**Host Site Facilitator Lesson Plan**

**2017 National 4-H Volunteer e-Forum**

***“STEM”ming into Animal Science, Growing True Leaders***

**Thursday, November 2, 2017, 7-8:30 p.m. (ET)**





TO: Host Site Facilitator

Welcome to the 2017 National 4-H Volunteer e-Forum, **“**#4HGrows Through Volunteers.” Thank you for choosing to host this event on behalf of 4-H Adult and Youth Volunteers and Extension Staff in your area. We appreciate your time and efforts with helping us make this training opportunity a successful one for all of the participants! This guide provides you with details regarding the **role of the facilitator** in hosting an e-Forum session.

The e-Forum has been designed to bring together volunteers both locally and across the country. Participants should meet in small groups in local sites and will connect to a virtual seminar along with other volunteers across the country. Virtual seminars will be facilitated by volunteer specialists, other Extension professionals, and volunteers, while local sites will be coordinated by 4-H program paid and/or volunteer staff. At each level, staff will be responsible for leading activities and supporting the learning and development of 4-H volunteers. This **e-Forum Host Site Facilitator Lesson Plan** is meant to help you lead the activities that will happen locally as well as provide instructions in a worse-case scenario where technology fails. While we do not anticipate that happening, it is possible, and we would like local sites to be able to continue the program, even if Internet connection is lost.

The 2017 e-Forum will include three (3) sessions. Please note that we encourage you to pre-register your site in order to allow us to more easily communicate with you in the event of any last-minute changes; however, pre-registration is not required to participate. Please refer to the **2017 e-Forum Host Site Facilitator Logistics Guide** for further details regarding registering your site to host the session and for connection details. Here is the schedule for the e-Forum sessions:

**Cultivating an Environment for Growing True Leaders**

* + - * Thursday, October 5, 2017, 7:00 – 8:30 PM (ET)

**“STEM”ming Into Animal Science, Growing True Leaders**

* + - * Thursday, November 2, 2017, 7:00 – 8:30 PM (ET)

**Helping 4-H’ers Grow in Life & Work**

* + - * Thursday, December 7, 2017, 7:00 – 8:30 PM (ET)

The live broadcast for each session is scheduled to last for 90 minutes. We recommend that you begin the on-site session 30 minutes earlier to allow for some introductions and on-site activities. Thank you for your interest and participation!

Sincerely,

National 4-H Volunteer e-Forum Steering Committee

**Welcome to Session 2 of the National 4-H Volunteer e-Forum!**

The title of this e-Forum session is **“Stem”ming Into Animal Science,** **Growing True Leaders** and includes the following design team members:

* **Design team:** Joel DeRouchey, Kansas State University, Aaron Fisher, Purdue University, Alexa Hayes, Kansas State University, Keri Hobbs, University of Georgia, Stacey MacArthur, Utah State University, Jamie Morris, University of Maryland, Pam Van Horn, Kansas State University
* **Steering Committee Liaison**: Jen Lobley, University of Maine

**Session Description:**Build on the roots of 4-H as we STEM our way into agriculture and animal science for experienced and new 4-H’ers. Gain resources to incorporate

Science, Technology, Engineering, and Math (STEM) leaders through traditional animal sciences project areas in communities. Volunteers will gain ideas for planning and organizing fun, educational sessions for youth.

**Supply List**

The following supplies will be needed at your host site for this session.

***Host Site Facilitators: Remember to test your equipment and connections prior to the session. See the instructions provided on page 3 of the Host Site Facilitator Logistics Guide.***

**General Supplies:**

* LCD Projector
* Laptop/personal Computer
* External speakers for audio (do NOT rely on laptop speakers; they will not be loud enough)
* Internet connection (wired, high-speed network connection preferred). System requirements are available at: <https://event.on24.com/view/help/sysreq.html>.
* Extension cord/power strip
* Separate laptop, tablet, or other device with Internet connection for participants to complete the online Qualtrics survey at the end of the program (optional) - Link for participant survey: <http://tinyurl.com/2017Nov-e-forum>; link for the demographic survey: <http://tinyurl.com/2017-e-forum-demo>.
* Sign in sheet to record attendance
* Name tags
* Writing utensils (pencils or pens)
* Paper for participants to take notes on
* Refreshments (optional)

**Supplies for Session Activities:**

**“Hay Storage Facility” Activity (On-site welcome activity)**

Provide a collection of the following items (similar to a “maker station” with multiple items to choose from)

