



ANIMALS INSIDE & OUT

Lessons for:

Management

Digestive

Skeletal

Circulatory

Muscular

Animal Science Signature Outcome Team



Lesson Title: Animal Management Field Day (rev. 2/21/15)

Normal Animal, UNL Quality Assurance Resources

Lesson By: Ashley Benes, Darci Pesek, Jana Schwarz, Deb Kraenow and Bethany Johnston

Subject Matter Area(s): *Learn all about proper ways to care for animals, uses of animals, medication vs. vaccination and symptoms of an animal being sick or injured, careers related to animal science.*

Grades: 3-6

Time involved: 1 hour, 25 min- 1 hour 50 min

(Lessons can be taken out to ensure a shorter schedule)

Careers: *Veterinarian, Feedlot worker, Farmer/Rancher*

Introduction:

Why is it important that humans care for animals? Because they cannot care for themselves and they provide many things that humans need and use. Do wild animals need humans to care for them? In some ways we do because we help manage wildlife populations by creating laws to protect them and taking care of the land they live on.

Activity1: Human/Animal Relationships (10 min)

Materials:

- Signs to place around the room with the words
 - o Food
 - o Clothing
 - o Byproducts
- List of various Animals

What is the lesson objective? *Student will be able to name the uses of various livestock species.*

Preparation:

- Place the signs around the room far enough apart that the participants need to move from the center to stand under them and so that they have enough space to group under each one.

Introduction to Activity:

- Humans need animals for many different reasons. Can you name some of the things we need animals for?
 - o Food: meat, milk, etc.
 - o Clothing materials: wool, hide/leather, other byproducts, etc.





- Byproducts: hooves to make glue and gelatin, medication, leather, etc.

Activity:

- Have entire group stand in the center of the room
- As an animal is called out they need to move to stand under the sign where they think that animal best fits. Example: Beef cattle-food/clothing or byproduct, Dairy Cattle-Food Merino Sheep-Clothing. If the animal fits under more than one area they should stand in the center of the room or go where they think it best fits.
- After the group stands where they think the animal should fit, discuss why they fit there. There will be some that should fit into multiple areas. Discuss why some overlap exists: Do most animals fit into more than one category? Why? What does that say about the importance of animals in our lives?

So let's clarify:

Before it comes to the store milk comes from which animal? Dairy Animal not beef animal

Before it comes to the store, hamburger comes from which animal? Beef Animal

Before you buy it in the store a wool sweater comes from which animal? Sheep or Goat

Debriefing: *Think about things you use each day. How does this apply?
Are animals important to our way of life?*

Activity2: Basic Needs (20 min)

(Normal Animal, Unit I, pp. 21-25)

Introduction: It is necessary for humans to manage animals. Part of this management is making sure they have all their basic needs. What is a “need”?

Short Activity: We all need certain things to keep us living or help us survive. What things do you need to survive??

- Discuss why some things are important for survival and others are not. Do we all NEED the same things to survive? What can we NOT live without: food, water, shelter. Do we all need the same food, water and shelter? All animals have varying types of food and shelter needs.

What do animals need to survive?





Food, Water, Shelter

As a Farmer/Rancher raising animals you need to provide these needs for animals because they cannot get them for themselves...food, water, shelter...are these basic needs the same for each animal? Why?

Every species of animals may require different kinds of shelter, different food and different amounts of water. By providing our animals with food, water and shelter that they each need, we are helping them stay healthy.

Activity 3.1: Unhealthy vs. Healthy Animals (20-30 min)

Animals, unlike people, can't tell you when they are sick or hurting. Because of this we rely on other methods to determine when they need medical attention. *How can you tell if an animal doesn't feel well? (PPT to go along with this including picture of animals) You can print off the pictures from the attached powerpoint to just show them if you don't want to use the powerpoint.*

- Dull hair coat
- Loss of weight
- Loss of appetite
- Keeps to themselves
- Hanging its head
- Laying down a lot/won't get up
- Limping

Material:

Computer
Projector
Unhealthy vs. Healthy Animal PPT
Healthy and Sick animal symptom slips of paper

Healthy and Sick Animal Symptom Sorting Activity

1. Put the animal symptoms strips into a plastic bag.
2. Have each student pick a symptom from the bag and then have them guess whether their animal symptom is a healthy animal or sick animal.
3. Instruct the students to stand on one side of the room if they are healthy animals and on the other side if they are sick animals.
4. Go through each symptom and discuss the correct answers and any terminology they don't understand.
5. Tell students that they can make some observations at home about their animal.
 - a. Breathing rate – is the animal breathing heavy compared to others?





- b. Temperature – take temperature with digital thermometer to make sure they are at a normal body temperature.
- c. Ear position – droopy ears usually signals the animal isn't feeling well.

Unhealthy vs. Healthy Animal PPT

- View each slide of the PowerPoint:
 - o Which is the healthy animal and which shows symptoms of being ill or injured?
 - o What are the specific symptoms you see?
 - o How can a farmer/rancher or feedlot worker make sure to see these symptoms?
Check the animal each day.
 - o It is also very important to keep good records. Keeping track of sick animals and animals that we have given medicine too helps to make sure we are keeping track of those animals needs and we are keeping those animals healthy. Keeping good records will help solve problems later on.

Because animals are an important part of our daily lives and we interact with animals in a variety of ways, we need to be able to manage them and care for them as best we can.

