

National Western Stock Show School Visits
TEACHER'S GUIDE

NATIONAL
WESTERN 
Stock Show



COLORADO STATE UNIVERSITY
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TEACHER'S GUIDE



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School Visits

at the



Book your school visit at adams.colostate.edu

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General Information

Following registration, schools will be contacted with date confirmation. Please have 2 potential dates before you register as your first selection might not be available.

The School Visits program is open to grades K-12 at no cost for grounds admission. If you plan to attend a rodeo or other ticketed event, please contact the National Western Group Sales Department at 303.295.3959. Due to safety precautions, no toddlers or strollers will be admitted with school visit groups.

Potential Costs:

If you purchase food onsite

If you attend a rodeo in the Denver Coliseum or any other ticketed event (Discounted tickets are available for groups of 15 or more. Please contact 303.295.3959 for more information.)

For more information on activities happening during your visit, go to <http://www.nationalwestern.com/schedule/>

Planning Your Day

A PLAN YOUR DAY map is provided for you at www.nationalwestern.com. Use this map to help plan your day.

On the website, there are different children's educational activities and will tell you approximately how much time it will take for each activity. Pre-plan your day around the activities and exhibits you would like to see.

NO tours are given by our staff or volunteers, but they are available to answer any questions you may have.

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Your Day: Start to Finish

Arrival

Arrive at your requested time (after 9am) on the date your school is scheduled. Have the buses drop you off on the east end of the Events Center Arena; volunteers will be there to assist.

Directions to Events Center Drop-Off:

- Going East or West on Interstate 70, take exit 275C onto Brighton Blvd.
- Go North to East 48th Avenue, and turn left (West).
- Turn left (South) on Baldwin Ct.
- Drop off is on the East side of the Events Center

Parking for the Buses:

Updated information will be available as Stock Show nears. One grounds admission ticket will be provided to your bus driver.

Parking for Other Vehicles:

Parking is free of charge for the general public in all National Western lots. Handicapped parking is located in Lot A. Parking maps are available at www.NationalWestern.com

Lunch

If you bring sack lunches, you may not sit in aisles, on stairs or in concession locations. Students should carry their lunch in a back pack as there is no storage area for boxes of lunches. Food also can be purchased at the National Western. Please plan on eating in the Stadium Arena (#5 on map).

Leaving

- Once you determine a time you will need to leave grounds and notify your bus driver of that time, be sure to arrive 15 minutes early to the Events Center.
- You will be directed to specific seating in the Events Center to wait for your bus. A volunteer will notify you when your bus is outside. Please remain seated until then.
- A sign with the name of your school will be displayed by this location
- Volunteers will help with the bus loading process
- All buses and drivers from your school must arrive at the same time so your group can be picked up together.

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Tips for Teachers

We want you to enjoy your visit and be safe while you are here. Please remember these important safety rules and continue to remind students of them:

- **RULE #1** – Use your **INSIDE VOICE**. This means no yelling or screaming
- **RULE #2** – **WALK** with your group and stay together. This means no running
- **RULE #3** – If you get separated from your group, you should find one of the safe people listed below to help you. **SAFE PEOPLE**:
 - o Volunteers in black/turquoise
 - o Uniformed Police Officers
 - o Uniformed Fire Fighters
- **RULE #4** – Get **PERMISSION** to touch any of the animals. If no one is around the animal, you are **NOT** to touch it. If you do touch any animals, don't forget to **WASH YOUR HANDS** afterwards.

Pre-Visits for Stock Show

Beginning in September, if you register with the National Western Stock Show School Visits program through the Adams County Extension Website, you will have the ability to schedule a Pre-Stock Show visit depending on the availability in your county.

A 4-H County Extension Agent and a NWSS Volunteer will visit your classroom to prepare you and your students for a successful field trip to the Stock Show. While your students participate in a fun educational agricultural activity, you will be learning the ins and outs of a trip to our complex.

For more information on pre-visits, please contact the Adams County Extension Office at 303-637-8100.

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HISTORY AND FACTS

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Mission

The Mission of the National Western Stock Show School Visits program is to provide hands-on, interactive and experiential in class lessons and an event experience to Elementary youth. The School Visits program fosters education for youth by learning about the tradition and history of the National Western Stock Show while creating connections and building bridges to modern topics.

Vision

To be the premier Agriculture, Economic and Western Heritage education program for Elementary age youth at the annual National Western Stock Show.

About School Visits

The School Visits program is a collaborative effort provided by Colorado State University Extension 4-H Program and the National Western Stock Show. Each of these organizations provides tremendous support and without the effort of both the program couldn't thrive as it does each January. The school visits program coincides with the Annual National Western Stock Show each January in Denver, Colorado. Since 1922 the visits have provided educational opportunities to over 10,000 youth throughout the Denver and Front Range Area annually. Each year volunteers provide 650 hours of service for the program that educates all of these youth. The school visits program aims to provide a well rounded educational program to the youth and educators who attend by the use of lesson plans and other resources.

Are you interested in Booking a School Visit for the Upcoming National Western Stock Show?

Register online at www.adams.colostate.edu

If you have questions contact CSU Extension – Adams County at (303) 637-8100 or email nwss@adamscountyextension.org

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About 4-H

The 4-H program is for youth ages 8-18 and comprised of many educational activities and opportunities. 4-H is provided as part of the Colorado State University – Extension Department and is mandated by the Land Grant University system in all 50 States.

4-H Outreach

4-H agents who work with school enrichment programs provide education in classroom settings to students on a variety of topics. Often these programs have little to no cost for schools, teachers and students. Programs aim to supplement and provide additional education for students on a particular topic or Education Standard, some may also include aspects of the Traditional 4-H program (described below). Some of the programs and topics that can be included through the 4-H School Enrichment Program are; STEM (Science, Engineering, Technology & Math), Ag in the Classroom, Foods and Nutrition, Entomology, Embryology, Manners and Respect, Plant Science and Animal Science. This is just a broad overview of the programs available. If you would like to find out more information about school enrichment programs offered by the 4-H program contact your Local County Extension Office.

Club Based 4-H

The Club Based 4-H program is an extracurricular program that provides structured opportunities for it's members to gain life skills. 4-H members are part of a 4-H club and they complete 4-H projects throughout the year, they also must keep records of their project that includes experiences, expenses and possible revenue generated from that project. Club Based 4-H projects cover over 200 difference areas and if members do not have a project that is included in those 200 options it is possible for them to 'self determine' a project. Club Based 4-H members have opportunities to serve on county wide activities and attend several leadership conferences throughout the year. They can also compete on competitive teams that represent many topics and contest throughout the project areas. Traditional 4-H program projects include (but are not limited to);

Livestock – Beef, Sheep, Swine, Goats

Equine and Horseless Horse(General Project)

Small Animal – Poultry, Rabbits, Dogs, Cavy (Guinea Pigs)

Family and Consumer Sciences – Cake Decorating, Baking, Cooking, Preserving, Sewing, and more!

General – Shooting Sports, Robotics, Heritage Arts, Leathercraft, Model Rocketry, Ceramics, Photography and more!

If you're interested in learning more about the Club Based 4-H program or starting a 4-H club at your school, contact your Local County Extension Office.

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History of the National Western Stock Show

Rugged cattlemen and livestock commission merchants attempted several stock shows at the Denver stockyards in the 1880s and again early in 1900, but they were hit and miss promotions until 1906.

- 1899 Organized livestock events begin in Denver but not on a regular basis.
- 1905 Site selected was near Denver Stockyards on South Platte River, which is still the current location of the show.
- 1906 First show opened on Monday, January 29 and ran for six days. Attendance was estimated at 15,000 with stockmen visiting from Omaha, Kansas City, Chicago and some eastern cities.
- The Grand Champion steer sold for 33 cents a pound, 23 cents over the market price.
- Name was changed to the Western Stock Show Association, as it is known today. The “not for profit” organization was incorporated on March 10, 1906.
- 1907 The Livestock Show was enhanced by the addition of a Horse Division.
- 1911 National Western introduced its first poultry show and its first beef carcass contest.
- 1916 The Livestock Exchange Building opened as the main building for Denver Union Stockyard Company.
- 1919 The Brown Palace Hotel paid a record 50 cents a pound for the Grand Champion steer.
- 1922 A program for admitting Denver and suburban school children to the show was established.
- 1932 The 25th National Western presented the first Rodeo in conjunction with the Livestock and Horse Show.
- 1935 The first Catch-A-Calf contest was held during the show.
- 1944 The Quarter Horse Show and Sale were introduced at the show.
- 1952 The Denver Coliseum was finally dedicated on January 10 for the 46th National Western.
- 1970 Attendance topped the 200,000 mark for the first time.
- 1973 The two-level 300 x 390 foot Hall of Education was opened to the public.
- 1974 Competition for girls was added to the 1974 Catch-A-Calf contest.

