit.

Process:
The teacher will demonstrate the concept of a web to the class, using the topic of clouds. The students will participate and help create the web. The web should consist of previous knowledge and questions the students would like to answer and learn more about. Students will then create a web on their own weather topic. Students will work together on their webs, in order to help and support each other, and have the support and knowledge of the teacher. The teacher will leave the class created model of the web up on the board as a reference as students work on their own,

Assessment:
The successful completion of each students' web will be the assessment.

Modifications/Accommodations by Disability:
It is impossible to prepare for every conceivable disability or language barrier until an instructor meets and evaluates the students. However, there are things teachers can do to accommodate the most prevalent of disabilities. Some techniques are to allow students to work together, translate for each other, to reduce the requirements of the assignment, and to allow more time.

Resources/Materials:
Students will he allowed to research their topic using the library, Internet, and any other resources to gather information on their topic. Weather and weather related topics will be exhaustively researched and studied in the science classes as part of a thematic unit.

Teacher Instructions for Creating the Web:

1. Start with the teacher selected weather topic of clouds. There is an overhead here to get you started with a few facts about clouds. Have the students brainstorm, as a class, on all they know about clouds. Write their responses on the web, adding as class participation increased. If possible, fill the web up.
2. Leave the class created web up for students to use as a model. Have students select their own weather topic, specifying that they cannot do a web on clouds, and have them begin their own web. Have them brainstorm on what they know and what they would like to learn. The teacher will help students complete the web.
3. Students need to fill the web up as much as possible. The more information they have on the web, the easier the assignments will be in the rest of this unit, including lessons from Science, Social Studies, and History.

Weather Book Lesson Plan

Introduction:
The objective of this lesson is to allow the students to write and publish their own books on weather. This project is a continuation of the weather unit and further develops skills begun while making the poetry cube. The students will create an illustrated book concerning facts they have learned about their weather topic. Each page of the book will be illustrated and at least one fact per page will be included. The teacher will model and demonstrate each step of the writing process and provide a completed book as an example.

Objectives/Outcomes:
The students will apply the knowledge they have gained while researching their selected weather topic in their science classes to create a book that expresses their learning in their own styles and in their own words. The books will be illustrated, bound with a cover, and show what the student has learned about their weather topic. The books will be shared among the class so that .each student's research and gained knowledge can be shared with classmates. Teacher instructions are included for the construction of the, book.

Process:
Using the knowledge the students' have gained on their topic, they will create books that let them show what they know. Each page of the book will have one fact learned about each student's weather topic and any illustration the student wishes to incorporate. The techniques for making the books will be demonstrated by the teacher and students will be able to help each other in the process. This project is designed to be fun and engaging. Students will be responsible for constructing pages of the book, building a cover, writing the text of each page, illustrating each page, and stapling the books together.

Assessment:
Completion of the book will be the assessment. Students will be graded on accuracy of the information they provide in their books and general neatness. Books must be at least 10 pages long.

Modifications/Accommodations:
Some of the modifications to be considered for students with special needs concerning this project would be to extend time limits, allow fewer pages to be completed, allow text to be written in students' native language and then translated, and allow students to work in groups. There are other options available.

Resources/Materials:
Students will be able to utilize any classroom and school resources to research their topics, including the library and the Internet. They will be provided materials to create the books, and they will be able to bring materials from home. Paper, construction paper, colored pencils, markers, glue, etc. will be provided by teacher.

Teacher Instructions for Constructing Weather Book:

1. Provide students with lined paper, white paper, construction paper, scissors, colored pencils, markers, pencils, erasers, scissors, and glue. Before construction begins on the book, have student list at least 5 facts that they have learned about their weather topic. Each page of the book will contain at least one fact, along with an illustration. The books will be at least 5 pages long, not including a cover.
2. Have each student take one standard sized piece of construction paper and fold it in half, book-like. Then, using the lined paper as a guide, have the students list their five facts as neatly as possible. The facts then can be cut into strips and glued to either white paper or 1/2 sheets of construction paper to create the pages of the books. Make sure the strips that the facts are written on fit the page size of the books. Let the students illustrate each page of the book, being as creative as they like.
3. Once all of the pages of the book are completed and checked by the teacher, the book can be constructed. The cover needs to be decorated, including the student's name and class. The pages of the book should then be stapled into the book. The accuracy of the facts will be part of the overall assessment of the project.

Poetry Cube Lesson Plan

Introduction:
This lesson is designed to meet the standards concerning poetry and to let students further research and discover different aspects of weather as part of a thematic unit on weather that works across the curriculum. Students will choose a weather-related topic and base the project on that topic. The teacher will model all steps and components and provide a completed cube as a model.

Objectives/Outcomes:
Students will create a Poetry Cube utilizing 6 different poetic devices and types. Students will show understanding of the concepts of acrostic, haiku, personification, simile, onomatopoeia, and rhyme. Students will have been exposed to these techniques through classroom lecture and practice. Students will complete one technique for each side of the cube. Mini-lessons are included for each of the six sides as well as teacher instructions for constructing the cube.

Process:
Using the results of classroom instruction and utilizing the assistance of the teacher, students will write an example of one of each of the following concerning their weather topic: acrostic, haiku, diamonte, simile, onomatopoeia, and rhyme. Each of these six exercises will be put on one of the six sides of the cube. Students will be allowed to decorate or illustrate each component of the cube. The cube will then he assembled.

Assessment:
The successful completion of the cube will be the assessment. The cube will be graded on the accuracy of each of the six elements, general neatness and presentation.

Modifications/Accommodations by Disability:
This exercise can-be modified by allowing students more time to complete each component, work in groups, write the components in their native language and then translating, and by reducing the requirements of the assignment.

Resources/Materials:
The students will have access to all notes and a poetry cube example provided by teacher. Students may also use any previous exercises completed in class, their textbooks, dictionaries, and thesauruses. Students will be provided with all necessary implements to construct their cube by the teacher. Students will be provided 6

cardboard squares to construct the cube, markers, colored pencils, scissors, yarn, and any other art supplies needed.

Mini-lessons for each side of the Poetry Cube:
Side 1: Acrostic Poem- This is a very basic, simple poetry form. The poem is constructed by using the letters that spell out the topic, or word being used. Words chosen should he adjectives that describe the topic. Students can practice using their names to make a poem before they begin their weather topic poem. An example of a name poem is below:

R owdy
O nery
B eautiful
I ntelligent
N aughty
S illy
O utgoing
N ice

Once the children have constructed an Acrostic poem using their name, something they know quite well, they then need to construct an Acrostic about their weather topic. The example that needs to be done with the class concerns the topic of "clouds". An example is below and can be used for the class to help the students when they get stuck for words.

C ircular
L ight
O utisde
U p
D rifting
S oaring

Side 2: Haiku- Haiku poetry is a Japanese form of poetry that concerns nature. It follows a simple format, good for kids. Basically, Haiku poems are 3 lines long with 5 syllables in the 1st and 3rd lines and 7 syllables in the 2nd. It is a good review of syllables and of adjectives, since adjectives are primarily used to write Haiku poetry. An example of a Haiku on clouds is below. Students should try to write one as a class for practice.

Drifting in the sky,
Billowing, fluffy white clouds.
Cotton candy skies.

