

Southeast Area 4-H Newsletter



COLORADO STATE UNIVERSITY
EXTENSION

January 2019

Important 4-H Dates

January

- January 1st - Extension Offices Closed
- January 12th-27th - National Western Stock Show
- January 18th - 4-H Day at the Stock Show
- January 26th-28th - Leadership Development Conference

February

- February 1st - Cheyenne County Enrollment Deadline
- February 8th-10th - Youth Fest



Southeast Area Office
411 North 10th Street
Rocky Ford, CO 81067
719-254-7608

Baca County
700 Colorado Street
Springfield, CO 81073
719-523-6971
coopext_baca@mail.colostate.edu

Cheyenne County
Box 395
Cheyenne Wells, CO 80810
719-767-5716
coopext_cheyenne@mail.colostate.edu

Kiowa County
Box 97
Eads, CO 81036
719-438-5321
coopext_kiowa@mail.colostate.edu

Prowers County
1001 South Main
Lamar, CO 81052
719-336-7734
coopext_prowers@mail.colostate.edu

Bent County
1499 Ambassador Thompson
Las Animas, CO 81054
719-456-0764
coopext_bent@mail.colostate.edu

Crowley County
613 Main Street, Courthouse Annex
Ordway, CO 81063
719-267-5243
coopext_crowley@mail.colostate.edu

Otero County
Box 190
Rocky Ford, CO 81067
719-254-7608
coopext_oter@colostate.edu

Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating. Extension programs are available to all without discrimination. The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by Colorado State University is implied.

Leadership Development Conference

Sign up now for LDC and 4-H Day at the Capitol, January 26th-28th. Join senior 4-H members from across Colorado at this outstanding leadership event, then see our state government at work. The conference includes community service, workshops, awards banquet, and a dance. A morning at the state capitol and visits with legislators wrap up the event. Registration for the event is \$160 plus hotel room. Remember some counties offer financial assistance for attendees. Participants will also need additional money for some meals. You must be 14 by Dec. 31, 2018 to attend. The Southeast Area registration deadline is January 7th, and is done through 4-H Online. Contact your local Extension office for more information.



Youth Fest

Youth Fest is a camp for youth ages 9-13 and is held each year at the Ponderosa Retreat and Conference Center in Larkspur. The camp is filled with activities, workshops, dances and great food. This year's camp will be February 8th-10th and is limited to the first 195 campers. Cost is \$140 per camper. The registration deadline for the SEA is January 25th. Registration is through 4-H Online. Camp fills up fast, so the sooner you register, the better. Information is available from your local extension office.

Camp Scholarships

The District VI 4-H Senate has voted to provide scholarships for district 4-H members to attend state, regional, and district events. For Dare to Be You and Caballeros & Clovers 4-H Camps one scholarship will be offered for each county. For LDC, Youth Fest, District Retreat and State Conference two scholarship maximum will be offered for the whole district. A deposit for the regis-

tion amount will be held, but will only be deposited if the scholarship winner does not attend. Due dates for scholarships will be advertised in the newsletter. There is an application that must be completed. You can get the application from your local extension office.

Deadlines for event scholarships are as follows: South Central District Retreat - February 15, State Conference - May 1, and Dare to Be You - November 1.



January 12-27, 2019

National Western Stock Show

The National Western Stock Show will be January 12th-27th 2019. 4-H Day at the Stock Show is scheduled for Friday, January 18th. 4-H will be highlighted at the 1:30 p.m. rodeo that day. For a complete schedule go to www.nationalwestern.com.

4-H Enrollment

Again for 2018/2019 year we will be using the 4-H Online program to enroll members. 4-H Online is a secure database that has been in use for quite a few years now in Colorado. Families will need to login to the 4-H Online site and complete the enrollment process. All counties will be providing very specific instructions, but don't hesitate to ask for help. Also, if you do not have access to a computer or would like to have our help we can schedule a time to help you enroll at your Extension office.

Members and volunteer leaders need to complete all parts of the online enrollment process, including adding online signatures for:

- Animal Care and Housing Form (if applicable)
- Permission to Participate
- Photo Denial (only check & sign if you don't want to allow photos)
- Code of Conduct

• Health Form

You will not have to print anything off UNLESS you are not housing your animals at your home in which case you will need to download and fill out the animal housing form and return to the Extension Office by the enrollment deadline.

Counties may have county specific forms that you still must sign and turn in.

To complete your enrollment, you must pay club fees as set by your county following the county process. Enrollment deadline is February 1 in Cheyenne County, March 1 in Baca, Bent, Crowley, Kiowa, Otero and Prowers Counties.

The Colorado State University 4-H Office has put together some excellent resources on 4-H Online. The link to these resources is <https://www.colorado4h.org/ye/>.

4H Online – Email Blasts

From time to time the State office will be sending emails directly to the 4-H mem-



bers. It is the easiest and most effective way to communicate important State events and requirements. We know that not everyone particularly enjoys the extra emails and there have been requests to be unsubscribed. It is important to know that if you do that, you would not receive any re-enrollment emails or information the county office sends directly to you. Please do not "unsubscribe."



Colorado 4-H ShootingSports Leader Trainings

The dates for the 2019 Colorado 4-H Shooting Sports Leader Trainings have been set. Approved leaders can register for these trainings through 4-H Online. See your local extension office for more information.

- Morgan County - March 8th-10th
- Pueblo County - March

22rd-24th

- Garfield County - March 29th –31st
- Boulder County - April 5th –7th

Meat Quality Assurance

All 4-H members in breeding and market beef, sheep, swine, goats, poultry, rabbits, dairy animal and horse projects must complete Meat Quality Assurance training the first year you are enrolled in a livestock project and then when you turn 14 years old. You may attend any MQA in the area; be sure to sign in and complete the quiz so your county will know you attended. The hands-on learning stations will be used again with changes in the stations. This is a come

and learn-by-doing training that will take approximately an hour to complete. Parents and leaders are strongly encouraged to attend. Times and locations will be announced in a future newsletter. Plan to attend one of these sessions:

- March 14th - Cheyenne County
- March 15th - Kiowa County
- March 18th - Baca County
- March 19th - Prowers County
- March 20th - Bent County
- March 21st - Crowley & Otero Counties

Carmel Churro Chex Mix

Ingredients

- 4.5 cups of Rice Chex cereal
- 4.5 cups of Corn Chex cereal
- 1 cup packed brown sugar
- 1/2 cup (1 stick) salted butter
- 1/4 cup light corn syrup
- 1/4 tsp baking soda
- 2/3 cup granulated sugar
- 2 tsp ground cinnamon

Instructions

1. Preheat oven to 350 degrees.
2. Place cereal in a large heat safe bowl. Line baking sheet with foil and spray with nonstick spray.
3. In small bowl, combine cinnamon and sugar. Set aside.
4. In a saucepan over medium heat, heat brown sugar, butter, and corn syrup until the mixture comes to a boil.
5. Let boil for one minute constantly stirring. Remove from heat.
6. Stir in baking soda and pour over cereal. Stir until cereal is coated.
7. Spread cereal over baking sheet. Sprinkle with cinnamon sugar mixture until coated evenly.
8. Bake for 5 minutes. Flip with a spatula and bake for 3 more minutes or until cereal is golden brown.
9. Remove from oven and cool completely. Store in an airtight container.