* Cotton swabs
* Paper plates
* Straws
* Index cards
* Craft sticks
* Masking tape
* Table Top Instructions - “Table Tent Hay Storage Facility” (one or two copies per table so groups can see what to do when they arrive)

**“A Stomach at Work” Activity**

* Resealable plastic sandwich bags (one per participant plus one for demonstration)
* Sliced white bread (one piece per participant plus one for demonstration)
* 2-liter bottles of orange juice or cola (about one bottle per 15 participants)
* 3-ounce disposable cups (one per participant)
* Paper towels (one sheet per participant and enough for clean-up)
* Clock or stopwatch
* Large trash bag (one or more depending on the size of your group)
* “Monogastric Digestive System” and “Ruminant Digestive System” resource sheets

**Digestion Puzzle Activity**

**Pre- Session Preparation:** Prior to the session print copies of the “Monogastric Digestive System” Puzzle and “Ruminant Digestive System” Puzzle. Print enough copies of each so that participants can work in small groups, preferably groups of 3-4 people. Cut out and laminate (optional) the pieces and store completed puzzles in separate envelopes. Label the envelopes for the system they contain, monogastric or ruminant.

It is recommended that each system be printed on different colors of paper. For example, monogastric may be on green and ruminant may be on white. This will facilitate a quick pick up when the activity is done. Keep one copy of each uncut for use by host. It is the correct sequence and the “answer key.” Since the time allotted this activity is only 5 minutes, it is recommended that a copy of each puzzle is placed on tables for easy access. It may be necessary to remind participants to leave the envelopes in the middle of the table, or wherever they are located, until they are used.

**Undressing the Mystery of Meat Activity**

* Fruit (1 orange/group)
* Paper Plate (1/group)
* Kitchen/Food Scale (1 to be shared between groups)
* Calculator (1/group)
* Protractor (1/person)-optional
* “Undressing the Mystery of Meat” worksheet (1/person)

**Training Handouts** (please prepare a copy of each handout below for each participant)

* STEM Fact Sheet (“S.T.E.M. Definition and Examples”)
* “Monogastric Digestive System” puzzle
* “Ruminant Digestive System” puzzle
* “Undressing the Mystery of Meat” worksheet
* Optional: print PowerPoint slides as a 6-slides/page handout
* Optional: “Livestock-Maker Packet” - contains resources that 4-H Volunteers could use with their 4-H Clubs beyond the e-Forum.

**Supplies for Evaluation**

* Internet access
* Extra computers, tablets or other devices ready to connect to Qualtrics survey
* Paper copies

**On-site welcome activity (Complete 30 minutes prior to the start of e-Forum)
FACILITATOR NOTE**: We recommend you lead the following on-site activity that has been designed to help participants get to know one another better. It is designed to be led 30 minutes prior to the start of the e-Forum.

**Hay Storage Facility (adapted from Purdue Extension Livestock-Maker Science Experiments)**

**Goal -** Participants will design a hay barn that (1) will hold as much hay as possible; (2) minimizes losses due to weather/pests; and (3) has a firm foundation.

 **Do the Activity:**

1. Allow participants time to discuss hay barns and what they know about them, then they should sketch out their plan.

2. Split the participants into groups of 3-4 of various age and ability levels and explain the various materials they can use to build a structure.

3. Give participants approximately 15 minutes to build a hay barn using the materials on hand. *(Very little instruction is given by the instructor during this time. The goal is for participants to work together and be creative using their own skills and background knowledge.)*

**Share:** At the end of the design session, it is time for the competition! Each group will explain their hay barn design. You should apply a little pressure to the top of the barn with your hand or finger to make sure it has a firm foundation. The biggest barn that does not collapse will be declared the winner.

**Process:**

1. How did your group work together to create your barn?

2. Did you have difficulties getting your barn to stand up?

**Generalize:**

1. What does a building need in order to stand? (a firm foundation)

2. What did you know about hay barns before this activity?

3. What did you learn about hay barns and buildings in general through this activity?

**Apply:** Even though buildings can look very different, they can have very similar purposes, and the good ones have a firm foundation. As you go out

into the world, take the time to look at the buildings around you. *How long do you think it takes to plan and build a hay barn in real life?*

A few minutes before the start time, please help the group find their seats and get ready for the start of the e-Forum.