Side 3; Personification- This technique makes things that are not human behave as humans do. For instance, the "whispering wind" would be personification. Keeping with the theme of clouds, examples are listed below. These should be shared with the class. The students should also try to come up with their own examples.

The clouds danced in the sky.

Clouds smile down on us.

Happy clouds soar up high.

Side 4: Simile- A simile is when 2 things are compared to each other to make a point or to create an image. The words "like" or "as" are used in the comparison. There are examples listed below that should be shared and

discussed with the class. The students should also come up with their own similes. These examples, again, all concern clouds in keeping with the class theme.

Clouds are as white as snow.

Clouds fly like birds.

Clouds are as dark as night.

Side 5: Onomatopoeia- Onomatopoeia is words that create sounds. Sometimes this will be hard, as in the case of clouds since they don't make sounds, but the students will have to use their imaginations. Some possibilities are below. Students should be encouraged to try and come up with as many as possible during the class presentation of this technique.

Whoosh! The clouds flew by.

The clouds went boom with thunder.

Side 6: Rhyme- This side is easy. Students have to create at least two lines of rhyming poetry about their chosen weather topic. The short rhyme about clouds needs to be shared with the students. They should then be encouraged to create their own rhymes about clouds, brainstorming their ideas as a class.

Clouds are up in the blue sky, Flying, floating, soaring by.

Clouds are fluffy, soft, and white. Up in the sky, even at night.

Teacher Instructions for Constructing Poetry Cube:

1. Provide each student with six 7" cardboard squares that can be cut from file folders or poster board to create the sides of the cube. Students can cut these squares themselves or they can be pre-cut. Each square should have a minimum of 6 hoes punched along each edge to permit them to be sewn into a cube. Provide students with yarn to construct the cube.
2. Provide each student with colored pencils, markers, ribbon, yarn, pencils, erasers, and paper. Students should be encouraged to be artistic and creative in the construction of their cube.
3. Using the examples of each poetic technique as examples, students will copy their own work onto each side of the cube. Each poetic exercise should be about their weather topic. They ran use their art supplies to decorate each side.
4. Once each of the 6 sides has been completed, and the poetic exercises have been graded and approved, the construction of the cube can begin. Have the students use the yarn to thread the sides of the cube together, using the pre-punched holes to sew the squares into a cube shape. Pull the yarn tight to secure the cube and tie the yarn off with a knot. The cube is now complete.

Ordering Whole Numbers Using Temperatures Lesson Plan

Introduction:

This lesson will work on ordering whole numbers from smallest to greatest and greatest to smallest. The students will use temperatures from various mediums to practice these skills.

Outcomes/Objectives:
Upon successful completion of this lesson students will be able order whole numbers from smallest to greatest and greatest to smallest, with 80% accuracy on a teacher generated exam.

Standards:

1. Relate counting, grouping and place value concepts to whole numbers (e.g., reading and writing the number represented when objects are grouped by thousands, hundreds, tens and ones)
    a. Order whole numbers (e. g., smallest to largest, largest to smallest) up to one thousand

Process:
The teacher will review and or teach place value concepts and the value of a given number. Students will manipulate cards with numbers in smallest to greatest and greatest to smallest. They can then check their answers by using a number line. Students will collect city temperature numbers in the order given by the teacher. They will then put numbers in order, first smallest to largest and second greatest to smallest. The teacher will usenewspaper weather pages and computer web sites on weather to generate the numbers.

Assessment:
The teacher will generate a worksheet with a table like the newspaper temperature table of cities in the U. S. The worksheet will consist of 20 problems and Mastery will be 16-20 correct.

Extensions/Modifications:

1. An extension would be for students to graph the various temperatures from greatest to smallest and smallest to largest, from cities around the world.
2. A modification for students would be to work with a peer tutor, dictate numbers in the correct order to someone, use a number line to help visualize the placement of the numbers, or work with a teacher in a small group.

Technology:
The students will use computer weather web sites to locate temperatures from around the world.

Resources/Materials:
Newspapers with weather information
Computers
Paper and pencils

Double Digit Subtraction with Temperatures Lesson Plan

Introduction:
This lesson will focus on the skills of double-digit subtraction. Students will use high and low temperatures to create subtraction problems.

Objectives/Outcomes:
Upon successful completion of this lesson the students will be able to create double digit subtraction problems using high and low temperatures from teacher selected cities.

Standards:

1. Understand the meaning for and application of the operations of addition, subtraction, multiplication and division.
    a. Demonstrate with models to show the process used in subtraction (takes away, compares, and fords the difference, decreases).
    b. Apply mathematical operations in everyday situations.
2. Demonstrate proficiency with the operations of addition and subtraction of whole numbers.
    a. Demonstrate proficiency with basic facts up to 20.

Process:
The teachers will teach/ review the concepts of subtraction with and without borrowing. Demonstrations by the teacher of how to read high and low temperatures from the newspaper and computer weather sites. The students will practice subtraction from a list of cities provided by the teacher. Example: Yuma's high temperature was 95 degrees, and Yuma's low temperature was 45 degrees. How many degrees difference is there between the high and low temperatures in Yuma? The students may practice with a partner and when the teacher feels the class is ready for individual work will assign new cities.

Assessment:
The assessment will be a teacher-generated worksheet with 10 similar problems practiced, and a chart from which to gather the information. Mastery would be to correctly solve 8 of the 10 problems.

Extensions/Modifications:

1. An extension would be to have students create a worksheet for fellow students similar to the one created by the teacher. Other students would then receive the opportunity to solve these student-generated problems.
2. Modifications for students may include using manipulatives in order to solve the problems, working with a partner, or dictating the problems to the teacher or fellow student.

Technology:
Students would use weather sites on the computer to create subtraction problems for high and low temperatures.

Resources/Materials:
1. Local newspapers.
2. Lined paper and pencils
3. Manipulatives (counters)
4. Computers

Patterning Types of Weather Lesson Plan

Introduction:
This lesson will work on patterning types of weather. Students will look at the weather for a week from various locations and predict what the weather will be for the following week. They will look at different weather patterns: rain, snow, tornadoes, hurricanes, and wind. They will work on creating patterns which demonstrate different types of weather from around the world.

Outcomes/Objectives:
Upon successful completion of this lesson the students will be able to create a predictable pattern of weather symbols to display and allow other students to figure out the continuing pattern.

Standards:

1. Create, describe and extend a variety of patterns using shapes, events, designs and numbers
    a. Create a pattern using a model (e.g., symbolically: number or letters; visually: shapes, designs, numbers or pictures; auditorally: clapping, singing or listening: and kinesthetically: dancing, movement or tactile)
    b. Communicate orally or in written form the repetition of objects in a pattern
    c. Extend patterns using a model
2. Formulate generalizations about patterns (e.g., color, shape, size, direction, orientation) to make predictions
    a. Make predictions based on a given pattern

Process:
Students will watch videos from National Geographic on Tornadoes and Hurricanes. They will find (nyelabs.kcts.org/flash_go.html) on the Bill Nye web site and read and participate in activities on the web site Interactive Weather, (win.nws.noaa.gov/iwin/graphicsversion/main.html). The students will draw symbols representing different types of weather and then create a pattern using these shapes. They will also create a second predictable pattern for fellow students to finish.