COLORADO

Department of Agriculture

Animal Health Division

Scrapie Tag Ordering Information for CDA Field and Office Personnel

A) Producers, Feeders and Veterinarian's ordering scrapie tags must contact USDA at 1-866-USDA or Dr. Melissa Cleavenger at 405-435-9558, Melissa.K.Cleavenger@aphis.usda.gov for free metal orange serial tags.

B) First time orders should contact Dr. Cleavenger for a Premises and Flock/Herd Identification number and free metal orange serial tags.

C) Producers, Feeders and Veterinarian's ordering free scrapie tags can receive 100 metal orange clip tags in a 24 month period. Additional tags must be purchased by the producer, feeder or veterinarian. Tagging pliers must be purchased by the producer, feeder or veterinarian at:

National Band & Tag Company

721 York St., P.O. Box 72430

Newport, KY 41072-0430, USA

Phone: (859) 261-2035

Fax: (859) 261-8247

E-mail: tags@nationalband.com

Web address: <https://nationalband.com/products/style-505/>

D) Producers, Feeders and Veterinarian's ordering scrapie tags from an approved tag dealer must have a Premises and Flock/Herd Identification number before placing an order for purchased tags.

E) Producers, Feeders and Veterinarian's ordering purchased scrapie tags may find a list of approved dealers at: <https://www.aphis.usda.gov/animalhealth/scrapie-tags>. These companies may provide plastic flock ID tags, metal tags and RFID tags.

F) Requests by markets, recognized dealers, and RSSS sites:

Metal serial tags will be provided for markets and RSSS sites in the amounts needed through FY 2019. Field offices may provide serial tags to recognized dealers who maintain appropriate records for the number needed for business operations in FY 2019. Please have these entities contact Dr. Melissa Cleavenger 405-435-9558 or the USDA Veterinary Services (VS) Area Office.

G) Metal tag applicators can be provided to or ordered for State or federal animal health officials for their use, and can be provided or ordered to fill reasonable start-up or replacement requests by livestock markets to replace broken or damaged applicators.

H) 4H, FFA and other youth programs: Field offices may use their discretion to provide 4-H and other youth program leaders with an appropriate number of tags for animals belonging to young people participating in their programs as long as they keep the required records. Please have these groups contact the USDA VS Area Office or Dr. Cleavenger. Exhibitors requiring Scrapie Identification should first contact the producer they purchased their project animals from and have that producer tag the sheep or goat projects prior to having USDA VS or CDA personnel tag their animals.

I) CDA Field Personnel: Review full USDA VS scrapie tag document for additional information on the use of plastic tags in scrapie flock/herd work and on farm RSSS opportunities.

For more information or questions, please contact the Colorado State Veterinarian's Office at the Colorado Department of Agriculture at 303-869-9130.

Bent County 4-H



January 2019 Newsletter

Volume 8, Issue 19, January 2019

State 4-H News

www.colorado4h.org
Project Resources
StateFairExhibitReq.pdf.



We're on FACEBOOK! Please **LIKE** our pages to stay up-to-date with all the upcoming events & share with your friends, let's get to 500 likes!

- ◆ Bent County Extension
- ◆ Bent County Fairgrounds

County News

Opportunities and Deadlines

January 4, 2019 - LDC Registration Deadline
January 4th - National 4-H Conference Registration Due
January 7th - Critter Corner Virtual Meeting
January 18th - 4-H Day National Western Stock Show
January 19th - 4-H Officer Training
January 26-27th - Leadership Development Conference
January 28th - 4-H Day at the Capitol

February 7th - 4-H Enrollment Night
February 23rd - Beef Weigh In

4-H Enrollment

4-H enrollment is currently open.. If you do not have access to the internet or need help with online enrollment, please plan to attend the enrollment night at the Extension Office on **February 7th at 4-6pm**. Some families may not be able to make that time work, so feel free to set up an appointment with the Extension Office Monday-Thursday 8am-2pm. If you are ready to sign up, complete the 3-step process. If you have a family account, please log on to **4-H Online** at <https://www.4honline.com/>.

Once you have signed up through 4-H Online, each participant will sign an enrollment agreement.. Please look for these forms from your 4-H leaders during your regular monthly meeting sometime before the

What to Look For:

1. 4-H Enrollment Night
2. Manual Orders
3. Extension Workshops
4. Meat Science Boot camp
5. Leadership Development Conference
6. Upcoming Events



March 1st enrollment deadline. Each participant must have their agreement filed at the Extension Office. The last step is to pay the \$20/child enrollment fee. All three steps must be completed before a member can participate in the Bent County Fair.



Manuals for 2019

There are manual changes for many of the projects this year. The new publications order form is available through Colorado 4H. The link to the website is <http://co4h.colostate.edu/resources/pub-order-form-self-calculating.xlsx>. The Extension Office will also be placing an order for new manuals. Feel free to call the office, and notify them of the manuals you need. Please note that all manuals will need to be paid for in advance. If you have any questions feel free to contact the Extension Office.

BENT COUNTY JANUARY 2019



Cookie Decorating Workshop

Thanks to everyone who attended the Cookie Decorating in McClave on December 20, 2018. There were nearly 40 participants who decorated cookies for Santa, and learned some new decorating techniques from Matt Biszak. Participants were eager to share about the good time they had, and were excited to take home a plate of decorated sugar cookies to share with Santa for the Holiday! 4-H members decorated extra cookies that were distributed to Bent County emergency personnel who had to work on the holiday. Cookies were also delivered to nursing homes employees who would be taking care of the elderly for the holiday season.



4-H Stem Workshop

The extension office took 4-H Stem to the K-12 classroom for Christmas card making. The Science Club in Las Animas, and two classrooms in McClave took part in creating light-up cards by making complete circuits. About 45 K-12 students, 3 4-H Council members, and 4 adults had the opportunity to learn about what Colorado 4-H Stem has to offer. Each participant created a working card that could be kept or gifted for the Christmas season!



