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Title

Swine - From the Animal's Point of View Complete (Parts 1 through 5)

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SWINE : *From the Animal's Point of View*

SUBJECT OVERVIEW AND BACKGROUND INFORMATION

Swine were first domesticated by humans 9,000 to 10,000 years ago, and the swine that we are most familiar with today probably are descendants of wild pigs from Europe and Southeast Asia. However, history shows that humans had a much earlier association with swine. Human artifacts, including carvings and paintings, that depict pigs date back as far as 25,000 years.

Today swine are, in one way or another, a part of most people's lives. Swine meat (pork) is the most commonly consumed meat in the world; the leather that we find used for a variety of consumer goods (e.g., gloves, luggage, balls) is made from swine hides; and the stiff hair from swine is used to make bristles for brushes. Additionally, swine are becoming popular as pets. These intelligent animals can be house trained and make very good companions. Swine are social animals, living in groups with an established "pecking order" or social hierarchy based mainly on size and gender. This hierarchy is maintained throughout a pig's life and it must be taken into account when feeding swine because the dominant animal will push others out the way if it can, resulting in a lack of nourishment for the weaker animals.

The content in this curriculum is designed to introduce youth to swine behavior, needs and care. Additional emphases include life skills and positive youth development. This is not a guide to raising swine for market or exhibition.



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Other characteristic swine behaviors include rooting and wallowing. Rooting is a behavior that stems from the wild, forest-dwelling ancestors of swine that would forage for their food. Swine use their highly developed sense of smell to locate underground food and then use the hardened front edge of their snout to dig (or “root”) for their subterranean meal.

Wallowing is a swine behavior that helps protect their skin from bug bites, sunburn, and parasites, and also keeps their body cool in the summer and warmer in the winter. Swine wallow by rolling around in a shallow, damp area, making a round or oval depression in the earth where they can cover their body with a protective coat of mud.

By learning about these and other aspects of swine behavior, youth can better understand these intelligent animals, and this understanding will help make owning and raising swine much more meaningful and enjoyable for them.

Concepts and Vocabulary:

- **Competition:** A struggle between individuals for food, space, and other important requirements for survival.
- **Dominant:** Having influence, control, and authority over others.
- **Olfactory receptors:** Structures that aid with an individual's sense of smell. The more receptors you have and the more diverse they are, the better your sense of smell.
- **Prenasal bone:** A bone found in a pig's snout. This bone allows the pig to use its nose to dig for food in the ground.

- **Rooting:** The act of pulling out or removing items from under the ground.
- **Rooting disk:** A disk found in a pig's snout that is very sensitive to touch and is used by the pig to explore its environment.
- **Social dominance:** The exercise of authority in a group, by which certain individuals lead and have authority over other individuals in the group.
- **Social hierarchy:** A system of social structure in which individuals are ranked from top to bottom according to their degree of authority or importance.
- **Social order:** A system of social structure that keeps a group stable and functioning.
- **Subordinate:** Belonging to a lower level or rank in a group.
- **Tactile receptors:** Structures that aid with a creature's ability to feel and touch objects in the environment.
- **Wallowing:** Rolling around in the mud.

Life Skills

Accepting differences, communication, contributions to group effort, cooperation, critical thinking, decision making, goal setting, organizing, problem solving, sharing, teamwork, wise use of resources

Subject Links

Science, Language Arts

Overview of Activities

The activities in this unit focus on three specific swine behaviors: rooting, wallowing, and social hierarchy. In the activity *Two Senses in One!*, youth will learn how swine combine their senses of smell and touch to find and obtain food located beneath the soil surface by means of a behavior known as “rooting.” Youth will mimic this rooting as they try to locate different scents buried in soil using their sense of smell. Once they accomplish this, they will search for the source of the scent, using their fingers to “root” through the soil in search of their “food.”

The second activity, *Save Your Skin*, will introduce youth to wallowing. Youth will explore a variety of natural materials (e.g., sand or gravel, water, grass clippings, soil) to see which might work best to protect their skin from the sun. Once they have completed this exploration, they can explore further by mixing the dry ingredients with water to see if that will allow them to produce a better sun block. The results can be a bit messy, but informative!

Swine are gregarious animals: they establish a social hierarchy with their littermates early in life, and this group order lasts their entire lifetime. Youth will explore aspects of swine social hierarchy through two activities. In *It's a Group Thing*, youth will work in teams to accomplish a common goal. However, the composition of the teams will be changed at random—giving youth an idea of the tension and anxiety that may arise with swine when new members are introduced to their social group. A second activity, *Food Fight!*, focuses on situations that can arise within a social group of swine. When youth role-play swine of different sizes and genders during feeding time, they will soon discover some of the effects that social structure can have!

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FACTS ABOUT SWINE

HISTORY AND DOMESTICATION

- Swine have existed for at least 45 million years and are related to hippopotamuses and peccaries.
- Swine were among the first animals to be domesticated, starting between 9,000 and 10,000 years ago in what is now China.
- Images of swine appear in paintings and carvings from as far back as 25,000 years ago.
- The majority of breeds descended from Eurasian wild boar (*Sus scrofa*).
- The first swine were brought to the United States by Polynesians, who introduced them in Hawaii around 1000 A.D. On the mainland, Spaniards brought swine to the American southeast in the early 16th century.
- Swine are found on every continent with the exception of Antarctica.
- Swine meat is used as a source of food (pork is the most-consumed meat in the world) and leather made from swine hides is used for gloves, footballs, and other items. The stiff hair from swine is used to make bristles for brushes.
- Some people raise swine as pets.

SWINE!

- Order: Artiodactyla (even-toed, hoofed animals).
- Family: Suidae.
- Biologically, swine are related to peccaries and hippopotamuses.
- The average lifespan of a swine is 6 to 10 years, although those kept as household pets can live considerably longer, up to 16 years!
- Hair type: Varies (bristles, hairless, curly wool).
- Hair color: Varies (white, black, multicolored).
- They are important farm animals.
- There are over 70 breeds of swine.
- Swine are omnivores and have an excellent sense of smell.
- Swine have a rather long, movable snout, their body is stout and heavy, with short legs, their hide is thick and bristly, and they have a short tail.
- Swine is the name typically used for domesticated animals, although they are also referred to as hogs or pigs.
- Adult female swine are called sows; adult males are called boars.
- Juvenile swine are referred to as piglets, while a litter of pigs is referred to a farrow.
- Sows normally produce 10 to 12 piglets per litter.
- A young swine ranging in size between 100 to 180 pounds is called a shoat.
- A gilt is an immature female pig; a barrow is a castrated male pig.

WILD SWINE

- Habitat: Wild swine roam in forests, meadows, and swamps.
- Characteristics: They are surefooted, rapid runners and good swimmers, and they love mud baths.
- When attacked, wild swine will always fight, using their tusks as weapons.
- Wild swine are known to eat leaves, seeds, roots, fungus, fallen fruit, grass, insects, birds' eggs, lizards, and even small mammals.

BEHAVIOR

- Vision: Not well developed.
- Hearing: Swine have excellent hearing.
- Smell: Swine have an excellent sense of smell.
- Touch: Their snout is very sensitive.
- Swine are very intelligent animals and are considered easier to train than dogs or cats!
- They spend most of their time foraging and eating.
- Wild (or feral) swine are nocturnal (active at night). Domestic swine adapt their behavior patterns to the light and feeding schedules of the farms on which they live.
- Swine are gregarious and social. They establish a lifelong dominance order with their litter mates early in life.
- Adult boars usually are territorial and solitary, except during the mating season.
- Social hierarchy among swine is established by fighting.

- Swine form matriarchal groups that consist of about 3 to 5 piglets and yearlings. Matriarchal groups are called herds or sounders. (In a matriarchal system, the mother is head and ruler of her family and their descendants.)
- A sow about to give birth will temporarily leave her group and make a nest for her newborns by rooting a shallow hole in the ground and building a nest there with branches and soft material.
- Rooting behavior: Swine have an excellent sense of smell. They often find food underground and use the hardened, front edge of their snout to dig, a behavior known as rooting. A swine will root about 60 times every 24 hours. Swine are able to do this because their snout contains a rooting disk that has many tactile receptors (like the tactile receptors of a human hand) that allow the pig to explore the environment and search for food on and under the ground.
- Wallowing: Swine lack sweat glands. In order to help keep their body cool, they wallow, rolling around in mud to keep cool, remove parasites, and acquire an external “coat” to protect them from biting insects.
- Despite their habit of wallowing in mud, swine are clean animals. They do not excrete wastes anywhere near the places where they live or eat.
- Swine have naturally dry skin and they scratch it a great deal. They also scratch heavily once a year when they lose their coat of hair.

SWINE AS PETS

- Pet swine require a lot of affection and attention.
- They are smart animals and can learn to push levers for food.
- Like dogs, swine tend to follow people around. They can be housetrained.
- People who own swine as pets often provide them with toys such as beach balls and old tires.
- Swine seem to enjoy listening to music.
- Swine need to be fed daily and must have unlimited access to clean water.

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ACTIVITY 1

Two Senses in One!

BACKGROUND INFORMATION

A pig's snout is a very important part of its body. Pigs dig with their snout (this is called rooting) and do so frequently (about 60 times every 24 hours). A pig has what is called the prenasal bone located just below its snout. This bone strengthens the snout, making it an efficient digging tool. A pig's snout also has a rooting-disk on the round end of the snout that has many tactile (touch) receptors, making it very sensitive to contact—something like the tips of your fingers. Finally, a pig's nose has excellent olfactory (smell) receptors, enabling them to have a great sense of smell. With their snout as a strong digging tool and their great senses of touch and smell, pigs are able to quickly and carefully explore their environment and search for food on and under the ground.

Time Required

45 to 60 minutes.

Concepts and Vocabulary

Olfactory (smell) receptors, prenasal bone, rooting, rooting-disk, tactile (touch) receptors.

Life Skills

Communication, critical thinking, record-keeping, teamwork.

Subject Links

Science, Language Arts

State Content Standards

Science

- Fourth Grade:
 - » Investigation and Experimentation – 6d

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies – 1.7, 1.8
- Fifth Grade:
 - » Listening and Speaking Strategies - 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies – 1.5

Suggested Grouping

Small groups of 3 to 5 individuals.

Materials Needed

- Aromatic objects (e.g., clove of garlic, chopped onion, piece of scented soap, citrus peels, cotton balls soaked with perfume, broken cinnamon sticks, coffee beans, and herbs or spices). To determine the number of aromatic objects you will need, plan to have one type (e.g., clove of garlic) of aromatic object per youth. You will need two samples of each type of aromatic object you use—one to bag and one to bury—so the total number of aromatic objects will be twice the number of youth.
- Medium to large containers (e.g., rectangular plastic containers approximately 11 x 14 x 6 inches). You will need as many containers as there are groups. For example, if you have four groups of youth, you will need four plastic containers.
- Two to four 8- to 12-lb bags of potting soil or topsoil.
- A brown paper bag (lunch bag-size) to hold each aromatic item.
- Flip chart paper
- Writing instruments (pencils, pens, or markers)

Getting Ready

- Take one of each aromatic item and place it in its own brown paper bag. Mark each bag with a separate number and place each bag at its own station.
- Fill each medium to large container with 5 to 6 inches of potting soil. Place each container at its own station.
- Divide the remaining aromatic objects into groups of three to four different objects. Bury each group of objects in one of the containers of soil, making sure the items aren't sticking out at all and can't be seen through the sides of the container. Try to place each item at a different depth as well.
- Divide the youth into groups of three to five.
- Provide each group with a piece of flip chart paper and writing instruments that they can use to keep a record of their thoughts and observations.

OPENING QUESTIONS

1. **What do we know about our five senses? Please explain.** Ask the youth to share their thoughts verbally or record their responses on their flip chart paper.
2. **Why do you think our senses are so important to us? Please explain.** Ask the youth to share their thoughts verbally or record their responses on their flip chart paper.
3. **Why do you think an animal's senses are important to it? Please explain.** Ask the youth to share their thoughts verbally or record their responses on their flip chart paper.

PROCEDURE (EXPERIENCING)

1. For the first part of the activity, have each group visit one of the stations where a paper bag is located. Ask them to reach into the paper bag to touch and feel the item with their fingertips (Volunteer Tip: Make certain they don't use their sense of sight!) After they feel the mystery item, have them smell the tips of their fingers. Ask them to describe what they felt and describe what they smelled, and ask them to record their observations. Encourage the youth to use a variety of adjectives to describe the objects. Ask them what they believe the item is based on their observations, but do not confirm whether their predictions are right or wrong.
2. Have each youth visit each paper bag station so that each youth will have a chance to touch, smell, and record his or her observations on the flip chart paper provided.
3. For the second part of the activity, have each group visit the stations with the containers filled with soil. At each station, ask them to smell across the surface of the soil. If necessary, have them get very close to the soil. What do they observe using their sense of smell? Ask them to record their observations. Are they able to locate any buried objects using their sense of smell? (Volunteer Tip: Make sure that the aromatic objects do not become uncovered.) Have the youth record what they smell, what they believe the items to be, and where they believe they will find them. Do not tell the youth how many objects are in the containers; simply tell them that there are items that need to be discovered.
4. Next, based on the predictions the groups made using their sense of smell, allow one youth from each group to use two fingers of one hand (but not the whole hand!) to probe in the soil and feel for the buried items. Have them record their observations based on their sense of touch, and ask them to predict what the items are

without removing the items from the soil. (Volunteer Tip: Let them know they may smell their fingers, but they must not expose the buried objects.)