Activity 3.2: Vaccinations and Injections (20-30 min)

****This lesson is an alternative lesson. If you are not comfortable with your group working with sharp objects, you may skip this lesson or modify it by doing one example for the whole group with the teacher or helper handling the syringe and needles. Regardless of doing the activity or not, the main points should be discussed.**

Description of Activity: Youth will explore the difference between vaccinations and medication treatments and reasons for needed medicines. Additionally, they will practice giving injections by the subcutaneous, intramuscular and intravenous methods

Required Materials:

Plastic syringes
16 gauge x 1 inch needles
16 gauge x 3/4 inch needles
Bowl of water
Food coloring
Hamburger buns
Plastic straws
Sandwich size Ziploc bags





What is the lesson objective? *Student will also learn why you give a vaccination vs. a medication treatment. Additionally they will learn about needle gauges, lengths and which to use depending on the type of injection performed. Finally they will get to perform mock injections on the hamburger bun to simulate working with an actual animal.*

Procedure:

Animal Symptoms Activity

Medication vs. Vaccination Purpose

1. Explain the difference between medications and vaccinations and their purpose.
 - a. Medication – treats an illness, infection or other symptoms of sickness
 - i. Usually antibiotics, but also anti-inflammatory and pain medications
 - b. Vaccinations – small dose of the virus to help the animal build immunity to various diseases
2. Important for students to be observing their animals behavior every day so they will be able to recognize quickly if the animal is getting sick or acting unusual.

Injection Activity

1. Fill up bowl of water and add food coloring to the water.
2. Give each student a plastic sandwich bag with a hamburger bun and straw inside of it, a plastic syringe and a 16 x $\frac{3}{4}$ inch needle. The plastic bag represents the hide of the animal, the bun is the muscle and the straw is a vein.
3. Needle sizes vary for multiple reasons. The first number is the gauge of the needle. The larger the number, the smaller in diameter the needle is. So for livestock you will normally see 16 or 18 gauge needles. The second number tells the length of the needle. $\frac{3}{4}$ or 1 inch are the most common you will see used in livestock. Ask the students if they would like to get a shot with the needles they are using for practice. People get shots with much smaller gauge needles. The shorter needles are used for subcutaneous injections and the longer ones for intramuscular injections.
4. Explain to the students to be very careful, as the needles are very sharp and to watch first before they try to complete on their own.
5. Have the students place their needles on the syringes and fill them up with water from the bowl. Show the students how to minimize the amount of air in the syringe and then once it's full, place the cap back on their needles.
6. Now instruct the students about subcutaneous injections (SubQ) and explain that this is the preferred method of injection, as it won't bruise the muscle. Ask students what location (in the neck) they should give injections on their animal to follow proper Quality Assurance programs.
7. Demonstrate injecting 2 cc of water under the surface of the bag but above the hamburger bun. You should see the water soak into the hamburger bun. After they have watched let



the students try what you showed them. Make sure they are careful not to poke themselves with the needles through the bag and into their fingers.

8. Next, give the students 16 x 1 inch needles and put them on their syringes. Demonstrate an intramuscular injection by injecting 2 cc of water directly into the hamburger bun without going all the way through the other side. Have students repeat your steps.
9. Lastly, demonstrate an intravenous injection by injecting the remaining water into the straw inside the bag without going through both sides of the straw. In reality, this type of injection should be done only by a veterinarian, but it is fun to try in this setting. Have the students repeat your steps.
10. Have the students keep their caps on the needles as much as you can to prevent them from poking themselves by accident. Emphasize safety over and over again.

Check for Understanding:

1. What is the difference between medications and vaccinations? Medications treat an existing disease or condition. Vaccinations prevent diseases.
2. What are some symptoms of healthy vs. sick animals? Healthy - Bright eyes, shiny hair coat, active. Sick – dull eyes, nasal discharge, droopy ears, fever.
3. What is a subcutaneous injection? Under the skin.
4. What is an intramuscular injection? In the muscle.
At what location should al

Activity 4: Career Game (15-20 min Can go as long as needed)

Materials Needed:

White Board

Dry Erase Markers

Written Animal related careers on notecards or slips of paper*

Activity Introduction:

What are some careers that are available to you in the area of animal care?

Careers:

Veterinarian- Veterinarians or Vets are animal doctors. Usually a vet is specialized to care for large animal, small animal, exotics, horses or are general animal doctors caring for a variety of species. Vets are primarily required to treat disease, disorder or injury in animals, which includes diagnosis, treatment and aftercare. Unlike in adult human medicine, vets must rely on clinical signs, as animals are unable to vocalise symptoms as a human would (and in that respect is similar to medicine on human children). In some cases, owners may be able to provide a medical history and the vet can combine this information along with observations, and the results of pertinent diagnostic tests such as x-rays, CT scans, blood tests, urinalysis or other diagnostics.



Under Veterinarian add Veterinary Technician/Assistant – A veterinary technician is an animal nurse. Some of their duties include collecting patient histories, performing laboratory tests, caring for hospitalized animals, processing livestock.

Rancher/Farmer- Those people producing or raising animals for either breeding or market purposes. It is their job to provide all basic needs of the animal and prevent illness and parasites for their animals.

Pen Rider/Feedlot Worker- These people watch over the animals in a feedlot (large animal feeding facility where animals are kept till they are ready to be harvested for meat production). Their daily tasks include feeding the animals, observing animals for sickness or treating animals who are sick.

These relate to animal management. What other animal related careers are there?

Animal nutritionist (Feed sales, Feed mill workers, feed truck drivers)

Meat Scientist

Animal Reproduction specialist

Lab technician

Biologist

Zoologist

Pet Groomer

Trainer

Animal Behaviorist

Engineer designing animal pens, sheds, working equipment, ect.