Bent County 4-H Council Retreat

The Bent County 4-H Council had their annual retreat in December. The group traveled to Pueblo where they enjoyed a movie, dinner, and an educational visit to the Pueblo Zoo where they got to view the Electric Critters. During dinner the council discussed the budget and plan for the upcoming 2019 year! The next council meeting will be January 23, 2019 at 6PM at the McClave United Methodists Church.



2019 National Western Stock Show

The National Western Stock Show runs from January 8-27, 2019. A schedule of events can be found at <http://www.nationalwestern.com/schedule/>. There are lots of activities for individuals and families! If you are only going to pick one day to go, consider going on **January 18th** - It's the 4-H Day at the Stock Show. **Good luck to all Bent county 4-H and FFA participants at the National Western Stock show!!**



BENT COUNTY JANUARY 2019



SOUTHEAST COLORADO 4-H

MEAT SCIENCE BOOT CAMP

Thirty Crowley, Otero, and Bent County 4-H members and Rocky Ford High School animal science students participated in Meat Science Boot Camp during the fall of 2018.

Demographics

47% Female	53% Male
3% Reporting More Than One Race	17% Latino
80% White	
Grades 3-12	
Ages 8-18	

At the completion of the program, 91% of youth were interested in meat judging, an increase of 12%.

Win #2: Interest in the program has grown, with additional high school ag scheduling sessions for 2019.

At the completion of the program, 91% of youth were also interested in livestock judging, an increase of 16%.

Win #3: Participants showed improvement in all areas evaluated. Youth increased confidence of their knowledge of food safety, meat animal evaluation, science in the meat industry, and meat judging.

Thank you for your support of Colorado 4-H!

COLORADO STATE UNIVERSITY EXTENSION

Otero County's 4-H Agent, Marlena Gries, explored the poultry, lamb, rabbit, pork, and beef industries with 7 4-H members from Bent County. Participants learned how to become an industry-savvy producer, being an informed consumer, and the importance of food safety. During the last session, participants had an opportunity to "Build the Best Burger".



District VI 4-H Senate

CAMP SCHOLARSHIPS

Deadlines

Leadership Development Conference - January 2
 Youth Fest - January 2
 South Central District Retreat - February 15
 State Conference - May 1
 Dare to Be You - November 1

These are the deadlines to apply for a scholarship to attend camps offered by Southeast Area 4-H only. Attached is the application. Please call the Bent County extension office with any additional questions.

4-H Club Officer Training

Join members from 14 Counties for a day of fun to develop leadership skills for officers on January 19, 2019. Register for 4-H Club Officer Training on your family's account on 4HOnline at <https://co.4honline.com/>. Registration will be open from December 15, 2018 to January 15, 2019. The day will consist of Workshops, lunch, parliamentary procedure, and swimming! Visit our website for more information or contact the Bent County Extension office.

Club Meetings

Western Prairie 4-H meetings will be each Monday following the 4-H Council meeting at 6:00PM.

Blue Ribbon Winners 4-H meetings will be the first Sunday of every month beginning in February at 3:00PM at the McClave United Methodist Church.

BENT COUNTY JANUARY 2019



Leadership Development Conference

Sign up now for LDC and 4-H Day at the Capitol January 26-28, 2018. Join senior 4-H members from across Colorado at this outstanding leadership event, then see our State government at work. The conference includes community service, workshops, awards banquet, and a dance. A morning at the state capitol and visits with legislators wraps up the event. Registration for the event is \$160. Participants will also need additional money for some meals. You must be 14 by December 31, 2018 to attend. The Southeast Area registration deadline is January 4th, and is done through 4-H Online. Contact the Extension Office for more information if you plan to attend.

LEADERSHIP
DEVELOPMENT
CONFERENCE
JANUARY 26TH-28TH, 2019
DENVER, CO

Registration deadline: January 4th
Cost: \$160

*Bring travel-sized bars of soap to donate to for this year's community service project, Denver Rescue Mission.

AT THE 2019 LEADERSHIP DEVELOPMENT CONFERENCE, COLORADO 4-H WILL BE RAISING SUPPLIES TO DONATE TO THE DENVER RESCUE MISSION, A NONPROFIT ORGANIZATION WITH A GOAL OF SERVING THE LOCAL HOMELESS POPULATION BY PROVIDING SHELTERS, MEALS, ETC. EACH DISTRICT WILL BE RESPONSIBLE FOR BRINGING ONE SPECIFIC TYPE OF SUPPLY/SUPPLIES. OUR DISTRICT IS ASKED TO BRING TRAVEL SIZE BAR SOAP IF YOU HAVE ITMES YOU WOULD LIKE TO DONATE, PLEASE BRING THEM TO THE EXTENSION OFFICE!

Critter Corner

4-H members who are enrolled in pocket pets, dogs, cats, rabbits, cavies, and any other small animal project have the opportunity to participate in the Critter Corner Virtual Club.. Registration is now open until January 4, 2019. Members who are interested should sign up through 4HOnline. The virtual club will be through Zoom. Once members have registered they will receive an email with the link to the Zoom. The first meeting will be January 7, 2019 at 6:pm. Kathy Wolyn-DVM, Pueblo Zoo will be the guest speaker. For any additional information please contact the Bent County Extension office.



FEBRUARY 23, 2019
10AM-11AM
BENT COUNTY FAIRGROUNDS
Beef Weigh-In

Save the Date!

Mark your calendars Beef weigh in will be February 23, 2019 from 10AM-11AM!



DISTRICT VI 4-H SENATE

4-H Camp Scholarship Application

District VI 4-H will allocate funds to provide an opportunity for youth to participate in 4-H camps offered by Colorado 4-H. Submit the 4-H Camp Scholarship Application to your County Extension Office on or postmarked by the date advertised. ***Late or incomplete applications will not be considered.***

HOW TO APPLY

The following guidelines have been established for applying for a scholarship to attend camps offered by Southeast Area 4-H only.

1. Any youth who are enrolled members in a Southeast Area 4-H program (Baca, Bent, Cheyenne, Crowley, Kiowa, Otero, and Prowers Counties) are eligible.
2. Participants will be required to include a deposit for the registration amount for the camp. That deposit will be held by the member's county Extension Office and will only be deposited in the case that the member does not attend the event.
3. The District VI 4-H Senate has a limited amount of funding available for camp scholarships. For Dare to Be You one scholarship will be offered for each of the seven counties. For Leadership Development Conference, Youth Fest, South Central District Retreat, and State 4-H Conference, two scholarships will be offered for the whole district.
4. The District VI 4-H Camp Scholarship Application is due by the date advertised. Applications that are incomplete or received after the deadline will NOT be considered.
5. All applications must be signed by the member, a parent, and the county Extension Agent. No funding will be provided without all signatures.
6. IMPORTANT: This application form is for camp scholarships only. Receiving a scholarship does not register youth for a camp. Instructions for registering for each individual camp must be followed.
7. Selection for Dare to Be You scholarships will be done at the county level at the discretion of the Extension Agent. Selection for scholarships for other camps will be done through a selection committee comprised of Extension Agents and district officers outside of the Southeast Area.
8. Award announcements will be made in advance of the registration deadline for each individual camp.



