



San Luis Valley Environmental & Conservation Education Council

Natural Resources Education Quarterly

Winter 2004, Volume 3, Issue 1

Mission:
Facilitate programs and services in environmental education for the people of the San Luis Valley.

Teacher Scholarship Available

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Thanks to the generous donation of the San Luis Valley Earth Day Committee, ECEC can send one San Luis Valley teacher to the CAEE: Teaching Outside the Box Conference. All you need to do is send in the application on page 7 of the newsletter.

Teaching OUTSIDE the Box Conference

The conference will be held at YMCA - Snow Mountain Ranch near Winter Park
April 30 - May 2, 2004

Teaching OUTSIDE the Box is an action-packed weekend workshop designed to help you rediscover the natural world in which we live, learn and play.

Experience how much fun you can have sharing nature with your students or visitors. Join us to relax, rejuvenate, rejoice, and rediscover the natural world!

Keynote Speaker: Joseph Cornell Known for his expertise and irrepressible enthusiasm for the grandeur and mystery of nature, CAEE is excited to announce Joseph Cornell as the 2004 Keynote speaker. Cornell, one of the world's most highly respected nature educators, authored a series of Sharing Nature Books which have been translated into twenty languages. In 1979, he founded Sharing Nature Worldwide, a popular and highly acclaimed nature organization.

See CAEE website for more information:
<http://www.caee.org/outside.htm>

Snowy Torrents

Mike Blakeman, Rio Grande National Forest

People flock to our mountains every winter after the first big snowfall. All are seeking the same thing – fun in the snow. Some use snowmobiles to travel deep into the mountains, while others just want to zoom around on the white hillsides. Non-motorized users flock into the backcountry on skis, snowshoes, and even split snowboards, while sledders and tubers take over open slopes near plowed roads. Everyone has big grins on their faces... and most are oblivious to the risks they may be taking.

Every year, thousands of avalanches release in the mountains of Colorado. In fact, Colorado has the highest fatality rate from avalanches of any state in the country (over six/year). Most people believe only those venturing into the backcountry are at



Snow science can be a great outdoor learning opportunity outside this winter.

risk, but sledding, tubing and even winter driving in the mountains can be risky. The good news is that risk to humans can be

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SLV ECEC
 2205 State Street
 Alamosa, CO 81101

Web Site:
<http://www.slv-rcd.org/ecec.html>



Teachers Make A Difference: A Student's Perspective

By Jade Brooks, Sierra Grande High School

As a student in school, I have come to understand that our society praises people who think outside the box – and so over my school career I have tried to become an out-of-the-box thinker. From the time I was in third grade, I recognized that when teachers become facilitators of student learning, students have an opportunity to become out-of-the-box thinkers. That's when I learned math by being a banker, history by being a part of different societies, and English by real story telling. So, Science Fair was an extension of this type of facilitated learning. Instead of doing science in a lab with a lab sheet, I went out in the field, found my own problem, and worked with professionals in the field. My teachers facilitated and guided my learning and helped me to experience the frustrations of real world science. This type of learning wasn't just science, it was math, it involved history, it took every ounce of writing skill I could muster, and made me stretch the scientific method to places I never



thought it could go. It has allowed me to travel and explore my hypotheses with professionals in the field at the local, regional and state Science Fair competitions, and then at conferences, like the American Engineering Geologists National Conference, where I was invited to present. The whole experience has taught me that thinking outside the box comes from having a mentor (teacher) who's willing to give you the opportunity to believe in yourself, by taking the time to let you think and decide what the correct outcomes should be.

I like to walk on fresh fallen snow
The kind that whispers and speaks.
It sings a song as I walk along
With crackles and scrunches and squeaks.



Earth Day for the San Luis Valley is just around the corner April 24, 2004! There are hundreds of ways we can help the Earth, can you think of one to do with your students on April 23, 2004—San Luis Valley Take Action for the Earth Day. Will it be planting trees, picking up trash, planting an organic garden, for more ideas and to participate in the Celebration and acknowledgement ceremony call Kristen Gilbert at 589-4021 or Angie Graber at 589-3907.