5. Repeat Steps 3 and 4 at each station, making sure each youth gets a chance to smell, feel, and record.

SHARING, PROCESSING, AND GENERALIZING

Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth. If necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

- When the youth share the observations, comparisons, and predictions they made, are they similar from one group to another? Different? Discuss.
- Have the youth remove the items from the paper bags and from the soil. Ask them to compare what they find to the predictions they wrote down on paper.
- Did the youth have any challenges when they tried to use their sense of touch on the items in bags or in the soil? What were they? Was it more challenging to identify items in paper bags or in soil? Why?
- Have the youth compare each method used for gathering information. Which sense (smell or touch) was easier for the youth to use to make observations? Discuss.
- Ask the youth if they think pigs face these same challenges when they use their snout. Why or why not?
- What advantages (if any) do the youth think there would be to having a nose that can smell and feel? Explain.
- Did the youth have any particular challenges when they tried to use their sense of smell to locate the different objects? If so, what were they? Was it more challenging to identify items by smell in paper bags or in soil? Please explain.

CONCEPTS AND TERMS

At this point, volunteers need to make sure that the concepts and terms **olfactory (smell) receptors**, **prenasal bone rooting**, **rooting-disk**, and **tactile (touch) receptors** have been introduced to or discovered by the youth. (**Note:** The goal is to get the youth to develop concepts like these through their own exploration and to have them define the terms using their own words.)

CONCEPT APPLICATION

Ask the youth each of the following:

- If you raise swine yourself, spend time observing them for any rooting behavior. When do they root? How often do they root? Do some members of the group root more frequently than others? Observe them at different times of the day as well as over a period of several days to make comparisons.
- Use your senses of smell and touch to shop for fruits and vegetables! During your next visit to the local grocery store, take a stroll down the produce aisle and pick up a fruit or vegetable (e.g., a cantaloupe or a tomato). Feel each food item. Can you tell by touch whether it's fresh? Try smelling it. Can you tell if it's fresh by smelling it? Which method do you think does a better job of indicating freshness? Or does a combination of touch and smell serve as a better indicator of freshness?

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ACTIVITY 2

Save Your Skin

BACKGROUND INFORMATION

Pigs do not have sweat glands, so to avoid overheating they roll themselves (or *wallow*) in mud. But wallowing serves other purposes besides just keeping the pig cool: the mud keeps mosquitoes and other insects from biting or irritating the pig's skin, protects the skin from harmful rays of the sun, cleans off external parasites, and, in cool weather, the extra "coat" of mud helps the pig stay warm.

Time Required

45 to 60 minutes.

Concepts and Vocabulary

Wallowing.

Life Skills

Communication, critical thinking, problem solving, teamwork.

Subject Links

Science, Language Arts

State Content Standards

Science

- Fourth Grade:
 - » Investigation and Experimentation – 6c 6d
 - » Language Arts
- Fourth Grade:
 - » Listening and Speaking Strategies – 1.7, 1.8
- Fifth Grade:
 - » Listening and Speaking Strategies – 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies – 1.5

Suggested Grouping

Groups of 3 to 5 individuals.

Materials Needed

(* = *Materials provided in curriculum*)

- 6 or 7 one-gallon milk jugs or other similar containers for each group. Jugs should be cut in half; use the bottom portion.
- Enough dirt, water, grass, and gravel or stones to each fill one of the jugs $\frac{3}{4}$ full (leave the remaining jugs empty).
- Paper towels, baby wipes, or buckets of clean water for hand cleaning
- Flip chart paper
- Writing instruments (pencils, pens, or markers)
- * *Breeds of Swine* pictures

Getting Ready

- Divide the youth into groups of 3 to 5 individuals.
- Set up one station per group. Each station should have the following materials:
 - » One piece of flip chart paper and a pen, pencil, or marker.
 - » Paper towels for youth to wipe off their hands.
 - » Four containers, each $\frac{3}{4}$ full with one of the following materials and set out in the following order (from left to right):
 - › Grass
 - › Dirt
 - › Water
 - › Gravel or stones

» Two or three empty containers (these will be used in the second part of the activity).

- Make enough copies of the pictures of *Breeds of Swine* for each group. Fold each picture as indicated so that the picture is on one side and the description is on the other.

OPENING QUESTIONS

1. **What happens to your body when you are exercising or in a hot place?** Ask the youth to share their responses verbally or record them on the flip chart paper provided.
2. **How do you feel when you get too hot? Please describe.** Ask the youth to share their responses verbally or record them on the flip chart paper provided.
3. **What are some things in the environment that you need to protect your skin from?** Ask the youth to share their responses verbally or record them on the flip chart paper provided.
4. **What can you do to protect your skin from the environment?** Ask the youth to share their responses verbally or record them on the flip chart provided.

PROCEDURE (EXPERIENCING)—STAGE 1

1. A volunteer should read the following scenario to the youth:

Pretend that you are stranded on a deserted island, wearing only your bathing suit. The sunlight is very strong on the island and there is very little shelter or shade. In addition, there are many biting insects, such as flies and mosquitoes. You decide that you are going to try to collect materials to build a shelter, but as you work you notice that your skin is starting to get very hot and you are getting a lot of insect bites. You decide that you need to find some way to protect your skin so you can keep working on your shelter. You find only four materials on the island that might work. They are water, grass, dirt, and stones.

2. Each station has a sample of these four materials. Have each group spend some time thinking about how each of these materials might solve the skin protection problem. Let them know they can touch all of the materials and try to cover their skin with them, but they may not mix them. Ask them to record all of their ideas, observations, and comparisons on the paper provided.

SHARING, PROCESSING, AND GENERALIZING—STAGE 1

After the youth have had a chance to explore all four of the materials and record their observations, volunteers should engage them in a group discussion about what they have written before they move on to the next stage of the activity.

PROCEDURE (EXPERIENCING)—STAGE 2

1. Now present the youth with 2 or 3 empty containers per group. Tell the youth that they may use these containers to make combinations of any two materials (e.g., water and grass, dirt and stones, water and dirt, etc.) to create the best substance possible for protecting their skin from heat and bugs.
2. Have each group spend a few minutes exploring the combinations and then ask each group to decide which material or combination of materials they think would work the best to protect their skin from the heat and bugs. Ask them to write their thoughts and ideas on the flip chart paper provided.

SHARING, PROCESSING, AND GENERALIZING—STAGE 2

Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

- Which material or combination of materials did your group choose, and why? Please explain.
- What is it about this material or combination of materials that makes you believe it is the best choice? Please explain.

If the youth are having trouble deciding on a combination of materials or explaining their choices, use the questions below to help them work through the process.

- How did each material make your skin feel while your hand was in the container?
- How did each material make your skin feel after you removed your hand from the container?

PROCEDURE (EXPERIENCING)—STAGE 3

Now volunteers can hand out the *Breeds of Swine* sheets to the youth. Have them spend a few minutes looking at each picture and making observations and comparisons. Have them record their observations and comparisons on the flip chart paper provided, and also record any questions that may arise.

Volunteer Tip: Make enough copies of the *Breeds of Swine* sheets for every group to have one. Each group should be able to observe all 12 sheets.

SHARING, PROCESSING, AND GENERALIZING—STAGE 3

Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

- Look at these pictures of different types of pigs. What can you tell about their skin? Explain.
- How do you believe a pig's skin is similar to your skin and how do you believe it is different? Explain.
- What are some things in the environment that pigs might need to protect their skin from? Explain.

CONCEPTS AND TERMS

At this point, volunteers need to make sure that the concept and term **wallowing** has been introduced to or discovered by the youth. (**Note:** The goal is to get the youth to develop such concepts through their own exploration and to have them define the terms using their own words.)

CONCEPT APPLICATION

Ask the youth these questions:

- If you raise swine, spend time observing their behavior. When and where do they wallow? How often do they wallow? Do some members of the group exhibit this behavior more than others? Observe them at different times of the day as well as over a period of several days so you can make comparisons.
- If you don't have swine, visit a swine production facility or another home where swine are kept and observe them there.

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BREEDS OF SWINE

Print one-sided on heavy paper and cut out along dashed lines.



Name: Hezuo. **Origin/Location:** Plateau region and in Gansu Province, China. **Characteristics:** Long, coarse, dense bristles. **Facts:** They are out at pasture year round.



Name: Berkshire. **Origin/Location:** Supposedly first discovered in Reading, England. **Characteristics:** Their coat was originally a reddish or sandy color; some were spotted. Cross-breeding with other swine gave the color pattern seen today. **Facts:** Berkshires produce fine quality ham and bacon and have an excellent carcass quality. They have had a great influence upon the swine industry over the past century.



Name: Angeln Saddleback (aka: Angler Sattelschwein) **Origin/Location:** Angeln, a region of Northern Germany. **Characteristics:** White belt on a black body; very large in size. **Facts:** In the 1950s, the Angler Sattelschwein was popular in the market, but a few years later it became too fat for the consumer. The breed is nearly extinct.



Name: Duroc (aka: Duroc-Jersey) **Origin/Location:** Eastern United States and in the Corn Belt. **Characteristics:** Durocs have a wide variation in color. An acceptable color may range from a very light golden (almost yellow) to a very dark red.



Name: Arapawa Island **Origin/Location:** They were brought to the New Zealand island of Arapawa in 1770 by Captain James Cook of England. **Facts:** Many of them are still wild and have remained purebred, roaming the island.



Name: Hampshire. **Origin/Location:** Hampshire swine originated in the south of England and were first introduced to the United States in the early 1800s. **Characteristics:** Hampshires are black with a white belt. They are typically large, have excellent foraging ability, and high carcass quality.

Print one-sided on heavy paper and cut out along dashed lines.



Name: Mangalitsa [a.k.a. Wollschwein (German), Mangulica, Mangulac, Mangalita, Mangaliza, Mangalica, Hungarian Curly Coat, Porc laineux des Pacages, Wollhaariges].
Origin/Location: Originated in the former Austria-Hungary and has spread throughout Europe. **Characteristics:** Mangalitsa swine are strong and resistant to disease and stress. They have powerful legs and strong hooves that allow them to move through any type of terrain. They have a thick, bristly coat that protects them in all types of weather. This breed exhibits a wide variety of colors, from a yellowish white to black or red. At one time they were popular for the production of bacon and lard.



Name: Swabian-Hall Swine (a.k.a. Schwäbisch-Hällisches Schwein).
Origin/Location: Originated in a region in southwestern Germany.
Characteristics: They typically have a large black head and hindquarters; in between is a grey zone of pigmented skin and unpigmented hair. **Facts:** Produces a high-quality ham. Although hardy, long-lived, and exhibiting a high rate of fertility, this breed was only recently near extinction. Today, though, there are many breeders and its tradition has been preserved.



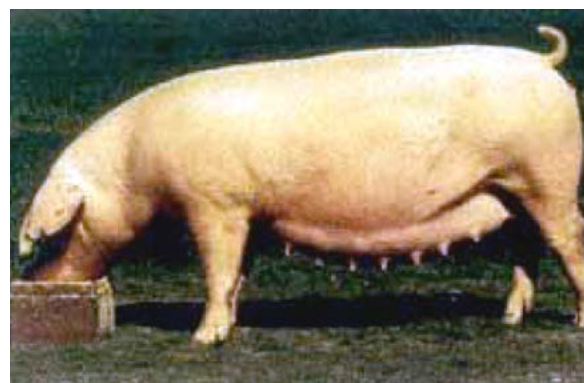
Name: Mukota (a.k.a. Rhodesian Indigenous, Zimbabwe Indigenous). **Origin/Location:** These swine are now predominately found in Zimbabwe and in some parts of Mozambique and Zambia, having been introduced there by European and Chinese traders in the 1600s and 1700s. **Characteristics:** There are two classes of Mukota pigs. One resembles the Chinese Lard pig and is short and fat with a short snout. The other class resembles the Windsnyer pig. It has a long nose and a razor back. Both classes are black with no shades or spots. **Facts:** Mukota pigs are well adapted to harsh tropical environments, with a low requirement for food and water.