DISTRICT VI 4-H SENATE

4-H Camp Scholarship Application

Name _____ Age _____

Home Address _____

City _____ State _____ Zip _____

Which 4-H camp do you want to attend? _____

Why would you like to go to this camp? _____

Why should you be selected for this scholarship? _____

Please list any 4-H, community, and school activities you are involved in. _____

SUBMIT APPLICATION TO YOUR EXTENSION OFFICE

I agree the information provided is true and accurate.

Member Signature _____ Date _____

Parent Signature _____ Date _____

Extension Agent Signature _____ Date _____



SEASONAL CLIMATES

VOLUME 8, ISSUE 1, JANUARY 2019



THIS MONTH:

- REASON FOR THE SEASONS - DEMO
- REASON FOR THE SEASONS - EXPERIMENT
- REASON FOR THE SEASONS - DATA COLLECTION
- REASON FOR THE SEASONS - ANALYSIS
- CAREERS - JOB SATISFACTION

POWER WORDS

- **altitude:** the height in relation to sea level
- **glacial:** the presence of ice especially in the form of glaciers: a glacial period
- **interglacial:** a period of milder climate between two glacial periods: interglacial period
- **latitude:** angular distance of a place north or south from the Earth's equator

CAREERS

Job Satisfaction is another aspect of your career. You will be spending approximately forty hours a week at your job. It certainly makes sense that you enjoy it!

See page 8 for careers activity in this month's issue.

OUR EARTH IS CONSTANTLY CHANGING

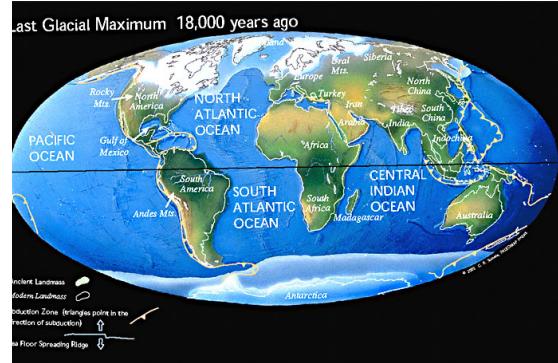
Climate Change is not new. We are in an interglacial period since the last glacial cycle, which ended 11,700 years ago. Since then, the climate has been fairly constant.

The graph below depicts the average global temperature over the past 450,000 years. The low temperatures were times when glaciers moved from the Arctic down to as far south as Ohio. Glaciers also advanced into Europe. The fjords in Iceland and Norway were formed by these ice sheets. Antarctica glaciers advanced towards the southern lands of Africa, South America, and Australia.



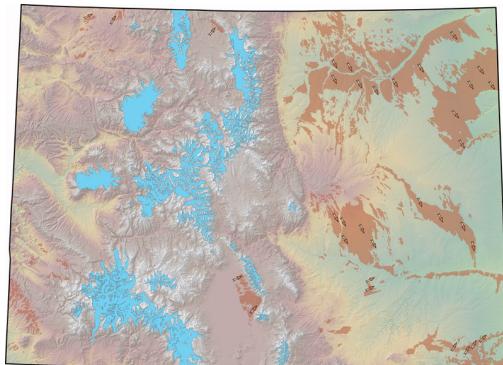
Generally, the higher in latitude the colder the climate. The latitudes 30° North and South are belts of desert, and the Equator is tropical. Climate is influenced by proximity of large bodies of water and the altitude of the landscape.

Dr. Scote's research focuses on plate tectonics and climate through time, and then he generates maps.



The map above depicts what Earth would have looked like 18,000 years ago.

Colorado also formed alpine glaciers. The Colorado Geological Society map below depicts glaciers (blue), sand dunes (brown), and wind direction (arrows) during this time.

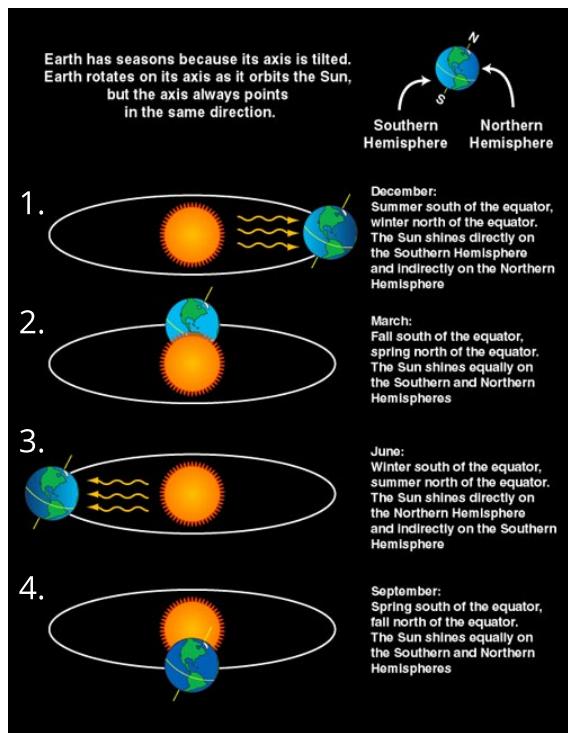


Finally, seasons influence climate. The Earth orbits the sun at a tilt. That tilt accounts for the season.



Directions:

- Carefully push the pointed end of the skewer completely through the Styrofoam ball.
- Darken the room and turn on the lamp without a shade. The lamp must be at the same height you hold the ball.
- Hold the skewer (axis of the Earth) at 23.5° angle using the protractor. Note which wall or corner the top of the skewer points. Always point it in the same direction for each step.
- Be sure that you do not stand between the "sun" (the lamp) and the "Earth" (the Styrofoam ball).
- The top of the Styrofoam ball represents the Northern Hemisphere, and the bottom is the Southern Hemisphere.
- Follow the NASA diagram of the Earth/Sun (below). Start with the ball's skewer pointed furthest away from the lamp. For each step (1, 2, 3, and 4),



move the ball 1/4 the way around the lamp. At each step, carefully observe where the light directly strikes the ball.

1. Winter solstice is December 21st, the shortest day in the Northern Hemisphere, and we receive the least amount of direct light. The Southern Hemisphere received the most direct light.