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| --- | --- | --- |
| **Slide Number** | **Presenter Script** | **Action Needed** (note that actions of local host site facilitators will be in **BOLD;** actions of online presenters will be in *ITALICS)* |
| None (pre- session introduction) | **None** | **Host Site Facilitators:** **Please read: “Welcome to the National 4-H Volunteer e-Forum! We are excited that you have chosen to join us! Tonight you are a part of a 3 session e-Forum series that includes youth and adult 4-H Volunteers from all across the United States. You’ll learn from Extension professionals, volunteers and teens who will be joining us virtually. And, you’ll have the chance to interact with one another on site and even share ideas with volunteers at other sites across the country. Before we join the national broadcast, we have an activity to help us get to know each other a bit better and to introduce this evening’s topic.”** |
| None (30 minutepre- session activity) | **None** | **Host Site Facilitators:** **Instructions: Engage participants with the ice breaker activity entitled Hay Storage Facility (see p. 6). Copies of the Table Top Instructions for the activity may be placed at tables or passed out after the activity. Have supplies set in the middle of each table for easy access. Supplies needed include: cotton swabs, paper plates, straws, index cards, craft sticks and masking tape (see p. 4). Print the table tent instruction card (enough for each table) on card stock, fold and place on tables. As people arrive, they can work on the activity. Reflection questions that can be used (optional) to pull people back together approximately 7-8 minutes before the official start time include:** **Reflect (sample questions selected from the activity description above):** **How did your group work together to create your barn? What challenges did you face in getting your barn to stand up?** **Connect and test your system to ON24 prior to the start time. The system will be live 15 minutes prior to the start time.****Have your group settled and ready to begin promptly at the start time.** |
| 130 sec | **LEXIE** – Welcome to the 2017 National 4-H Volunteer e-Forum, “#4HGrows Through Volunteers.” My name is Lexie Hayes, from Kansas State University. I'm pleased to serve as your narrator for the session this evening. We are excited that you have joined us from one of the host sites located across the country! You will have the opportunity this evening to interact with volunteers and staff in person and virtually. And, you’ll gain some new knowledge and tips that will help you work with your 4-H members at home!As you see at the bottom of this slide, the National 4-H Volunteer e-Forum is on Social Media. We encourage you to post photos of your site on the 4HeForum pages, using the #4HeForum and #4HGrows. Thanks for sharing! |  |
| 210 sec | **LEXIE** – Tonight’s session is titled, “STEMming into Animal Science, Growing True Leaders.”  |  |
| 310 sec | This session was designed to build on the roots of 4-H as we STEM our way into agriculture and animal science. We hope you will gain resources that will help you incorporate Science, Technology, Engineering and Math (STEM) into traditional animal sciences project areas in your community. We will give you a taste of some fun, animal science focused STEM activities that we hope you will take back to your clubs to help plan and organize fun, educational sessions for youth.  |  |
| 430 sec | **LEXIE-** Tonight’s e-Forum session will:1. Provide research-based resources for extending educational opportunities, increasing learning activities and growing leaders through STEM.2. Identify components needed for organizing fun, educational, and experiential learning sessions for youth participants.3. Share basic livestock knowledge for creating competent volunteer leaders that teach 4-H youth. |  |
| 5 1 min | **LEXIE** - Before we get started this evening, we want to offer special thanks and words of appreciation to both National 4-H Council and 4-H National Headquarters for their support of the National 4-H Volunteer e-Forum.National 4-H Council has allowed us to use their ON24 technology platform to lead these sessions. And, we are able to host our e-Forum resources on the 4-h.org website, managed by the National 4-H Council.Doug Swanson, Program Leader at 4-H National Headquarters, has been instrumental in supporting the concept of the National 4-H Volunteer e-Forum and with facilitating our discussions with National 4-H Council. Doug, we thank you for your support! |  |
| 630 sec | **LEXIE-** Before I introduce our first speaker tonight, I want to note that we will not be utilizing video of the presenters as they are speaking tonight. We have sites joining us from a wide range of locations and want to minimize accessibility issues that may be created by varied internet speeds with the large bandwidth of streaming video. If you would like to see a photo of the presenters, click on the Bio tab at the bottom of the screen.Tonight we are pleased to welcome Jamie Morris from the University of Maryland. Jamie is the Extension Specialist for 4-H Youth Development and Volunteer Systems and Development. She has also worked at the county level and understands all aspects of program outreach including club work, camps and school enrichment programs. Welcome Jamie! |  |
| 71 min | **JAMIE**- Many people may not see how agriculture or animal science is connected to STEM. They may seem as different to them as the pictures on the screen. Two of the pictures clearly have nothing to do with the other one, right? Perhaps if we break STEM down into its component parts, then we might be able to de-mystify what a STEM activity or program is or can be and start seeing the connection with animal science and agriculture. STEM stands for Science, Technology, Engineering, and Math. Most people, when they think of STEM tend to think more of the robot or the engineering or drafting pictures because they represent two of the big components, Technology and Engineering. But our hope is to help broaden that lens so that we start seeing all pictures on the screen as STEM. How are we going to do that? Well, let’s get started and see! |  |
| 82 min | **JAMIE-** Let’s start by putting some new pictures in your head. As I read the following statements, what comes to mind?* The study of organisms and their parts
* The study of life and living things
* The study of organisms in their environment
* The study of food and nutrition
* The study of functions of living organisms.
* The study of the structure, physiology and development and classification of animals.