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History of the NWSS *(continued)*

- 1975 | The National Sheep Shearing Contest was moved to Denver and has been here ever since.
- 1976 | Attendance set a record of more than 240,000 and entries reached an all time high of 5,320.
- 1978 | “Broncomania” swept Denver, with the football team making its initial Super Bowl appearance. Attendance dipped by 12,500.
- 1980 | A record 22 cattle breeds and Bison held shows/auctions. This was the first year of the Bison show and sale.

President Petry announced the creation of the National Western Scholarship Fund, with eight annual \$1,000 four-year grants to the Colorado State University and the University of Wyoming.
- 1981 | Attendance soared to more than 360,000 when the show dates were increased to 12 days and included 21 Rodeo performances.

A still-standing record of \$301,000 was paid at auction for a Hereford bull.
- 1985 | The downtown parade in advance of the show was revived, and the show offered a record 23 Rodeo performances and drew a record attendance of 439,000.

The large attendance required the Denver Fire Department to close access to the grounds for almost an hour on the first Saturday, the initial sign that the National Western was in need of an even larger facility.
- 1987 | The International Center was opened for the first time and registered over 600 guests.
- 1988 | Show was expanded to 14 days and attendance topped the half million mark for the first time at 500,301.
- 1989 | The National Western Volunteer Program was established.
- 1991 | The Expo Hall and Stadium Hall were completed just in time for the show.
- 1993 | Mutton Bustin for kids becomes a popular new attraction at the Rodeo, which had a record attendance of its own with a crowd of 178,012, the most since 1986.
- 1995 | The Events Center, a state-of-the-art equestrian arena with a 150 x 300 foot floor, was dedicated at the show.

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History of the NWSS *(continued)*

- 1995 | The Mexican Rodeo Extravaganza, inaugurated in the Denver Coliseum, was a sell out.
- 1996 | The 90th National Western Stock Show was expanded to 16 days, with 23 Rodeo performances, 11 Horse Shows performances and two Mexican Rodeo Extravaganzas. Attendance exceeds 600,000.
- 1996 was also the first year for “An Evening of Dancing Horses”, featuring musical freestyle riding performances choreographed for individuals and groups.
- 1997 | A record 23 breeds of cattle had a show and/or sale
- Family Fun Night was added.
- 1998 | National Western went on-line for the first time at nationalwestern.com .
- 1999 | Elk and Yak sales were added to the livestock sales program.
- Olympic qualifying competition for the United States Equestrian Reining Horse Team makes its debut.
- Attendance records were set for both single day and entire run - 68,357 and 603,328 respectively.
- 2001 | This was the first year for the Boer Goat show, and the Antique Tractor Parade and Show.
- 2003 | The Junior Livestock Auction had record-high earnings of more than \$500,000.
- Mike Shaw of Denver, Colo., was the first-ever buyer to purchase three grand champion animals at the Junior Livestock Auction. He also holds the record for bid price at \$110,500.
- National Western hosted the Colorado Rocky Mountain Fiddle Championships for the first time.
- 2006 | National Western celebrates its 100th anniversary; an attendance record is shattered when recorded attendance reaches 726,972 for the 16-day show.
- 2007 | A record five consecutive weeks of snowstorms occur during the set up and run of the 2007 Stock Show.
- 2008 | The National Western Donkey and Mule Show hosted the Official Donkey Mascot Contest for the 2008 Democratic National Convention to be held in Denver.
- 2009 | Interactive fun was enjoyed for the entire family in the new Ames Activity Pavilion. National Western visitors participated in pedal tractor races and stick horse rodeos. Plus, there were horseshoe tosses, dummy roping and other contests for prizes.

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History of the NWSS *(continued)*

- 2010 | For the first time in its 104 years, heifers were shown in the market division at the National Western Stock Show. The Grand Champion Market Heifer, Lidy, went on to make even more history when Judge Dan Hoge chose her as overall Reserve Grand Champion. Lidy was exhibited by Bailey Core of Pleasantville, Iowa.
- Clint Craig set a National Western record by scoring a 92 to win the PRCA Bull-Riding on “Ole Yeller”
- Kody Lostroh of Longmont, Colorado, won the 2010 PBR Denver Chute-Out following his incredible 2009 season as PBR’s Million-Dollar Man.
- 2011 | Paul Andrews takes the reins as new President and Chief Executive Officer, replacing Pat Grant who becomes Chairman of the Long Range Planning Group.
- The New National Western Wild West Show premieres.
- In spite severe cold and snow during the first week of the Show, attendance was 644,818
- 2012 | Waygu cattle are shown in the open cattle show in their first national show.
- Despite severe weather much of show, attendance ended at 636,662
- 2013 | Stock show creates a new rodeo for opening day called “Colorado vs. World”. Moves to 3 rodeo performances on opening day as Colorado champions face World champions in this rodeo.
First ever Fan Appreciation Day is created as the last day of Stock Show
The WSSA creates a new event to be held each April in Denver. It will be called “Rodeo All-Star Weekend”. The first event dates are April 4-6, 2013.
- 2014 | NW Nursery is created in Events Center, showing newborns with their moms on display
Attendance increases to 640,022
- Jr. livestock auction set an all time record for sales of \$714,900
- 2015 | Denver voters overwhelmingly approved Measure 2C, which will invest in Denver’s tourism industry by improving the Colorado Convention Center and creating the new National Western Center, a year-round educational, research, commerce and entertainment campus that will be the permanent home for the National Western Stock Show held each January.
- The first annual National Western BBQ Throwdown is held. It is a Kansas City Barbecue Society sanctioned event. Forty world’s elite barbecue teams will compete in four barbecue categories including chicken, pork, ribs and brisket
- The National Western Stock Show announces the largest single day attendance in Stock Show history with 68,757 fans entering the gates on Saturday, January 17th. The number exceeds the former Stock

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History of the NWSS *(continued)*

- 2015 | Show record of 68,610 set back in 2008.
- Jr. livestock auction sets all time record for sales of \$754,750
- Attendance grows to 682,539 with good weather and exciting shows
- 2016 | The first Invitational Ranch Rodeo and NRCHA Shows are held during the National Western Horse Show.
- Jr. livestock auction sets all time high for sales of \$886,250
- Attendance soars to second highest all time mark of 686,745
- 2017 | The Stock Show parade is cancelled because “The risk of animal injury and injury to people is far too great with the 4 to 8 inches of snow predicted and six degree temperatures”
- Jr. livestock auction sets all time high for sales of \$912,750
- The Western Stock Show Association purchases the Denver County Fair. The first fair under the umbrella of the National Western is held in July.
- The final Sunday sets a record with 42,661 attendees.
- The National Western Scholarship Trust Awards \$500,000 to Agriculture Students, a \$100,000 increase which increases the number of scholarship recipients to more than 90.
- Strong attendance continues as the show ends with 684,580
- WSSA writes new Vision, Mission and Values statement for the Association
- 2018 | The Coors Western Art Sale & Exhibit celebrates its 25th Anniversary.
- The National Western experiences it's second highest attendance ever, 705,574. Attendance records are set for three days: opening day, 52,969; Day 2, 50,577; and Day 4, 33,149
- The first ever “Horseman’s Challenge” debuts at show. Riders navigate difficult obstacles on horseback.
- 2019 | The first Youth Ranch Horse Mentor Match and Youth Freestyle Reining Showcase are held at the National Western Horse Show.
- 2020 | The 25th Anniversary of Freestyle Reining and Dancing Horses.

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Economic Impact of the NWSS

Each January the National Western attracts hundreds of thousands of visitors to Denver. This contributes around \$75,000,000 in economic revenue for Colorado in the form of sales, motels/hotels, restaurants, employment and transportation. In addition to the revenue generated during the Stock Show in January, the National Western Complex is home to many events held in Denver throughout the year. These events include, monster truck shows, equine events, livestock shows, crafts fairs, and more.

In January many animals and their owners arrive in Denver for one day only and some for the duration of the entire event. This includes, 11,000 horses that represent over 30 different breeds and types, as well as 8,000 cattle, sheep, hogs, goats and exotic livestock. In addition to the animals there are over 900 National Western Volunteers that help provide the experience to the visiting public and exhibitors through the duration of the stock show.

Facts About the NWSS

National Western Stock Show – Youth Participation

The National Western Stock Show is dedicated to education and the promotion of agriculture. The National Western provides 41 College scholarships youth involved in agriculture and medicine. Throughout the annual Stock Show there are many youth contests such as: the junior livestock show and sale, catch-a-calf contest, heifer wrangle contest, sheep shearing. They also put on a livestock-judging contest where youth judge four animals against each other compared to the ideal of the species.

Some of the youth you may see at the National Western Stock Show, may be members of one or more of the following organizations.

4-H- The goal of 4-H is to develop citizenship, leadership, responsibility and life skills of youth through experiential learning programs and a positive youth development approach. Though typically thought of as an agriculturally focused organization as a result of its history, 4-H today focuses on citizenship, healthy living, science, engineering, and technology programs. 4-H is available for youth ages 5-18 years old.



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Facts About the NWSS (ctnd)

National Western Stock Show – Youth Participation (ctnd)

FFA- The National FFA Organization is a dynamic youth leadership organization that strives to make a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agriculture education.