Farrier (sometimes referred to as a horse trimmer/shoer)

**The kids will think up some that aren't listed as well. It builds on the knowledge they already have.

Game Instruction:

1. Choose one youth to be "it" or designated as the guesser. They need to turn their back to the white board.

2. A second youth chose an animal related career and wrote it on the whiteboard.

3. The person who is "It" or the guesser, (still with their back to the white board and facing the group, gets hints one-by-one from the group about what the career is until they guess it.

4. Repeat until all the career options are depleted or until time runs out.

**May want to have some options written on slips of paper like charades to spur on the game if they have trouble thinking of careers.





Conclusion:

Why is it important that humans care for animals?

Because they cannot care for themselves and they provide many things that humans need and use.

Do wild animals need humans to care for them?

In some ways we do because we help manage wildlife populations by creating laws to protect them and taking care of the land they live on.

How can you tell if an animal doesn't feel well?

Animals, unlike people, can't tell you when they are sick or hurting. Because of this we rely on other methods to determine when they need medical attention.

List several symptoms of a sick animal.

How do Farmers/Ranchers, Feedlot workers or veterinarians provide care for sick animals? How do they provide general daily care for animals?

Record Keeping, Vaccinations/Medications, Looking at and checking them daily, providing them with the proper food, water, shelter and space needed.

Why is record keeping so important?

Record keeping is the best and most important management tool we have to use. Keeping good records ensures that we know when animals are sick, what we treat them with, who treated them, how much medicine they received, the withdrawal time and how the medication was given. It can also be a record of when an animal is impregnated and is expected to calve or a record of calving indicating the weight, sex, tag number and other information of a cow's calf.



Healthy / Unhealthy Characteristics or Symptoms

- **Contentment**
- **Alertness**
- **Chewing of cud**
- **Sleek coat**
- **Bright eyes and pink eye membrane**
- **Normal feces and urine**
- **Normal temperature**
- **Normal pulse rate**
- **Normal respiration**
- **Loss of appetite**
- **Rough hair coat**
- **Abnormal feces**
- **Dull eyes**
- **High temperature**
- **Discolored urine**
- **Ruminants not chewing their cud**
- **Runny Nose**
- **Lazy, Listless**



Lesson Title: Skeletal System Field Day -Joint Modeling Activity (Revised 2/18/15)

Source: © Partnership for Environmental Education and Rural Health (<http://peer.tamu.edu>)
College of Veterinary Medicine & Biomedical Sciences, Texas A&M University

Subject Matter Area(s): Animal Science, Joints, Skeletal System

Grades: 3-5th

Description of Activity: Youth will create joints to understand how our skeletal system moves.

Time Involved: 20-30 minutes

Required Materials:

- 5/16 inch diameter wooden dowels (each group will need two-three inch pieces)
- modeling clay (one small ball per group)
- plastic wrap, cut into 3 inch x3 inch squares (one square per group)
- small rubber bands (one per group)
- Samples of bones and joints of animals if available or pictures

What is the lesson objective?

Student will learn that

- A joint is the location at which two or more bones make contact.
- Joints are constructed to allow movement and provide mechanical support.
- Joints contain a variety of fibrous connective tissue such as ligaments (connect the bones together), tendons (connect muscle to bone), and cartilage (covers the ends of bones and provides some cushioning).
- Muscles provide the forces that cause the body to move.

The Skeletal system has three very important jobs: Support, protection, and movement. Just think, if we did not have a skeletal system for support we would be just like a blob of Jell-O. The bones also protect many organs, and also the brain. Our skull protects the brain and our ribs protect our internal organs.

The place where bones are connected is called a joint. Joints give you the ability to move your body. A skeleton without joints would be like a statue. There are several different





types of joints in our body. The hinge joint (knee, elbow, fingers) works like a door's hinge. It only allows movement in one plane. The ball and socket joint (hip, shoulder) allows a greater range of movement in all directions. The pivot joint (neck) moves around in a back and forth motion.

How are our joints similar to an animal's?

Today we are going to build a joint so that we can see how joints work.

Direct instruction & Check for Understanding:

Procedure:

- Prepare materials for the model. Cut the dowels into 3 inch long segments. An easy way to do this is to score the dowel with a pair of scissors. At this point, you can snap it at the score line. Also, cut the plastic wrap into 3"x3" squares. Each participant will need 2 dowel segments and one square of plastic wrap.
- Ask youth to think about where moveable joints are in their bodies (Examples: fingers, knees, elbows, and toes).
- Ask youth to think of moveable joints of cattle, sheep, goats or pigs. Explain that all of these joints have the same basic components. Each component of a joint has a specific function which the group will work together to discover.
- Tell the youth that they will be making a model of a **synovial joint**. A **synovial joint** is the most common and most movable type of joint in the body of a mammal.
- Have colored copies of the Joint Modeling Worksheet on the table for participants use as we build and discuss the model synovial joint
- Make sure they know that you will be giving them instructions along the way so they should not get ahead of you.
- Provide each group two wooden dowels. These **dowels** will represent the **bones** of the joint.
- Ask youth questions to help them discover the purpose of a bone, which is to provide support and a place for muscle attachment. Questions you may want to ask include:
 - What would a limb without a bone be like?
 - What functions could it not perform?
 - Since we know bones are hard, what does this tell you about its job?
 - What do you think the purpose of a bone is?
- Have them complete step 1 on the **Joint Modeling Student Instructions**. They should position the dowels together as if they were a joint, bending and extending them with their hands. Ask students if they think the joint is complete.
 - Do the ends fit together well?
 - Would a goat's joint work well if it only consisted of bones?