Give your site host a show of hands if you pictured a sheep, cow, goat, pig, or any other livestock animal as I read the definitions associated with the subjects listed in the science column. I can’t see all of you out there, but I am willing to bet that a majority of you raised your hand and are well on your way to seeing the STEM and Animal Science connection.We could do the exercise with the other three areas of STEM shown on this slide, and again I bet you would start to see connections between STEM and Animal Science. Your site host has a STEM Fact Sheet that will provide an expanded list of examples to continue making STEM connections. For example, with the technology available today, our 4-H animals can be tagged with RFID chip tags which would connect to communication technology for tracking purposes. When thinking about the area of Math, analysis entails the calculation of the rate of change, which in 4-H is critical to the rate of gain for a market animal. | **Host Site Facilitators:****Pass out copies of the “STEM Fact Sheet.”** |
| 92 min | **Jamie-** We want to give you a chance to provide some feedback and interact with us through something called Poll Everywhere. Those of you who have a cell phone with you, and want to give this a try, take them out..., open up a new text message…, and type into the CONTACT section, the number you see on my slide... 22333. There are **no fees** associated with this technology. Text messaging fees may apply. After you input the number, put jamiemorris034 into the message section and hit send. In a few seconds, you will receive a text message response saying you have joined Jamie Morris’s session. This is where you will type in your response to the poll question.  | **Host Site Facilitator:****If you are facilitating this on your own (separate from the live broadcast), you will not need to use polleverywhere.com. Simply ask for your local participants’ responses popcorn style, where they can raise their hands or stand up to give you their one word answers.** |
| 105 min | You have the STEM Fact Sheet in front of you. Thinking back to the examples I just spoke about in the last slide, please answer the following poll question: “What examples from the STEM categories did you see or experience in the Hay Storage Facility activity?“ I might type in “Economics,” because I might have youth calculate the cost of their structure. Let’s give it a try! The instructions are also on the slide. If you didn’t get to try the activity at your site and you would still like to try out the technology, go ahead and follow the directions and type in “no activity” for your answer.***Pause to let them respond and read some of the poll responses to highlight what participants saw.***I am glad to see that we are making good connections with STEM and AG and Animal Science already. I hope as we continue through the evening, you will find more connections. | Webinar Producer- put up the poll question, “What examples from the STEM categories did you see or experience in the Hay Storage Facility activity?”  |
| 111 min | **JAMIE-** In this upcoming activity, “A Stomach at Work,” hay can be seen as the “fuel” for the animals that will go through the digestion process and in the end help an animal grow and develop. If that animal is a market animal, the growth will finish out in a meat product which will be discussed later this evening in another activity. Many of you may have knowledge about this topic just from its title, but let’s investigate a little further to see how you might use it to help youth make STEM and Animal Science connections.Animals need to eat. Perhaps they eat the hay that was stored in the hay barn that you built in the opening on-site activity, but they eat for energy, to grow and to survive. What happens when people or animals eat? We taste, we salivate, we chew, we swallow, we digest.  | **Host Site Facilitator:** **Although there are 10 minutes allotted for the “A Stomach at Work” activity, it is recommended that bags of bread (a slice of bread per baggie and a paper towel) be prepped before-hand to allow for quick distribution at the start of the “A Stomach at Work” activity.**  |
| 121 min | **JAMIE**- The process of digestion and absorbing nutrients is how animals maintain or increase their weight. It is also where they get the energy to move, think and perform other tasks.You see an animated version of the digestion process in the graphic on this slide. You see the mouth moving/chewing and then you see the food travel down the esophagus into the stomach where it changes color and then continues its journey through the intestines and ends in a completely different form at the end. There are a number of science concepts at work here including the use of energy, motion and force, the interaction of the body’s organs, and even a law. The Law of Conservation of Matter, which states, matter cannot be created or destroyed. The food was not destroyed and the “end product” was not created. The food matter was changed, it was broken down, nutrients were absorbed, and other material may have been added to produce the “end product”.Our next hands on activity this evening will demonstrate the digestion process that occurs in the stomach. |  |