Junior Breed Associations- Organizations sponsored by the individual breed associations to promote breed awareness and popularity. The age at which you can join differ for each breed and species, most junior member's then pass on to adult members when they reach 18. Usually a member of a junior breed association must own at least one animal from that particular breed. Junior Associations exist for many different species of animals but are common for Beef Breed Associations. Many Junior Association members and officers assist during the shows that represent the same breed for which they are a member. Their insignia varies depending on the association to which they represent or belong.

So what is exactly is a class?

There are a few simple steps to understanding different classes and shows you may see while at the Stock Show.

First, determine if the show is a Breeding or Market Animal Show. In a breeding show, the judge is looking at the structural and reproduction qualities of the animal. This is because breeding stock is used to continue the production of a particular breed of animal. In market shows the judge is looking for the highest quality meat animal. The intention for animals in the market shows are to be harvested or human consumption.

Next, determine which class is in the ring. Is it a specific breed class? Is it the males or females and what age are they? Breeding are divided based on all of these things, in addition males will always compete against males and females against female. For the Market classes, animals will be split depending on their breed and weight. Animals 'finish' or become ready for harvest generally around a specific weight, although judges have different expectations of when that is.

Once an animal places first or second in its initial class (Breeding or Market) they will be brought back to compete against animals of a similar type and kind for the title of champion. For example, in a Market Hog Show all of the 1st and 2nd place hogs in a breed division will be asked back to the ring to compete for the Breed Champion. After Champions and Reserve Champions are selected they are asked back to compete for the title of grand champion. So, the pig who was selected Champion in each breed division will be brought back to compete for Grand Champion. The Grand Champion animal is determined by the judge to be highest quality animal at the show on that day.

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LESSON PLANS

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Lesson Plan



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4-H Project Connections:

- Foods and Nutrition
- Livestock - dairy

Goals:

- To help students understand how cheese is made
- To teach students about the science behind making cheese

Age Appropriate:

- 2nd – 5th grade

4-H Life Skills:

- Critical thinking
- Personal safety
- Learning to learn

Colorado Department of Education Standards:

Science:

2.1.1 Matter exists as different substances that have observable different properties

5.1.1 Measurements of a variety of observable properties can be used to identify particular material

5.1.2 Chemical Reactions that occur when substances are mixed can be identified by the emergence of substances with different properties

Chees-y Science

Cheese has been a popular snack for centuries. According to legend, it was discovered several thousand years ago by an Arabian traveler who placed milk into a pouch made of a sheep's stomach. During the day's journey, the combined action of the sun's heat and the enzymes in the lining of the stomach changed the milk into a snowy white curd of cheese and the thin liquid called whey. Do you know what cheese is made of? Today, we're going to make our own cheese!

Beginning the lesson...

1. Tell the students the "Little Miss Muffet" nursery rhyme. Ask students what they think Miss Muffet was eating in the rhyme. Explain that whey is the liquid that separates from the curds when you're making cheese, as they will see in this experiment.
2. Pour milk into a saucepan. Have one student check the room temperature and another student insert the liquid thermometer in the milk to find its temperature. Tell students that the milk must reach room temperature before you can continue with the experiment.
3. Hand out student worksheets, and have students work in groups to find definitions for the vocabulary words.
4. When the milk has warmed to room temperature, show students the rennet tablet. Ask one student to share his or her definition of "rennin" (from the worksheet). Explain that rennet is the solid form of rennin. Have students predict what will happen if you add the rennet tablet to the milk.
5. Crush the rennet tablet, and dissolve it in $\frac{1}{4}$ cup water, then stir it into the milk. Have students check the mixture about every 30 minutes and record their observations on their worksheets. After 1-2 hours the mixture should begin to separate. (If you want to speed up the process, add $\frac{1}{2}$ cup vinegar.) Ask students which part of the mixture is the curd (the solid part) and which is the whey (the liquid).
6. Pour off the whey, and cut the curd into $\frac{1}{2}$ inch cubes with a long knife.
7. Place the colander in the bowl, and line the colander with cheesecloth. Pour the mixture through. Drain thoroughly, and squeeze out the moisture.
8. Show students the finished product, and ask them to describe it. How is it similar to the dairy products with which they are familiar? Have students record their observations on the student worksheets.

Test your understanding...

What is the difference between curds and whey? What happened when we added the rennin to the milk? Do you think things would be the same if we had a different amount of milk, or a different kind of milk? Why?

Time Required:

-90 minutes

Materials:

- 1 gallon homogenized milk
- Saucepan
- Room thermometer
- Liquid thermometer
- 1 rennet tablet (Available in most grocery stores. Ask your grocer.)
- $\frac{1}{4}$ cup lukewarm water
- Large colander
- Cheesecloth
- Large bowl
- Long knife
- Chees-y Science Worksheet (Appendix 6)

Vocabulary:

- Coagulate
- Enzyme
- Curd
- Bacteria
- Culture
- Rennin

Adapted From:

Oklahoma Ag in the Classroom Materials at:
<http://www.agclassroom.org/ok>

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Lesson Plan



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4-H Project Connections:

- Heritage Arts
- Clothing
- Horse

Goals:

- To help students understand what the word "heritage" means
- To teach students to name several pieces of cowboy clothing and understand the clothings' purpose

Age Appropriate:

- Kindergarten - 1st grade

4-H Life Skills:

- Learning to learn
- Contributions to group effort
- Critical thinking

Colorado Department of Education Standards:

Social Studies:

K.1.1 Ask questions, share information and discuss ideas about the past

1.1.2. Family and cultural traditions in the United States in the past.

Cowboy Clothing and its Importance

What does the word "heritage" mean? Each person's heritage is a little different! An important part of our heritage, since we live in the Western United States, is cattle and ranching. The cattle industry affects everyone in Colorado in some way, whether it's eating beef or going to the National Western Stock Show. Cowboys are also a large part of that western heritage with their involvement in the cattle industry.

Beginning the lesson...

Cowboys have specialized clothing and tools to help them carry out their jobs. These clothes and tools aren't just supposed to make them look like a cowboy; the clothing and tools all have purposes.

1. Explain the different purposes of pieces of clothing and tools as you transform an adult into a cowboy or cowgirl.

- Cowboy hat—uses of hat are to keep the sun off and like an umbrella to help keep the rain off. Other uses might be to scoop water or feed a horse.
- Bandana—also called a wild rag. Used to keep the sun off the neck, as a wash cloth, perhaps even a tourniquet or to cover a horse's eyes.
- Chaps—pronounced "shaps." Used to keep mud, rain, cattle blood, off the rest of the clothing as well as protection against stickers or even a branding iron.
- Belt and buckle—are not just to hold pants up. It can be used to lead a horse if reins break, as a tourniquet, or even as a weapon.
- Boots—have many functions. The high top helps protect against thorns and stickers as well as snakes. The bigger heels help keep the foot from slipping through the stirrup on a saddle and serves as a brace in roping. Boots are smooth on the bottom to aid the cowboy in dismounting from his horse.
- Spurs—attached to the cowboy's boot heel. They help remind a horse to pay attention or speed up. They could also be used as a weapon.
- Lasso—sometimes called a lariat. Used to rope cattle or other animals. Could also be used to pull something or even to lead a horse if the reins break. In the "old days" it was believed that if you slept with a rope outlining your bed roll that a snake would not cross it.
- Leather gloves—protection for the hands from a hot branding iron or sharp barbed wire or the cold in the winter.

2. Add other clothing and tools that might be available such as a slicker, canteen, halter, or saddle. Take a picture!

Test your understanding...

Ask students to explain what "heritage" is and have them draw a picture of something that represents their heritage.

Time Required:

-30 - 40 minutes

Materials:

- Cowboy hat
- Wild rag
- Chaps
- Belt with buckle
- Cowboy boots
- Spurs
- Lasso
- Branding iron
- Leather gloves
- Other clothing and/or equipment
- Camera
- Paper
- Pencils and/or crayons

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TEACHER'S GUIDE

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COLORADO STATE UNIVERSITY
EXTENSION

4-H Project Connections:

- Poultry
- Nutrition

Goals:

- To teach students the parts of an egg
- To help students understand the strength of a structure with arches in it

Age Appropriate:

- 1st - 4th grade

4-H Life Skills:

- Learning to learn
- Observation
- Prediction
- Hypothesize

Colorado Department of Education Standards:

Science:

1.2.1 All organisms have external parts that they use to perform daily functions

2.1.1 Matter exists as different substances that have observable different properties

4.2.1 Organisms have both internal and external structures that serve various functions

Eggs-periment with eggs! Part 1

An egg is a wonder of nature. The parts of the egg all have important purposes both for chickens and for human nutrition. Even the architecture of the egg is copied by engineers today! The study of eggs is called oology, a word that can be remembered because some of its letters (write oology on the board) look like an egg. Let's do a little oology today. Note to teacher: the lesson is divided into 2 parts - see next page for Part 2.

Time Required:

-30 minutes

Materials:

- Picture of a bridge with arch structure
- At least 5 eggs
- Modeling clay
- Rectangular piece of plywood
- At least 7 or 8 heavy books

Vocabulary:

- Architecture
- Oology
- Arch
- Hypothesis

Beginning the lesson...