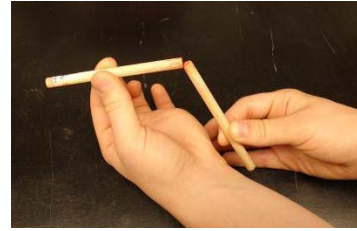
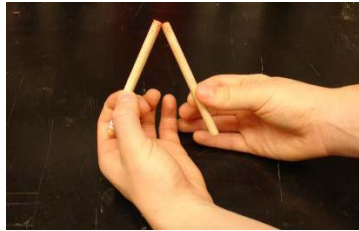


- Give each group a small piece of modeling clay. Tell them that the **clay** represents **cartilage**.
- Have them complete step two by dividing the clay into two pieces, rolling each piece into a ball, and flattening the ball on one end of each of the dowels.
- Explain that if a joint only consisted of two bones rubbing against each other, the bones would begin to wear down. Also, without anything in between the bones there would be no shock absorbency, causing a lot of force to be exerted on the bones. Cartilage is a soft surface that acts to cushion the bones and help them fit together.
- Instruct the participants to take turns positioning the dowels together as if they were a joint, moving them with their hands. Ask the youth if they can tell how the joint is different from the pre-cartilage model.
 - Is the cartilage absorbing the force?
- Ask students to look at their joint and see if they see any problems.
 - Do they notice that the joint is not held together?
 - What kind of structure is needed to hold the joint structures in place?
- Hand each participant a square of plastic wrap. Tell them that the **plastic wrap** represents the **synovial membrane** that encloses the **joint capsule**. Have the students complete Step 3 by rolling the dowel/clay up in the plastic wrap, overlapping the plastic wrap all around the joint so that it holds together.
- Ask whether cartilage is alive or not. Cartilage is in fact alive, but it is important to remind students that cartilage does not have blood vessels. This means that it needs another way of getting the nutrients that most organs get from blood. Ask the youth to look at their model, how do they think cartilage could get its nutrients?
- Explain that in addition to holding the joint together, the joint capsule produces a fluid that supplies these nutrients. **In our model, we have not included the fluid that would be inside of the plastic wrap.**
- Ask if they know the name of the fluid that supplies the cartilage with nutrients. This fluid is called the synovial fluid.
- Remind students that the joint is also held together by ligaments.
- Have youth complete Step 4 in which they add **rubber bands** to represent the **ligaments**. Have them move the joint with their hands again to see if it stays connected easier now that it is held together. Ask the youth what is missing in the model, or what their own hands represent. It is important for them to know that the muscles are what cause the force that moves the joint. The **students' hands** represent **the muscles** in this model because they cause the force that moves the model joint.
- Congratulate the students for completing their synovial joint!



Independent Practice: Joint Modeling Instruction Sheet

Step 1: Bones: Try to make a joint using only the dowels. Is the joint complete? What is missing?



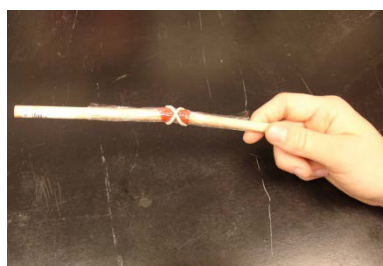
Step 2: Cartilage: Add clay to the ends. How has the joint improved? What is still needed?



Step 3: Joint Capsule: Roll the joint up in the plastic wrap. What are the functions of the joint capsule?



Step 4: Ligament: Add a rubber band around the joint. What changed with the addition of the rubber band ligament?



Step 5: Your model is now complete. Move the joint with your hands. What do your hands represent in this model?

Debriefing Questions for Day of lesson:

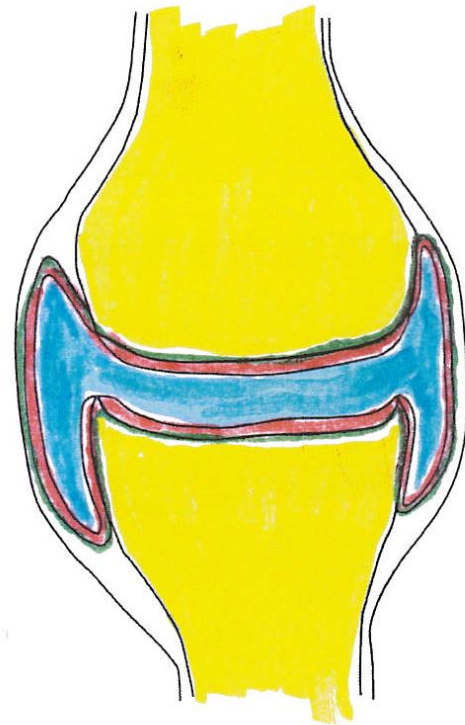
What would be some careers that are available to you in the skeletal area of animal science?



Joint Modeling Worksheet

Body Part:	Represented by:	Functions:
Bone	Wooden Dowel	
Cartilage	Clay	
Synovial Membrane/Joint Capsule	Plastic Wrap	
Ligaments	Rubber Band	
Muscles	Students' Hands	

<u>Component</u>	<u>Color:</u>
Bone	Yellow
Cartilage	Blue
Synovial Fluid	Red
Synovial Membrane/ Joint Capsule	Green
Ligaments	Gray





Lesson Title: Muscular Field Day (Revised 4/15/14)

Subject Matter Area(s): *Learn all about the usefulness of all parts of an animal.*

Grades: *3rd-5th*

Careers: *Veterinary Science*

Description of Activity: Youth will explore the muscular system of livestock.