The reason for seasons is the Earth's tilt, not how close or far we are from the sun

2. Move counterclockwise 1/4 the way around the lamp. Spring Equinox is March 20th. The sun's direct light is on the equator, and day and night are 12 hours each there.
3. Move counter-clockwise 1/4 the way around the lamp. Summer Solstice is June 21st. This is the longest day in the year in the Northern Hemisphere.
4. Move counterclockwise 1/4 the

POWER WORDS

- **equinox:** the time or date (twice a year) at which the sun crosses the celestial equator, when day and night are equal length
- **solstice:** either of the two times in the year, the summer solstice or winter solstice, when the sun reaches its highest or lowest point in the sky at noon, marked by the longest or shortest days

way around the lamp. Fall Equinox is September 23rd. The sun's direct light is on the equator, and day and night are 12 hours each there.

- **NOTE:** each time you move your "Earth" around the "Sun," the axis (bamboo skewer) must remain at the same angle and pointing in the same direction in space.

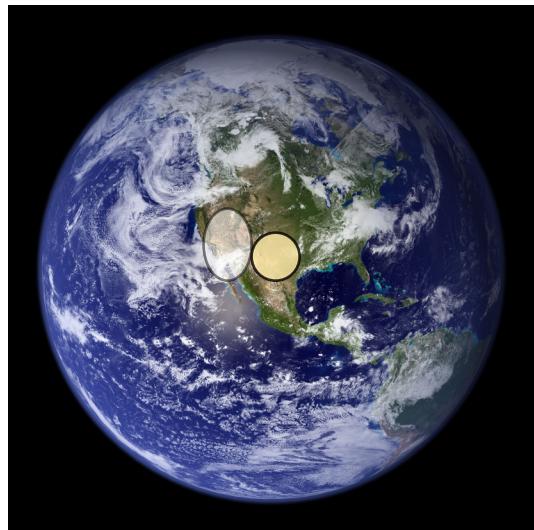
MATERIALS

- Styrofoam ball
- bamboo skewer
- dark room
- lamp without a shade
- flashlight
- box or book (2-3" high)
- toilet paper tube
- 2 metric rulers
- clipboard
- Print:
 - data sheet (page 4)
 - 4 sheets graph paper (pg 6)
 - protractor (pg 7) and cut out red, green, blue, and black markers
 - masking tape
 - scissors



Directions:

- This experiment collects data on light (flashlight is proxy for solar energy) striking the Earth surface (clipboard) at different angles during summer, spring/fall, and winter. In Colorado, angle of incidence is greatest during the winter, and closest to 90° during the summer.
- Hypothesis:** Examine the NASA image below.
 - yellow circle represents area of light striking the Earth during the summer
 - white circle represents light striking the Earth during the winter.



- Predict which area receives more intense solar radiation: yellow summer or winter white.

Build the experiment:

- The base for the experiment must be 5-8.5 cm high (2-3"). Use a narrow corrugated box or a large hardcover book. Tape the TP tube on the top edge of the box/book, making sure the TP tube is aligned 90° with the box.

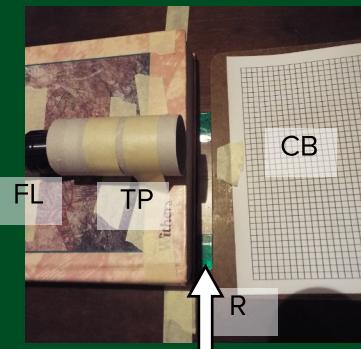
- Align and place the flashlight just into the TP tube, and tape the flashlight on the box.
- Print four copies of the graph paper (page 6), and attach 3 sheets to the clipboard. With a bit of masking tape, secure the bottom of the paper to the clipboard so it won't move.

We are closest to the Sun (perihelion) in December!

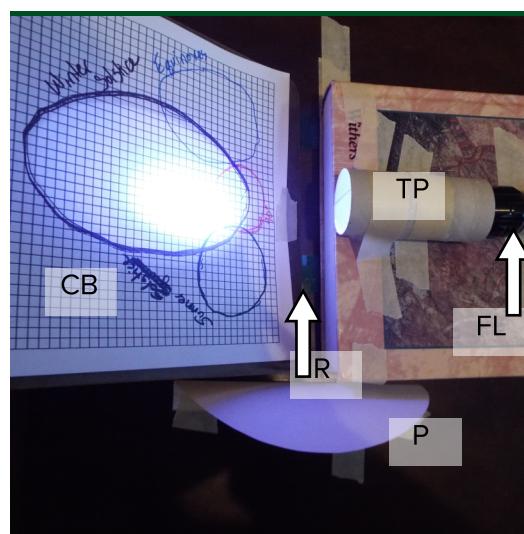
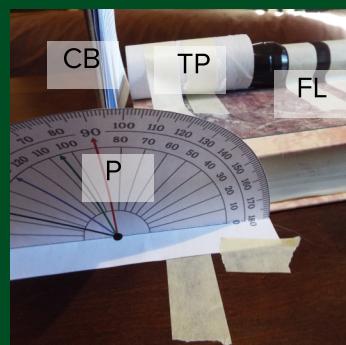
- Set the box on a table. Place each ruler on either side of the box, extending in front by 1 cm. Tape the rulers in place. You can also tape the box to the table so it will not slip.
- Place the clipboard in front of the box, touching the two rulers, so the clipboard is 1 cm away from the end of the TP tube. Align the protractor to the clipboard perpendicular (90°) to the table.
- Control:** Turn on the flashlight. Keep the clipboard at the 90°, and with the red marker, draw the outline of the light circle on the graph paper.

POWER WORDS

- angle of incidence:** the angle a ray of light strikes a surface
- insolation:** the amount of solar radiation in a given area
- perihelion:** when the Earth is closest to the Sun during the year
- perpendicular:** at an angle of 90° to a given line, plane, or surface
- proxy:** the power to act for another (flashlight acting for the sun)
- radiation:** energy



- TP = TP tube
- FL = Flashlight
- P = Protractor
- R = Rulers
- CB = Clipboard w/graph paper



What data to collect:

- Colorado is between latitudes 37° N and 41° N. We will use the center latitude of **39° N**, for this experiment.
- The Earth's tilt is 23.5° in relation to the Sun.
 - In Colorado, the Sun's angle is 74.5° above the horizon during the Summer Solstice.
 - In Colorado, the Sun's angle is 51° above the horizon during the Fall and Spring Equinoxes.
 - In Colorado, the Sun's angle is 27.5° above the horizon during the Winter Solstice
- Use a different color marker for each angle.
- Hint: move the clipboard left or right each time so your circles/ovals do not overlap.