1. Show students a chicken egg. Explain that the chicken egg is an architectural (way things are built) marvel. When an egg is stood on one end, the arch that it forms is really stronger than you might think. (Show a picture of a bridge with an arch structure).
2. Let's do an eggs-periment to show the strength of an egg. Explain that you are going to put four eggs in a rectangular outline with the large end of each egg set firmly into a piece of clay. A small piece of clay is put on the top (small end) of the egg with a thin piece of plywood on top of the eggs.
3. Have students hypothesize how many large books can be set on the plywood before the eggs break. Take a count so a graph can be made if you would like a math lesson to evolve also.
4. Carefully add books one at a time to the center of the platform.
5. See who was closest to the amount of books held before the eggs broke.

Test your understanding...

Have each child tell whether their hypothesis was found to be true or not.

Extending the lesson...

1. Try the experiment with the eggs lying on their sides (a different size of arch).
2. Have students find pictures on the Internet or otherwise that show structures with an arch. Discuss.
3. Do a magic trick for your students. (Test the egg yourself before having students do this, just in case there is a crack that is not detectable.) Pick up an egg; make sure it has no cracks in it. Ask the class who one of the strongest students is. Have the student come up front. Put the egg in his/her hand lengthwise across the palm of the hand. Tell the student that you bet they aren't strong enough to break the egg by squeezing it. Make sure the student does not have a ring or anything on their hand that would give uneven pressure on the egg shell. Have the student try it. (They should not be able to break it unless it has a minor crack in it.) Now put it in your hand the same way, but make sure you have a ring with a setting on your hand that will give uneven pressure on the shell so that it breaks. (The setting will have to be turned toward your palm.) You are now the strongest person in the classroom!

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COLORADO STATE UNIVERSITY
EXTENSION

4-H Project Connections:

- Poultry
- Nutrition

Goals:

- To teach students the parts of an egg
- To help students understand the strength of a structure with arches in it

Age Appropriate:

- K - 4th grade

4-H Life Skills:

- Learning to learn
- Observation
- Prediction
- Hypothesize

Colorado Department of Education Standards:

Science:

K.2.1 To live and grow, animals obtain food they need from plants or other animals

2.1.1 Matter exists as different substances that have observable different properties

4.2.1 Organisms have both internal and external structures that serve various functions

Eggs-periment with eggs! Part 2

Let's take a look at the parts of the egg. We already know that the egg's shell is very strong, but did you know that the shell has hundreds of tiny little holes in it called pores? That's what we call porous. The reason it has those holes is so that the air can go in and out of the egg as well as moisture. If the egg is a fertilized egg, this is very important for the embryo inside. *Note to teacher: the lesson is divided into 2 parts - see previous page for Part 1.*

Beginning the lesson...

1. Let's crack the egg. You could have one egg per group of students or just one for the class. Point out each of the parts:

- Membrane – Attached to the shell there are two membranes called the outer and inner shell membranes. Membranes are a little like a very thin layer of skin. Like the shell, these protect the rest of the egg.
- Air Cell – Inside every egg there is an air cell usually at the large end of the egg. When you hard boil an egg and then peel it, you can see the air cell as the indent on the big end of the egg. When the egg is first laid, there is not an air cell, but as the egg cools down from being the same temperature as the hen's body, a vacuum is formed which draws air into the egg through the pores. The air cell forms between the two membranes. If the egg is a fertilized egg, the air cell is where the baby chick pips into to get its first breath of air when it is ready to hatch.
- White – This is the watery clear part of the raw egg. When the egg is heated, the substance becomes a solid and turns white. It is also called albumen which has a high water content, but also has protein and enzymes. For humans, the protein helps us build muscles when we eat eggs. In a fertilized egg, it provides the embryo with the same things and it also serves as a cushion for the embryo.
- Yolk – This is the yellow part of the egg. It has a lot of proteins, vitamins, minerals, and fats in it. The yolk is where we get the most nutrition for us. In a fertilized egg, this is what furnishes the embryo with its food and also gives the embryo antibodies to keep it healthy.
- Chalazae (kuh-LAY-zee) – If you look on the yolk you can usually see some white, twisted cords. Ask students what they think these are. The cords are what holds the yolk in the center of the egg. The chalazae have a protein in them, so they are good for you nutritionally.

Nutrition Facts: Eggs are a great source of protein which helps build muscles. Eggs are one of the most nutritionally complete foods that you can eat and they have only 80 calories in a large egg.

Test your understanding...

Have the children draw the egg and label the parts that were talked about.

Time Required:

- 30 minutes

Materials:

- Plate or bowl
- At least one egg or one per group

Vocabulary:

- Pores
- Porous
- Embryo
- Membrane
- Protein
- Enzyme
- Albumen
- Antibodies
- Fertilized
- Chalazae

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COLORADO STATE UNIVERSITY
EXTENSION

4-H Project Connections:

- Horticulture
- Foods
- Nutrition

Goals:

- To teach students about where the food they eat comes from
- To teach students the nutrition elements of pizza
- To help students recognize products they may see at the NWSS

Age Appropriate:

- K – 5th grade

4-H Life Skills:

- Teamwork
- Problem solving
- Wise use of resources

Colorado Department of Education Standards:

Comprehensive Health:

2.2.1 Identify eating and drinking behaviors that contribute to maintaining good health

3.2.1 Demonstrate the ability to make and communicate appropriate food choices

4.2.2 Examine the connection between food intake and physical health

5.2.1 Demonstrate the ability to engage in healthy eating behaviors

Colorado Department of Education Standards *Science:*

K.2.1 To live and grow, animals obtain food they need from plants or other animals, and plants need water and light

Farmers Grow Our Pizza

Who likes pizza? Almost everyone! Many kids think that pizza comes from Dominos, King Soopers, Pizza Hut, or their freezer. While this is true, the ingredients of pizza come from someplace besides those we think of. Where do stores and restaurants get the ingredients for pizza? ALL of the ingredients in pizza come from a farm!

Beginning the lesson...

1. Today we are going to be learning about where our pizza comes from. Each of the ingredients of a pizza comes from a farm somehow. Let's go through the ingredients and where they come from (start with the green felt and attach each felt "ingredient" in order):

- Crust or pizza dough (tan) – The crust is made from wheat, which is grown by farmers in big fields. When the wheat plant turns tan and the seeds dry out, farmers use a big machine called a combine to harvest the wheat seeds. Once the wheat seeds are harvested they have what they call wheat kernels. The kernels are collected and sent to a mill to grind the wheat into flour. This is mixed with other ingredients to produce the crust.
- Sauce (red) – The sauce is made from tomatoes, which can be grown in your back yard or in large quantities on a farm or in greenhouses.
- Cheese (yellow) – Cheese is made from milk, which comes from cows! On average, dairy cows can produce three or four gallons of milk each day.
- Onions, mushrooms, hamburger, and pepperoni – all of these things come from a farm too! Onions and mushrooms are grown by farmers, while hamburger and pepperoni are meat from the animals that farmers raise.

2. Have the students break up into groups to make their own English muffin pizza. Put one tablespoon of pizza sauce on the English muffin, and top however they'd like! Then, place the pizza in the microwave or on a cooking skillet until the cheese is melted. Enjoy!

Fun Facts about Pizza:

1. Pizza includes different nutritional values depending on toppings. The food groups pizza includes are: milk, vegetables, fruit, grains, meat and beans, and oils.
2. October is National Pizza Month in the United States.
3. Approximately three billion pizzas are sold in the U.S. each year!
4. The first U.S. pizzeria was opened in New York City in 1895. The first recorded pizzeria was in Naples, Italy in 1738.
5. On average, each person in the U.S. eats approximately 23 pounds of pizza each year.
6. The top 5 pizza sale days are Superbowl Sunday, New Year's Eve, Halloween, the night before Thanksgiving, and New Year's Day.
7. There are approximately 61,269 pizzerias in the United States!

Time Required:

- 45 - 75 minutes

Materials:

- 1 Large cardboard cutout pizza slice covered in green felt
- Tan felt the size of a pizza slice for dough
- Red felt a little shorter than the pizza slice for sauce
- Yellow felt for cheese
- Brown felt cutout in small circles for hamburger
- White felt for onions
- Maroon felt for pepperoni
- Light brown felt for mushrooms
- Additional for students to make pizza (one each per student):*
- ½ whole wheat English muffin
- 1 Tbs. pizza sauce
- 2% shredded cheese
- 2 slices turkey pepperoni
- Sliced onions
- Diced peppers (green, red, yellow or orange)
- Cooking skillet or microwave
- Spatula
- Cooking spray
- Plates
- Napkins

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EXTENSION

4-H Project Connections:

-Horse

Goals:

- To teach students the differences between horse colors
- To help students recognize different colors and breeds of horses

Age Appropriate:

-1st - 4th grade

4-H Life Skills:

- Team work
- Contributions to group effort
- Learning to learn
- Observation

Colorado Department of Education Standards:

Reading, Writing and Communicating:

1.1.1 Multiple strategies develop and expand oral vocabulary

2.1.2 New information can be learned and better dialogue created by listening actively

3.2.3 Increasing word understanding, word use, and word relationships increases vocabulary

4.1.1 A clear communication plan is necessary to effectively deliver and receive information

Horsin' Around with Horse Colors

Horses, just like people, come in all different shapes, sizes and colors.