Assessment:
Students will be assessed on the predictable patterns they created, and the patterns created for fellow students to solve, by using a teacher/student generated rubric.

Extensions/Modifications:

1. Center activity: Create a chart to show the frequency of Hurricanes, or tornadoes in the world.
2. Students may work with partners, peer tutors, and may draw the weather patterns and help place the objects in a pattern.
3. Students may choose to use an experiment to demonstrate how tornadoes, hurricanes, rain, snow, etc. happen.

Technology:
The students will use the computer and web sites listed in the lesson for this component.

Resources and Materials:
Computers
VCR and Videos from National Geographic on Tornadoes and Hurricanes.
Construction paper Colored pencils
#2 lead pencils.

Temperature /Reading a Thermometer Lesson Plan

Introduction:
The students will learn how to use thermometers for measuring temperatures. They will learn how to read a thermometer. Students will graph weekly temperatures. Compare temperatures form various cities in the United States and World.

Outcomes/Objectives:
After a lesson on how to read a thermometer, the students will successfully read and graph temperatures for a week with 80% accuracy.

Standards:

1. Explain the concepts related to units of measure and demonstrate the process of measurement with non-standard (e.g., using paper clip lengths), U.S. customary and metric unit5s
    a. Read a thermometer in Celsius and Fahrenheit to the nearest degree
2. Construct, read and interpret displays of data to make valid decisions, inferences, and predictions
    a. Make and label a graph (horizontal bar, vertical bar, picture graph or tally chart) from organized data
    b. Write a title representing the main idea of a graph
    c. Draw conclusions (e.g., valid decisions, conjectures and predictions) from graphed data
    d. Formulate questions from graphs, charts and tables
    e. Solve problems using graphs, charts and tables (e.g., given a bar graph or preferred flavors of ice cream, students have to decide what flavors of ice cream to order)

Process:

The students will first learn how to read a thermometer in Fahrenheit and then Celsius to the nearest degree. Students will watch a video on temperature. Students will gather information on high and low degrees on teacher selected cities in the newspaper. Students will graph and compare these temperatures. Students will then take temperature readings twice daily and keep a log of their findings. They will then graph the information gathered in their logs. Students will generate questions about temperature in various cities and predict what the following weeks temperature will be in their city.

Assessment:

Project: Create a graph of collected temperatures. The graph will include a title and high/ low temperatures from their log. Temperatures will be shown to the nearest degrees.

Extensions/Modifications:

Enrichment activity center: Counting Cricket Chirps
Center supplies needed:

1. crickets in a cage
2. timer (must count seconds)
3. paper/pencils

Students will work in groups of two or three. The timer counts off eight seconds. During this time the recorder makes a tally mark for every chirp they hear. Then they count up the tally marks and add four. The sum will be the degree in Celsius. (To convert to Fahrenheit, just double the number, then add thirty.) Students can then check the room thermometer to see if the crickets correctly told the temperature of the room.

Modification:

Students may work with a partner, or small group, or have time extension for their part of the project.

Technology:

Students will use the weather sites on a computer to collect data on temperatures.
Students can also check on scientist's experiments with crickets and weather, by checking with www.ajkids.com.

Resources / Materials:

Newspapers
Weather Web sites (accessible from any internet server)
Construction paper
Thermometers

Video on Weather- Magic School Bus In a Hurricane, Bill Nye Atmosphere/ Heat

Measurement in Weather Lesson Plan

Introduction:
This lesson will measure the size of individual raindrops using inches/centimeters. The students will estimate the various sizes of the raindrops, measure the raindrops for actual size, compare the estimation to the actual size, and evaluate the reasonableness of their estimations. This is a great activity for rainy days and teaching the skill of measuring in inches, half inches, and centimeters.

Outcomes and Objectives:
Upon the successful completion of the lesson, the students will be able to estimate sizes of raindrops and measure correctly to the nearest inch or half-inch, or centimeters on a teacher/student generated rubric.

Standards:

1. Make Estimates of Measurement
    a. Estimate a Measurement
    b. Compare the estimation to actual measure
    c. Evaluate the reasonableness of the estimation
2. Explain the concepts related to units of measure and demonstrate the process of measurement with non-standard (e.g., using paper clip lengths), U.S. customary and metric units.
    a. Select the appropriate unit of measure for a given characteristic of an object
        Length - inches, feet and yards; Centimeters and meters
        Capacity/volume - cups, gallons and liters
        Mass/weight - ounces, pounds, grams and kilograms
    b. Measure a given characteristic of an object using standard units of measure

Process:
The students will practice estimating the size of various school objects. They will them measure these objects with various items, (e.g., paper clips, erasers, etc.) and compare the sizes. Then they will practice measuring to the nearest inch, the nearest half-inch, and the nearest centimeter. The teacher can demonstrate on the overhead projector. The teacher will teach students the difference between inches and centimeters. They will work on worksheets generated from a computer site listed above. They will estimate and measure raindrops. (If there is no rain, the teacher can manufacture raindrops by sprinkling water onto dark paper.) They will compare the size of the raindrops. The students will write a paragraph about their estimations and measurement observations. Then the students will measure the raindrops and compare actual measurements to estimations.

Assessment:
The assessment will be to demonstrate to a small group of classmates how they estimated and measured their raindrops. They will also write a paragraph explaining the process they used and their results. The students and the teacher will generate a rubric for the paragraphs. The teacher will use the paragraphs to check for understanding and give a grade based on the rubric developed.

Extensions/Modifications:

1. Students would also go into weather web sites to learn about rainfall in parts of the world.
2. Students with special needs would work in pairs or small groups. Students could have a peer tutor describe clouds and their shapes and have the student offer input on estimations and actual readings.

Technology:

Students would participate in on line sites, (e.g., Bi11Nye.com, www.vlib.org/Science.html, etc.) learning about rainfall in various parts of the community. They would be able to look at satellite views, temperatures, etc.

Resources/Materials:
Rulers (standard and metric)
Dark construction paper.
Computer Web Site: www.mathstories.com/grade2, for estimation ideas
Paper clips, pencils, crayons, etc. to use for measuring devices.
Overhead projector
Books: The Virtual Library: Science (http://www.vlib.org/Science.htrni)

Geometric Shapes in the Clouds Lesson Plan

Introduction:
This lesson will introduce students to basic geometric shapes. They will look for geometric shapes in the clouds. The students will graph and predict changes of shapes from observations of clouds.

Outcomes/Objectives:
Upon successful completion of this lesson the students will be able to identify basic geometric shapes (square, rectangle, triangle, circle, sphere, cube rectangular prism, cone, and pyramid), and the students will graph geometric shapes seen in clouds. Before graphing the students will predict the type of geometric shapes they think they will see in clouds, then graph the shapes, check their predictions, and write in their journal about their observations.