Trial A:

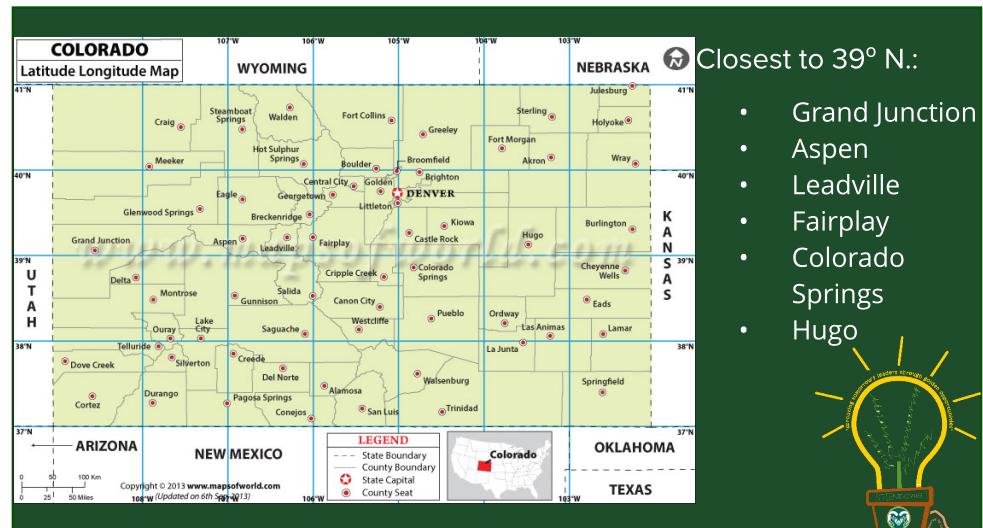
- Summer Solstice:** Tilt away from the flashlight, and measure the clipboard to 75.5° on the protractor (90° - 15.5°). Trace light outline with a green marker.
- Equinoxes:** Tilt away from flashlight, and measure the clipboard to 51° (90° - 39° = 51°). Trace the light outline with a blue marker.
- Winter Solstice:** Tilt away from flashlight, and measure the clipboard to 27.5° (90° - 62.5° = 27.5°). Trace the light outline with a black marker.

Trial B and Trial C:

- Use the 2nd sheet of graph paper for Trial B and a 3rd sheet of graph paper for Trial C, repeating the above steps.

Solar Insolation Datasheet				
Trials Angle	Trial A Number of Squares	Trial B Number of Squares	Trial C Number of Squares	Average # Squares (A+B+C/3)
Control 90°				
Summer Solstice 75.5°				
Equinoxes Fall/Spring 51°				
Winter Solstice 27.5°				

- Count the number of grid squares in each circle or oval (red control, green Summer, blue Equinoxes, and black Winter) and record on your data sheet above. If the line is more than halfway through the square, count that square. If the line is less than halfway through the square, do not count it.
- Repeat this step for Trial B and Trial C.



Analyze and interpret your data:

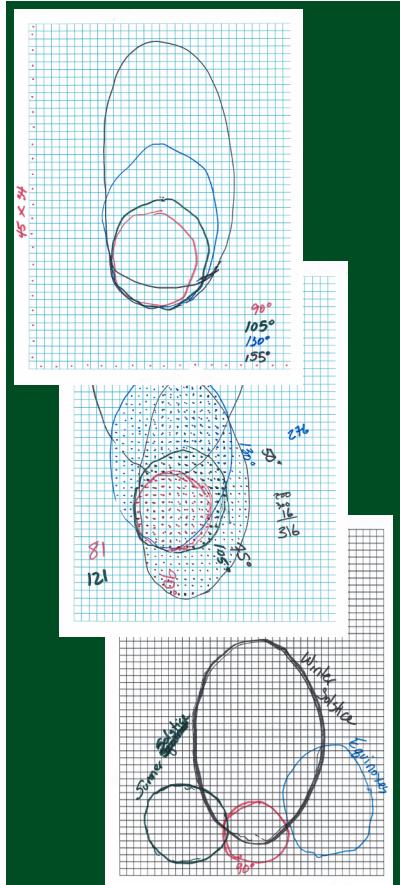
- Now that you have collected your data, you can begin analyzing what you collected.
- Find the average number of grid squares for each season (Summer Solstice, the Fall and Spring Equinoxes, and the Winter Solstice). Add Trial A, B, and C together, then divide the total answer by 3 to find the mean (average). For each season, you have the average area (number of squares).
- Develop a graph of your data. What kind of graph do you think will best represent your data? Do you know what each of the graphs below are?
 - bar chart
 - line graph
 - pie chart
 - scatter plot
 - stem and leaf
 - histogram
- The graph that will be a good choice for these data is a bar graph. The graph paper included in this issue is 45 x 34 squares. Take your largest number of squares average (Winter Solstice) and divide by 45 (number of squares long).
- **Example:** if your Winter Solstice had an average of 316 squares, you would divide 316 by 45. $316/45 \approx 7$. Round 7 up to 10. For your bar graph, every square on the graph paper equals 10 squares of data. Count 31.6 squares up, and color in with that column of 31.6 squares with black marker.
- Did you observe the intensity (how bright) of light on the clipboard's graph paper. Look

carefully at the image on page 3 of the flashlight held at 155° . What happens as the light spreads out towards the top of the graph paper?

- Think about the following questions:
 - On the equator, where is the sun located during the Spring Equinox?

The Southern Hemisphere is closest to the sun during their summer (our winter).

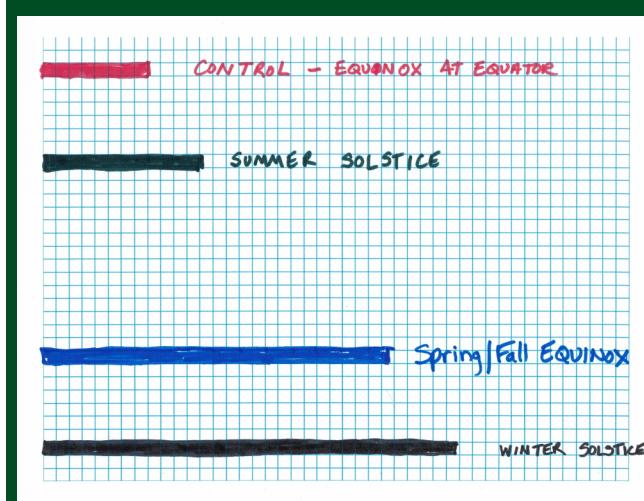
- How about the Fall Equinox? (equi comes from aequus, which means equal, and nox means night in Latin).
- At the North Pole, how long is day on June 21st (the Summer Solstice)? How long is the day on December 21st (the Winter Solstice)?
 - What happens as the light spreads over a larger surface (compare light at 90° and 155°)?
 - What do you conclude?