Just like there are different ethnic groups of people, there are different breeds of horses. And, just like people different hair colors, horses also have different coat colors. We call a person with golden hair "blonde," but a horse that is golden yellow is called "palomino." Today, we'll learn the different colors of horses.

Beginning the lesson...

1. Explain to students that horses have different colors of "hair," just like people. Explain the different colors of horses:

- Chestnut - A reddish brown horse with reddish, brown or tan mane and tail, with legs the same color as the body. Chestnut runs from very light reddish brown to red or very dark liver color. Sometimes the mane and tail may be flaxen (pale yellow).
- Bay - A brown horse with black legs, mane and tail. Body color run from light brown, reddish to very dark brown, but legs, mane and tails are always black (they may also have white markings).
- Brown - A very dark brown, almost black coat with lighter brown highlights on the muzzle, the flanks and inside the legs. Mane and tails are always black. They are hard to tell from dark bay.
- White - White horses are born white. They have pink skins and usually blue or pink eyes.
- Pinto - A white horse with large patches of black, brown, chestnut or any other colors.
- Gray - Horses that are born with dark skin. Hair becomes whiter with age until pure white. A gray may range from iron gray (nearly black) to dapple gray, white gray or flea-bitten gray (with tiny flecks of black or brown).
- Black - A horse that is coal black with no brown highlights. The mane and tail are also black.
- Buckskin - A light to dark yellow horse with black mane and tail.
- Dun - A horse that is sandy yellow, reddish or brown, usually with darker legs, a dark stripe down the back, and a dark mane and tail.
- Palomino - A golden-colored horse with a white mane and tail. A palomino can range from a light yellow to a very dark gold color.
- Roan - A horse that has a mixture of white hairs and one other color (chestnut, bay or black). A chestnut roan is called a strawberry roan or red roan. A black roan is called a blue roan.

2. Divide the students into pairs, and give each pair a set of matching cards. Have the students take turns trying to find a matching pair by flipping the cards over. Give the students 15-20 minutes to complete this activity.

3. Determine which student has the most pairs at the end of the 20 minutes. Play again!

4. Review the colors of horses by describing the color and asking students to answer what color of horse you're describing.

Time Required:

-45 minutes

Materials:

-Matching cards for game (Appendix 7, 8, 9)

Vocabulary:

-Bay
-Chestnut
-Black
-Brown
-White
-Pinto
-Gray
-Buckskin
-Dun
-Palomino
-Roan

Adapted From:

Oklahoma Ag in the Classroom Materials at:
<http://www.agclassroom.org/ok>

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4-H Project Connections:

-Livestock

Goals:

-To help students understand the importance of agriculture
-To teach students to name five things that they use that come from the farm

Age Appropriate:

-Kindergarten - 3rd grade

4-H Life Skills:

-Contribution to group effort
-Teamwork
-Learning to learn

Colorado Department of Education Standards:

Science

2.1.1 Matter exists as different substances that have observable different properties

Social Studies

1.2.2. People in different groups and communities interact with each other and with the environment
Economics

1.3.1. People work at different types of jobs and in different types of organizations to produce goods and services and receive an income

Reading, Writing, and Communicating

1.1.1. Multiple strategies develop and expand oral vocabulary

2.1.2 New information can be learned and better dialogue created by listening actively

3.1.2. Successful group activities need the cooperation of everyone

Plants and Animals in the Outfield

Does anyone in this classroom like baseball? Does anyone know what the word "agriculture" means? Agriculture is "the science, art, or occupation concerned with cultivating land, raising crops, and feeding, breeding, and raising livestock; farming."

What do you think agriculture and baseball have in common or how are they related? Take some answers. Let's see if we can figure out anything that connects baseball and agriculture.

Beginning the lesson...

1. Divide students into groups of 4 to 6. Give each group one object that is related to baseball. (Refer to list of materials).
2. Each group has an item that you might find at a baseball game. How does this item relate to baseball and also to a farm? Decide as a group. *Give students a minute or so to talk about their group's item.*

3. Ask each group what the relationship is. After a group has responded, tell them what the relationship is:

- Baseball – the outside is made of leather which is the hide (skin) of an animal. Inside the baseball is either a core of cotton or wool. (Discuss where cotton and wool come from.) The little red stitches on the baseball are also made of cotton. **Trivia: There are exactly 216 red stitches on a regulation baseball.**
- Baseball mitt – most good baseball mitts are made of leather.
- T-shirt or cap – a lot of things that we wear have some cotton in them. Your tennis shoes may have leather or cotton on them.
- Candy bar – there are lots of things from a farm in a candy bar. Carmel is made from milk and sugar, both of which come from a farm. Nuts are grown on a farm, on a tree. Peanuts, which are not really a nut, are also grown on a farm in the ground.
- Hot dog bun – this also has many ingredients from the farm, but the major one is flour which is made from wheat.
- Popcorn – even this grows on a farm, on a stalk, just like the corn on the cob we eat.
- Sunscreen – most sunscreen has a variety of animal or vegetable by-products in them. One ingredient is stearic acid which is found in animal and vegetable fats.
- Soda – most soda is sweetened with corn syrup, which comes from corn.

4. So you can see that we wouldn't have baseball without the farm or what we call agriculture. We should all remember how important agriculture is to us. If you look around our class, almost everything in our classroom has something in it that started out on a farm.

Test your understanding...

Think of another sport and name some things used in that sport that have something in them that comes from a farm.

Time Required:

-30 minutes

Materials:

-Baseball
-Baseball mitt
-T-shirt or a cap of a baseball team like the Rockies
-Candy bar (Snickers or something that has caramel and nuts in it)
-Hot dog bun
-Popcorn
-Sunscreen
-Soda

Vocabulary:

-Agriculture
-Cultivating
-Occupation
-Regulation
-Hide
-Ingredients
-By-product

Adapted From:

Oklahoma Ag in the Classroom Materials at:
<http://www.agclassroom.org/ok>

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4-H Project Connections:

- Horticulture
- Foods

Goals:

- To teach students about where the food they eat comes from
- To help students identify which products they may see at the NWSS
- To teach students why plants are important to people

Age Appropriate:

- Kindergarten - 2nd grade

4-H Life Skills:

- Problem solving
- Wise use of resources
- Creative thinking

Colorado Department of Education Standards:

Comprehensive Health:

K.2.1 Identify the major food groups and the benefits of eating a variety of foods

1.2.1 Eating a variety of foods from the different food groups is vital to promote good health

2.2.1 Identify eating and drinking behaviors that contribute to maintaining good health

Science:

K.2.1 To live and grow, animals obtain food they need from plants or other animals, and plants need water and light

The Hamburger Plant

What are some of your favorite foods? Do you know where those foods come from? Hamburgers are one of almost every American's favorite foods. Do you think hamburgers grow on plants? Today, we're going to learn more about hamburgers and where they come from.

Beginning the lesson...

1. Build a hamburger plant using the dog chew toy and fake plant.
2. Ask the students to draw what they think a hamburger plant would look like.
3. Show the students the hamburger plant that you have made with the dog toy and fake plant (picture below). Give a few students a chance to show the class their creative diagrams of the hamburger plants. As the students describe their plants, when they say a part of the hamburger write each part on the board. Ask the students if they have any additional items they like to eat on a hamburger.



4. Go through the list with the students and ask them to have you circle which of the words they named come from a plant. If the words they named don't come directly from a plant write where it originates and keep diagramming it out until you find the plant connection. Here are some examples:

- Hamburger Patty – Cow – Cows Eat Grass
- Buns – Flour – Wheat
- Mayonnaise – Eggs – Chickens – Chickens eat grains

5. Have students create their own hamburger plant using construction paper, glue, scissors, and crayons!

Test your understanding...

Ask students to name more items that are on a hamburger, or other sides that you eat with hamburgers, and chart the plant connection for each.

Time Required:

-45 minutes

Materials:

- Hamburger dog toy
- Fake plant
- Crayons
- Markers
- Paper
- Pencils

Adapted From:

Texas Junior Master Gardener Book

4-H Project Connections:

-Livestock - swine

Goals:

-To teach students about the history of hogs in the United States
-To help students learn various facts about hogs
-To teach students to research their own questions and find answers

Age Appropriate:

-2nd - 4th grade

4-H Life Skills:

-Team work
-Contributions to group effort
-Learning to learn

Colorado Department of Education Standards:

Reading, Writing and Communicating:

2.1.1 Discussions contribute and expand on the ideas of self and others

2.4.1 Reference materials help us locate information and answer questions

3.1.2 Successful group activities need the cooperation of everyone

3.4.1 Researching a topic and sharing findings are often done with others

4.4.1 Comprehending new information for research is a process undertaken with discipline both alone and within groups

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Truth or Hogwash?