Winter Reading



Winter, an Ecological Handbook, by James Halfpenny & Roy Douglas Ozanne, Elizabeth Biesiot (Illustrator)

Book Description

"Winter: An Ecological Handbook" is a guide for anyone who is curious—or needs to know—about winter. Naturalists, winter sports enthusiasts, residents of cold climates, and others who deal with winter on a daily basis will find this an enlightening as well as useful book. "Winter" explores the stresses of cold temperatures on animals, plants, and people, and describes coping mechanisms, from biochemical changes to behavioral responses. The authors examine the causes, characteristics, and energy costs for offsetting the forces of winter, and they explain the variety of adaptations to extreme conditions utilized by mammals, birds, and insects, as well as plants.

The human perception of winter is also covered, from snow terms used by natives of northern regions to the web of interactions between human and animal populations. A guide to winter recreation and travel features solid advice on avoiding avalanches, frostbite, and other hazards; clothing to keep you warm; shelters to build in the snow; and the best winter camping techniques and equipment (by Amazon.com).



Celebration of Cranes: Project WILD II

Monte Vista, CO. Immerse yourself in the sights and sounds of thousands of cranes, bald eagles and waterfowl. Learn from the experts about local wildlife and tour the refuge in search of cranes. Improve your wildlife watching skills by drawing and recording observations in handmade journals. Learn basic bird biology. Explore the mysteries of migration. Hear Japanese Legend of the Cranes and fold origami birds. Then share your expertise leading activities for children. Target Audience: K-12 Teachers. Time: 5 pm March 12 to 1pm March 14. Cost: \$50.00 Credit: one semester hour available. Participants must arrange for their own food and lodging (see (<http://Alamosa.fws.gov>)). To register, contact [Lynda Grove](#) at 719/475-9199

San Luis Valley Education Events

January-February

Colorado Junior Duck Stamp School
Programs call 589-4021 (Kristen).

Rio Grande National Forest Avalanche Field
Trips call 852-6212 (Mike)

Late January- Great Sand Dunes Education
Planning Meeting- call 378-6344 for more
info.

March

4-5 55th SLV Regional Science
Fair, Adams State College

"Hotbox" Fire Workshop for Teachers

Saturday and Sunday March 20-21, 2004
For 4-12 TH GRADE Educators

- Explore the "FIRE BOX" and "FIRE WORKS" trunks
- Receive Project Learning Tree materials
- Learn about the how to use the highly acclaimed Burning Issues CD with students
- Visit recent burn sites (optional later field trip)
- Learn about the effects of fires on wildlife, air, water, soils, people
- 1 semester credit, Adams State College (optional)

Location: San Juan Mountain Association classroom, Durango

Cost: FREE! (funded by Project Learning Tree/BLM grants) (Additional optional recertification credit fee payable at workshop)

Register: For Saturday and Sunday: Send a \$25 deposit (refunded only at the workshop) to:
Project Learning Tree, PO Box 25127, Lakewood, CO 80225

Deadline: March 5, 2004 . *Special gifts for the first 15 people to register for Saturday and Sunday class.*

For more information: 303-275-5358 or
scrocker@lamar.colostate.edu

EE Contacts

Geology, Animals & Ecosystems, Cultures & Archaeology	Great Sand Dunes National Monument and Preserve. . . Kathy Zelenka. . . 719-378-6344 Kathy_Zelenka@nps.gov
Wetland Ecosystems and Wildlife	Alamosa/Monte Vista National Wildlife Refuges . . . Kristen Gilbert. . . 589-4021
Water and Soil Conservation	SLV Conservation Districts . . . Angie Graber. . . 589-3907 X117
Service Learning	Volunteer Connections. . Kristene Mooman. . . 719-589-5688. . . vcf@amigo.net
Natural Resource Conservation Camp at Beaver Creek	Colorado State University Extension Service. . . Robert Mathis. . . 657-0213
Forest, Range and River Ecosystems	Rio Grande National Forest . . . Mike Blakeman . . . 852-6212
Other Resources	Colorado State Forest Service. . . Boyd Lebeda SLV Resource Conservation and Development. . . Jim Mietz



Outdoor Activity and Learning Not an Oxymoron!