| 1330 sec | **JAMIE**- At your site, you will conduct a hands on demonstration of the chemical and mechanical digestion that occurs in your stomach. You will use a plastic bag, orange juice or soda, and your hands to break down food. Make careful observations and think of how it is demonstrating digestion. We will sign off for 10 minutes to allow your site host to lead you through “A Stomach at Work.”The screen will count down by minutes to help you keep on task. When you see 2 minutes, you should begin wrapping up. It will count down by 30 seconds at that point.  | **Host Site Facilitators:** **1. Distribute the bags and cups. 2. Pour orange juice or cola in each participant’s cup. 3. Ask participants what they think each item could represent in the digestive system of an animal.** Answers: *the baggie represents the stomach, the bread represents the food an animal might eat, the orange juice or cola represents the stomach acid and enzymes, the cup is only the vessel to hold the “stomach acid” until they use it and the paper towel is used if things get messy.***4. Direct participants to remove the paper towel from their bag (if the Session Set-up preparation suggestion is followed) OR direct them to place the bread into the baggie. 5. Direct participants to pour the orange juice or cola into the bag with the bread. 6. Ask them to observe and share what is happening to the bread.** Comments may include: *The bread is turning colors. The bread is absorbing the orange juice/cola. The bread is starting to look mushy.* **7. Direct participants to seal the plastic bag so that no liquid will come out. 8. Direct the participants to use their hands and knead the bag to “churn” the contents inside. Ask them to watch what is happening for the next two minutes while they act like a stomach.****Some questions to ask while they are “churning”:****How do you think this is demonstrating how your stomach works?** *The motion is mechanical digestion and is similar to the way stomach muscles work. The liquid works like stomach acid helping with chemical digestion or breaking down food chemically.***What other animals may have a digestion process like this? Explain your answer.****What are you seeing in your plastic bag now? Describe how it is different from when you started.****Why do you think the stomach needs to break down food like this?** *To help get the nutrients contained in the food that the body needs.***What type of nutrients are in food that our bodies need?** *There are six basic nutrients that our bodies need and get from food. They are fat, carbohydrates, protein, calcium, minerals and water.***Describe what your bread looks like now and explain how that happened.****9. Collect or have participants dispose of their plastic bags, paper towels and the 3-ounce cup in the trash bag or garbage can. Should be done no later than at the two minute warning.** |
| 1410 min | **10 minute Countdown slide**  |  |
| 151 min | **JAMIE-** Welcome back. I hope you had fun with the “Stomach at Work” activity. Let’s review what you saw in this activity.During this activity, when you poured the soda into the bag and then began to mush the bag with your hands, your hands were acting like the stomach muscles and the soda was acting like stomach acid both working to break down the bread. Had the liquid been water, the process would have been slower, since the acids in the soda accelerate the digestion process, similar to the acids in your stomach. How does this demonstration compare to that of an animal’s digestive process? Depending on the animal in question, the process may be more elaborate, but regardless, all animals utilize mechanical and chemical digestion. Let’s further investigate to learn more. | Webinar producer- put up group chat pods: “How might you use this activity in YOUR programming?” |
| 162 min | **JAMIE-** Many of you may be able to identify ways the two animals on this slide are different. Pig vs. cow. Short vs. tall(er). Bacon vs. steak. However, they both eat; therefore they both digest food, but they do it differently. One is a monogastric, or one-stomach animal, and the other is a ruminant, an animal that chews the cud regurgitated from its rumen. If you were not sure which is which, you may have a better idea now, if you have seen a cow chew its cud or heard a reference to it. Although I grew up in the “city”, my mom would always say we looked like “cows chewing our cud” when we chewed with our mouths open at the dinner table.So how are these two animals different in the digestion department? We will again turn the session over to your site host who will help you work through some digestion puzzles in pairs or small groups to put together a monogastric and ruminant digestion sequence chain to compare the two digestive systems. | **Host Site Facilitators: Pre- Session Preparation**: **Prior to the session print copies of the Monogastric Digestive System Puzzle and Ruminant Digestive System Puzzle. Print enough copies of each so that participants can work in small groups, preferably groups of 3-4 people. Cut out and laminate (optional) the pieces and store completed puzzles in separate envelopes. Label the envelopes for the system they contain, monogastric or ruminant.