Standards:
1. Construct read and interpret displays of data to make valid decisions, inferences and predictions.
    a. Make and label a graph (horizontal bar, vertical bar, picture graph or tally chart) from organized data
2. Relate geometric concepts to number and measurement ideas (e.g., dividing a rectangle into parts to represent multiplication)

Note: two-dimensional shapes: square, rectangle, triangle, circle Three-dimensional shapes: sphere, cube, rectangular prism (box), cone, pyramid Attributes: size; shape; the number of sides, corners and faces

a. Identify two-dimensional shapes by name and attribute
b. Draw two-dimensional shapes
c. Identify three-dimensional figures by name and/or attribute

Process:
Preparation: Gather manipulatives of geo shapes to be covered. Familiarize yourself with sections in the Math book on Geometry; Check out web sites for possible pictures and definitions of clouds. The teacher will teach geometric shapes. The students will look for those shapes in everyday objects. The teacher will also review patterning. Students will predict what shapes they believe they will see in the clouds and write down predictions in their journals. Students will then use computer pictures of clouds and go outside to view clouds to look for geometric shapes. They will then log in their journal observed shapes. They will then create a pattern using the geometric shapes they observed as well as graph the shapes seen and compare their predictions to their actual observations.

Assessment:
1. Graph: Students will show at least four of the basic shapes in their graph. (sphere, circle, cube, square, rectangle, triangle, pyramid)

2. Students will write 5 sentences, which include at least 2 observations made of geometric shapes seen in the clouds and I sentence about their prediction.

Extensions/Modifications:
Extension:
1. Students will predict and graph alternate days, to compare and contrast.
2. Students will study and report on the movement of clouds and how weather affects the shapes seen. Students may do a report on types of clouds or write a poem about geometric shapes in clouds.

Modifications:
1. Students will work in-groups of two or three.
2. Students will use wooden/plastic geometric shapes to manipulate and make a graph instead of drawing a graph.

Technology:
1. Students will use computers to write their final draft of observations made.
2. Students will use information gathered about weather to help with predictions, etc.
3. Students will go to teacher selected sites for pictures of clouds and geometric shapes.

Resources/Materials:
Math Book- Geometry Section/ Science book
Computer Programs; BillNye.com
Graph paper
Pencils- Colored and #2 lead
Writing paper
Geometric shapes: overhead and manipulative shapes for students
NASA channel

Weather Extremes Lesson Plan

Introduction:
This lesson is to acquaint children with the idea that weather is different in different parts of the country. Most days, weather is typical or ordinary for the area's general climate. Some extreme variations, however, occur. In this lesson, children have the opportunity to learn about some of these weather extremes as well as to practice skills locating specific map features.

Outcomes/Objectives:
Upon successful completion of this lesson, students will have specific practice with locating communities and comparing that location with that of the home community. Students will also have to locate specific geographical features such as rivers, lakes and mountains as well as to learn the directions of north, south, east and west on a map. Children will have additional practice with weather vocabulary and can draw conclusions about how a specific weather event may have affected that community.

Standards:
1. History and Nature of Science- Students understand the nature of scientific ways of thinking. Students understand that scientific investigation grows from the contributions of many people. (Foundations Grades 1-3)
    a. Recognize that scientific contributions have been made by all kinds of people everywhere in the world.

    b. Understand that scientific inquiry has produced much knowledge about the world, that much is still unknown, and that some things will always be unknown.
2. Earth and Space Science- Students understand the composition, formative processes, and history of the earth, the solar system and the universe. (Readiness and Foundations levels, Grades K-3)
    a. Identify how the weather affects daily activities.
    b. Describe natural events and how humans are affected by them.

Process:

Preparation:

Mount a large map of the United States in a location where the entire class is able to see it. Familiarize yourself with the location of the various sites on the map. Make slips of paper large enough to write weather facts on them and have them ready with a means of attaching them to the map.

Tips:

If the children are unfamiliar with maps, it would be a good idea to provide a brief overview. Point out their current location and provide opportunities for children to discuss places they have visited or places where friends and relatives live. A discussion of what weather is probably like in different places on the map might also be useful.

Tasks:

Introduce the lesson to the children. Weather happens everywhere on Earth. Some places it is usually very cold while some places it can be very hot. Discuss what your local weather is normally like. Tell the children that scientists from all over the world have recorded weather data for over 100 years and have found some real extremes. Review the 10 extremes for the United States. Have children plot and label the location of each of the extremes on the map. Students could complete this task by having volunteers come to the map, one at a time. Students who might be unsure of how to find the location could get directions from other students or the teacher. After all of the weather locations have been found, have the children create and answer questions based on the mapped data. Some examples might include:

- Which event happened closest to our community?
- Which event happened farthest south? east? west? north?
- Which event happened nearest an ocean? a mountain? a river? a big city? A neighboring country?
- In what direction would we travel from our community to visit each location?

Conclude by discussing how the weather event probably affected the people in that community. Also ask the class to discuss whether there is a possibility of more weather extremes occurring in the near or distant future.

Outcomes:

Students should come away with the understanding that weather has been studied by various individuals for many years. They should understand that the weather is very different in different parts of the country. They might also comprehend that it is generally colder to the north or on top of a mountain and warmer in the south and low lying areas. They should be able to locate their hometown on the map. Students should be able to reason how weather extremes might make it difficult for the people who live in a particular area and verbalize how they would feel if they had to live through such an extreme. Students should understand that weather is always changing and will continue to change.

Assessment:

An assessment similar to this could be given:

1. Locate our hometown on this map.

2. Is the weather in New York the same as it is here?
3. Which would be colder, the top of a mountain or down at the bottom of it?
4. If it were to rain a lot here, how would that make our lives different?
5. What is your favorite kind of weather? Why?

Extensions/Modifications/Accommodations by Disability:
This lesson is easily extended in many different ways:

- Older students could be asked to research the initial list of weather extremes using the web.
- Students could also be asked to research weather extremes for the local area and use the computer to build a graph of them. www.yeather.yshoo.c,om has records and averages for all parts of the country.
- Students might interview a local person who was alive at the time of the weather aberration.
- Students could be asked to write a fictional story about a person experiencing one of the weather extremes.
- Weather extremes could also be studied worldwide rather than just in the United States.
- This lesson could also be carried out independently (for extra challenge) or in small groups with each student or group of students locating weather events on a smaller, more personal map. This group option would allow for peer tutoring for the individuals in the class with special needs (LD, MR, ESL) and would lighten the reading and writing requirements. It would also provide opportunity to verbalize while in the process of learning. The assessment can be given orally to those students who require it.

Technology:
As previously mentioned in the above section students could use the internet to research their own weather extremes or local weather records. They could pick some different locations and keep track of the temperatures there each day for a period of time. www.learnersonline has a great lesson called in the eye of a hurricane. Students can take a cyber flight through a hurricane. Other good websites are www.educationplant.com and www.geocities.com.

Resources and Materials:
Students will need a large map of the United States, paper, pens and pencils. The teacher will need the following list of weather extremes for the United States.

- Mount Waialeale on Kaui, Hawaii, is the world's wettest spot. It averages about 460 inches of rain each year.
- On July 10, 1913, Death Valley, California, had the highest temperature ever recorded---134 degrees F.
- On January 23, 1971, it was -80 degrees in Prospect Creek, Alaska---the lowest temperature ever recorded.
- Mt. Rainier, Washington, had the greatest snowfall over a one-year period---from February 19, 1971, to February 19 of the following year 1,122 inches fell.
- In one 24-hour period on April 14-15, 1921, 76 inches of snow fell at Silver Lake Colorado.
- St. Petersburg, Florida, had a record 768 sunny days in a row--from February 9, 1967 to March 17, 1969.
- On July 25-26, 1979, Alvin Texas, received a record rainfall of 43 inches over a 24 hour period.
- The greatest wind speed recorded was 231 miles per hour on Mount Washington, New Hampshire, on April 12, 1934.
- The greatest speed during a tornado---281 miles per hour---occurred on April 2, 1958, in Wichita Falls, Texas.
- The greatest one-day change in temperature happened in Browning, Montana. On January 23, 1916, the temperature was 44 degrees F. By January, 24a', it had fallen to -56 degrees

The Water Cycle Lesson Plan

Introduction:
This lesson centers on the water cycle. In it students will make their own terrariums in order to observe precipitation, condensation and evaporation.