Name: Fengjing. **Origin/Location:** Introduced to the United States at Iowa State University in 1989, these swine originated in a north central region of China where there is a mild climate. **Characteristics:** Pigs of this breed are slow growing and fat. They are resistant to some diseases. You can recognize them by their wrinkled face and skin. **Facts:** These pigs are highly prolific breeders. They commonly have two large litters per year and the survival rate for litters is very high.



Name: Lithuanian Native (a.k.a. Vietines kiaules). **Origin/Location:** This breed, which originated in the country of Lithuania, is now close to extinction and efforts are being made to preserve it. **Characteristics:** These pigs can exhibit a range in coloration, including white, black, and tan, but most are multicolored. The "beads" that hang from under their neck are their most distinctive physical feature. **Facts:** Native Lithuanian pigs have an average body size and are highly tolerant to a range of feeding and housing conditions. Their skin is relatively thick and they have long bristles.



Name: American Landrace. **Origin/Location:** This breed is a descendant of the Danish Landrace hogs from Denmark. **Characteristics:** The American Landrace is a white hog with a long body with an unusually flat back. The pigs have large, heavy ears that are close to the face. **Facts:** Sows of this breed reproduce well and produce large amounts of milk.

ACTIVITY 3

It's a Group Thing

BACKGROUND INFORMATION

Swine are social animals. They live in groups with an established social order where some individuals are more dominant than others. An individual's place in this social order is based mainly on size and gender. The social hierarchy is life-long and you have to keep it in mind when feeding the animals because larger, more dominant swine will push others away from the food if they can. When a social order has been established in a group, pigs are said to “know their place”; however, when you introduce unfamiliar pigs into the group, this balance is disrupted and aggressive encounters (e.g., biting) may occur. This is particularly common when pigs are housed in small pens.

Time Required

20 minutes.

Concepts and Vocabulary

Social dominance, social order.

Life Skills

Accepting differences, decision making, goal setting, organizing, problem solving, teamwork, wise use of resources.

Subject Links

Science, Language Arts

State Content Standards

Science

- Sixth Grade
 - » Investigation and Experimentation – 7d

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies – 1.7, 1.8
- Fifth Grade:
 - » Listening and Speaking Strategies - 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies – 1.5

Suggested Grouping

Groups of 3, 4, or 5 youth.

Materials Needed

- Metal paperclips (No. 1 Size) (4 per group)
- Popsicle sticks (1 per group)
- Rubber bands (2 per group)
- Plastic straws (1 per group)
- Pieces of string (5 inches in length; 2 per group)
- Chenille stems (pipe cleaners) (3 inches in length; 2 per group)
- Small rectangular boxes: shoeboxes, tissue boxes, etc. (approximately 6 inches wide and 3 inches tall; 1 per group)
- Eggs (1 per group) (**Volunteer Note:** Eggs should be hard-boiled, but do not tell the youth that they are)
- Clock with a second hand
- Flip chart paper
- Writing instruments (pencils, pens, or markers)

Getting Ready

- Note: This is a materials-intensive activity, so advance preparation is important.
- Before starting the activity, put the youth into groups of 3, 4, or 5.
- Give each group a box and an egg.
- Distribute materials to each group according to the charts below.

Groups of 3	Straws	Popsicle sticks	Rubber bands	Chenille stems	String	Paperclips
Child 1	1	1				
Child 2			2	2		
Child 3				2	2	2

Groups of 4	Straws	Popsicle sticks	Rubber bands	Chenille stems	String	Paperclips
Child 1	1					
Child 2		1	2			
Child 3					2	2
Child 4				2		2

Groups of 5	Straws	Popsicle sticks	Rubber bands	Chenille stems	String	Paperclips
Child 1	1					
Child 2		1				
Child 3			2			
Child 4				2		2
Child 5					2	2

Note: If you need to keep track of each group's materials, make copies of the blank chart below.

Groups #	Straws	Popsicle sticks	Rubber bands	Chenille stems	String	Paperclips
Child 1						
Child 2						
Child 3						
Child 4						
Child 5						

OPENING QUESTIONS

1. **What are some things you enjoy about being on a team?** Please record your responses on the flip chart paper provided.
2. **What characteristics do you think help make the members of a team work well together?** Please record your responses on the flip chart paper.
3. **What are some characteristics of a group that can make it difficult for group members to work together?** Please explain and record your responses on the flip chart paper.

PROCEDURE (EXPERIENCING)

1. Provide a total of 20 minutes for the activity.
2. Make sure each youth knows which materials he or she is responsible for.
3. Ask each group to construct a bridge over the widest part of the box opening, from one side to the other, using only the materials they were provided with for the activity. Their goal is to make a bridge that will support the egg without breaking it. Remind the participants that they are working as a team and should develop a plan together. They are allowed only 7 minutes for this round.
 - » **Volunteer Note:** Youth are not allowed to manipulate, shorten, or warp the box to make it easier to make the bridge.

4. Once the 7 minutes are up, choose one person from each group and rotate that person to another group. Those participants should take the materials they brought to their first group with them. Make sure that each person being rotated has items that are different from those of every other person who is being rotated. (For example, if you have three groups altogether, you can choose one member with pipe cleaners, another with popsicle sticks, and another with paper clips.) In addition to the rotation, choose one participant at random from one of the groups to sit out the next round. That participant should leave his or her items behind. He or she will be put back into a group after the end of the round.
5. Have the groups continue building their bridges, or they may have to develop plans for a new bridge because their materials will have changed. Allow 5 minutes for this round.
6. After 5 minutes, stop the activity and rotate one person from each group again. Make sure that participant takes his or her materials. As before, choose one participant at random to sit out the round, leaving his or her materials, and put him or her back after the end of the round.
7. After the rotation, have the groups start building again. After 3 minutes, rotate one last time. (Note: At this point the groups will have only 5 minutes remaining to complete their task.)
8. At the end of this activity, have each group explain to the other groups why they built their bridge the way they did and tell how well it functioned.

SHARING, PROCESSING, AND GENERALIZING

Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

- What were the most challenging parts of this activity? What were the easiest parts? Please record and discuss your responses.
- Was it better to have members of the groups rotate or have the groups stay the same? Why? Please record and discuss your responses.
- How did it feel to be part of a group? If you were removed from a group, how did that make you feel? Please record and discuss your responses.
- How do you think the experience of living in groups applies to the lives of other animals? Please record and discuss your responses.
- Pigs are social animals and live in groups. How do you think changing the makeup of their groups (like you did in this activity) might affect them? Please discuss and record your responses.

CONCEPTS AND TERMS

At this point, volunteers need to make sure that the concepts and terms **social dominance** and **social order** have been introduced to or discovered by the youth. (**Note:** The goal is to get the youth to develop these concepts through their own exploration and to have them define the terms using their own words.)

CONCEPT APPLICATION

Ask the youth these questions:

- If you raise your own swine, observe and record the social behavior of your animals 10 minutes each day for one week. Can you identify which animal is the most dominant animal? What types of behavior does this animal exhibit that indicates his/her dominance? How do the other swine respond? Explain.
- If you do not raise swine, observe and record the behavior of any animals living in a group (e.g., a flock of ducks or geese) for 10 minutes per day for one week. How do they interact? Are there any indications of social interactions? If so, please record and explain. Is there any indication of social dominance by one or more animals? If so, what types of behaviors indicate that to you? Please record and explain.

REFERENCES

University of Arizona Institutional Animal Care and Use Committee. 2008. IACUC learning module: Species information—Pigs. www.iacuc.arizona.edu/training/swine/species.html.

ACTIVITY 4

Food Fight!

BACKGROUND INFORMATION

Pigs establish their social hierarchy at birth. As piglets, the larger animals easily climb over the smaller ones to reach the sow's teats. If the group of piglets grows up together, then that hierarchy will probably remain unchanged throughout their lives. In groups of adult pigs, the social hierarchy is determined to a large extent by size, with larger pigs being more dominant than smaller pigs. To determine which pig is the most dominant in the group, just watch how the other pigs react to each other. If one pig can push and shove at the food trough, causing the others to move aside, this is generally a dominant pig. Sometimes there is fighting among the pigs—especially when a smaller pig challenges a larger one, for instance by refusing to move aside when shoved by the larger pig. Fighting usually occurs between males. They grunt loudly, froth at the mouth, and bite one another. Sometimes adult boars are extremely aggressive and have to be removed from the group.

Time Required

40 minutes.

Concepts and Vocabulary

Competition, dominant, social hierarchy, subordinate.

Life Skills

Contributions to group effort, cooperation, critical thinking, decision making, problem solving, sharing.

Subject Links

Language Arts

State Content Standards

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies – 1.7, 1.8
- Fifth Grade:
 - » Listening and Speaking Strategies – 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies – 1.5

Suggested Grouping

Groups of 5.

Materials Needed

(* = *Materials provided in curriculum*)

- * *Pig Profiles* (photocopy and cut along the lines). Each youth will need one pig from the “similar weights” set of profiles (set 1) and one pig from the “different weights” set of profiles (set 2).
- 1-lb bag of candy (individually wrapped, such as hard candy, salt water taffy, fruit-flavored chews, etc.)—one bag for each group of 5 youth.
- Small plastic containers (to hold the candy)—have one container per group (the sizes can vary).
- Flip chart paper
- Writing instruments (pencils, pens, or markers)

Getting Ready

- There are TWO sets of *Pig Profiles*. One has a group of pigs with similar weights (set 1); the other, pigs with evenly distributed but different weights (set 2). Make sure to keep these two sets separate.
- There are enough *Pig Profiles* for two groups of 5 youth to complete the activity. If you need to create more groups, you will need to make additional copies of the profiles.
- For each group of 5 youth, place 1 lb of candy in a plastic container. If there are fewer than 5 youth in a group, decrease the amount by about 3 handfuls per youth.

OPENING QUESTIONS

Ask the youth these questions:

- What do you know about animals that live in groups? Please record your thoughts and ideas on the flip chart paper provided.
- What do you know about competition? Please record your thoughts and ideas on the flip chart paper provided.
- What effects do you think competition within groups of animals might have on the group? Please record your thoughts and ideas on the flip chart paper provided.

PROCEDURE (EXPERIENCING) – ROUND 1

1. Divide the youth into small groups.
2. Explain to the youth that they are going to compete for a limited resource: the candy. The rules of the game are as follows:
 - » The youth will be playing the role of pigs in a group. Each pig will have a chance to take candy from the container depending on his or her size. The largest pigs should be allowed to go before the smaller pigs.
 - » The leader will instruct everyone about how to start the game. When they are told to “go,” each youth in each group must first look at his or her profile card. Then they will work as a group to determine the order in which the members of the group will get access to the candy.
 - » Once the groups have determined their order, the leader will signal for the first “pig” to go.
 - » After 5 seconds, the second pig should join and so forth until all pigs are at the container.
 - » The youth are to use ONLY ONE HAND to gather and hold candy—no filling of pockets, shirts, etc. Once the first youth in a group has gathered all the candy he or she can hold, he or she must move away from the container.
 - » When there are multiple pigs at the container, allow them to “fight” over the candy until all of it is gone. Some pigs may end up with no candy at all.
 - » Have the youth count how many pieces of candy they gathered and then return them to the containers. Then have them hand their profile cards to the leader.

3. Use Set 1 of the *Pig Profiles*, where all of the pigs are one of two weights. There are enough profiles in Set 1 for 10 individuals to participate. Give 5 youth a profile for a 60 kg (132 lb) pig and give the other 5 youth a profile for a 250 kg (550 lb) pig. Make sure that the youth do not look at their profile cards until they are told to start.

Note: The minimum food requirements for this activity are 35 to 40 pieces of candy for a 250 kg (550 lb) pig and 15 to 20 pieces for a 60 kg (132 lb) pig.

SHARING, PROCESSING, AND GENERALIZING

Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

- What happened in this activity, and how did it make you feel? Explain. Record your responses.
- What might happen if groups of pigs always had to compete in this way over important resources like food and water? Explain. Record your thoughts and ideas.
- What thoughts or ideas do you have to try to reduce this type of competition if you were raising a group of swine? Please record your responses.

PROCEDURE (EXPERIENCING)—ROUND 2

1. Divide the youth into small groups.
2. Explain to the youth that they are going to compete for a limited resource: the candy. The rules of the game are as follows:
 - » The youth will be playing the role of pigs in a group. Each pig will have a chance to take candy from the container depending on his or her size. The largest pigs should be allowed to go before the smaller pigs.
 - » The leader will instruct everyone about how to start the game. When they are told to “go,” each youth in the group must first look at his or her profile card. Then they will work as a group to determine the order in which the members of the group will get access to the candy.
 - » Once the groups have determined their order, the leader will signal for the first “pig” to go.
 - » After 5 seconds, the second pig should join and so forth until all pigs are at the container.
 - » The youth are to use **ONLY ONE HAND** to gather and hold candy—no filling of pockets, shirts, etc. Once the first youth in a group has gathered all the candy he or she can hold, he or she must move away from the container.
 - » When there are multiple pigs at the container, allow them to “fight” over the candy until all of it is gone. Some pigs may end up with no candy at all.
 - » Have the youth count how many pieces of candy they gathered and then return them to the containers. Then have them hand their profile cards to the leader.