Cathy Morin

Mysteries and joys of life- the fuzzy caterpillar, a snowflake landing on your tongue, the warmth of the sun on a cold, winter day. For many reasons children today have less and less opportunity to experience the outside. And it is showing – nationally, 30% of today's 7 year olds are overweight or at risk for obesity. Here in the Valley, we are seeing a similar pattern. Time spent outdoors has been shown to be indicative of how physically active an individual is. Perhaps, getting children outdoors could be done as part of a school curriculum. For those teaching science and the environment there are many opportunities to go out in the schoolyard to understand basic science principles – observation, the weather, the sun as energy, identifying and dissecting plants, comparing water uses. A walk around the school can be used to identify how man and nature interact, how are rocks and minerals are used. A brisk walk is an easy way to show how mechanical energy produced by muscle movement can result in heat production! Learning outdoors is experiential and allows for a deeper understanding of environmental issues at a

concrete level where younger children are. Allowing children to be more active can help increase their self esteem and capacity to learn, it can help kids handle stress, and obviously physical activity builds strong bones and muscles!

There are science programs available for more extended trips outdoors. Little Bear Snowshoes and Winter Wildlands Alliance have teamed up to develop an interactive winter curriculum involving lessons being taught outdoors using snowshoes. The snowshoes are designed for children – easy to use and safe! This group works with partners and individual schools to develop an appropriate curriculum for their location and learning objectives. The Colorado Division of Wildlife is listed as a partner on the web site (www.snowschoo.com) - maybe we can have this program developed for the Valley. If you are interested in learning more about a snow school program, call Cathy Morin, 589-5801. Teachers play an incredible role in our children's lives – so help our kids to be healthy.



Creating Your Own Outdoor Classroom

June 14-17 & 21-24 2004

Get outside this summer and lesson plan at the same time.

Teachers participating in this graduate-level workshop will choose one of four outdoor sites to create an environmental education unit to use in their classroom. This innovative teacher workshop gives teachers the background knowledge to tackle complicated ecology topics, and the time and resources to plan a one week unit to use in your classroom.

Week 1: Workshop Introduction

In-depth study of one San Luis Valley Outdoor Site: Rio Grande National Forest, Great Sand Dunes National Monument and Preserve, Monte Vista/Alamosa National Wildlife Refuge or Agricultural Lands

Week 2: Design and plan personalized outdoor/nature unit with peer and expert input.

Week 3: Revise and polish units for publication and use by fellow teachers.

Sign-up early to be involved in this unique professional development opportunity!

Call Mike Blakeman at 852-6212 for more information.

Teacher Resources Page

Snow Density Experiment

Content Area: Earth Sciences

Grade Level: 3-6

Materials Needed: deep snow, snowshoes, three large buckets or liquid containers the same size with lids, measuring cups, 1 student page/student.

Background

In many places, people depend on winter snow to provide the water supply for cities and farms. They watch and measure the amount of snow all winter long. It is not just the depth of the snow that is important, but the amount of precipitation or the amount of water in the snow.

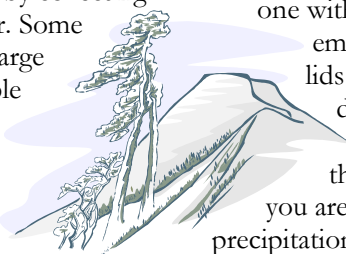
You can measure the amount of water in snow by collecting some snow, melting it, and measuring the water. Some snow is very dense, which means it contains a large quantity of water for its relative size. An example might be that one gallon of snow, when melted, becomes one quart of water.

Many things affect snow density: temperature, air pressure, the nature of the storm, geographic location and altitude, etc.

In this lesson, students determine how much moisture is available in the snow in their area. This experiment does not require you to track precipitation for a complete season. The best time to do it, however, is during the biggest snow weeks when there is lots of activity in the weather.

DENSITY: The amount of space between molecules or particles of any substance is what determines its density. Lead is more dense than aluminum which is more dense than wood which is more dense than foam rubber which is more dense than Styrofoam. Density is equal to the mass (or weight) of a substance divided by its volume ($d=m/V$). The metric system was set up in such a way so that the density of water can be written as 1 gram per milliliter (1g/mL). One milliliter (mL) is also equal to one cubic centimeter.