Outcomes/Objectives:
Students will become familiar with the concepts of precipitation, evaporation and condensation as well as to obtain a basic understanding of the water cycle. Students will record their own scientific observations in journals.

Standards:

1. Science as Inquiry- Students understand and use the processes of scientific investigation and scientific ways of knowing. They are able to design, conduct, describe and evaluate these investigations. They are able to understand and apply concepts that unify scientific disciplines. (Readiness and Foundations)
    a. Ask questions about the natural world (e.g., Where does rain come from?)
    b. State simple hypotheses about cause-and-effect relationships in the environment.
    c. Communicate observations and comparisons through various means such as pictographs, pictures, models and words.
    d. Observe and describe changes in a simple system (e.g., a plant terrarium)
    e. Construct models that illustrate simple concepts and compare those models to what they represent)
    f. Identify and record changes and patterns of changes in a familiar system.
2. Physical Science- Students understand the nature of matter and energy including their forms, the changes they undergo and their interactions. (Foundations)
    a. Demonstrate and explain that materials exist in different states (solid, liquid and gas) and can change from one to another.

Process:
Preparation:
Make sure above supplies are on hand so each student or group of students can have a terrarium. In preparation a general class discussion should begin about rain and what happens to it after it falls. Ask: What are clouds? What are they made of? What is rain? Why does it rain? Where does the rain go after it falls? What happens to puddles after it rains? Encourage use of the words precipitation, condensation and evaporation. Determine what the level of knowledge of the students is and any misconceptions they might have.

Tasks:
After the discussion have each student, or group of students, assemble a terrarium. Put a small amount of soil in the bottom of each container and plant some seeds according to the directions on the package. Water well and close the container. This watering should be all that is needed as the containers should remain closed. Label the containers and put them in the window or under a grow light. Each day have the students make observations about their terrariums and record their observations in their journals. Observations can be at varied times of the day. Concluding questions that can be asked of students include: How did water get on the lid or top of your terrarium? Why is the soil still wet? Do you think any water evaporated from the soil? If any water evaporated, where did it go? Did it ever rain? Where did the rain come from? Is there anything that reminds you of a cloud or cloud drops in your terrarium?
Finally, a connection should be made between the weather in the terrarium and in the real world. The teacher should ask questions: If the terrarium was like the real world what do you see outside that reminds you of the plants in the terrarium? What reminds you of the soil in the terrarium? What reminds you of the water droplets

on the lid? The soil in our terrarium stays moist, the ground inside never dries out completely. Why? What keeps it moist? Water collects on the lid of the terrarium, water also collects in the sky as clouds, where does the water in the clouds come from?

Expectations:
Students are expected to attain a basic understanding of the water cycle and the concepts of precipitation, condensation, and evaporation. They should be able to transfer these concepts to the world around them and state what happens to water that is standing in a puddle, how clouds form, and how rain comes about all over again.

Assessment:
Students can make a picture model in their science journal, which represents the terrarium. Have students include and label all parts such as container, soil, lid, plants, etc. Also have them draw and label the processes (evaporation, condensation, and precipitation) they see happening and their locations in the terrarium. Students should also be able to verbally explain the basic processes of the water cycle.
A Rubric may be used for grading such as:

5- Complete pictures with all parts labeled. The processes of the water cycle are clearly represented and the student is able to completely explain the drawing.
4- Drawings may be missing 1-2 labels but the basic processes of the water cycle are represented. The student has a general idea of the water cycle in a verbal description.
3- Drawing is mostly complete and has more than 1/2 of the labels. The student is able to explain most of the basic processes of the water cycle.
2- Drawings are of poor quality and more than 1/z of the parts are unlabelled. The student is able to verbally explain less than less of the water cycle.
1- Few-or no drawings in the journal. The student is unable to explain any of the components of the water cycle.

Extensions/Modifications/Accommodations by Disability:
This lesson can be extended by completing a number of simple scientific experiments which also demonstrate the water cycle. One would be to heat water in a kettle. When the water in the kettle is boiling, hold a saucepan of cold water or ice cubes just above the steam from the kettle. Watch the condensation occur on the bottom of the saucepan. When enough condensation occurs, it will begin "raining". Ask students to draw conclusions about how this experiment relates to how rain forms in our world.
This lesson is easily modified/accommodated for disabilities because it is highly visual in nature. It also does not require a large amount of seat-work but rather encourages verbal interaction with others. Students who have difficulty with writing can be paired with peers who can do the majority bf the writing. The final assessment phase is done in picture and/or verbal format. Students needing accommodations can have a word list supplied to them. If the student is unable to draw, then they could be asked to explain orally what is happening in their terrarium and how it relates to the real world.

Technology:
www.ga.usgs.gov/edu/watercycle2ndgrade has a really cute interpretation of the water cycle by a second grade class in Sydney, Australia. There are also an endless number of websites that give good explanations of the water cycle.

Resources and Materials:
Students will need zip lock plastic baggies or plastic containers, soil, water, a spray bottle, fast germinating seeds, and a large sunny window or grow light. Students will also need science journals in which to record their observations.

Weather and Workers Lesson Plan

Introduction:
This lesson is to acquaint students with the idea that weather is especially important to people whose jobs are outside. It will also acquaint students with the roles of various workers in the community and what each one does. Students carry out the activities in a cooperative learning format.

Outcomes/Objectives:
Upon successful completion of this lesson, students will be familiar with various jobs in the community, the requirements of the jobs and how the weather might affect that worker's day. Students must work together in cooperative learning groups to accomplish their end goal.

Standards:

1. Language Arts
    a. Writing (Readiness and Foundations grades K-3)
        1.) (Readiness) Create a narrative by drawing, telling and/or by emergent writing.
        2.) (Foundations) Generate topics through-prewriting activities (e.g., brainstorming, webbing, mapping, drawing, writer's notebook, K-W-L charts, scaffolds, group discussion)
2. Workplace Skills
    a. Students work individually and collaboratively within team settings to accomplish objectives (Readiness and Foundations Grades K-3)
        1.) Interact positively with other students and work cooperatively as a team member on class projects.
        2.) Demonstrate teamwork skills by contributing ideas, suggestions and effort; resolving conflicts; and handling peer pressure.
    b. Students will demonstrate- a set of marketable skills, which enhance career options. (Readiness and Foundations Grades K-3)
        1.) Describe examples of where people work and what they do.
        2.) Explore areas of interests and possible work choices.
3. Science
    a. Earth and Space Science- Students understand the composition, formative processes, and history of the earth, the solar system and the universe. Readiness (Kindergarten)
        1.) Identify how the weather affects daily activities (Foundations- Grades 1-3)
        2.) Describe natural events and how humans are affected by them.