Use Set 2 of the *Pig Profiles*, where the weights of all of the pigs are different. There are enough profiles in Set 2 for 10 individuals to participate. Give each youth one profile card. Make sure that the youth do not look at their profile cards until they are told to start. **Note:** The minimum food requirements for this activity are 35 to 40 pieces of candy for a 250 to 300 kg pig, 25 to 30 pieces for a 150 to 249 kg pig, 15 to 30.

SHARING, PROCESSING, AND GENERALIZING

Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

- In what ways did the first round of this activity differ from the second round? In what ways was it similar? Record your responses.
- Did everyone get at least their minimum specified amount of food? Why or why not? Record your thoughts and ideas.

CONCEPTS AND TERMS

At this point, volunteers need to make sure that the terms **social hierarchy**, **competition**, **dominant**, and **subordinate** have been introduced to or discovered by the youth. (**Note:** The goal is to get the youth to develop concepts like these through their own exploration and to have them define the terms using their own words.)

CONCEPT APPLICATION—ENTIRE GROUP

1. Looking at these two activities, ask the youth to brainstorm ways for all pigs, regardless of size, to get enough resources. Ask them to record their thoughts and ideas and then explain them.
2. How might the activity be modified so everyone will get the amount of food they need? Ask them to record their thoughts and ideas and then explain them.

CONCEPT APPLICATION

Ask the youth to the following:

1. For youth who have their own pigs: Spend some time observing the pigs and watching their social interactions. The youth can use a notebook to record how the pigs behave during feeding time or in other social situations, and should try to determine the social hierarchy in their group of pigs, trying to determine which pigs are dominant and which are subordinate. The youth should also watch to make sure that there is not too much fighting and that all of the pigs are getting the resources they need to grow and be healthy. If fighting does occur, the youth should talk with their family about changes they might make to the pigs' environment that could help decrease competition and facilitate a more equitable distribution of resources.
2. If you do not raise pigs yourself, find an opportunity to visit a farm or a zoo and observe animals that live in a group, and watch their social interactions. The youth can use a notebook to record how the animals behave during feeding time or in other social situations. Youth should try to determine if there is a social hierarchy among the group of animals and what the hierarchy is, trying to determine which animals are dominant and which are subordinate. They should also watch to see whether there is much fighting over necessary resources. If fighting does occur, the youth should talk with their family about changes that could be made to the animals' environment that could help decrease competition and facilitate a more equitable distribution of resources.

REFERENCE

- Farley, J. L., and W. J. van Riet (eds.) n.d. Swine care practices. California Pork Industry Group and University of California Cooperative Extension. www.vetmed.ucdavis.edu/vetext/local-assets/pdfs/pdfs_animal_welfare/swinecareprax.pdf.

PIG PROFILES · SET I (similar weights)

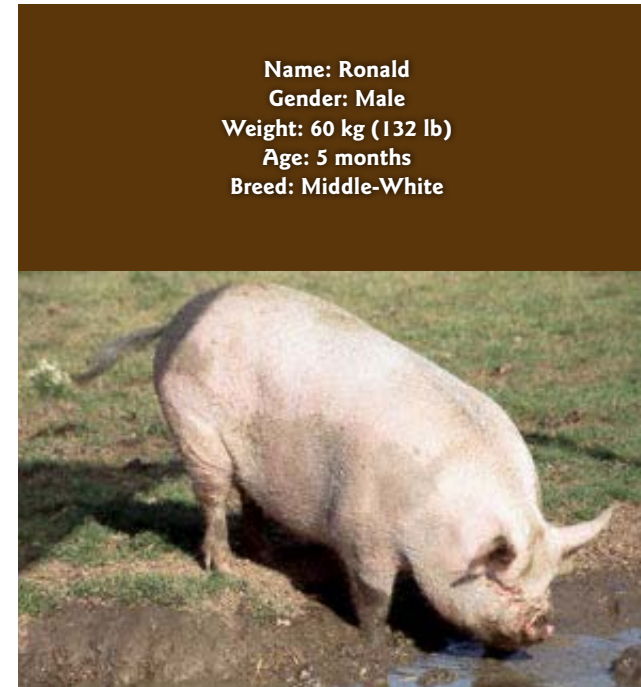
Print one-sided on heavy paper and cut out along dashed lines.



Name: George
Gender: Male
Weight: 60 kg (132 lb)
Age: 11 months
Breed: Vietnamese Potbelly



Name: Katie
Gender: Female
Weight: 60 kg (132 lb)
Age: 8 months
Breed: Fengjing



Name: Ronald
Gender: Male
Weight: 60 kg (132 lb)
Age: 5 months
Breed: Middle-White

Name: Daisy
Gender: Female
Weight: 60 kg (132 lb)
Age: 1 year
Breed: Mong Cai



Name: Mary
Gender: Female
Weight: 60 kg (132 lb)
Age: 10 months
Breed: Guinea

Name: Erik
Gender: Male
Weight: 250 kg (550 lb)
Age: 11 months
Breed: Krskopolje



PIG PROFILES · SET I (similar weights)

Name: Dan
Gender: Male
Weight: 250 kg (550 lb)
Age: 1½ years
Breed: Bentheim Black Pied



Name: Jenny
Gender: Female
Weight: 250 kg (550 lb)
Age: 11 months
Breed: Swabian-Hall



Name: Annie
Gender: Female
Weight: 250 kg (550 lb)
Age: 7 months
Breed: Mora Romagnola



Name: Jeff
Gender: Male
Weight: 250 kg (550 lb)
Age: 4 years
Breed: Turopolje



PIG PROFILES · SET 2 (varied weights)

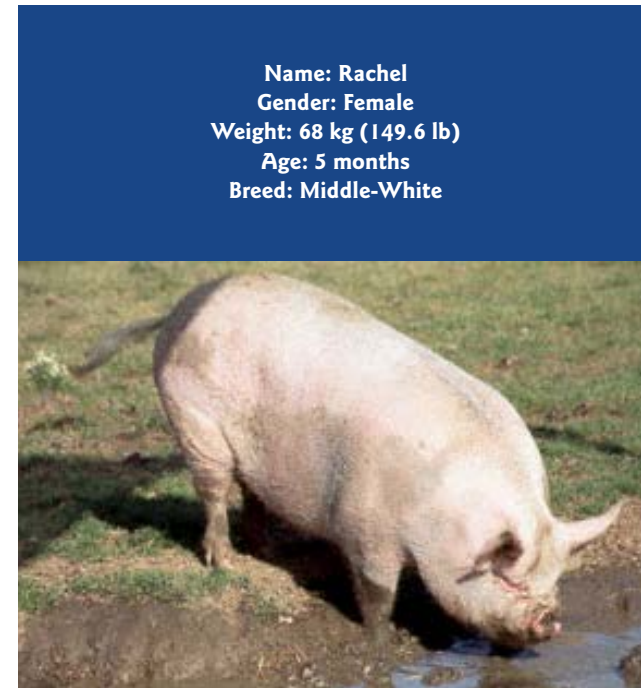
Print one-sided on heavy paper and cut out along dashed lines.



Name: Mark
Gender: Male
Weight: 68 kg (149.6 lb)
Age: 11 months
Breed: Vietnamese Potbelly



Name: Katie
Gender: Female
Weight: 180 kg (396 lb)
Age: 8 months
Breed: Fengjing



Name: Rachel
Gender: Female
Weight: 68 kg (149.6 lb)
Age: 5 months
Breed: Middle-White

Name: Danielle
Gender: Female
Weight: 180 kg (396 lb)
Age: 1 year
Breed: Mong Cai



Name: Paul
Gender: Male
Weight: 68 kg (149.6 lb)
Age: 10 months
Breed: Guinea



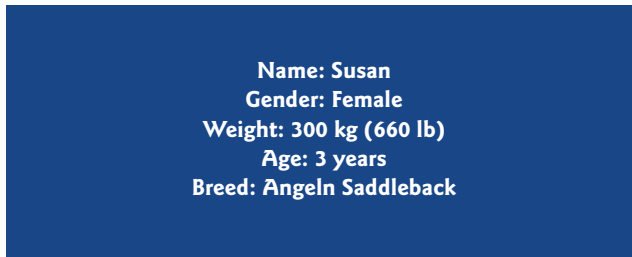
Name: Chris
Gender: Male
Weight: 300 kg (660 lb)
Age: 11 months
Breed: Krskopolje



PIG PROFILES · SET 2 (varied weights)



Name: Donna
Gender: Female
Weight: 180 kg (396 lb)
Age: 2 years old
Breed: Lithuanian Native



Name: Susan
Gender: Female
Weight: 300 kg (660 lb)
Age: 3 years
Breed: Angeln Saddleback



Name: Jack
Gender: Male
Weight: 300 kg (660 lb)
Age: 10 months
Breed: Bentheim Black Pied



Name: John
Gender: Male
Weight: 35 kg (77 lb)
Age: 1 year
Breed: Tibetan

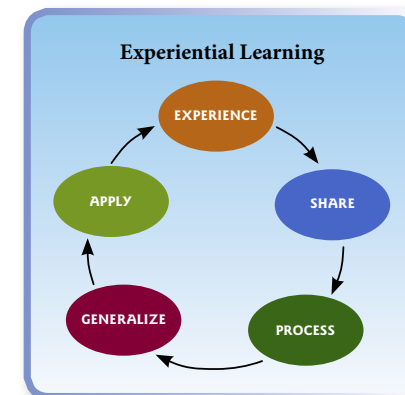


GLOSSARY

- **Balanced diet:** Eating the right types of food in the right amounts to maintain a healthy body.
- **Basic nutrients:** Substances that help maintain a healthy body. These include carbohydrates, proteins, vitamins and minerals.
- **Care:** Having concern for someone or something, which leads to tending or overseeing that person or thing.
- **Competition:** A struggle between individuals for food, space, and other important requirements for survival.
- **Direct contact:** Physical contact between an ill person or animal and a healthy person or animal.
- **Disease:** An abnormal condition that affects the normal function and health of an organism, decreasing the health of that organism.
- **Disease prevention:** Taking the necessary steps to prevent humans and/or animals from getting sick.
- **Disease transmission:** To transfer a disease from one person or animal to another.
- **Dominant:** Having influence, control, and authority over others.
- **Environmental needs of humans and swine:** The things that both humans and swine need in their home or living area to help them survive and live comfortably.
- **Essential nutrients:** Nutrients that humans and animals must have to live and function properly.
- **Germs:** Microorganisms that have the potential to cause diseases.
- **Health care monitoring:** Closely observing an animal's health, behavior and activity everyday to determine what is normal or abnormal about your animal.
- **Illness:** Being unhealthy or in poor health.
- **Indirect contact:** When an uninfected person or animal touches the contaminated surface (e.g., table top) of an inanimate object (e.g., food dish).
- **Life stages of swine:** Swine are categorized in different stages of development or life stages. Swine at each life stage have different nutritional requirements to grow and stay healthy.
- **Olfactory receptors:** Structures that aid with an individual's sense of smell. The more receptors you have, the better your sense of smell.
- **Prenasal bone:** A bone found in the snouts of pigs. This bone allows them to use their nose to dig for food in the ground.
- **Preventive health care:** The act of maintaining the health of humans and animals by preventing them from catching an illness or disease.
- **Responsibility:** Being accountable for one's actions or behaviors.
- **Rooting:** The act of pulling out or removing items from under the ground.
- **Rooting-disk:** A disk found in the snout of pigs that is very sensitive, allowing them to explore the surrounding environment.
- **Social dominance:** In a group, there are individuals that lead and have authority over others in the group.
- **Social hierarchy:** A system where individuals are ranked from top to bottom according to authority or importance.
- **Social order:** A system in place that keeps a group stable and functioning.
- **Subordinate:** Belonging to a lower level or rank in a group.
- **Tactile receptors:** Structures that aid with someone or something's ability to feel and touch items in the environment. The more receptors you have, the better your sense of touch.
- **Wallowing:** To roll around in the mud.

APPENDIX

The activities in this curriculum were designed around inquiry and experiential learning. Inquiry is a learner-centered approach in which individuals are problem solvers investigating questions through active engagement, observing and manipulating objects and phenomena, and acquiring or discovering knowledge. Experiential learning (EL) is a foundational educational strategy used in 4-H. In it, the learner has an experience phase of engagement in an activity, a reflection phase in which observations and reactions are shared and discussed, and an application phase in which new knowledge and skills are applied to a real-life setting. In 4-H, an EL model that uses a five-step learning cycle is most commonly used. These five steps—Experiencing, Sharing, Processing, Generalizing, and Application—are part of a recurring process that helps build learner understanding over time.