PRECIPITATION: is any form of water that falls from clouds and reaches the ground; the amount being expressed in inches of liquid water depth. For this activity, we will compare not the depth, but the volume of the snow or water. Water is "pure precipitation." Snow, on the other hand, is mostly air. As you can see, the density of snow is related to the measure of the water in snow. The density of snow might be expressed as 1 cup of water per gallon of snow or 100 mL/L [density= $V(\text{water})/V(\text{snow})$, where V =volume.]



Learning Activities

Introduction: Explain the concept of density. Allow the students to hold a brick and a block of wood or foam rubber the same size. Use an illustration to show something that is loosely filled with particles versus something that is tightly filled with particles. Have students stand together in an area and give them instructions to space apart or bunch together to show the realities of high and low density.

Ask them how much water they use at home. Make a list on the board of all the things we use water for. Ask them where the water comes from. Talk about how the winter snow fills up our rivers, streams, and reservoirs for use in summer. Explain how forecasters measure snow and precipitation to determine how much water will be available in summer.

Preparation Activity: Using the buckets for the experiment, fill one with water, one with snow, and leave the last empty (filled with air). Cover the containers with lids to avoid spills. Show how each has a different density. Discuss how the snow, once melted will no longer fill the bucket completely. Explain that by measuring the water from melted snow, you are actually measuring the amount of precipitation.

Field Trip: Using snowshoes, take the class into deep snow. You have three buckets. Use one to collect snow from the surface. Avoid compressing the snow as you collect it. (This can be difficult, but the activity will work regardless of the collection methods used.) In the second bucket, collect snow from deep beneath the surface. The final bucket is to be used more like an actual forecaster might use it. Find a place where you can leave the bucket to collect falling snow. On the first day, you will not have data for this bucket, unless you make arrangements to leave it out the day before.

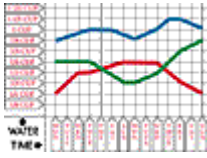
Cover the containers and take them inside to melt. Each day (or whatever time interval you choose) you will repeat this field trip activity. Be sure to plan ahead to guarantee that your collection methods can be repeated for at least 10 time intervals.

Using Handouts: Once the snow is melted, measure the water in each container and ask the children to record the information on their [Data Record handout](#).

Presenting The Data: Using the handout on [Making A Chart](#) and the completed Data Record handout, assign the students for make their own Data Presentation Chart.

Learning Assessment: A [Snow Density Quiz](#) at <http://www.snowschoo.org/denquiz.html> is a possible learning assessment method. Use the quiz as best fits your students' needs.