Pigs were among the first animals to be domesticated, probably as early as 7000 BC. Forty million years ago, hog-like animals roamed forests and swamps in what are now Europe and Asia. By 4900 BC, hogs were domesticated in China, and by 1500 BC they were being raised in Europe. In 1539, Hernando de Soto introduced pigs to the United States when he landed at Tampa Bay, Florida, with 13 pigs, the first in North America. By the time of deSoto's death, three years later, his hog herd had grown to 700. Today, we're going to find out more about pigs!

Beginning the lesson...

1. Divide students into groups of 4-5 students.
2. Give each group of students a "deck" of cards that you've created from the worksheets and two folders, labeled "TRUTH" and "HOGWASH."
3. Tell students to place the cards picture side up, so the pigs are showing. Don't peek at the backs of the cards!
4. Give the students 10-15 minutes to go through the seven "facts" and determine whether each is truth or hogwash by placing them in the correct folder. Here are the answers:
 - 1 - Pigs eat and really "pig out." - Hogwash: they stop eating when they have had enough.
 - 2 - Pigs are not stupid. They are as smart as dogs. - Truth: They can be taught to do tricks such as fetching. They have even been taught to do important jobs. In war they have served as mine sniffers in battlefields.
 - 3 - Pigs never grow to weigh more than 1,000 pounds. - Hogwash: The heaviest hog in history, Big Bill, weighed 2,552 pounds.
 - 4 - Pigs have small eyes and poor eyesight. - Truth: But they have a strong sense of smell.
 - 5 - Pigs are dirty animals that love to wallow in the mud. - Hogwash: They are cleaner than most farm animals. They roll in the mud to cool off because they have no sweat glands. They love to take showers.
 - 6 - Pigs have rings in their noses to keep them from smelling. - Hogwash: The rings are used to keep them from rooting, or digging up the earth with their snouts. This is a natural behavior of hogs in the wild, who dig for roots to eat. It can cause a lot of damage on a farm.
 - 7 - Pigs enjoy listening to music. - True: Pigs are curious and like to keep busy. Some farmers entertain their pigs with beach balls and old tires.
5. When every group has finished, go through the answers as a class, and determine which group had the most cards in the correct folders.

Extending the lesson...

Have students research and make up their own "truth" or "hogwash" questions and answers as a group. Make sure they write the answers on the backs of their cards! Then, let groups switch questions, and see how well they do determining whether something is truth or hogwash.

Time Required:

-45 minutes

Materials:

-Cards made from work sheets printed front to back to look like flashcards (Appendix 4 & 5)
-Folders
-Computers for looking up more questions

Adapted From:

Oklahoma Ag in the Classroom Materials at: <http://www.agclassroom.org/ok>

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4-H Project Connections:

-Livestock - beef

Goals:

- To help students understand that NWSS is part of the heritage of this area
- To teach students the purpose of branding and how to “call” a brand

Age Appropriate:

-2nd - 4th grade

4-H Life Skills:

-Teamwork

Colorado Department of Education Standards:

Social Studies:

1.1.2 Family and cultural traditions in the United States in the past

2.1.2 People have influenced the history of neighborhoods and communities

3.1.2 Use a variety of sources to distinguish historical fact from fiction

4.1.1 Organize and sequence events to understand the concepts of chronology and cause and effect in the history of Colorado

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EXTENSION

Western Heritage and Cattle Branding

In this lesson, we will:

- Talk about what heritage means, what the NWSS is, and how the NWSS affects the area's economy.
- Learn about the purpose of branding and how to read a new language (callin' a brand).

Time Required:

-45 minutes

Materials:

- Pictures of calves (Appendix 1)
- 5 brown paper lunch bags
- Crayons
- Callin' a Brand rules (Appendix 2)
- Pencils and paper
- Pictures of brands (Appendix 3)

Vocabulary:

- Heritage
- Brand
- Stock show
- Economy

Beginning the lesson...

1. Define heritage and talk about what a stock show is and why it's important to Denver.
2. Divide class into groups of 5 to 7 students.
 - Give each group a paper bag with identical pictures of calves in them (sheet of calf pictures included).
 - Have each student in the group reach into the bag and take one piece of paper.
 - Direct all students to look at the picture for a second and put it back in the bag.
 - Have one student dump all the pieces of paper out on the table and instruct students to find their picture.
 - If some students are sure they know their picture, put doubt in their mind by comparing pictures.
 - Have students put some type of mark on their calf with a crayon.
 - Direct them to put the pictures back in the bag again and repeat the process.
 - Ask which time it was easier to pick out their calf.
3. Explain that the students just branded their calves.
 - Branding is like a return address on cattle:
 - If lost or gets out in a blizzard, etc.
 - If stolen, is proof of ownership
4. Show branding iron if one is available, explain process.
5. Tell students they are going to learn a new language - "callin'" a brand (rule signs included). Rules are:
 - Read from left to right
 - Read from top to bottom
 - Read from outside to inside
6. Help students read several brands (included). Depending on time, show them a brand that is "hanging," "connected," "combined," and maybe even "lazy."
7. If time allows, let students come up with their own brands and then "call" them.

Test your understanding...

Show students two more brands and have them "call the brand."

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EXTENSION

4-H Project Connections:

- Textiles
- Livestock - Sheep

Goals:

- To help students understand where fabrics come from
- To teach students about the science behind genetics of animals

Age Appropriate:

- 2nd – 4th grade

4-H Life Skills:

- Problem solving
- Wise use of resources
- Critical thinking
- Personal safety

Colorado Department of Education Standards:

Science:

1.2.1 All organisms have external parts that they use to perform daily functions

2.1.1 Matter exists as different substances that have observable different properties

4.2.1 Organisms have both internal and external structures that serve various functions

Woolly Water

Do you know the difference between wool, cotton, and silk? Do you know where each of these fibers comes from? Wool, cotton, and silk are all used in our clothing, but they each have different origins. Do you know any other things that wool, cotton, and silk are used for? Can you think of any of the clothes in your closet that might have one of these fibers in it?

Beginning the lesson...

1. Have students look up the definition of wool, cotton, and silk in the dictionary. Here are the definitions from dictionary.com:

- Wool - the fine, soft, curly hair that forms the fleece of sheep and certain other animals, characterized by minute, overlapping surface scales that give it its felting property.
- Silk - the soft, lustrous fiber obtained as a filament from the cocoon of the silkworm.
- Cotton - a soft, white, downy substance consisting of the hairs or fibers attached to the seeds of plants belonging to the genus *Gossypium*, of the mallow family, used in making fabrics, thread, wadding, etc.

2. Those are the definitions of wool, silk, and cotton. Now, let's look at what each is used for:

- Wool - is the protecting factor for sheep in various weather conditions. Wool is similar to a rubber band, as it can be stretched out and then return to its natural shape. Wool is capable of extinguishing a fire, because it naturally resists the fire. Wool is often used in clothing such as socks, blankets, sweaters, and coats.
- Silk - is the strongest natural fiber used to make clothing. It takes approximately 2,000 to 3,000 cocoons to produce one pound of silk. Silk is very dense compared to cotton and wool. Eighty percent of the world's silk is produced in China. Silk is used in a wide variety of products, such as dresses, parachutes, and medical sutures.
- Cotton - is used for both food and fiber. Cottonseed oil is used as a supplement in dairy foods as well as pressed into oil. Cotton is milled and uses the long fibers to make fabric as well. Some common uses for cotton are sheets, table cloths, and clothing.

3. Now, we are going to do an experiment to figure out which material is most absorbent: wool, silk, or cotton. Have the students form a hypothesis about what they think. Write this on their worksheet.

4. Fill three cups with the same amount of water. Dip each piece of fabric in the water. Watch to see how the fabric absorbs the water. Test different time limits and different amounts of water, if desired.

Test your understanding...

Ask students how this could affect the different clothes they wear? Would you want to wear cotton in a rain storm? Why or why not?