For more information on inquiry, EL, and the five-step learning cycle, please visit the University of California Science, Technology, and Environmental Literacy Workgroup's Experiential Learning website, <http://www.experientiallearning.ucdavis.edu/default.shtml>.

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SWINE : *From the Animal's Point of View*

2

SUBJECT OVERVIEW AND BACKGROUND INFORMATION

Pigs are unique in the sense that they are the only large mammals that can be found on every continent of the world, in a variety of sizes and breeds, and that they are both wild and domesticated. Pigs have keen senses and instincts; furthermore, they are intelligent, clean, and easily trained.

Despite differences in breeds and in the places they live, all pigs share a number of traits and behaviors in common. Pigs wallow as a means of keeping cool and protecting their skin, they explore their environment by digging and rooting in the ground, and they are very social animals.

Wild pigs live in forests, meadows, and swamps and have adapted to survive in their environment by becoming good swimmers, nocturnal (nighttime) hunters/foragers, and by establishing social hierarchies within their groups.

The domestication of pigs, which began around 10,000 years ago, involves a more controlled environment where the animals rely on a person to care for them by providing appropriate food, water, and shelter. However, domesticated pigs exhibit wallowing and rooting behaviors like their wild relatives and these behaviors should be considered when creating pig housing areas.

The content in this curriculum is designed to introduce youth to swine behavior, needs and care. Additional emphases include life skills and positive youth development. This is not a guide to raising swine for market or exhibition.

Pig Housing: *Designing a Swine Habitat*



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To take proper care of swine you need to provide a clean, dry housing space that allows access to both sun and shade, plenty of clean water, areas to root and wallow, and the company of other pigs. Raising pigs may be costly, but with a basic knowledge of pigs' needs and an efficient budgeting plan, you can find the experience fun and rewarding.

Concepts and Vocabulary

Environmental needs of humans and swine: The things that both humans and swine need in their home or living area to help them survive and live comfortably.

Life Skills

Communication, decision making, empathy, keeping records, organizing, planning/organizing, teamwork, wise use of resources.

Subject Links

Science, Language Arts, Math

Overview of Activities

All animals have certain needs in common, such as food, water, shelter, and space. As a lead-in to discovering the needs of pigs, youth will use the first activity to discover what their own needs are by thinking about their own homes and working out what it is that they need in order to live. They will then use this as reference information as they try to work out what they think a swine would need.

In the second activity, the youth will be given a set budget to cover the cost of the items they will need to establish a home for a pig. By “going shopping” for the items they need to build and furnish their pig’s home, they will learn to make buying decisions based upon a budget.

The environmental needs of pigs are not constant. Different ecological factors and geographical locations can bring about different specific needs. The youth will be given various scenarios for which they will need to adjust their swine environment.

Finally, to apply their newly gained knowledge, the youth will use the shopping list they drew up in their activity to budget for the materials needed to create and maintain an environment suitable for their swine.

REFERENCES

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FACTS ABOUT PIGS

PIG HOUSING

When selecting or designing housing for pigs, it is important to keep their natural behaviors in mind. Ideally, any housing for pigs should allow for social interaction and provide opportunities for rooting, wallowing, and enrichment.

SOCIAL GROUPINGS

Pigs are highly social. Therefore, it is important to house your pig in a compatible social group. Social housing can benefit pigs by giving them opportunities to express their social needs and at the same time making them less susceptible to stress.

Pigs, like other social animals, develop dominant-subordinate relationships within their social groups. If the social group is changed by the removal or replacement of an adult group member, these relationships may be disrupted and fighting may result, so it is important to avoid changes in social groupings as much as possible.

ENCLOSURE

Temperature regulation is very important in pig housing. The temperature of the housing area should be at the pig's thermoneutral zone, which varies depending of the life stage of the pig. During cold weather, pigs should be warm and comfortable in their housing. They should have enough dry bedding and insulation to keep them warm. During warm

weather, pigs should be able to keep cool and not overheat. You can accomplish this by installing misters or fans in the housing area to keep it cool and well ventilated. Also, if you allow pigs to wallow they will help keep themselves cool.

There are three basic types of housing enclosure for pigs. The first option is to house pigs indoors, which gives you reasonable control over their environment, easy clean up and disinfection, and a better ability to manage disease outbreaks. There are drawbacks, however: the indoor option can be expensive, pigs kept indoors rely solely on their caretaker for food and water, and there is a potential for increased incidence of disease if there is a large packing density. Each adult pig should be allowed a minimum space of 2.4 to 3.6 m² if you want to avoid aggression between pigs. Enough space and visual barriers should be provided to minimize any aggression that may result from the pigs' being confined. In general, the more space a pig has, the better its behavior will be.

Another housing option is hoop housing. This is usually used for gestation and grow-finish pigs. The benefits of this type of housing are that it can be used for other purposes other than housing swine and that it allows the caretaker a reasonable amount of control of the pigs' environment. However, it does require a lot of bedding, the housing is hard to clean and sanitize, temperature regulation is more difficult, and handling pigs takes more time than in indoor housing.

The last basic approach to pig housing is to keep the pigs outside on pasture. All pigs at all different life stages can be housed at pasture. This approach provides enough room for the pigs to perform their natural behaviors and reduces the potential for disease transmission because pigs are more spread out. It also provides pigs with exercise and high-quality forage. The problem with this type of housing is that the caretaker has only minimal control of the pigs' environment, the housing is difficult to clean and sanitize, and it is harder to protect the pigs from predators, wild animals, and diseases. It also takes more time to handle the pigs than in indoor housing.

There are pros and cons to each type of housing. You may find that by combining two or more types of housing, you can provide the greatest benefit to the pigs while minimizing the risks associated with each individual type of housing.

ENRICHMENT

Pigs spend a lot of their time foraging and eating. They have a strong rooting behavior, so it is important to provide areas where they can root. If no area is provided, they will redirect this behavior toward substitute objects, such as other pigs.

Wallowing is another important behavior for pigs. Pigs lack sweat glands, so the main method they have for cooling themselves down is to wallow in mud. If their housing facility does not provide misters or some other way to facilitate

cooling, you should make sure to provide a wallowing pool. The mud protects their skin from being sunburned and also protects the pigs from insects and other pests.

Pigs are very intelligent creatures and need mental stimulation to prevent boredom and frustration, so it is important that you provide them with enrichment in the form of toys. The availability of enrichment will make the animal more calm and less likely to be startled by sudden noises or new people. This will also help prevent them from performing certain stereotypical behaviors (e.g., pacing in their enclosure) or antisocial activities (e.g., chewing the ears and tails of pen mates).

Pigs are very sensitive animals and require careful attention to minimize any stress. It is important that caretakers provide their pigs with positive human contact through regular interaction with their pigs. This will make the pigs calmer around humans and less stressed during otherwise-unpleasant procedures.

REFERENCES

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ACTIVITY 1

My Home, a Pig's Home

BACKGROUND INFORMATION

There are certain things in our environment that we either need or want. Some things are essential, such as food, water, and shelter, and without these we cannot survive. However, there are other, supplementary things that we do not strictly need to live, but that enrich our lives—such as books, music, and play structures. By comparing humans and swine, we can see many similarities and differences in our environments relative to what is essential and what is supplementary.

Time Required

40 minutes.

Concepts and Vocabulary

Environmental needs of humans and swine.

Life Skills

Communication, decision making, empathy, organizing.

Subject Links

Science, Language Arts

State Content Standards

Science

- Sixth Grade:

- » Investigation and Experimentation – 7d

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies – 1.1, 1.8, 2.2b
- Fifth Grade:
 - » Listening and Speaking Strategies – 1.5

Suggested Grouping

Groups of 3 to 4.

Materials Needed for Each Group

- Flip chart paper
- Writing instruments (pencils, pens, markers)

Getting Ready

- Divide the youth into groups of 3 to 4.
- Distribute the materials.

OPENING QUESTIONS

1. **Think about where you live. What are some things that you need in your home in order to survive? Please describe.** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

2. **What are some things in your home that improve the quality of your life?** Ask the youth to share their ideas verbally or write their responses on the paper provided.
3. **What are some things in your home that are really important to you? Why are these your favorite things?** Ask the youth to explain their ideas verbally or write their thoughts on the paper provided.

PROCEDURE (EXPERIENCING): PART I

1. Ask the youth to work together to make a list of things they need in their homes, including all of the things in their house or community that they need in order to live safely and comfortably and to be healthy.
2. Then have the youth organize these items into categories:
 - » Social needs (friends, family, teachers, etc.)
 - » Physical needs (shelter, safety, health, comfort, etc.)
 - » Behavioral needs (toys, activities, exercise, etc.)
 - » Other needs

SHARING, PROCESSING, AND GENERALIZING: PART I

Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

- Ask each group to share their list, explaining what they have described as their needs and how they chose to categorize these needs. Are there similarities between the lists? Differences? Explain.

PROCEDURE (EXPERIENCING): PART II

1. On another sheet of flip chart paper, have the youth list all of the things they think a pig needs.
 - » **Volunteer Note:** Remind the youth to think of their own needs as they work this out.
2. Then have the youth organize these items into categories:
 - » Physical needs (shelter, safety, health, comfort, etc.)
 - » Social needs (friends, family, teachers, etc.)
 - » Behavioral needs (toys, activities, exercise, etc.)
 - » Other needs

SHARING, PROCESSING, AND GENERALIZING: PART II

Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

- Ask each group to share their list and to explain what they have described as a pig's needs and how they chose to categorize these needs. Are there similarities between the different groups' lists? Differences? Explain.

- Ask the groups to compare and contrast the lists of human needs and the lists of pigs' needs. Encourage them to discuss how the needs of humans are similar to or different from the needs of pigs.

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the concept of environmental needs of humans and swine have been introduced or discovered by the youth. (**Note:** The goal is to get the youth to develop these concepts through their own exploration and to have them define terms using their own words.) Youth should also note that both humans and swine have a variety of types of needs, including physical, social, and behavioral needs.

CONCEPT APPLICATION

Ask the youth to do each of the following:

- Observe and compare different types of homes in your community. Some people live in single-standing homes, some people live in duplexes or townhouses, and other people live in apartments. How are these homes similar to each other? How are they different?
- Observe the homes of wild animals and compare them to those of domesticated animals. How does each type of animal meet its needs?

REFERENCES

- Grandin, T. 2009. Comfortable quarters for pigs in research institutions. Animal Welfare Institute.
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ACTIVITY 2

Designing a Pig's Environment

BACKGROUND INFORMATION

In the wild, pigs are able to survive by living in small maternal-based groups. A wild sow that is about to give birth (to farrow) will leave the group and create a shelter in which to farrow. She will build a nest by rooting a shallow hole and filling it with branches and soft material. In contrast, a domesticated pig relies on its owner to provide it with the best housing situation and enrichment that will enable it to live a happy, comfortable life. There are some things that a pig—whether wild or domesticated—needs in its environment. These things may address physical needs, social needs, or behavioral needs, or any combination of those.

Time Required

1 hour.

Concepts and Vocabulary

Environmental needs of pigs (whether physical, social, or behavioral in nature).

Life Skills

Communication, decision making, empathy, keeping records, planning/organizing, teamwork, wise use of resources.

Subject Links

Science, Language Arts, Math

State Content Standards

Science

- Fourth Grade:
 - » Investigation and Experimentation – 6f

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies – 1.1, 1.8
- Fifth Grade:
 - » Listening and Speaking Strategies – 1.3

Math

- Fourth Grade:
 - » Number Sense – 2.1
 - » Mathematical Reasoning – 3.3
- Fifth Grade:
 - » Number Sense – 2.1
 - » Mathematical Reasoning – 3.3
- Sixth Grade:
 - » Mathematical Reasoning – 3.3

Suggested Grouping

Groups of 2 to 3.

Materials Needed

(* = Materials provided in curriculum)

- * *Pig Housing Item Price Lists*
- * *Shopping List*
- Flip chart or other large paper
- Notebook paper
- Pencils
- Paper
- Crayons/markers
- Scissors
- Calculators (optional)
- Stapler (optional)

Getting Ready

- Set up a “store” where the youth are to go shopping. To do so, start out by making twice as many *Swine Housing Item Price Lists* as you have groups. Cut out each item from the lists, gather multiples of each item into stacks, and staple each stack together. Arrange the stacks of items from each category (fencing, housing, feeders and waterers, toys, flooring and bedding) on different tables so the youth can visit each “store” separately.
- Make enough *Shopping Lists* for each group to have one.
- Divide the youths into groups.