DATASHEETS 1, 2, AND 3



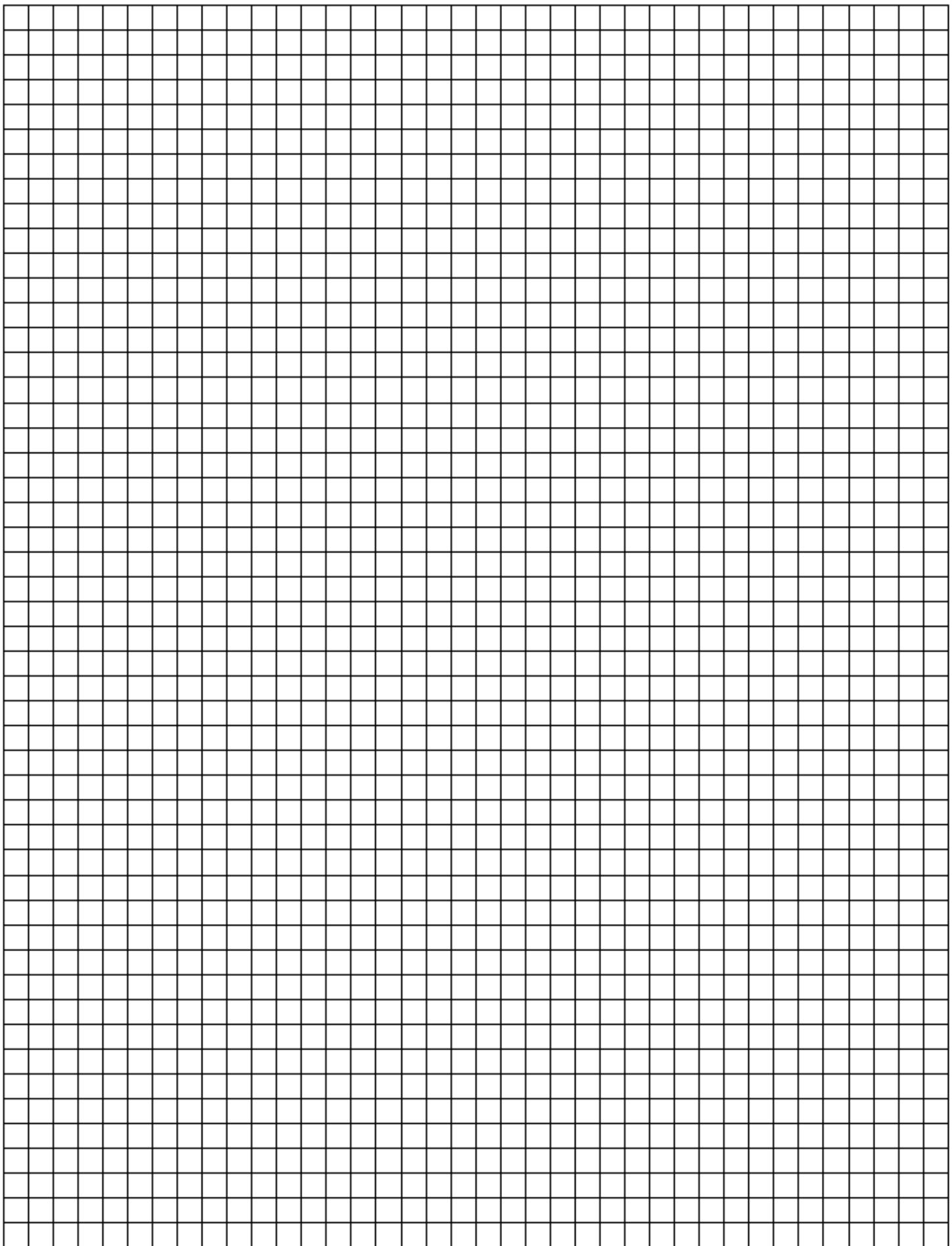
LIGHT AT 90°

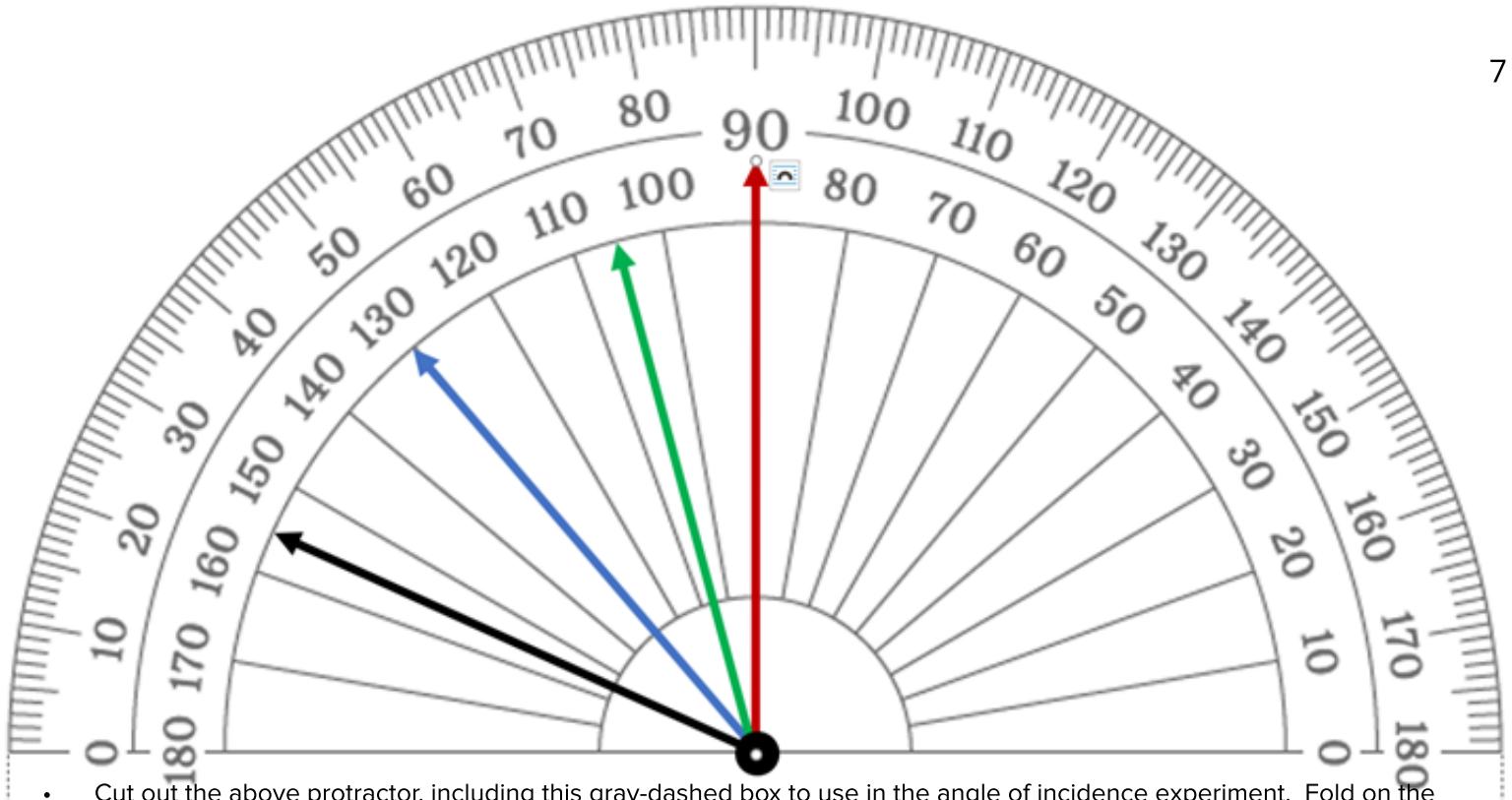


Graphed results

Needs a title, the x and y axis identified, a legend, and a brief description.



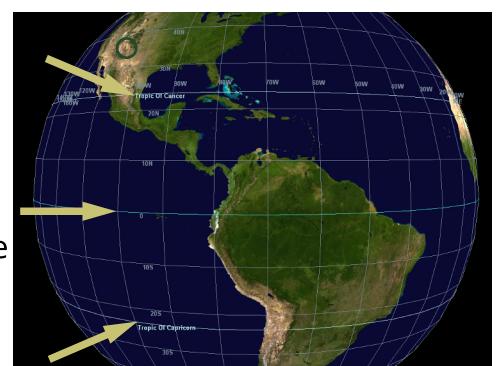




- Cut out the above protractor, including this gray-dashed box to use in the angle of incidence experiment. Fold on the $0^\circ/180^\circ$ line. The red arrow points to 90° . At the Equator, the Sun is at 90° at both the Spring and Fall Equinoxes, directly overhead. During the Solstices at the equator, the Sun is either 23.5° North or 23.5° South from directly overhead.

How to Calculate the Math to Find the Angle of Incidence in Colorado

- Latitudes are the imaginary lines on the Earth. The Equator is at 0 Latitude. Colorado falls between the 37° and 41° Latitude; for this exercise, we will use 39° Latitude.
- We measure the sky like the above protractor: 0° is the horizon and 90° is directly overhead.
 - Equinoxes:** Equinoxes are at 90° overhead at 0° Latitude, the Equator. Colorado is at 39° Latitude. To find the angle of incidence of the sun during the Equinoxes, you need to subtract 39° Latitude on Earth from 90° (directly overhead) = 51° , the angle above the horizon we see the sun in Colorado on March 20 and September 23, 2019. The blue arrow points to 51° .
 - Summer Solstice:** The sun is highest in the sky during Summer Solstice in the Northern Hemisphere, directly over latitude 23.5° North (called Tropic of Cancer). Colorado is Latitude 39° , which is 15.5° in latitude higher. ($23.5^\circ + 15.5^\circ = 39^\circ$). When the sun is highest in the sky in Colorado, it is 75.5° from the horizon ($90^\circ - 15.5^\circ = 75.5^\circ$).
 - Winter Solstice:** The sun is lowest in the sky during the Winter Solstice in the Northern Hemisphere, and it is located over latitude 23.5° South (called the Tropic of Capricorn). The angle of incidence is very shallow in Colorado, around 27.5° above the horizon. ($23.5^\circ + 39^\circ = 62.5^\circ$; $90^\circ - 62.5^\circ = 27.5^\circ$).
- While you work through these calculations, follow on the NASA image of the Earth with latitudes imposed on it. The green circle is Colorado, and the arrows point (from top to bottom) 23.5° North, 0° , and 23.5° South.



Why do people work?

Think forward to when you are an adult, and consider the following:

- Would you work if you were independently wealthy? How would you spend your time if you didn't work?
- Is there more to working than just making money?

Why do you work? Check the following if they apply to you:

- earn money
- be useful
- help others
- make a difference
- be a leader/boss
- be appreciated
- be successful
- feel competent
- be with other people