Process:
Divide the class into groups of 3-4 students. Begin by having the groups of students brainstorm lists of workers whose jobs are affected by weather. Some possibilities might include: construction worker, farmer, sailor, police officer, house painter, fireman, pilot, mail carrier, lifeguard, etc. Have one representative from each group share the group's list with the class. On the chalkboard, combine the lists into one master list of weather workers. Then have each group select one worker to report on. Within each group, assign individual students the following reporting responsibilities:

- Draw and label illustrations of your worker on the job (Can be assigned to the student with the poorest written language skills)
- Write a simple job description for your worker.
- List ways different types of weather *affect your* worker's job.
- Record a list of interview questions for your worker to answer.

After each group has presented its report to the class, help students combine their information into a friendly letter inviting a real-life worker to respond to the questions in writing or, if possible, visit your classroom. (parents could be used as a resource for this activity)

Assessment:
1- The group demonstrates a clear understanding of how their worker is affected by weather. The group has a complete illustration with labels of their worker as well as a complete job description and interview.
2- The group has most of the components listed above but are somewhat weak in one of the areas listed above.
3-The group has a thorough presentation in 2 of the 4 areas listed.
4- The group has a thorough presentation in 1 or none of the areas listed.

Extensions/Modifications/Accommodations by Disability:
Students can be split into teams with one interviewer and one "weather worker". A mock interview can be carried out. Research and discuss occupations in other parts of the country (not in your local area) that are dependant on weather (lighthouse operator, snowplow driver, cowhand, ski instructor, etc. - Students with poor written language skills can be given the task of drawing a picture of the worker or decreased requirements in their weak areas) on the presentation assessment

Technology:
Students can use the internet to read about different jobs. See the web site listed under the resources and materials section. Students can also do word processing to write the letter requesting a worker to visit the class.

Resources and Materials:
Students will need paper, pencils, and art supplies such as crayons or colored pencils. If knowledge of community helpers is not great, books describing some may need to be available from the library. Some suggestions of suitable books, websites and videos are available on www.educationplanet.com

Weather Art Lesson Plan

Introduction:
This lesson centers on the different kinds of weather. Students will study pictures of different kinds of weather through books as well as technology and be able to name them. Students will also construct a collage of different types of weather for a room decoration.

Outcomes/Objectives:
Upon successful completion of this lesson, students will be able to name wind, snow, rain, hurricane, hail, fog, and tornados and tell something about each on.. Students will also be familiar with a collage as a type of art and learn that not all art is an individual effort.

Standards:
1. Visual Arts
    a. Creating Art- Students know and apply the arts disciplines, techniques and processes to communicate in original and interpretive work. (Readiness and Foundations levels, Grades K-3)
        1.) Identify and use a variety of art media (e.g., papermaking, tempera paint, film, computer, fiber, clays and *techniques* (e.g., crayon resist, collage, wet-on-wet, computer graphics, coil/slab construction) to communicate ideas, experiences and stories.
        2.) Select and use subjects, themes and symbols in works of art.
2. Language Arts

a. Listening and Speaking- Students effectively listen and speak in situations which serve different purposes and involve a variety of audiences. (Readiness and Foundations levels, Grades K-3)
    1.) Tell or retell a personal experience or creative story in a logical sequence.
    2.) Share ideas, information, opinions and questions
    3.) Participate in group discussions
    4.) Use effective vocabulary and logical organization to relate or summarize ideas, events and other information

3. Workplace Skills
    a. Students demonstrate technological literacy for productivity in the workplace. Foundations (Grades 1-3)
        1.) Use technology to access information demonstrating basic computer skills (e.g., pull down menus, passwords, icons, key word searches)

Process:
The teacher can begin by holding up large photos of various types of weather that can be discussed with the class. Encourage students to share any experiences they have had with these kinds of weather. Discuss such things as the time of year in which specific weather might occur, the outside temperature, and the localities in which these weather conditions occur if they are not common in your area. Students can then be divided into small groups to go on the internet and look at some of the above websites. The websites contain pictures of various types of weather as well as some videos and audios of weather. Students then will use the pictures of the weather that they have brought in to construct a weather collage for the classroom. If particular types of weather are not represented, ask students to draw pictures to complete the collage and/or use computer graphics depicting weather. Pictures of weather could also be printed out from the weather websites on the computer. Finally, each student will select his/her favorite picture from the collage and give a brief summary in front of the class as to what kind of weather is in the picture and why they chose it as their favorite. Students in class can be encouraged to ask questions about the weather chosen and why that particular student chose it.

Assessment:
Students will be expected to name their favorite kind of weather and tell why they like the weather in the picture they chose. Their learning will be assessed during their brief class presentation and will be judged on relevance of vocabulary used, organization of thought, ability to listen to others' presentations, and overall participation in the art activity. A rubric can be used such as the one that follows: (perhaps students should help to organize it and agree on the rubric before the project is begun.)

1- Student tells favorite kind of weather and why they like it. Presentation is well organized, student participated in all aspects of the activity and showed good listening skills when others were presenting.
2- Student's presentation is organized- Student usually participated during the activity and listened well when others were presenting.
3- Student has little to say about their favorite kind of weather. Student only occasionally participated in the art project and displayed poor listening skills when others were presenting.
4- No organization to presentation, little to no participation during group art project, poor listening skills during other's presentations.

Extensions/Modifications/Accommodations by Disability:
This lesson is extremely adaptable to meet a number of different goals. It can easily be expanded into a writing or research assignment in which each student is asked to research the kind of weather they chose and to write a paper on it. These papers could then be shared as an oral presentation. Students could also be asked to write papers comparing and contrasting the different kinds of weather. Modifications for students should not be many as this project is highly visual with very little reading and writing involved. Students could have decreased

requirements for their oral report. They could also be allowed to record the oral report prior to presentation and/or have small group help with organizational fees for the sport.

Technology:
Technology will be used by making use of information and websites available on the internet. Students will be able to view photos and videos of different kinds of weather on the internet sites listed in the resources and materials section.

Resources and Materials:
Pictures of weather, websites: www.wiredshire.org., www.whnt19.com, and www.weatherworks.com for pictures and videos of various types of weather, clippings from magazines, books, etc. that show various types of weather. Parents can be asked to contribute any pictures they are able to collect from newspapers and magazines. Also needed, will be paper for individual drawings as well as paper on which to mount them either on the wall or a bulletin board. Art supplies such as paint, pencils, crayons, etc. can be used as needed for extra decoration or for drawing pictures as needed.

I Change My Form Lesson Plan

Introduction:
This lesson centers on the various forms of water as a liquid, a solid, and a gas.

Outcomes/Objectives:
Students will demonstrate and explain that materials exist in different states (solid, liquid and gas) and can change from one to another.

Standards:
1. Physical Science Foundations (Grades 1-3)
    a. Students understand the nature of matter and energy including their forms, the changes they undergo and their interactions.
        1.) Demonstrate and explain-that materials exist indifferent states (solid, liquid, and gas) and can change from one to another

Process:
The teacher explains that water comes in many different forms. Children are asked to name the forms in which it can appear. After ideas have been discussed, the teacher shows the class the ice cubes and asks, "What do you think will happen if these are heated?" Most members of the class will know that they will melt and eventually start to boil. Some will not know that if the water continues to boil it will eventually disappear in the form of steam. Have students come up in small groups during the process of the experiment to record what is happening in their journals. Recording can be done in the form of pictures with labels and/or writing a narrative. This would depend on the ability level of the child. When the water has almost disappeared, turn off the heat. Ask children "Where did it go?" and relate back to the lesson on the water cycle. Discuss other things that also change their forms such as ice cream, popsicles, wax, etc. Are they a part of the water cycle?