Snow Density Experiment— Making a Chart

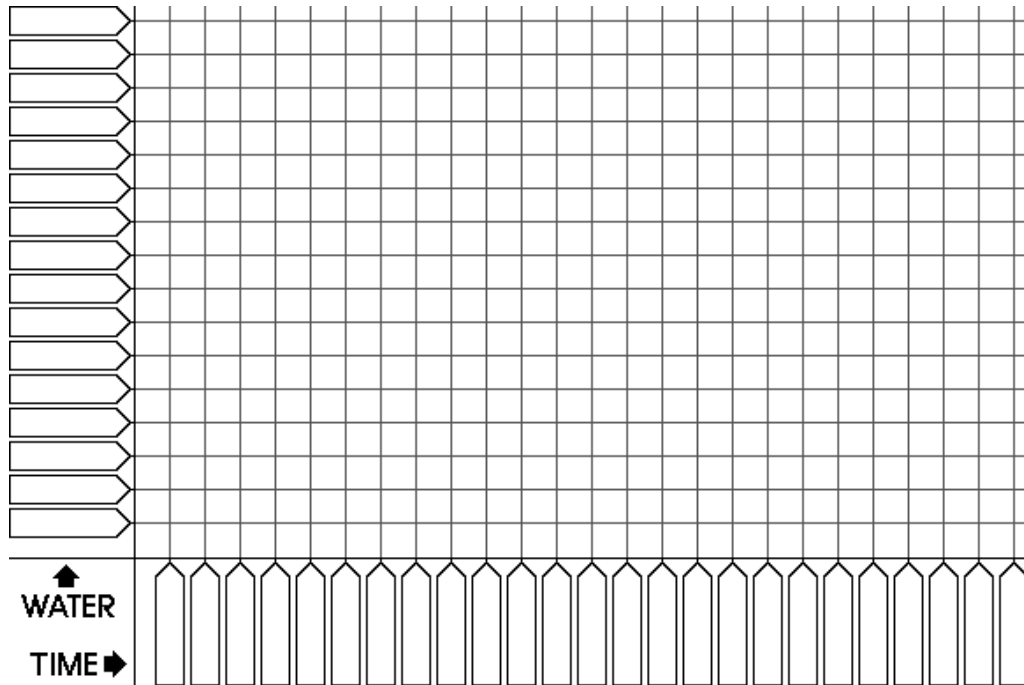


Why Use Charts: A page full of numbers is very hard to understand. But if you put those same numbers on the right kind of chart, they become very easy to understand. There are many kinds of charts. For this experiment, we will use a line graph. Think of a chart as your presentation or final report showing all the work you have done.

Units: The first step is to select the units of measure. Along the bottom of your chart, write in the dates that correspond to the days on which you took measurements. Put the first day next to the word "TIME" at the left. Each new date should be an increase of equal amount. The amount of change from date to date is called the unit of measure.

To determine the best units for the water (precipitation), look at the measurements on your Data Record Handout. When you write the units on your chart, you want your smallest unit to be near the bottom, just above the word "WATER." Your largest measure should be near the top. Choose the units that would make this possible. Example: 1/8th cup steps.

Plotting Data Points: It is easiest to plot only one column from your Data Record at a time. Draw a dot above each date for the amount of "Snowfall" recorded. When you are finished, connect the dots with a colored marker. Next, draw dots for the surface density and use a different color of marker to connect the dots. Do the same for the "Snowpack." Choose a title or headline for your graph and write it along the top.



Questions

According to your chart, how much water was in the snowpack on first day?

Numbers from a table are represented by what on a chart?

Give an example of something that is very dense.

How can you find out how much precipitation is in snow?

Why is it important to know how dense the snow is?



Continued from page 1. . .

greatly reduced with a little understanding of when and where avalanches are likely to occur.

The key factors affecting avalanche hazard are weather, terrain, and snowpack. Most avalanches occur during, or right after, a winter storm that drops six inches or more of snow. Wind alone can also increase avalanche conditions by moving snow from a windward slope (a slope facing the direction of wind) to a leeward slope (a slope facing away from the direction of the wind). *Bottom line:* The deeper the snow piles up, the greater probability avalanches occur.

The steepness of the slope also affects avalanche risk. Slopes from 30-45 degrees are the most hazardous, but in some conditions, even 20-degree slopes can slide. Slopes greater than 45 degrees tend to slough snow continually during a storm, thus preventing the build up of a dangerous "slab" of snow.

The stability of the snowpack is the third factor affecting avalanche conditions. Snowpacks are continuously changing due to temperature changes, humidity, and the pressure of overlying snow. The probability of avalanches is low when there is good bonding

between all the layers of the snow. When a weak layer forms in the snowpack, all that is needed to start the snow sliding is a trigger. That trigger could be the addition of more snow from a storm or an unsuspecting human crossing a slope.

Studying avalanches with your students is fun and instructive. For example, during the winter, students can keep track of the weather on Wolf Creek Pass (see link below) and correlate it with avalanche hazard ratings found at the Colorado Avalanche Center (link below). By studying the snowpack, students can learn about metamorphism, density, diffusion, and sublimation. And most importantly, studying avalanches just might save the life of one of your students.

To set up an avalanche class and/or field trip, contact Mike Blakeman of the Rio Grande National Forest, at 852-6212 or mblakeman@fs.fed.us

For more information about avalanches and some lesson ideas, check out:

http://www.pbs.org/wgbh/nova/teachers/activities/2418_avalanch.html

Link to Colorado Avalanche Information Center: <http://www.geosurvey.state.co.us/avalanche/>

Teaching OUTSIDE the Box Teacher Scholarship Application

Name _____ Address: _____

Email _____

Day Phone _____ Best Time to Call: _____ School _____

Please answer the following questions:

What conservation/environmental education activities would you like to explore with your class?

How would attending this conference help you achieve these activities?

Deadline: February 20, 2004

Send to
ECEC Scholarship
Carole Gurule, SLV RC&D
2205 State Street, Alamosa, CO 81101