Time Involved:

Required Materials:

Whole fresh pineapple

Sharp kitchen knife

Pan to catch juice – cookie sheet works great

Cutting Board – to fit inside the cookie sheet

Scale

Bowls

Forks

What is the lesson objective? *Student will view the dissection of a fresh pineapple and determine how much of the fruit can be eaten and how much would be considered a by product.*

Muscles are another important system in an animals body. Most animals have several hundred muscles. They do everything from pumping blood to helping move. Some muscles are controlled muscles, while others — like the heart — do their jobs without thinking about them.

Muscles are all made of the same material, a type of elastic tissue (sort of like the material in a rubber band). Thousands, or even tens of thousands, of small fibers make up each muscle.

There are three different types of muscles in the body: smooth muscle, cardiac (say: KAR-dee-ak) muscle, and skeletal (say: SKEL-uh-tul) muscle.

Smooth Muscles

Smooth muscles — sometimes also called involuntary muscles — are usually in sheets, or layers, with one layer of muscle behind the other. These are not controlled muscles. The brain and body tell these muscles what to do without thinking.





But smooth muscles are at work all over the body. In the stomach and digestive system, they contract (tighten up) and relax to allow food to make its journey through the body.

We'll find smooth muscles at work behind the scenes in the eyes, too. These muscles keep the eyes focused.

Heart Muscle

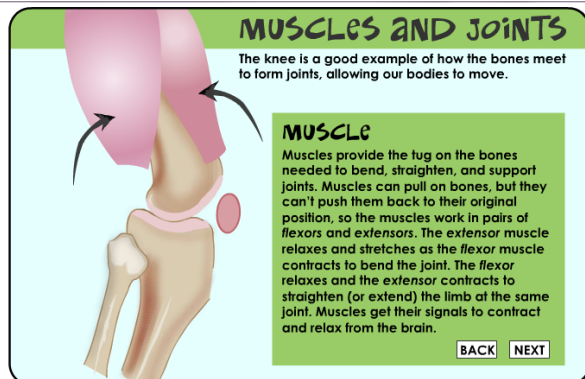
The muscle that makes up the heart is the cardiac muscle. The thick muscles of the heart contract to pump blood out and then relax to let blood back in after it has circulated through the body.

Just like a smooth muscle, the cardiac muscle works all by itself with no thinking.

Skeletal Muscle

Now, let's talk about the kind of muscle you think of when we say "muscle" — the ones that show how strong you are and let you boot a soccer ball into the goal.

Skeletal muscles are voluntary muscles, which means they can be controlled. The leg won't bend to walk unless the animal wants it to.



Together, the skeletal muscles work with the bones to give the body power and strength. In most cases, a skeletal muscle is attached to one end of a bone. It stretches all the way across a joint (the place where two bones meet) and then attaches again to another bone.

Skeletal muscles are held to the bones with the help of tendons (say: TEN-dunz). Tendons are cords made of tough tissue, and they work as special connector pieces between bone and muscle. The tendons are attached so well that when you contract one of your muscles, the tendon and bone move along with it.



Skeletal muscles come in many different sizes and shapes to allow them to do many types of jobs. Some of the biggest and most powerful muscles are in the back, and legs. These muscles help keep the animal balanced and standing.

They also give the body the power it needs to pull and push things. Muscles in the neck aren't as large, but they are capable of some pretty amazing things: similar to us they control the head. Try rotating your head around, back and forth, and up and down to feel the power of the muscles in your neck. These muscles also hold the head high.

And don't pass over the tongue — a muscle that's attached only at one end! The tongue is actually made of a group of muscles that work together to allow animals to eat and chew food. Stick out your tongue and wiggle it around to see those muscles at work.

So we know that muscles help our animals to function. And we know that livestock animals are primarily made for food. So what part of a livestock animal is meat?

The muscle

When an animal is harvested blood circulation stops and muscles of the animal exhaust their oxygen supply. When the muscle is cut up we have different kinds of meats....

Pictures of different cuts of meat.

We know that most of the animal is used for meat, but we also want to show you it's not all meat or muscle. We are going to use a pineapple today to represent an animal that is harvested. We are going to see how much "meat" we get from the animal.

Procedure: Have one youth record for you!

1. Place cutting board inside the drip pan
2. Weigh the whole fresh pineapple and record weight on the record sheet.
3. Instructor cuts the bottom and top of the pineapple off.
4. Weigh the top and bottom separately and record on the record sheet.
5. Instructor rough trims the outer covering of the pineapple.
6. Weigh the first outer covering trimmings and record on the record sheet.
7. Instructor closely trims pineapple meat removing dark spots and remaining outer covering.





8. Weigh the close trim and dark spots on the record sheet.
9. Instructor divides the pineapple in half lengthwise.
10. Instructor divides each half again lengthwise.
11. Instructor trims the core (center) off of each quarter.
12. Weigh all of the quarters together and record on record sheet.
13. Instructor slice meat of the pineapple into chunks.
14. Weigh meat of the pineapple.
15. Collect and weigh any scraps and juice that were caught in the drip pan during the entire process.
16. Complete the calculations on the record sheet.