** **It is recommended that each system be printed on different colors of paper. For example, monogastric may be on green and ruminant may be on white. This will facilitate a quick pick up when the activity is done.****Keep one copy of each puzzle uncut for use by host. It is the correct sequence and the “answer key.”** **Since the time allotted this activity is only 5 minutes, it is recommended that a copy of each puzzle is placed on tables for easy access. It may be necessary to remind participants to leave the envelopes in the middle of the table, or wherever they are located, until they are used.**  |
| 1730 sec | We will sign off for 5 minutes to allow you to put together the Digestion Puzzles.  | **Host Site: Ask participants to work with the other people at their table to place the cards from each envelope in the correct order that represents what happens to food that passes through that particular digestive system. Participants should be encouraged to work on both puzzles at the same time, which can help demonstrate the similarities and differences.**Webinar Producer: put up the 30 sec countdown slide when there are 30 seconds remaining. |
| 185 min | **5 minute Countdown Slide** |  |
| 191 min2 min | **JAMIE-** Let’s talk a little bit about these two digestive systems. A monogastric digestive system, like that of swine, horses, poultry and humans, is characterized by having one stomach compartment. However, some other interesting facts about monogastric digestion include the fact that food is only chewed once and the efficiency of digesting plant and plant by-products is limited. Whereas, a ruminant animal such as a cow, sheep, or goat has a polygastric digestive system, which is characterized by having four stomach compartments: the Rumen, the Reticulum, the Omasum and the Abomasum. Each compartment helps to ferment, mix, and digest roughage which results in a high efficiency of digesting plant and plant by products.Let’s take a moment and check in on our STEM connections. Please refer again to the STEM Fact Sheet and think about the activities you just engaged in. “What examples from the STEM categories did you see or experience in the the stomach activities?“ My answer might be “Power and Energy Technology,” since the food that an animal digests gives them the energy to move, breath, and grow.Please share your responses via Poll Everywhere using the text messaging on your phone.***Pause to let them respond and read some of the poll responses to highlight what participants saw.*** | **Host Site Facilitators - Make sure participants have their “STEM Fact Sheet ” handouts.**Webinar Producer: Put up the Poll Everywhere question, “**What kind of STEM did you see or experience in the stomach activities?”** |
| 2030 sec | **JAMIE-** As we wrap up the first half of tonight’s session, I thought you might like totake a peek at rumen fluid- this was referred to when we talked about the ruminant digestive system. As you can see, there is a lot of activity that indicates a very energetic digestion process. There is also a great short video in the resources from tonight’s session where you can learn more about ruminant digestion.  | Webinar Producer: show the rumen fluid active slide/video<http://www.youtube.com/watch?v=-ban6fHArBU> |
| 215 min | **LEXIE-** Thank you Jamie for the first part of the presentation tonight. Folks at our participating sites, we are now going to take a 5 minute break- give folks a chance to stretch a bit and our host sites might want take a few minutes to re-group for the second part of our session this evening. When we come back together we will be learning about the Mystery of Meat. As a reminder, while you’re on break, why not post a photo from your site on the National 4-H Volunteer e-Forum social media page? The hashtags appear on your screen!See you in 5 minutes! | STRETCH BREAK/INTERMISSION**Host Site Facilitators:** **Post a photo of your site to the 4HeForum social media page!** |
| 2230 sec | **JOEL-** Welcome back everyone! Hello, I’m Dr. Joel DeRouchy an animal scientist from Kansas State University, plus, just like you, a 4-H volunteer. It’s my pleasure tonight to guide you through the next educational session. |  |
| 231 min | **JOEL-** Having just learned about animals’ digestive systems, the monogastric and ruminant, let’s move toward understanding the value of animal products produced, such as meat in people’s diets. Meat is the muscle and fat from a livestock animal. Meat provides important nutrients for our bodies and is a protein source that contains B vitamins, vitamin E, iron, zinc and magnesium. Protein is important in a person’s diet for muscle growth and repair. The processing of the animal is referred to as harvesting, similar to harvesting corn or wheat. After skinning and removing the internal organs, the body is called the carcass. The three main livestock species harvested in the United States include beef, sheep, and swine.  |  |