Assessment:
Students can be graded on a rubric that looks at the final product of their journals as well as their participation in the activity. Students can be shown work samples from a previous class to illustrate the quality of work that is expected.

1- Journal is neat with complete descriptions of the steps involved in the experiment. It may contain pictures of the process that are fully labeled. Words such as melt, boil, steam and evaporate should be used. The student was a good listener and active participant in the experiment.
2- Journal has complete descriptions of most of the steps involved in the experiment. It has illustrations that are mostly labeled. The student was an active participant in the majority of the experiment.
3- Journal has incomplete descriptions of some of the processes and contains few pictures. The student participated in part of the experiment.
4- Journal contains almost no descriptions or pictures. Participation was minimal.

Extensions/Modifications/Accommodations by Disability:
This lesson is very visual in nature and should accommodate a variety of disabilities and/or second language learners. Modifications can be made to the rubric for grading for some special education students. Please see accommodations list. Perhaps they can give an oral description of the events that took place rather than writing about them. The class might want to brainstorm a list of other materials that change their form. Groups could be assigned to do a report on each.

Technology:
Students can use the computer to type their final reports or to build a graph or table to compare objects that change their form.

Resources and Materials:
You will need ice cubes and a heat source such as a bunson burner or a stove. If one is not available the experiment can still be completed but it will take more time. A container to hold the ice will also be needed. Students should have science journals in which to record the events.

Temperature Lesson Plan

Introduction:
This lesson centers on thermometers. In it students will learn to read a thermometer and discover basic temperature differences between sunlight and shade as well as time of day.

Outcomes/Objectives:
Students will become familiar with reading thermometers as well as basic determinants of variation in temperatures in a local area.

Standards:
1. Science
    a. Science as inquiry- Students understand and use the processes of scientific investigation and scientific ways of knowing. They are able to design, conduct, describe and evaluate these investigations. They are able to understand and apply concepts that unify scientific disciplines. (Foundations Grades 1-3)
        1.) Identify and record changes and patterns of changes in a familiar system.
        2.) Plan, design, conduct, and report on the conclusions of basic experiments.
    b. Physical Science- Students understand the nature of matter and energy including their forms, the changes they undergo and their interactions.(Foundations Grades 1-3)
        1.) Demonstrate that heat, light, motion, magnetism and sound can cause changes.
    c. Earth and Space Science(Foundations grades 1-3)
        1.) Measure and record changes in weather conditions.

Process:
Preparation:
Make sure each student or group of students has the proper supplies. If thermometers are difficult to obtain, then the class could do the experiments together with different students taking turns reading the thermometers. The experiments are done in three different parts. Ask for student ideas as to the results of each one before beginning.

Tasks:

- Sunlight versus shade- Take the air temperature in direct sunlight in several different spots. Which temperatures are higher? Why? Why should a thermometer be located in the shade?
- Time of day- Take the temperature at five different times during the day: early morning; mid-morning; noon; mid-afternoon; and late afternoon. What time of day is hottest? What is the temperature reading? What time of day is the coolest? What is the temperature reading? What is the average temperature for the day? (add the reading and divide by 5) What adjectives would you use to describe the day's temperature?

Expectations:
Students are expected to attain a basic understanding of how to read a thermometer and how such variables such as sun, shade, and time of day can affect the temperature.

Assessment:
A test can be given similar to this:

1. During what part of the day is it the hottest? Why?
2. What is the temperature on this thermometer?
3. What is the temperature on this thermometer? (picture of a thermometer)
4. Is the temperature higher in the sun or the shade? Why?
5. Draw a thermometer that reads 85 degrees.

Extensions/Modifications/Accommodations by Disability:
This lesson can be extended/modified by:

- Measuring the temperature throughout the day by taking a reading every hour from 9:00 a.m. to 5:00 p.m. and then drawing a simple line graph of the results. Ask the students what the temperature pattern is. When is it the hottest? When is it the coldest?
- Record the hourly temperatures each day over a week. What patterns do you see? How much does the temperature rise each day? The next week, see how closely the students can predict the noon temperature based on the morning temperature. How closely can the students predict the mid-afternoon temperature based on the noon temperature?
- Students can practice converting Celsius temperatures to Fahrenheit. To do this multiply the degrees C by 1.8 and then add 32.
- Students can make their own thermometers.
- Students might also compare the effect of wind chill by mounting one thermometer inside a box where it is protected by the wind and mounting another thermometer outside the box.
- Accommodations for disabilities include but are not limited to cooperative learning groups, reduced workload, use of pictures, answering the assessment questions orally, etc. Students may also need more time to complete tasks. For a complete list of accommodations, please see the master list.

Technology:
The computer can be used to build graphs or tables on the differences in temperature studied above.

Resources and Materials:
Students will need a thermometer. They will also need paper and pencils and/or a science journal.

Supplemental Information Sheet

"Temperature" is a measure of the degree of heat that is in the air. An area gets hotter when it is heated (by the sun), and cools when the heat leaves the area. The coldest time of the 24-hour day is just before sunrise, after the earth has been losing heat all night. Temperature is measured in degrees Celsius, or degrees Fahrenheit in the United States. A thermometer consists of a narrow glass tube containing mercury or colored alcohol. As the temperature increases, the mercury or alcohol expands and its level in the tube rises. The number next to the liquid's level at any given time is the temperature reading
When you take air temperature, it is important to keep the thermometer in the shade. The idea is to measure the temperature of the surrounding air, not the temperature of a thermometer heated by the sun. It is also important to keep the thermometer in one place for several minutes after it has been moved in order to get a correct reading.

Special Education Adaptations

The following is a listing of possible modifications in several disability areas. Teacher will have to choose from the suggestions in each area those that are most suitable for a particular child.

Hearing Impairment:

- Use preferential seating for lip-reading and viewing of signs or listening. The student should be seated for decreased noise interference (not by a fan, group activities, open windows, etc.)
- Provide a sign interpreter if needed.
- Use software for caption decoding for video presentations.
- FM device/ hearing aids, both should be checked daily and batteries charged and changed as needed.
- Work with an assigned interpreter/ aide to facilitate an effective instructional program
- Other teachers, adults and students in contact with the student need to be aware of his special needs.
- Use simple, clear directions, written or signed, and check for comprehension.
- Model the activity and provide examples.
- Emphasize key words and concepts.
- Write oral instructions down and keep in same location.
- Teach and review test-taking vocabulary.
- Use peer scribes for note taking.
- List critical vocabulary for content material.
- Highlight key points in textbooks and notes.
- Use pictorial directions/signs.

Visual Impairment:

- Tape record instructions.
- Use voice output reminders for assignments, studying steps of task, schedule, etc.
- Change lighting (light on desk, back to window, etc.)
- Use a light box.
- Use talking clocks.
- Use recorded material such as books on tapes, taped lectures, etc.
- Use supplementary, multi-modality materials.
- Use black magic marker to darken worksheets and other materials.