OPENING QUESTIONS:

1. **What do you know about what a swine needs in its home in order to live comfortably? Please explain.** Ask the youth to record their ideas on the flip chart paper provided or to share their thoughts verbally.
2. Types of responses to expect include appropriate food, shelter from heat or cold, comfortable bedding, water, safety (no dangerous materials, protection from predators), enough space to move around, appropriate lighting, clean floors with a non-slippery surface, fresh air, a stable social group (including at least one social companion).
3. **What do you think are some extra things that might make the quality of a swine's life better? Please explain.** Ask the youth to record their ideas on the flip chart paper provided or to share their thoughts verbally.
4. Types of responses to expect include toys, multiple social companions, and variety of feed types.
 - » **Volunteer Tip:** If the youth are having trouble coming up with ideas for responses to these questions, ask them to refer for inspiration to the lists they made of their own needs. For example, if they mentioned toys as one of their needs,

ask them what purpose the toys serve (e.g., fun, exercise, challenge, keeping away boredom). Explore with the youth how these same needs may also be important for pigs, and consider how we can address those needs. Are toys appropriate for pigs, or are there other means for allowing them to get exercise and avoid boredom? As another example, if the youth mentioned family or friends among their own needs, ask what purpose the family or friends serve (e.g., comfort, fun, companionship, love, safety). Explore with the youth how these same needs may also be important to pigs. Why might having the company of other pigs be important for a pig? What might be some problems that would be associated with housing pigs alone (e.g., stress, fear, loneliness)?

PROCEDURE (EXPERIENCING) – BUDGETING AND SHOPPING

1. At this point, the youth are going to go shopping for the items they believe their pig will need for its home. Inform the youth that they will be shopping for supplies to appropriately house two pigs.
2. Each group of youth will be assigned a different budget. For five groups, set budgets of \$500, \$600, \$700, \$800, and \$900.

3. The groups will then visit the “store” and select the items they feel will best meet the needs of their pigs and at the same time fit within their budget. For each item they choose, the youth should record on their shopping list the item, the type of need (physical, social, behavioral, etc.), the cost, and the reason they chose that particular item. Remind the youth that they are shopping for the supplies they will need to appropriately house two pigs.
4. Finally, ask each group to create a drawing of the home they would create for their pigs using the materials they have purchased. (**Note:** The drawing should be large. Ask the youth to use a piece of flip chart paper.)

SHARING, PROCESSING, AND GENERALIZING

Once they have completed their shopping and their drawings, engage the youth in a discussion about the items they have chosen. Have each group share their drawing and describe the items they chose to buy for their pigs. They should tell why they chose those items and tell how they made choices that would fit within their budget. Compare the lists. How did the amount of money in each budget affect the groups' choices?

CLOSING QUESTIONS

1. **What are some things you learned about the environmental needs of pigs and how you can help provide for them? Please explain.**
2. **How might cost affect the decisions a person makes when trying to provide appropriate housing for pigs? Please explain.**

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the concept that pigs have important environmental needs (e.g., physical, social, and behavioral needs) has been introduced to or discovered by the youth. (**Note:** The goal is to get the youth to develop concepts such as this through their own exploration and to define terms using their own words.)

CONCEPT APPLICATION 1

The things you need to have in your home or an animal needs to have in its home may change. The situations in the following scenarios would require that modifications be made to your pig's environment. What would you need to do to address these changing needs?

1. Suppose your family had to move from a warm area to a colder climate where it snows several months of the year. How would you design an environment to keep your pigs comfortable and healthy in the cold weather?
2. Suppose that your family had to move from a cooler area to a very warm climate where it is hot and dry several months each year. How would you design an environment to keep your pigs comfortable and healthy in the heat?

3. Imagine that your pigs are not getting enough exercise. How can you address this problem by changing the pigs' environment?
4. Imagine that one of your pigs has been nosing at the fence and repeating this behavior over and over, which may indicate that the pig is bored. How can you change the pig's environment to be more interesting and give the pig more to do?
5. Suppose that you want to improve the quality of your pig's environment but you have no more money to spend. What changes can you make that cost no money?

CONCEPT APPLICATION 2: FOR YOUTH WHO HAVE PIGS

Have the youth take home a copy of their completed shopping list. Ask youth to talk with their family about the costs of creating and maintaining an appropriate environment for pigs. Youth who already have pigs at home should evaluate the animals' current environment and decide whether there are ways to improve their environment. The youth should talk about these improvements and their costs with their family members.

CONCEPT APPLICATION 3: FOR YOUTH WHO ARE PLANNING TO OBTAIN PIGS

Have the youth take home a copy of their completed shopping list. Ask youth to talk with their family about the costs of creating and maintaining an appropriate environment for pigs. If the youth are planning to obtain pigs, they should work with their family to create a budget and plan a shopping list for the items they will need to properly house their pigs.

CONCEPT APPLICATION 4: FOR YOUTH WHO DO NOT HAVE PIGS AND DO NOT PLAN TO GET THEM

Ask youth in this category to think about any animal that they own or that someone they know owns. Then they can create a list of that animal's environmental needs based on what they have learned about pigs' environmental needs. Remind the youth that some of the needs will be similar to those of pigs and some will be different. If the youth have pets at home, they can evaluate their pets' current environment and decide whether there are ways they could improve that environment. The youth should talk with their family members about these improvements and their costs.

REFERENCES

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PIG HOUSING ITEM PRICE LISTS

(Note: The price for each item is an estimate of the real cost.) For adult pigs in groups, each pig requires a minimum area of about 1.4 m².

FENCING

Wood fence with wood panels

- Wood fence with wood panels and gate: 8' x 8' = \$157.00
- Wood fence with wood panels and gate: 12' x 12' = \$241.00
- Wood fence with wood panels and gate: 18' x 18' = \$ 276.00
- Wood fence with wood panels and gate: 40' x 40' = \$490.00
- Wood fence with wood panels and gate: 80' x 80' = \$912.00



Wood posts with wire

- Wood posts with wire and gate: 8' x 8' = \$117.00
- Wood fence with wire and gate 12' x 12' = \$129.00
- Wood fence with wire and gate: 18' x 18' = \$141.00
- Wood fence with wire and gate: 40' x 40' = \$164.00
- Wood fence with wire and gate: 80' x 80' = \$224.00

Metal posts with wire

- Metal posts with wire and gate: 8' x 8' = \$115.00
- Metal posts with wire and gate: 12' x 12' = \$124.00
- Metal posts with wire and gate: 18' x 18' = \$133.00
- Metal posts with wire and gate: 40' x 40' = \$142.00
- Metal posts with wire and gate: 80' x 80' = \$177.00



HOUSING

Pig Shelter: \$450

- Timber frame and roof that is treated with weatherproofing material.
- Triangle-shaped roof.
- Strong and sturdy.
- Enough to fit about 4 pigs.



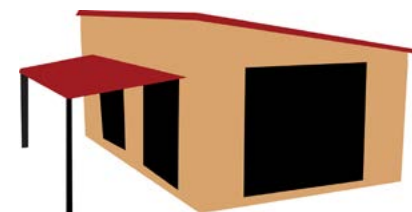
Pig Ark

- Easily movable.
- Made from high-grade steel.
- Very durable.
- Doesn't have a floor.
 - » 6' x 4': \$361.80
 - » 8' x 6': \$400.66
 - » 8' x 8': \$489.10
 - » 8' x 10': \$596.30
 - » 8' x 12': \$643.20



Permanent Pig Shelter

- Body made of wood. Roof made of tin.
- Three openings for easy access into and out of the shelter.
- Mini-roof attached to the side.
- Structure cemented into the ground to prevent from being uprooted.
- 5' tall x 8' wide.
 - » Estimated material cost: \$500



WATER AND FEED CONTAINERS

Rubber Bucket

- Crack- and crush-resistant.
- Flexible.
- Long-lasting and durable.
 - » 26 quart: \$9.95
 - » 42 quart: \$19.95



Print one-sided on heavy paper and cut out along dashed lines.

Plastic Utility Pan

- Can be used as a feed or water dish on the ground.
- Tested to be stable and durable.
 - » 5 quart: \$3.13
 - » 3 gallon: \$7.50



Hook-Over Portable Feed Pail: \$7.50

- For goats, sheep, horses, and llamas.
- Hooks over 2" x 4" or 2" x 6" board.
- Can be permanently mounted with screws.
- 8 quart.



Hook-Over Corner Feeder: \$18.95

- Used in corners.
- Attach to fence with screws.
- 26 quart.



Plastic Feeder Pan

- Can be used as a feed or water dish on the ground.
- Impact resistant.
- Tested to be stable and tough.
 - » 10 quart: \$10.50



Hook-Over Portable Feeder

- For sheep, goats, dogs, and horses.
- Can be used for field, pasture, trailer, or stall.
- Rounded corners for easy access.
- Can hook over "2-by" boards (1¾" wide).
- Can be permanently screwed onto boards.
 - » 12 quart: \$19.50
 - » 15 quart: \$23.50



Bucket

- Multi-purpose use.
- Made of plastic.
- Metal handle.
 - » 8 quart: \$5.95
 - » 10 quart: \$7.95
 - » 12 quart: \$9.95
 - » 32 quart: \$19.95



Plastic Flat Back Bucket

- Can be used as a feed or water dish placed against a wall or fence.
- Handle makes it easier to carry and hang.
- Impact resistant.
- Tested to be stable and durable.
 - » 8 quart: \$6.95
 - » 12 quart: \$7.95
 - » 18 quart: \$9.95
 - » 20 quart: \$10.95



Mini Hook-Over Portable Feeder: \$10.95

- Good for smaller breeds.
- Easy to transport.
- Hooks over fence.
- 6 quarts.



Portable Feeder with Divider: \$23.95

- Hooks to a variety of fences (wire, pipe, and board fences).
- Has adjustable steel brackets that fit most fence types.
- Can hook onto wire fences with spring clips (not included).



Print one-sided on heavy paper and cut out along dashed lines.

Multi-Purpose Buckets

- Used for multiple purposes (e.g., feed storage, waterer, feeder).
- Made of durable, sturdy plastic.
- Short rope handles.
 - » 8 quart: \$4.50
 - » 70 quart: \$20.50



Automatic Waterer: \$32.95

- Install on a fence, wall, or corral.
- Adjustable float maintenance for constant water.
- Connects with ordinary ¾" garden hose.
- Durable polyethylene and nylon construction.
- 16 quart



Steel Automatic Waterer: \$33.95

- Ideal for horses, cattle, hogs, and dogs.
- Constant float-controlled water level.
- Easy to use and clean.
- Made of high quality steel.
- 8" across x 4¾" deep.



Rubber Ground Feeders

- Placed on the ground.
- Made of durable rubber.
 - » 2 quart: \$3.95
 - » 4 quart: \$4.50
 - » 8 quart: \$6.50
 - » 3 gallon: \$9.50
 - » 6½ gallon with small handles: \$13.50
 - » 6½ gallon with metal hooks: \$17.50
 - » 15 gallon: \$26.50



Flat-Back Rubber Feeder: \$17.95

- Made of durable rubber.
- Metal handle that can easily hook onto nails.
- 20 quart



Over-the-Fence Feed Trough

- Hooks onto fence.
- Durable and sturdy.
- Hangs on any wire or wooden fence.
- Easy to clean.
- 12" L x 9" W x 6" H: \$22.95
- 36" L x 9" W x 6" H: \$47.50



Water Basin with Hose: \$92.50

- Able to refill automatically to a desired level.
- Contains non-siphon valve to adjust the water level.
- Includes 6' hose.
- 26" top x 31" bottom x 14" height



Over-the-Fence Feeder

- Heavy-duty construction.
- Able to hook onto sturdy fences and corrals.
- Resists cracking and weather damage.
- Vented closure.
 - » 20 gallon: \$47.95
 - » 50 gallon: \$52.00



Print one-sided on heavy paper and cut out along dashed lines.

Hog Feeder

- Made of heavy-duty steel.
- Top door flips open from the back for easy loading.
 - » 1 panel: \$79.95
 - » 2 panel: \$133.50



Calf Bottle and Nipple: \$5.99

- 2 quart sturdy plastic nursing bottles with snap-on rubber nipple.
- Easy to clean and sterilize.



Toys

Bowling Ball: \$1.50



Beach Ball: \$1.00



Old Tire: Free



Rubber Ball: \$7.00

- Provides exercise, alleviates boredom, and keeps the pig curious.
- Can be drilled with a hole to dispense food as the pig pushes it around.



Football: \$22.00

- Provides exercise, alleviates boredom, and keeps the pig active.



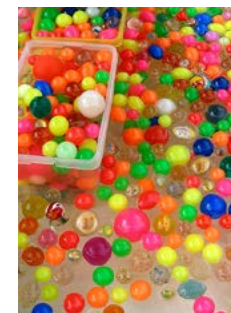
Rooting Box: \$30.00

- Specially designed for the safety and comfort of pigs.
- Can be filled with mud or dirt.
- Can also be filled with plastic balls or smooth river rocks for an alternate rooting activity.
- 2' x 2', 4" deep



Plastic Balls: \$21.50

- Colorful plastic balls.
- Balls are in various sizes.
- Balls are made of soft plastic so they will indent if squeezed or sat upon.
- Can be put in a rooting box to promote rooting behavior.