| 241 min | **JOEL-** As a review of tonight’s presentation of “Stem”ming into Animal Sciences,” we “engineered” a hay storage facility for the important food that animals need for growth and maintenance. We then analyzed the different digestive systems animals have for breaking down food from mechanical to chemical. It is the butcher’s responsibility for getting the edible product from the animal to the the plate. The butcher completes the next step in the process called harvesting. This process introduces math calculations into animal sciences as we uncover live weight to dressed weight.  |  |
| 2530 sec | **JOEL-** Meat that comes from cattle is called beef. Cattle take about 14 to 18 months to reach market weight, which is 1,000 to 1,300 pounds. The average daily weight gain for a beef animal is 3 pounds per day when fed and cared for properly. Rate of gain is an important measure for feed efficiency and time for getting product to consumer.  |  |
| 261.5 min | **JOEL**- As you think about rate of gain, we’ll calculate ending weight, with an end date of August 1. If today is April 1 and the steer weighs 900 pounds, let’s predict how much the steer might weigh on August 1. Here’s the math formula: April 1 to August 1 is four months, or 120 days. Multiply 120 days by 3 pounds of weight gain per day, which equals 360 pounds. Adding 360 pounds to the April 1 weight of 900 pounds means bodyweight on August 1 would be 1,260 pounds. Remember, not all of the animal can be used for meat such as skin and internal organs, so only 756 pounds of the 1,260 pound beef animal is available edible meat. | Webinar Producer: As the script is read, slide #25 is advanced as each math concept is added |
| 2730 sec | **JOEL-** Some beef meat cuts or product include steaks, roasts, and hamburgers and are the economic profits for producers...this is how they make their money. |  |
| 2830 sec | **JOEL-** Meat from pigs is called pork. Some pork cuts that you may know are pork chops, ribs, bacon, sausage, and ham. Pigs typically take about 5-6 months to reach market weight. The market weight of a market hog is 230-290 pounds. A 250-pound hog will yield about 175 pounds of meat. |  |
| 2930 sec | **JOEL-** Meat that comes from sheep under a year of age is called lamb. Meat from older sheep is called mutton. Some lamb cuts are rack of lamb, leg of lamb, lamb chops, or lamb kabobs. Sheep typically take 5-6 months to reach market weight. Market weight for a lamb is 100 to 140 pounds. A 130-pound lamb will yield about 65 pounds of meat. |  |
| 301 min | **JOEL-** Our next activity will simulate what a butcher does to process the animal that becomes meat in the store. Instead of an animal, you will be processing an orange to harvest for edible fruit. As the butcher you will process the meat, or “fruit” in this case, and then calculate the dressing percentage using math skills.**You Be the Butcher!**First let’s define three important words …1) **Butcher** – the person who harvests animals and processes them for meat products 2) **Carcass** – the body of an animal after skinning and removing the internal organs3) **Live weight** – the original weight of the animal before it is harvested |  |
| 3130 sec | **JOEL-** At this point we are going to turn things over to your local host and have you work in groups at your sites to try out this activity. We look forward to seeing you in about 10 minutes.  | **Host Site Facilitator: Lead the “You Be the Butcher” activity (10 mins) with small groups (this activity is found on p. 3 of the handout, “Undressing the Mystery of Meat.”) Be sure materials are prepared and ready ahead of time for easy access.**Webinar Producer: put up the 2 minute countdown slide (#31) for the last 2 minutes of the activity |
| 3210 min | **10 minute Countdown slide** | Countdown slide |
| 335 min | **JOEL-** Welcome back! Let’s take a look at how to figure out the dressing percentage for an orange. I took my orange, and I found the total weight to be 270 grams. I then peeled it and removed the core and any seeds. I weighed just the fruit and discovered it was 193 grams. So to determine the dressing percentage, I divided the carcass weight by the live weight, or 193 by 270, and then multiplied it by 100, and I ended up with 71% for a dressing percentage. Feel free to type into the chat box the responses that your site calculated for a dressing percentage of your orange. Please enter your answers to this question in the chat box: How might you tie math in with other animal science or other livestock activities? Take a moment and add a suggestion or two from your site. You will get to see ideas from other sites as well. These will all be collected and posted later on the e-Forum resource web page.  | **Host Site Facilitator: you may or may not choose to type in the dressing percentage from your site- you might wish to put them into the chat box like this- *Washington County, ME-135, 129, 133, 140, 134***Webinar Producer: add question to chat box, “How might you tie math in with other animal science or livestock activities?”**Host Site Facilitator: solicit answers to the question and submit in the chat box.***Online Presenter: share some of the responses you see coming in the chat box.* |