Check for Understanding:

1. **This pineapple can be used to represent an animal that has been harvested. Which weight did you take that would fit the following for a harvested steer?**
 - Live weight? (total pineapple wt)**
 - Weight of the head and tail? (top and bottom trimmings)**
 - Weight of the hide? (rough or 1st trim)**
 - Weight of the internal organs? (core wt)**
2. **What term do we use to describe all the products that could be used for something other than meat? By Product**
3. **What does the term dressing percentage mean for an animal? The percent of the animal's weight that is considered meat.**

You are going to learn more about by-products in a different session if you have not already. But you can see that an animal is not all meat!

What would be some careers available to you in the muscular area of animal science?



Pineapple Dissection Record Sheet

1. Total whole fresh pineapple weight _____
2. Top trimming weight _____
3. Bottom trimming weight _____
4. Rough (1st) trimming weight _____
5. Close (2nd) trimming weight _____
6. Pineapple meat weight _____

Dressing percentage of a pineapple

Whole, fresh pineapple weight _____

Pineapple meat weight _____

Pineapple meat weight/total weight = _____ dressing %



Lesson Title: Digestive Systems Field Day (Revised 4/25/15)

Know how. Know now.

What is the lesson objective? *Student will discover the function and organs types of digestive systems.*

Life Skill: Organizing information – selects appropriate categories

Educational Standard: NS 5-8.3 Life Science: Structure and function in living systems

SET Abilities: Categorize/Order/Classify, Collect Data, Hypothesize, others may also apply

Time Involved: 30 minutes

Required Materials:

Photos (slide set) of different types digestive systems

Digestive systems Handout

Direct instruction:

Proper nutrition is an important part of keeping animals healthy! To provide proper nutrition to animals, it's important to understand the different types of foods animals need to maintain their health. In this activity you'll investigate different feeds, nutrients in feeds and how animals use nutrients.

Nutrients are the substances needed by living organisms for growth, maintenance, reproduction, work and lactation. Nutrition is the study of how animals take in, digest and use nutrients. There are many career opportunities in the area of animal nutrition.

The **digestive system** takes in, breaks down, absorbs, and excretes food. It is made up of the mouth (entrance and crusher), esophagus (food tunnel), stomach (holding area), liver (filter), pancreas (digestive juice factory), intestines (tunnels) and the rectum (exit).

Different animal digestive systems how many stomachs compartments and structure of the system depends on what they eat.

Briefly explain the different systems: Simple system, Ruminant system, Avian systems

The six major nutrient groups are protein, carbohydrates, fats, minerals, vitamins, water.

Water is the most important nutrient! Cells that make up an animal's body need water to function; 85-95% of an animal's body is made up of water. It is necessary for digestion, carrying food nutrients and waste products, cooling the body and lubricating the joints. The amount of water an animal will drink depends on its size, activity, diet and environment. Dehydration results from not enough water intake or too much water loss.

You can bring an empty gallon container of milk to use as a visual for discussion.

Chickens/poultry - .15 - .25 gallons/day

Swine - .75 (young pigs), 3-5 for finishing pigs, up to 6 gallons/day for pregnant sows

Sheep – .25 (lambs), 2-3 gallon/day finishing and adult sheep

Goats – 2-3 gallons/day

Dairy Cattle & Beef Cows w/calves – 18.5 gallons/day

Beef Cattle – 12 gallons/day finishing cattle

Have actual containers -

Proteins help the body grow, repair and maintain muscles. Tendons, ligaments, enzymes and antibodies are also made of protein. Protein is also needed for milk production. Examples of high protein feeds include peanuts, alfalfa, meat, peas, beans, soybean meal, sunflower meal, eggs and distillers' grains.

Carbohydrates provide energy needed to carry out all life processes. Feeds with lots of carbohydrates include grains such as corn, oats, wheat and barley. Molasses and sugar beet pulp are high in sugar. Feeds with more fiber that still provide carbohydrates are called roughages; examples are grass, hay, see, hulls and silage. Hypoglycemia is low blood sugar caused by lack of carbohydrates or energy.

Fats also provide energy and help carry and store vitamins. Extra energy is stored by the body as fat, which provides insulation for warmth and energy when food is less plentiful.

Minerals aid in many functions of the body, ranging from bone and teeth formations to nerve and muscle functions to blood clotting and energy use.

Vitamins serve many important functions. They are either fat soluble (A,D,E and K) or water soluble (B's and C). Lack of B-vitamins can lead to anemia and disorders of the nervous system. Lack of Vitamin A,D, or K can cause blindness, rickets and bleeding. *** All animals except humans, primates and guinea pigs make their own Vitamin C.

Have the above info on a visual -

Have feed sacks ready to view to see that info is listed – **but not fill out form (Not sure there will be time unless you think there will be)**

Independent Practice:

Feeds and Nutrients Comparison worksheet Scenario

We are going to visit a feed store to find out what feed will be best for our livestock to eat. Look at the feed labels on the table and then we will answer some questions.

Feed Name	Type of animals fed to	Main ingredient	Nutrient group of main ingredients	Other ingredients	% protein	Vitamins and minerals	% Moisture

Debriefing questions for day of the lesson:

Go over a couple of feed labels and ask them to identify the categories on the above worksheet. Then ask:

Share –

What was the most common feed ingredient you found?

What was the most unusual feed or feed ingredient you found?

Process –

Why should you learn about nutrition?

Why is it important to be able to read food labels?

Generalize –

Besides providing proper nutrition, what other things need to be done to help keep animals healthy?

What kinds of foods help keep you healthy?

Apply –

How can you use your new knowledge with your own animals?