Time Required:

- 45 minutes

Materials:

- Raw wool samples (contact your local extension office for help with this)
- Cotton balls
- 1 piece of silk
- 3 small cups
- Water
- Silk garments
- Wool garments
- Cotton garments
- Science Inquiry Sheets (Appendix 10 & 11)

Vocabulary:

- Wool
- Cotton
- Silk
- Fiber
- Absorbent

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APPENDICES

Book your school visit at adams.colostate.edu

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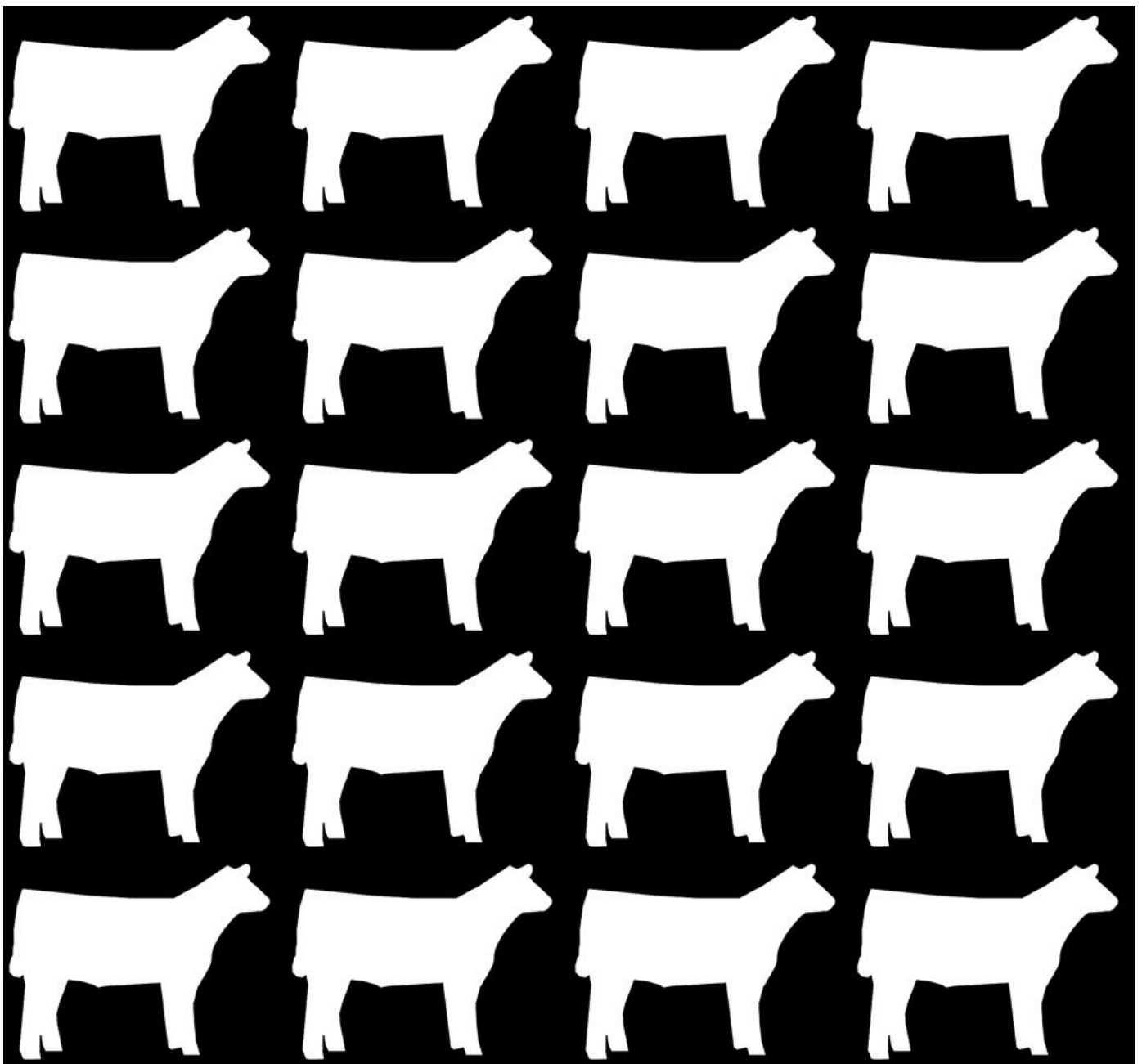
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Appendix 1



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Western Heritage and Cattle Branding - Calf Pictures





Western Heritage and
Cattle Branding

Callin' a Brand

3 Basic Rules:

1. Read from the left to the right.
2. Read from the top to bottom.
3. Read from the outside to inside.

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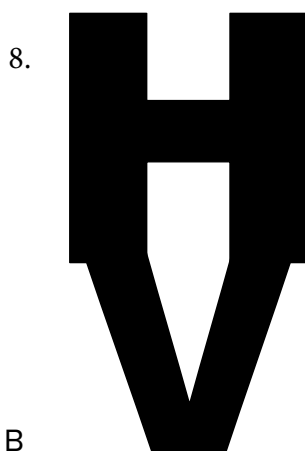
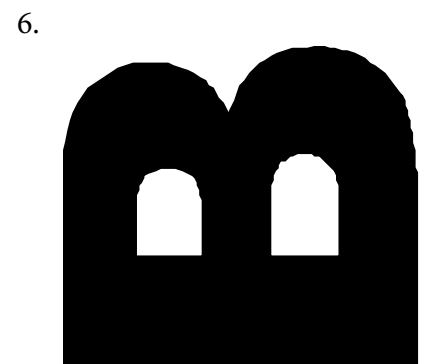
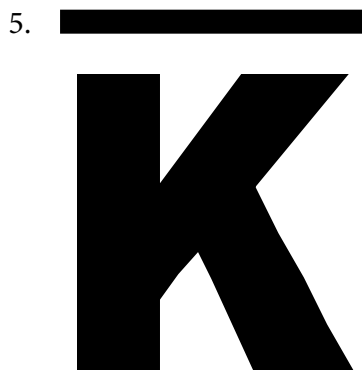
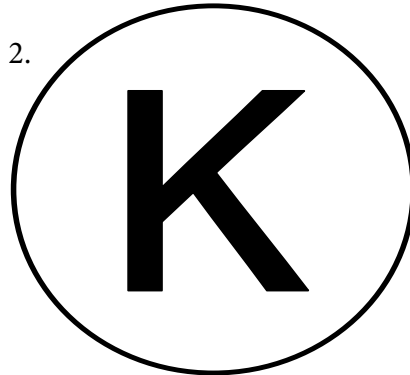
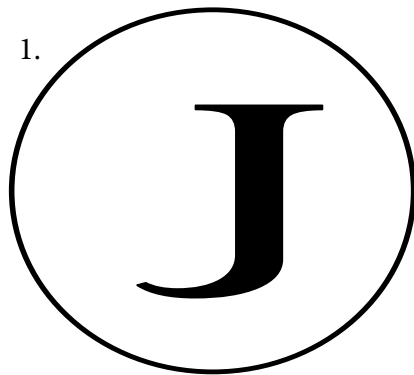
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Appendix 3



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Western Heritage and Cattle Branding - Brand Pictures



Answer Key:

- | | | |
|-----------------|---------------|-----------|
| 1. Circle J | 2. Circle K | 3. RH |
| 4. Bar D | 5. Bar K | 6. Lazy B |
| 7. Connected VB | 8. Hanging HV | |
| 9. Combined HD | | |

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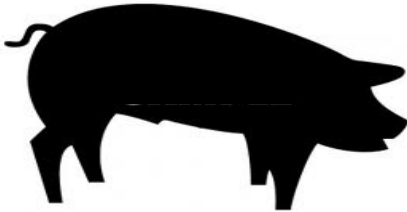
Appendix 4



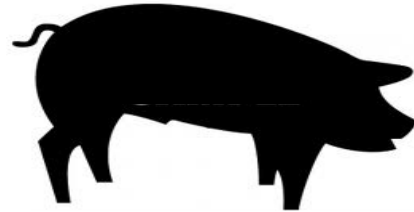
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Truth or Hogwash? Pig Facts Pg. 1

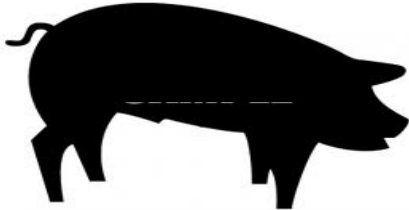
1. Pigs eat and eat and really “pig out.”



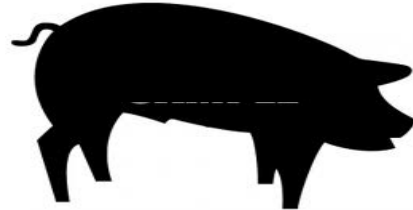
2. Pigs are not stupid. They are as smart as dogs.



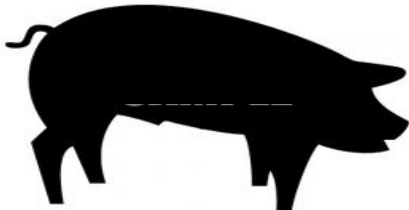
3. Pigs never grow to weigh more than 1,000 pounds.



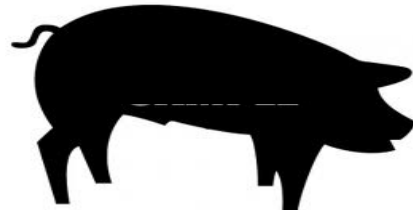
4. Pigs have small eyes and poor eyesight.



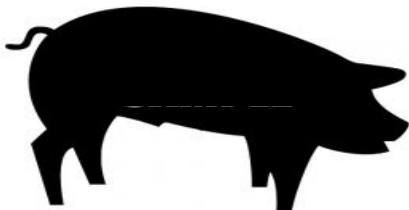
5. Pigs are dirty animals that love to wallow in the mud.



6. Pigs have rings in their noses to keep them from smelling.



7. Pigs enjoy listening to music.



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Appendix 5



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Truth or Hogwash? Pig Facts Pg. 2

2. Truth: They can be taught to do tricks such as fetching. They have even been taught to do important jobs. In war they have served as mine sniffers in battlefields.