| 341 min | **JOEL-** Tonight, we’ve uncovered meat’s mysteries, from the animal to the meat products. However for many youth, they may want to know how their interest in STEM can lead to a career. There are many careers available that relate to science and business throughout the process of providing wholesome, nutritious, quality meats and meat products to the consumer. Opportunities in the meat industry involve all sciences. The meat industry is one of the fastest changing of the food industries. Many fields of study can lead to careers in the meat industry including microbiology, chemistry, engineering, sales, management, and marketing. Careers are found in several segments of the meat industry including:**Production** - raising livestock animals to be used for meat and meat products**Fresh Meat** - harvesting and processing fresh meat**Manufacture** - processing meat products like beef jerky, smoked hams, bacon, and much more**Support Industry** - which includes equipment, ingredients, chemicals, packaging materials, and services.As one can see, STEM can open doors in agriculture. |  |
| 353 min | **VIDEO OF MEAT JUDGING** | Link to video: <https://drive.google.com/file/d/0BxgSF-hvbxiPMHFTemZWV0FxZ0k/view?usp=sharing>  |
| 361 min | **LEXIE-** Thanks Joel! That was a fun activity and so neat to see all the different ideas coming in from all our participants across the country. A broad list of resources regarding livestock, STEM, and ag-related topics has been provided. This is definitely not an all-inclusive list. However, it does provide resources ranging from basic project-related information that could be used for project meetings during the winter months, to more advanced activities to challenge critical thinking skills of older youth. We also tried to provide a wide range of resources that can be used by volunteers with varying levels of expertise and knowledge bases. Some resources provide content information, while others provide step-by-step activities, and leader guides. Experienced and seasoned volunteers may also be able to use their creativity to develop activities or facilitate a discussion regarding STEM in livestock projects from the resources that primarily provide content. For example, a leader could further elaborate on the impacts of improper injection methods found in the quality assurance manuals to meat science and carcass quality. We hope you can use one or several of these resources to guide you in youth livestock educational programs at the local level.  |  |
| 3730 sec | **LEXIE-** All resources referenced in any of the e-Forum sessions will be available on the 2017 National 4-H Volunteer e-Forum Website as shown on the slide. Please note that the first time you visit this site, you can create a personal account to allow you to access the materials. You are welcome to access these resources and share them widely! |  |
| 3830 sec | **LEXIE-** As we wrap up our time together tonight, I want to remind each of you to take a few minutes to fill out our e-Forum survey. Your evaluation information is important to us. This is the first national e-Forum series we have organized. Your feedback will help assess if we have met our objectives and determine if future e-Forums will be offered. Your site facilitators will have paper copies and/or a link for you to complete the survey with a computer, tablet, or your smart phone. We are interested in hearing your feedback about tonight’s e-Forum session and we want to know what you learned from the session.  | **Host Site Facilitator: Provide participants with access to the survey by having a laptop or tablet in the meeting space at the end of the session. Be sure to place the device(s) in a private location so participants feel comfortable and free to answer questions confidentially. Participants can use their smart phones and/or you can provide paper copies. Please note, if you use paper copies, please collect and input the evaluation data in Qualtrics (**[**http://tinyurl.com/2017Nov-e-forum**](http://tinyurl.com/2017Nov-e-forum)**) within one week of the session. A separate survey is provided to enter demographic data from your site:** [**http://tinyurl.com/2017-e-forum-demo**](http://tinyurl.com/2017-e-forum-demo)**.**  |
| 3930 sec | **LEXIE-** Special thanks to the team of Extension staff from across the country who worked together to prepare and deliver tonight’s session. |  |
| 4030 sec | **LEXIE-** Finally, just a quick reminder. We have one more session in our e-Forum series that will be happening on December 7th, Helping 4-H’ers Grow in Life & Work. We hope you will plan to join us again. Also, please note you will be able to access all three recordings of these sessions and the accompanying resources from the 4-h.org site.Recordings of each session will be available at the 4-h.org/professionals site. The link to the recording will be the same as the registration link. Thank you….and good night. | Webinar Producer: Put up final slide #41 “Thank you” after speaking. |

***Thank you, Host Site Facilitators, for your help with the 2017 National 4-H Volunteer e-Forum!***