Lesson Title: Livestock Feed Rations

Terms to use: Protein

Carbohydrates

Fats

Minerals

Vitamins

Water

Grains & Forages (also distinguish between)

Have sample livestock rations available – identify grains/pellets – hands on

Direct instruction:

Most of you like to eat don't you? What do you like to eat? *(Let students give their answers)*

Those all sound like good things to eat to me too. Are you able to eat whatever you want, whenever you want? I didn't think so. Your parents tell you what you can eat and the kitchen staff at school decide what you're going to have every day at school. They make sure you have a balanced diet and are eating foods from all 5 food groups. Who can name one of the food groups for me?

Have a copy of My Plate poster for the group to look at. You can also have these available to give each student at the end of the session if you choose. It is available at:

http://teamnnutrition.usda.gov/Resources/mpk_poster2.pdf Briefly go over it!

Good. Well, animals on the farm like to eat too. Do you think that animals like to eat the same things we do? No. They have to eat different things because they are different than us. Why do they like to eat different types of food than humans? *Reference back to the different types of digestive systems.* What are some things that livestock eat?

Take answers from students.—corn, hay, alfalfa, soybeans, milo, etc. As the students name things, you can pass around samples. Samples are great! I double bag my samples in zip lock bags because the kids love to feel them and have broken my bags. 😊

Please explain to them the difference between Forages and Grains as they look at samples and go over what is a sample of each!!!

Do you think animals can eat anything they want to? No, they have to eat a balanced diet too. When a livestock producer prepares feed for livestock, he doesn't call it a balanced diet, but a **balanced ration**. They need food from all the food groups just like we do. Their food groups are a little different than ours. But they are similar.

An animal's food groups are: **Protein, Carbohydrates, Fats, Minerals, Vitamins, Water**

These food groups can be matched to the MyPyramid food groups.

Protein (soybeans) = Meats and Beans

Carbohydrates (corn) = Grains

Forage (prairie hay, oats, alfalfa, etc.) = Vegetables or Fruits

Minerals and Vitamins (salt, minerals) = Milk

As I mentioned earlier, a livestock producer will prepare a balanced ration for his livestock. Different livestock require different feed rations. A calf requires different things than a pig does and a lamb requires different feed than a horse does. Also, animals at different stages in their lives require different rations. Just like you require a different diet than your mother or father, a young animal has different nutritional requirements than their parents. Livestock producers have to know their animals and understand their nutritional needs just like the cooks at school need to understand your nutritional needs so they can prepare meals for you. Would you like to be a livestock producer?

Careers:

What would be some careers that are available in the area of animal digestion?



Lesson Title: Cardio Pulmonary System Field Day(rev 4/3/14)

Source: Youth In Motion NE4H5100, pgs.3, 6 & 7

Subject Matter Area(s): *Learn all about the heart and lungs and how they work together to provide an animal's body with oxygenated blood.*

Grades: 3rd-5th

Careers: *Farmer/rancher, veterinarian, vet technician*

Connection of the systems: What evidence is there from the activity you just completed that the cardio (heart) and pulmonary (lung) systems are directly related to each other?

As the heart rate increases, the breathing rate also increases.

Why do the two systems seem to be linked together?

Because the blood carries oxygen. As your body works harder, it needs more oxygen so the blood has to be pumped faster through the veins.

Description of Activity: Youth will learn the terms associated with the cardio pulmonary system.

Time Involved: 10 min

Required Materials: writing utensil, cardio pulmonary worksheet, crayons, computer with internet access, projector, red colored paper to be carried, blue colored paper to be carried, material to mark the floor (chalk if on concrete outside, masking tape, string or yarn, paint diagram on a sheet) or the blood flow activity sheet in the tote. CD player & music of various speeds.

What is the lesson objective? *Student will label the organs in the cardio pulmonary system*

Direct instruction: *Using the terms on the worksheet, label each part appropriately by writing the term in the blank associated with the organ.*

- 1) Youth will complete the worksheet
- 2) Using the computer and projector, have the group watch one of the short blood flow clips below. Pick one of the following that most closely matches the ability of your group.





<http://youtu.be/KSbbDnbSEyM>
<http://youtu.be/5tTkxYeNF9Q> - schoolhouse rock
http://youtu.be/FCimR_P9ID0
<http://youtu.be/JA0Wb3gc4mE>

- 3) Youth will use red and blue crayons and color the worksheet with the proper colors indicating oxygen rich blood and oxygen poor blood.

*** You could insert the “How Lungs Work” activity here if time permits.*

Check for Understanding: How accurate is the worksheet completed?

Activity: Blood Flow – large space needed either in a large room or outside on concrete or a lawn. (15 min)

Preparation: You can use worksheet 1.0 to assist with marking the paths.

- Mark on the floor a heart with the 4 chambers numbered 1 – upper right, 2 – lower right, 3 – upper left, & 4 – lower left. Left and right are as if the living thing on the ground is facing upward toward the ceiling. (numbers can be written on the ground or on a piece of paper)
- Mark 2 lungs, one on either side of the heart.
- Mark a path from the lower right side of the heart to each of the lungs.
- Mark a path from each lung back to the upper left side of the heart.
- Mark paths from the lower left side of the heart to outside the heart within the boundary of the living thing. One path toward the head, the other toward the lower part of the body.
- Exchange zones for blue and red items should contain 2 containers; one for each color.