- other _____
- other _____
- other _____
- other _____

How can you figure out if career satisfaction is important? You can interview people in different careers to find out if people generally feel job satisfaction, and how important that is to them.

Who to interview (suggestions):

- parents
- neighbors
- teacher(s)
- religious leader (e.g. priest)
- 4-H leader or agent
- a store manager
- people in careers you have identified as interesting

People love to talk about their jobs, and will be happy to help you. Let them know you are specifically curious about job satisfaction.

Preparing for the interviews:

- In the green box at the bottom of this page are some interview question ideas. Rewrite them in your own words.

Job Satisfaction: the feeling of pleasure and achievement that you experience in your job when you know that your work is worth doing, or the degree to which your work gives you this feeling

Cambridge Dictionary

- Call to set an interview with the people you have identified as potential interviewees.
- Dress professionally, and arrive on time.
- Listen as your interviewee responds. You may have more questions.
- Bring a pencil and paper or a tablet with your questions, and a place to jot down notes.
- Have fun!

JOB SATISFACTION



DR. LUIS RUEDAS



DR. RENEE RUMRILL



MR. SETH POTTS

What does it all mean?

- Did everyone you interview have a sense of job satisfaction? Why or why not?
- Review notes and write your own definition of job satisfaction.

INTERVIEW QUESTIONS IDEAS:

- How would you describe the job you do?
- What are the main tasks of the job?
- The skills we learn in school are important in the jobs we do at home and at school. In your opinion, which school subjects help you the most (in this job)?
- What are your reasons for doing this job?
- Tell me a little bit about what you really like about this job.
- What don't you like?
- What are your overall thoughts and feelings

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Citations:

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Colorado's last Ice Age Map: <http://coloradogeologicalsurvey.org/colorado-geology/glacial-geology/>

NASA image of Earth and Sun throughout the year: <https://spaceplace.nasa.gov/seasons/en/>

Graph Paper: <https://incompetech.com/graphpaper/plain/>

Planet Earth NASA image: <https://www.nasa.gov/topics/earth/overview/index.html>

Latitude map of Colorado: <https://www.mapsofworld.com/usa/states/colorado/lat-long.html>

Earth's Latitudes image:

<https://ti.arc.nasa.gov/tech/cas/advanced-exploration-knowledge-networks/world-wind/screenshots/globe/>

Career Connection ideas: https://dese.mo.gov/sites/default/files/CD_7_A_Grade4-6_L3.docx

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