Hard Plastic Pool: \$10.00

- 16" deep x 66" diameter.
- Holds up to 50 gallons at 80% of the wall height (recommended fill level).
- Fill with water and mud for wallowing.
- Fill with dirt and food items for rooting.



Large Plastic Pool: \$24.00

- 21" H x 71" W x 73" L
- Includes inflatable floor with drain plug and repair patch kit.
- Holds up to 100 gallons at 80% of the wall height (recommended fill level).
- Fill with water and mud for wallowing.
- Fill with dirt and food items for rooting.



Hose: \$15.00

- 5/8" x 50'
- Can be used to fill the inflatable pool.
- Can also be hung from a fence or ceiling as a toy to stimulate the animal.



Print one-sided on heavy paper and cut out along dashed lines.

Wood Shavings

- Small to medium flakes, not dusty.
- Can be stored outside under a tarp.
 - » 50 lb bag: \$8.00

**MISCELLANEOUS SUPPLIES****Feed Scoop: \$4.50**

- Used for feed and supplements.
- Made of durable plastic.
- Enclosed for easy scooping.
- Handle attached.
- Measurements located inside for easy measuring.
- Holds up to 3 quarts.

**Scraps of Cloth: Free**

- Hang on the fence or ceiling to stimulate the animal.
- Can use old clothing, sheets, or ask your local fabric store for scraps.

**Mixed Shavings**

- Screened, leaving only uniform shavings.
- 100% natural.
- Virtually dust-free.
- Soft and comfortable.
- Made of fir and pine shavings.
 - » 50 lb bag: \$5.85

**Small Feed Scoop**

- Used to pick up feed.
- Made of plastic.
 - » 2 pints: \$2.50
 - » 5 pints: \$4.50

**FLOORING AND BEDDING****Rubber Mats: \$39.99**

- Great anti-fatigue mats.
- Used in stalls and trailers.
- Non-absorbing and easy to clean.
- 1/2" x 4' x 6'

**Oat Straw**

- In conventional (small) bales.
 - » \$3.35 per bale for up to 5 bales
 - » \$3.00 per bale for 6 to 49 bales
 - » \$2.68 per bale for over 50 bales

**Steel Feed Scoop**

- Used to pick up feed.
- Made of galvanized steel.
- Great for scooping grain.
 - » 3 quart: \$8.95
 - » 4 quart: \$11.00
 - » 6 quart: \$13.50



Print one-sided on heavy paper and cut out along dashed lines.

Angled Stall Fork

- Made of 100% polycarbonate, which provides strength and flexibility.
- Weather resistant.
- Lightweight.
- Angled fork designed to easily pick up manure and prevent spillage.
 - » Without side panels:
(fork: 13½" long x 15½" wide): \$23.95
 - » With side panels:
Small (fork: 12½" long x 11½" wide): \$21.95
Large (fork: 13" long x 16" wide): \$29.95



Professional Heavy-Duty Broom: \$34.50

- For contractors, landscape work, and agriculture.
- Durable and long lasting.



Janitor Broom: \$11.50

- Handmade.
- Bristles made of corn fibers.
- Hardwood handle.
- 5 rows of stitching.



Scoop Shovel

- Plastic shovel:
Large scoop/plastic handle: \$32.50
- Aluminum shovel:
Small scoop/short handle: \$31.95
Large/long handle: \$34.95



Hay Fork

- Used to pick up hay and manure.
 - » 5 prongs (longer): \$58.50
 - » 6 prongs (shorter): \$62.00



Dust Pan: \$12.50

- Handle attached for easy trash pickup.
- Opening closes when hung, to trap trash.



Steel Trash Can: \$26.95

- Holds up to 30 gallons.
- Made of galvanized steel with a zinc coating.
- Can be used to storage or trash.



REFERENCES

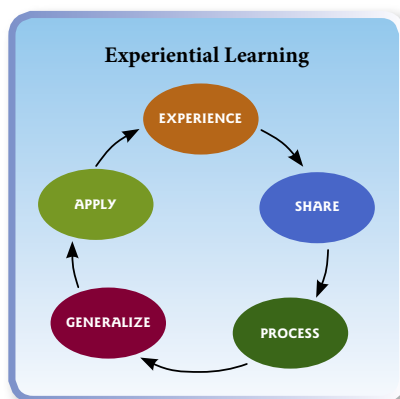
Photographs courtesy of Higby's Country Feed Store, Dixon, California.

GLOSSARY

- **Balanced diet:** Eating the right types of food in the right amounts to maintain a healthy body.
- **Basic nutrients:** Substances that help maintain a healthy body. These include carbohydrates, proteins, vitamins and minerals.
- **Care:** Having concern for someone or something, which leads to tending or overseeing that person or thing.
- **Competition:** A struggle between individuals for food, space, and other important requirements for survival.
- **Direct contact:** Physical contact between an ill person or animal and a healthy person or animal.
- **Disease:** An abnormal condition that affects the normal function and health of an organism, decreasing the health of that organism.
- **Disease prevention:** Taking the necessary steps to prevent humans and/or animals from getting sick.
- **Disease transmission:** To transfer a disease from one person or animal to another.
- **Dominant:** Having influence, control, and authority over others.
- **Environmental needs of humans and swine:** The things that both humans and swine need in their home or living area to help them survive and live comfortably.
- **Essential nutrients:** Nutrients that humans and animals must have to live and function properly.
- **Germs:** A microorganism that has the potential to cause diseases.
- **Health care monitoring:** Closely observing an animal's health, behavior and activity everyday to determine what is normal or abnormal about your animal.
- **Illness:** Being unhealthy or in poor health.
- **Indirect contact:** When an uninfected person or animal touches the contaminated surface (e.g., table top) of an inanimate object (e.g., food dish).
- **Life stages of swine:** Swine are categorized in different stages of development or life stages. Swine at each life stage have different nutritional requirements to grow and stay healthy.
- **Olfactory receptors:** Structures that aid with an individual's sense of smell. The more receptors you have, the better your sense of smell.
- **Prenasal bone:** A bone found in the snouts of pigs. This bone allows them to use their nose to dig for food in the ground.
- **Preventative health care:** The act of maintaining the health of humans and animals by preventing them from catching an illness or disease.
- **Responsibility:** Being accountable for one's actions or behaviors.
- **Rooting:** The act of pulling out or removing items from under the ground.
- **Rooting-disk:** A disk found in the snout of pigs that is very sensitive, allowing them to explore the surrounding environment.
- **Social dominance:** In a group, there are individuals that lead and have authority over others in the group.
- **Social hierarchy:** A system where individuals are ranked from top to bottom according to authority or importance.
- **Social order:** A system in place that keeps a group stable and functioning.
- **Subordinate:** Belonging to a lower level or rank in a group.
- **Tactile receptors:** Structures that aid with someone or something's ability to feel and touch items in the environment. The more receptors you have, the better your sense of touch.
- **Wallowing:** To roll around in the mud.

APPENDIX

The activities in this curriculum were designed around inquiry and experiential learning. Inquiry is a learner-centered approach in which individuals are problem solvers investigating questions through active engagement, observing and manipulating objects and phenomena, and acquiring or discovering knowledge. Experiential learning (EL) is a foundational educational strategy used in 4-H. In it, the learner has an experience phase of engagement in an activity, a reflection phase in which observations and reactions are shared and discussed, and an application phase in which new knowledge and skills are applied to a real-life setting. In 4-H, an EL model that uses a five-step learning cycle is most commonly used. These five steps—Experiencing, Sharing, Processing, Generalizing, and Application—are part of a recurring process that helps build learner understanding over time.



For more information on inquiry, EL, and the five-step learning cycle, please visit the University of California Science, Technology, and Environmental Literacy Workgroup's Experiential Learning website, <http://www.experientiallearning.ucdavis.edu/default.shtml>.

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SWINE : *From the Animal's Point of View*

3

SUBJECT OVERVIEW AND BACKGROUND INFORMATION

Just as humans need to monitor the food they eat to help ensure optimal health, food that swine consume affects their health, too. Because domesticated pigs consume the food that humans make available to them, it is important for the pigs' caretaker to understand the nutritional needs of swine in order to provide them with a proper diet.

Swine and humans are very similar when it comes to the digestive system. Both have what are referred to as a simple stomach (monogastric), meaning that they have only a one-chambered stomach, compared to ruminants that have a four-chambered stomach. Furthermore, the digestive systems of humans and swine are comparable. For both species, digestion, or the breaking down of the food, starts in the stomach and most nutrients are absorbed in the small intestine. Finally, both pigs and humans are omnivores; their diets include foods from both animal and plant sources.

The nutrient requirements for swine are similar to the basic requirements for other animals. Pigs need an ample supply of fresh water, carbohydrates, fats, protein, and other vitamins and minerals. Most of the nutrients can be supplied by common commercial feeds, but some vitamins and minerals need to be added to ensure complete health.

The content in this curriculum is designed to introduce youth to swine behavior, needs and care. Additional emphases include life skills and positive youth development. This is not a guide to raising swine for market or exhibition.



Pig Nutrition: What You Need to Know

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Partially funded through a grant from the Wells Fargo Foundation.

Pigs in the wild use their snout to dig for food in the ground. This is called rooting behavior. Food such as earthworms and roots can be dug up and eaten this way. It is important for the domesticated pig to have dirt or a grassy area so that it can exhibit rooting behavior.

Concepts and Vocabulary

- **Balanced diet:** Eating the right types of food in the right amounts to maintain a healthy body.
- **Basic nutrients:** Substances that help maintain a healthy body. These include carbohydrates, proteins, vitamins, and minerals.
- **Essential nutrients:** Nutrients that humans and animals must have to live and function properly.
- **Life stages of swine:** Swine are categorized in different stages of development or life stages. Swine at each life stage have different nutritional requirements for growing and staying healthy.

Life Skills

Communication, contributions to a group effort, cooperation, critical thinking, decision making, healthy lifestyle choices, keeping records, planning/organizing, problem solving, sharing, teamwork

Subject Links

Science, Language Arts

Overview of Activities:

The first activity is entitled *Eat Your Vegetables!* In this activity, youth will look at a list of foods and categorize them according to the nutrients they provide. They will also be asked to create a list of the types of food they eat on a regular basis and categorize them based on their nutrient content. They will compare these lists and determine whether the foods they eat provide their necessary daily nutrients.

The second activity is entitled *Diet Detectives*. Each group of youth will be given a scenario of the diet and common daily activities of a fictional person. They need to determine whether the person received all of his or her necessary nutrients. If they did not, the youth will need to determine

what is in excess or what is lacking and how that might have affected the person's daily activities. The youth will also need to make recommendations regarding dietary improvements.

The third activity, *Shopping by Chance in Pigs*, teaches youth that pigs do not have the luxury of choosing what they eat, and that it is the job of the caretaker to ensure that his or her pigs are getting all their necessary nutrients. It is important for youth to know that pigs at different life stages have different nutrient requirements. This activity will allow the youth to discover the importance of reading food labels and the consequences of providing pigs an improper diet.

REFERENCES

- Rowan, J. P., K. L. Durrance, G. E. Combs, and L. Z. Fisher. 2009. The digestive tract of the pig. Electronic Data Information Source. <http://edis.ifas.ufl.edu/AN012>.
- Laerke, H. N., and M. S. Hedemann. 2012. The digestive system of the pig. In K. E. Bach Knudsen, N. J. Kjeldsen, H. D. Poulsen, and B. B. Jensen (eds.), *Nutritional physiology of pigs* (online publication). Foulum: Videncenter for Svineproduktion. http://vsp.lf.dk/~media/Files/Laerebog_fysiologi/Chapter%205.ashx.

FACTS ABOUT SWINE

NUTRITION

Basic Facts

- Swine are omnivores. Just like people, they eat foods from both plant and animal sources.
- A swine's digestive system is very similar to that of a human.
- Swine are monogastric, or simple-stomached, meaning they have only one stomach.
- Swine chew food with their incisors and molars and swallow their food only once. They do not regurgitate and chew their food a second time the way ruminants (e.g., sheep) do.
- Digestion occurs mainly in the stomach; most food nutrients are absorbed by the small intestines.

Required Nutrients

- Water is the most important nutrient of all. Water deprivation leads to reduced feed intake, which in turn slows growth. Too little water also negatively affects many body functions. The water-to-feed ratio of swine is approximately 2:1.