Activity:

- Youth choose a spot on the path to begin. Make sure everyone is spaced evenly.
- Distribute red and blue items to youth based on their location in the diagram. See enclosed diagram for proper placement of red and blue items.
- Have youth begin to follow the path in a clockwise motion.
 - o If they are in the body area or head area, they should move to heart chamber 1.
 - o If they are in heart chambers 1 or 2, they should move to the lungs. (They exchange blue item for a red item at this point because the lungs put oxygen into the blood).



- If they are in the lungs, they should move to heart chambers 3 or 4, they should move to the body and head. (They exchange red item for a blue item at this point because the body cells used the oxygen in the blood).
- Begin with youth walking around to path. Once they get the hang of it, you can skip, jog, run, bounce a ball, etc.
- Once their heart rate increases you can review what is happening between the two systems.
 - How long can they keep up the faster pace? This is called working heart rate.
 - How long can they keep up the slower pace? This is called resting heart rate.
 - Why are these answers different?

Scenarios with livestock:

Scenarios to show heart rate.

Your goat jumped the fence and you are trying to get him in. He is not cooperating.

You are feeding your calf and she runs to the bunk to eat!

You are walking your pig down the driveway and back!

Your 4-H sheep are not very tame and you are trying to catch them to put the halters on them!

You are washing your calf so he gets used to being washed!

A fox is in your chicken pen!

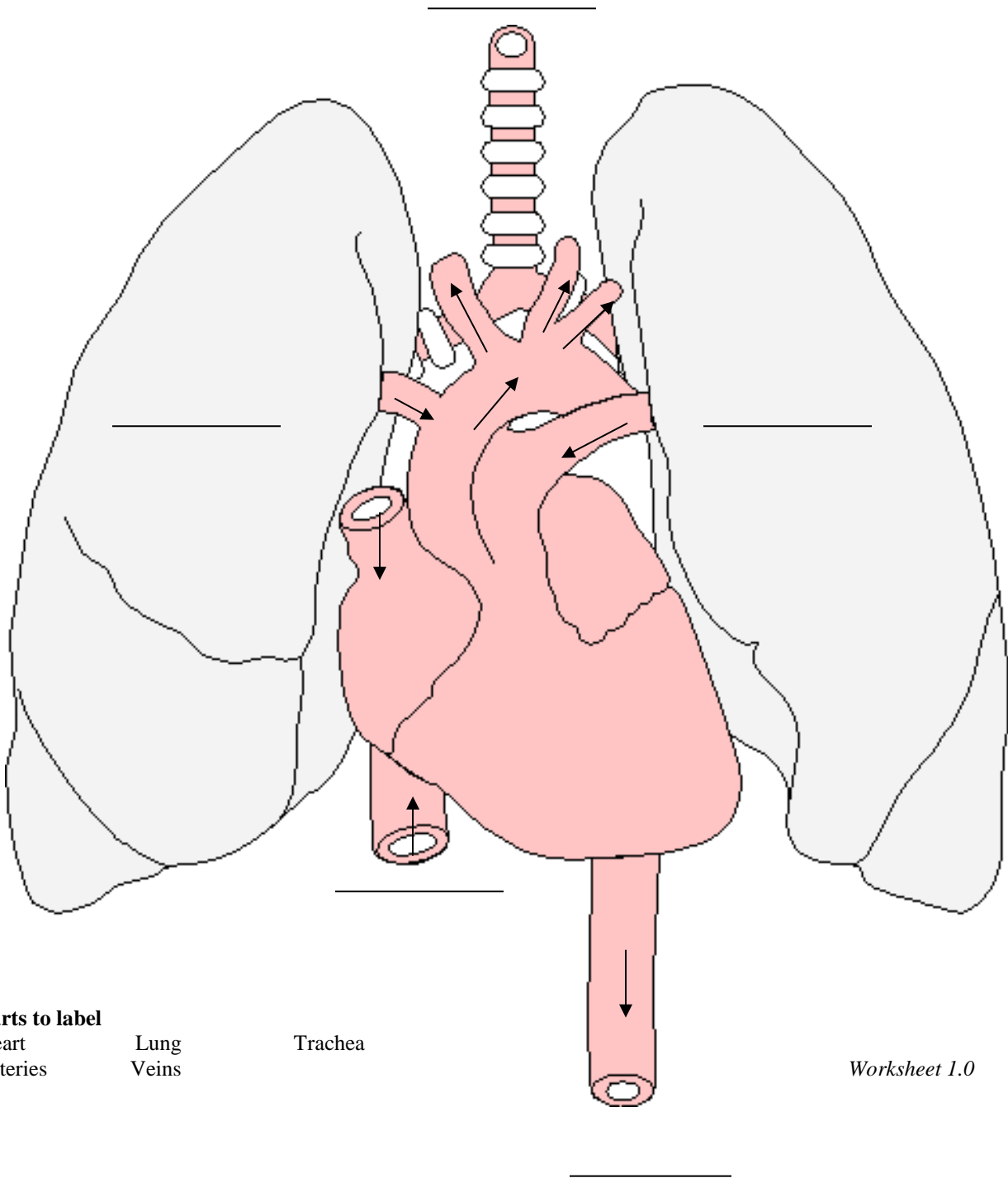
It is 100 degrees and your rabbit is out of water.

Careers:

What would be some careers available to you in this area of animal science?



Know how. Know **now.**



Parts to label

Heart
Arteries

Lung
Veins

Trachea

Worksheet 1.0



Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln cooperating with the Counties and the United States Department of Agriculture.

The 4-H Youth Development program abides with the nondiscrimination policies of the University of Nebraska–Lincoln and the United States Department of Agriculture.



Blood Flow Activity

Red/Blue Flow Chart