- Allow the student to have tests read to him by the special ed teacher, a student volunteer, etc.
- Allow lower standards for acceptable handwriting quality.
- Use unglazed paper.
- Use large print for worksheets and reading material or Braille printers.
- Other students and adults in contact with the student need to be a ware of his special needs.
- Use a word processor for written assignments with enlarged or Braille key covers or caps.
- Reduce or use alternative assignments/tasks.
- Use a peer scribe for note taking or dictation.
- Use tactile letters.
- Use high-contrast colors.
- Electronic/talking dictionary/thesaurus.
- Screen magnifier or screen magnification software.
- Screen reader
- Portable note taker- regular or Braille
- Use manipulatives
- Talking calculators
- Printing calculators/ Braille calculators
- Calculator with large keys, large LCD and/or printout.
- Math talking worksheet software
- Reduce the number of items per page
- Large print output device/ Braille output device.
- Braille displays
- Download books from the net and upload to talking word processor software.
- Scanner or OCR to upload to talking word processor software.
- Use voice recognition software
- Reduce clutter on desk/ organize materials

Physical Impairment:

- Use peers, cross age tutors and volunteers
- Use alternative page set-ups.
- Consider seating and positioning needs.
- Use supplementary multi-modality materials.
- Extend time for assigned tasks.
- Reduce or use alternative assignments/tasks.
- Consider use of wheelchair accessible desk, laptop, flip top desk, etc.
- Allow single word or short answers if in need of a communication device. Present questions in yes/ no format, etc to allow for this.
- Give multiple-choice tests.
- Allow either printing or cursive.
- Use pencil grips/ holders as needed. (Short pencil stub, pens with different grips, straps or splints for pencils, T-holder for pencil)
- Use a writing frame.
- Printing calculator
- Dycem or other non-slip material.
- Magnetic letters and board/ cookie sheet
- Tape recorder with adapted controls if needed.

- Key guard for computer with reduced number of keys
- Alternative mouse
- Alternative methods to access the key board (mouth sticks, head sticks, electronic)
- Voice recognition software
- Software for adapted input methods.
- Slant board
- Book holder
- Page fluffers or extenders to help turn the pages.
- Eye gaze to choose books
- Paper clips and a magnet to turn pages.
- Page protectors
- Devices with speech output (low tech communication book, tape recorder with loop tape, high tech touch or light talker)
- Single switch software for reading

Learning Disabilities/ Emotional Handicaps/ Mental Retardation/ ESL:

- Reduce clutter on desk.
- Use clear, simple, directions and check for comprehension.
- Use peers, cross-age tutors and volunteers.
- Attach assignments, schedule, timetable, checklist, etc. to the desk.
- Allow separate settings for tests and assignments
- Have the student arrive early to go over the day's plan, preview materials or tasks.
- Model the activity to provide an example.
- Break information into steps.
- Prioritize tasks with time suggestions.
- Teach study skills and self-monitoring.
- Provide an essential fact list.
- Establish routines for handing in work, heading papers, etc.
- Review and practice in real situations.
- Plan and teach for generalization.
- Use a variety of instructional strategies.
- Schedule frequent short conferences to check for comprehension.
- Use organizers for materials and the desk.
- Use supplementary mufti-modality materials.
- Tape record instructions. Highlight key words and instructions.
- Use vocabulary cards, files, and books
- Use study sheets to organize material.
- Prepare a summary of important facts with blanks to be filled in by the student during the lesson.
- Make a list of confusing words
- Use talking clocks
- Use books on tape.
- Mini pocket/ key chain recorders
- Voice output reminders for assignments.
- Software for manipulation of objects and concept development
- Videotape lesson for later review.
- Electronic dictionary/encyclopedia

- Extend time for assignments/tasks
- Reduce or use alternative assignments/tasks
- Allow use of word cards, spelling list, hints, etc.
- Allow alternative methods such as oral reports
- Do not penalize for misspellings, poor writing, or grammar
- Allow single word o short answers
- Give multiple-choice tests.
- Allow printing or cursive.
- Use checklists to help get started
- Teach and review test taking vocabulary
- Provide models of tests (assignments)
- List critical vocabulary for content material.
- Use sections on paper (draw lines, fold, etc.)
- Cover parts of worksheet
- Put less information on a page
- Use word cards
- Trace numbers, letters, words on worksheet
- Tactile letters
- Pictures, drawings, photos, etc.
- Sentence strips
- Use word processors
- Screen reader
- Use software strategies such as word prediction, abbreviation, expansion, etc.
- Software for talking word processor
- Allow calculators, counters and manipulatives.
- Stress functional application of math skills.
- Teach "counting on" and other math strategies.
- Teach "problem solving"
- Use concrete materials and manipulatives.
- Use visual cues such as a sliding math line, number line, posters, templates, walking math fine on the floor, etc.
- Use graph paper for place vale ix; adding/ subtracting
- Use a multiplication grid
- Use software with templates for math-calculation, software for money skills, budgeting, check-writing, etc, and software that allows for the manipulation of materials.
- Let students self-select books of interest.
- Provide extra cues/prompts. Allow extra time for responses
- List critical vocabulary for content material
- Provide discussion questions before reading.
- Reduce the reading level
- Use provided pictures for context
- Skim material before reading
- Label important items in the room
- Add pictures, symbols, and or signs
- Use pictorial directions (Rebus, PCS symbols, etc.)
- Download books, from the net and upload to talking word processor software

- Allow open book tests
- Require fewer spelling words

Websites

www.educationplanet.com - can find weather websites and lesson plans
www.usgs.gov.edu -under water cycle/second grade there is a really cute interpretation of the water cycle by a second grade class in Sydney, Australia.
www.nssl.noaa.gov.edu -Children can download coloring books about weather, analyze a weather map and find out about careers in meteorology.
www.theteacherscorner.net
www.weather.com/weather/us - U.S. city forecasts, etc.
www.rnathstories.com - ideas for estimation
www.vlib.org/Science.html -satellite views and temperatures in the community
www.BillNye.com -satellite views, temperatures, etc.
www.ajkids.com - scientist's experiments with crickets and weather
www.learnersonline- has a cyber flight, in the eye of a hurricane
www.weather.yahoo.com has weather records and averages for all parts of the country.
www.wiredshire.org - has pictures and videos of various types of weather
www.whntl9.com - has pictures and videos of weather
www.weatherworks.com - has pictures of weather
www.c3lanl.gov/mega-math/menu.htm1-math resource site
www.edie.cprost.sfu.ca/'~rhlogan/basicmth.html -basic math facts and fundamentals
www.geocities.com - explanations of different kinds of weather.
www.geocities.corn/!mathskills/ math help for students
http://bjpinchbeck.com education site, links to math and science
www.spacelink.msfc.nasa.gov/.index.html - links to NASA resources
www.athena.wednet.edu/ -space weather oceans and more
www.nasa.gov/ - has a NASA for kids site
www.nationalgeographic.com/kids/ - national geographic
www.ur.utenn.edu/'ut2kids -links to all kinds of science topics
www.kidsaimsedu.org/ -AIMS- Activities that integrate science and math web site
www.ed.gov/databases/ERIC_Digests/ed - has information on weather, etc.