1. Hogwash: they stop eating when they have had enough.

4. Truth: But they have a strong sense of smell.

3. Hogwash: The heaviest hog in history, Big Bill, weighed 2,552 pounds.

6. Hogwash: The rings are used to keep them from rooting, or digging up the earth, with their snouts. This is a natural behavior of hogs in the wild, who dig for roots to eat. It can cause a lot of damage on a farm.

5. Hogwash: They are cleaner than most farm animals. They roll in the mud to cool off because they have no sweat glands. They love to take showers.

7. Truth: Pigs are curious and like to keep busy. Some farmers entertain their pigs with beach balls and old tires.

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Appendix 6



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Chees-y Science - Worksheet

Find the definition of these words. Draw a line from the word to the correct definition.

Coagulate	A liquid extracted from enzymes found in a calf's stomach.
Enzyme	A colony of bacteria or other living matter grown in a specially-prepared nutrient medium.
Curd	To cause a liquid to change into a soft, semisolid or solid mass.
Bacteria	The thick substance that forms when milk ferments.
Culture	The watery substance that separates from milk as cheese is made.
Rennin	A protein produced by a living organism that speeds up a chemical process.
Whey	Tiny organisms.

Write what you observe.

Room temperature _____ Temperature of the milk _____

Write three words that describe how the milk looked at the beginning of the experiment.

1. _____ 2. _____ 3. _____

How long did it take for the milk to reach room temperature? _____

Rennet is the solid form of rennin. Read your definition of rennin above and predict what will happen after you add rennin to the milk. _____

Appearance of milk:

At the beginning: _____

After 30 minutes: _____

After two hours: _____

Write three words that describe how the milk looked at the end of the experiment.

1. _____ 2. _____ 3. _____

How does the end product of this experiment compare with dairy products you can buy in the grocery store?

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Appendix 7



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Horsin' Around with Horse Colors - Matching Cards Pg. 1



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Appendix 8



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Horsin' Around with Horse Colors - Matching Cards Pg. 2



Chestnut

A reddish brown horse with reddish, brown or tan mane and tail, with legs the same color as the body. Chestnut runs from very light reddish brown to red or very dark liver color. Sometimes the mane and tail may be flaxen (pale yellow).

Bay

A brown horse with black legs, mane and tail. Body color run from light brown, reddish to very dark brown, but legs, mane and tails are always black (they may also have white markings).

Brown

A very dark brown, almost black coat with lighter brown highlights on the muzzle, the flanks and inside the legs. Mane and tails are always black. They are hard to tell from dark bay.

White

White horses are born white. They have pink skins and usually blue or pink eyes.

Pinto

A white horse with large patches of black, brown, chestnut or any other colors.

Gray

Horses that are born with dark skin. Hair becomes whiter with age until pure white. A gray may range from iron gray (nearly black) to dapple gray, white gray or flea-bitten gray (with tiny flecks of black or brown).

Black

A horse that is coal black with no brown highlights. The mane and tail are also black.

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Appendix 9



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Horsin' Around with Horse Colors - Matching Cards Pg. 3

Buckskin

A light to dark yellow horse with black mane and tail.

Dun

A horse that is sandy yellow, reddish or brown, usually with darker legs, a dark stripe down the back, and a dark mane and tail.

Palomino

A golden-colored horse with a white mane and tail. A palomino can range from a light yellow to a very dark gold color.

Roan

A horse that has a mixture of white hairs and one other color (chestnut, bay or black). A chestnut roan is called a strawberry roan or red roan. A black roan is called a blue roan.

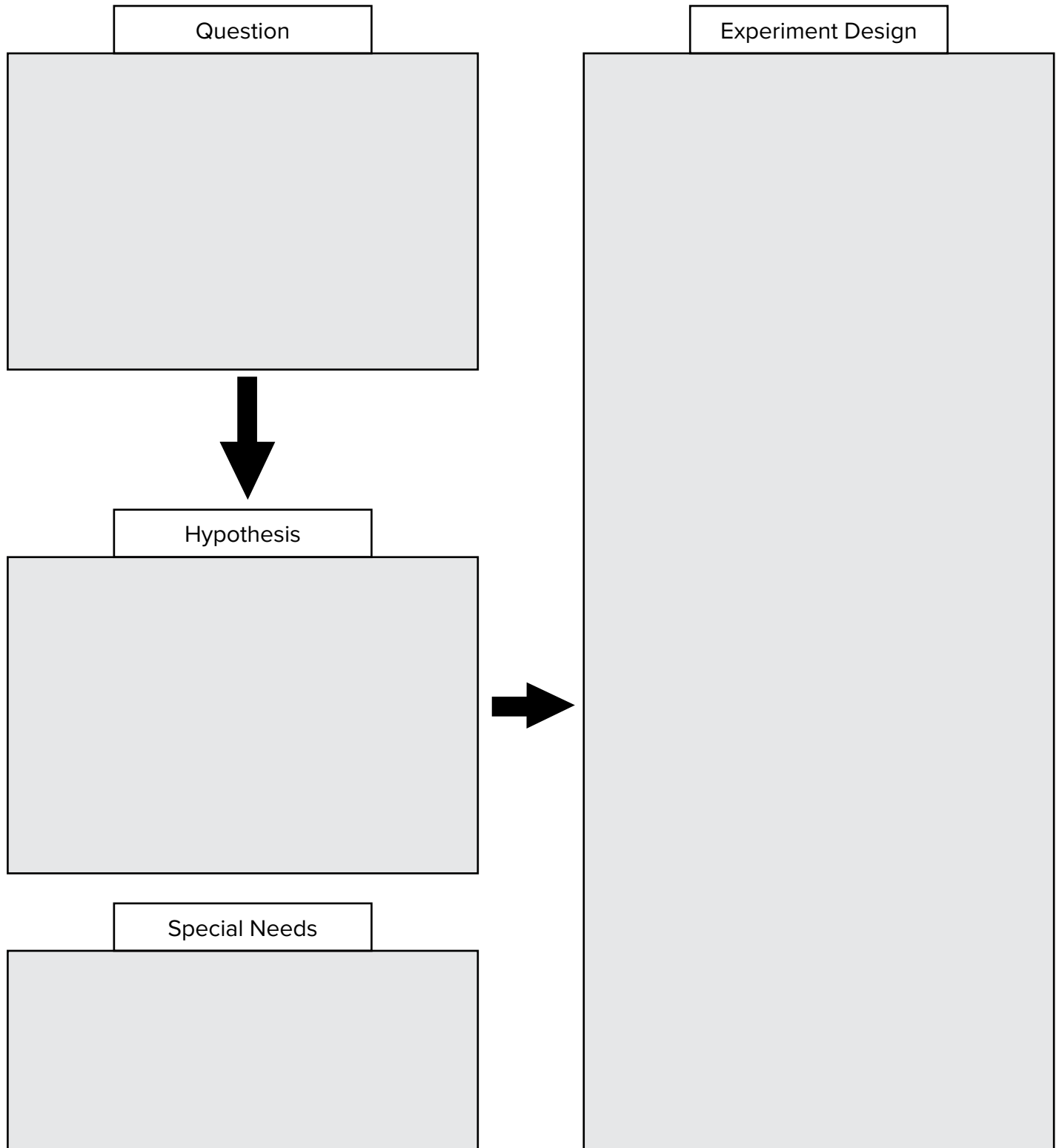
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Appendix 10



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Appendix 11



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Data

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Conclusion

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Appendix 12



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Further Learning Links

General

- [National Ag in the Classroom](#) - online, searchable, and standards-based curriculum map for K-12 teachers
- [National Association of Agricultural Educators](#) - ag lesson plans, games, and activities
- [4-H Animal Science Anywhere](#) - series is designed to engage youth in learning more about the science and life skills involved in animal and veterinary science

Poultry

- [American Egg Board](#) - lesson plans that cover standards in language arts, math, and science
- [Colorado Egg Producers](#) - facts and experiments about Colorado eggs
- [Chicken Genetics](#) - online Punnett Square simulation

Beef

- [Colorado Beef Council](#) - lesson plans, activity sheets, virtual resources
- [American National CattleWomen](#) - beef education tools

Pork

- [National Pork Board](#) - introduction to pork curriculum, lesson plans, videos
- [Colorado Pork Producer Council](#) - facts about pigs and pork

Horses

- [Paints Family Tree](#) - Students will explore the complexity of heredity by studying horses and creating a horse's family tree.
- [Horse and Rider](#) - (Grades 3-5) Students will explore the role that horses have played in culture and history by learning about draft horses in agriculture and mapping Pony Express stations across the state of Utah.
- [Horse and Rider](#) - (Grades 6-8) Students will explore the role that horses have played in culture and history by learning about draft horses in agriculture and mapping Pony Express stations across the state of Utah.
- [National Association of Agricultural Educators](#) - Equine educator resources

Sheep

- [Learn About Wool](#) - lesson plans and curriculum linked resources for science, geography, history, economics & business, design & technologies, and media arts

Goats

- [National Association of Agricultural Educators](#) - goat resources