- Carbohydrates make up the main source of energy for pigs, mainly in the form of cereal grains such as corn, wheat, barley, and oats.
- Fat provides more energy than carbohydrates do. Adding fat to the diet will also increase the weight gain-to-feed ratio. However too much fat can cause health problems.
- Protein is required because it supplies specific amino acids that are needed by swine. Usually, there are adequate amounts of protein in common feeds, such as soybean meal, fish meal, cottonseed meal, or bone meal.
- Many vitamins are naturally produced in a pig's body, some are found in common feeds, and others need to be supplemented.
- Minerals that are often added to the diet are calcium, phosphorus, sodium, chloride, zinc, copper, iron, manganese, iodine, and selenium. Minerals should be added carefully, since an excess can be toxic.

Eating Behavior

- Swine exhibit a rooting behavior, where they dig in the soil with their tough snouts. They can find food such as worms and various roots this way.
- Pigs are pushy when it comes to their food, so when you have more than one pig, it is important to have enough space for all to feed because the larger one may push the smaller one away.

REFERENCES

- Hansen, J. A. n.d. Swine nutrition guide. <http://mark.asci.ncsu.edu/Nutrition/NutritionGuide/default.htm>.
- Meisinger, D. J. (ed.). 2010. National swine nutrition guide. Ames, IA: U.S. Pork Center of Excellence.

ACTIVITY 1

Eat Your Vegetables!

BACKGROUND INFORMATION

Do you know why it's important to eat vegetables? Different kinds of foods provide us with different types of nutrients that allow our bodies to function properly. Some of the basic nutrients that we acquire from the foods we eat are carbohydrates, proteins, fats and oils, calcium, vitamin C, vitamin A, and fiber. There are some people who are very conscious of the food they eat and the nutrients that it provides them, and there are some people who are not. Writing down what we eat can help us determine if we are getting the right nutrients in our daily diet.

Time Required

30–45 minutes

Concepts and Vocabulary

Basic nutrients (this includes carbohydrates, proteins, calcium, vitamin C, vitamin A, and fiber)

Life Skills

Communication, critical thinking, healthy lifestyle choices, keeping records, problem solving, sharing

Subject Links

Language Arts

State Content Standards

Language Arts

- Sixth Grade:
 - » Listening and Speaking Strategies – 1.8
- Fifth Grade:
 - » Listening and Speaking Strategies – 1.5

Suggested Grouping

Pairs

Materials Needed

(* = Materials provided in curriculum)

- * *General Source of Nutrients*
- * *List of Familiar Human Foods*
- Notebook paper
- Pens, pencils, or markers
- Flip chart paper

Getting Ready

- Make enough copies of the *General Source of Nutrients* worksheet so each youth can receive two copies.
- Pass out the *List of Familiar Foods* to each pair.
- Provide each pair with flip chart paper and something to write with.

OPENING QUESTIONS

1. **We've all heard our parents say, "Eat your vegetables!" Why do you think this might be important? What do you think makes vegetables and other foods such as fruit so important to our diet?** Ask the youth to explain their thoughts verbally or record their ideas on the flip chart paper provided.
2. **What other foods do you think are important to eat? Explain why you think they are important.** Ask the youth to share their ideas verbally or record their thoughts on the flip chart paper provided.

PROCEDURE (EXPERIENCING)

1. Working in pairs, have the youth look at the *List of Familiar Foods*. Have them organize the foods and place each one under the correct nutrient category (e.g., protein, carbohydrate) on the *General Source of Nutrients* worksheet.
2. Additionally, because everyone comes from a different background and culture, have each pair brainstorm and write down at least one other food that is common in his or her home or culture and that is not on the *List of Familiar Foods*. Have them place these food items, too, under the correct nutrient category.

SHARING, PROCESSING, AND GENERALIZING

Have the youth share their lists with the rest of the group.

Have them compare their lists to other groups' lists. What are the similarities? What are the differences, if any? If there are differences, discuss why. Have the youth also share their ethnic foods and compare them with those of other groups.

Follow the lines of thinking developed through the general questions raised by the youth to draw out their thoughts and ideas; if necessary, use more specific questions as prompts to get to particular points. Examples might include:

1. **If there are differences between how the groups categorized the foods, discuss these differences and work toward a consensus.**
2. **Why do you think it is important to eat a variety of foods each day?** Ask the youth to record their thoughts and ideas on the flip chart paper provided.
3. **Why do you think that certain foods are called “junk foods?”** What do you think the differences are between junk foods and healthy foods? Ask the youth to record their thoughts and ideas on the flip chart paper provided.

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the concept of basic nutrients has been introduced or discovered by the youth. (Note: The goal is to have the youth develop concepts through their own exploration and define terms using their own words.)

CONCEPT APPLICATION

1. Ask each youth to develop a list of foods that they eat frequently.
2. Working in pairs, ask the youth to categorize their lists under the correct nutrient category on the General Source of Nutrients worksheet.
3. Have the youth discuss their food choices and, if they believe that their diet is not balanced, decide on some alternatives they might choose in order to obtain different essential nutrients.

REFERENCES

Mann, J., and A. S. Truswell. 2007. *Essentials of human nutrition* (3rd. ed.). Oxford, NY: Oxford University Press.

United States Department of Agriculture, Center for Nutrition Policy and Promotion. 2011. MyPlate.
<http://choosemyplate.gov>.

LIST OF FAMILIAR FOODS FOR HUMANS

- apple
- avocado
- banana
- beef
- broccoli
- brown (whole grain) rice
- butter
- candy
- canola oil
- carrot
- cheese
- chicken
- chili
- chocolate
- coconut oil
- corn
- cucumber
- deep-fried food
- donut
- egg
- grapefruit juice
- grapes
- green beans
- ice cream
- kidney beans
- lemon
- margarine
- milk
- oatmeal
- orange
- pasta (processed)
- pastry
- peach
- peanuts
- pork
- potato
- pretzel (processed)
- salmon
- soda
- spinach
- strawberry
- syrup
- tomato
- tuna fish
- white bread (processed)
- white rice (processed)
- whole grain bagel
- whole wheat bread
- whole wheat pasta
- yogurt (plain, low fat)

GENERAL SOURCE OF NUTRIENTS WORKSHEET

Protein

Protein is found in animal products, nuts, and beans.

1. _____
2. _____
3. _____
4. _____
5. _____

Carbohydrates

Carbohydrates are found in processed wheat and grains and in starchy vegetables.

1. _____
2. _____
3. _____
4. _____
5. _____

Fiber

Fiber is found in whole grains, beans, oats, and bran.

1. _____
2. _____
3. _____
4. _____
5. _____

Calcium

Calcium is found in dairy products and dark green vegetables.

1. _____
2. _____
3. _____
4. _____
5. _____

Vitamin C

Vitamin C is found in fruit, and especially citrus fruit.

1. _____
2. _____
3. _____
4. _____
5. _____

Vitamin A

Vitamin A is found in animal products and reddish foods.

1. _____
2. _____
3. _____
4. _____
5. _____

Fats and Oils

Oils can be found in fish, nuts, and vegetable oils. Fats come from many animal foods and processed vegetable oils, including butter and margarine.

1. _____
2. _____
3. _____
4. _____
5. _____

Limited Nutritional Value

These are foods that don't provide important nutrients. This group includes processed snack foods that are high in salt and sugar.

1. _____
2. _____
3. _____
4. _____
5. _____

GENERAL SOURCE OF NUTRIENTS KEY

Note: The examples for each category are common sources for each nutrient

Protein

- beef
- cheese
- chicken
- chili
- corn
- egg
- kidney beans
- milk
- peanut
- pork
- salmon
- tuna fish

Carbohydrates

- brown rice
- corn
- pasta (processed)
- pretzel
- white bread
- white rice

- whole grain bagel
- whole grain pasta
- whole wheat bread

Fiber

- apples
- broccoli
- brown rice
- chili
- corn
- kidney beans
- oatmeal
- orange
- peaches
- potato
- strawberry

- whole grain bagel
- whole grain pasta
- whole wheat bread

Calcium

- broccoli

- cheese
- low fat milk
- spinach
- whole milk
- yogurt (low fat, plain)

Vitamin C

- apple juice
- apples
- broccoli
- cucumbers
- grapefruit juice
- grapes
- green beans
- lemon
- orange
- peaches
- potato
- spinach
- strawberry
- tomato

Vitamin A

- beef
- broccoli
- carrot
- cheese
- egg
- green beans
- milk
- peach
- spinach
- strawberry
- tomato

Fats and Oils

- avocado
- butter
- canola oil
- coconut oil
- margarine
- peanuts
- salmon

Limited Nutritional Value

- chocolate
- deep-fried food
- donuts and other pastries with high sugar content
- ice cream
- other candy
- soda
- syrup

REFERENCE

Nutrition data. 2008.
www.nutritiondata.com

ACTIVITY 2

Diet Detectives

BACKGROUND INFORMATION

What we eat can have a big influence on what we can do and how we feel. Having deficiencies in important nutrients such as carbohydrates, proteins, calcium, vitamin C, vitamin A, and fiber for a period of time can lead to problems like low energy, poor concentration, and illness. A balanced diet that contains all essential nutrients will help keep our minds and bodies healthy, active, and strong.

Time Required

40–60 minutes

Concepts and Vocabulary

Balanced diet

Life Skills

Communication, contributions to a group effort, cooperation, critical thinking, healthy lifestyle choices, keeping records, problem solving, sharing, teamwork

Subject Links

Science, Language Arts

State Content Standards

Science

- Fourth Grade:
 - » Investigation and Experimentation – 6c
- Sixth Grade:
 - » Investigation and Experimentation – 7a, 7e

Language Arts

- Fourth Grade:
 - » Reading Comprehension – 2.3
 - » Listening and Speaking Strategies – 1.7, 1.8
- Fifth Grade:
 - » Reading Comprehension – 2.4
 - » Listening and Speaking Strategies – 1.5
- Sixth Grade:
 - » Reading Comprehension – 2.3
 - » Listening and Speaking Strategies – 1.5

Suggested Grouping:

Groups of 2 to 5 individuals

Materials Needed:

(* = *Materials provided in curriculum*)

- * *Sample Diets*
- * *General Facts on Nutrients Handout*
- * *General Sources of Nutrients Key*
- * *USDA MyPlate*
- Flip chart paper
- Pens, pencils, or markers
- Notebook paper

Getting Ready

- Make enough *Sample Diets* worksheets for each group.
- Make enough copies of the *General Facts on Nutrients Handout* and *General Sources of Nutrients Key* for each group.

- Make enough MyPlate handouts for each group.
- Pass the materials out to each group.

OPENING QUESTIONS

1. **When you hear the phrase “a balanced diet,” what does that mean to you?** Ask the youth to share their ideas verbally or record their ideas on the flip chart paper provided.
2. **What do you think might happen if we didn’t eat enough of the types of foods that provide the proper nutrients?** Ask the youth to share their thoughts verbally or record their ideas on the flip chart paper provided.

PROCEDURE (EXPERIENCING)

Facilitator Note: Please set up this scenario for the students. Explain to them that they are “Diet Detectives.” Their job is to review people’s diets and use the resources provided to recommend changes to make them more balanced.

1. A set of *Sample Diets*, a copy of the *General Facts on Nutrients Handout*, and a copy of the MyPlate handout will be distributed to each group.
2. Each group will read the *Sample Diets*. From the information provided on the diets, the *General Facts on Nutrients Handout*, and the MyPlate handout, youth will work together to determine:
 - » Which nutrients (if any) do they believe are missing or in excess from the different diets? Have them record and explain their ideas on the flip chart paper provided.

- » How can each diet be improved? What foods would they recommend be added to or removed from the diets to make them more balanced? Have them record and explain their ideas on the flip chart paper provided.
- » **Volunteer Note:** It may help to have the youth generate a chart to organize their thoughts.

SHARING, PROCESSING, AND GENERALIZING

After the youth have completed the procedure, have them share their thoughts and responses to the different scenarios. Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

1. **If your group's answers differ from other groups, compare and discuss why.** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

» **Volunteer Tip:** Below is a key for the different *Sample Diets*:

- › Mark's diet: Low in protein
- › Jenny's diet: Low in carbohydrates
- › Justin's diet: Low in calcium
- › Claire's diet: Low in Vitamin C
- › Ryan's diet: Low in Vitamin A
- › Molly's diet: High in fiber
- › Scott's diet: Too many sweets
- › Sydney's diet: Too much saturated fat

2. **What do you believe might happen if people who were missing an essential nutrient continued their diet for a longer period of time?** Ask the youth to share their thoughts and ideas verbally or record them on the flip chart paper provided.

3. **What are some ways you can make sure you have a balanced diet and get the proper nutrients?** Ask the youth to share their thoughts and ideas verbally or record them on the flip chart paper provided.

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the concept of balanced diet has been introduced or discovered by the youth. (Note: The goal is to have the youth develop concepts through their exploration and define terms using their own words.)

CONCEPT APPLICATION

1. On their own piece of notebook paper, ask each youth to write down everything they can remember eating in the last three days. Ask the youth in each group to share with one another, and then have the different groups share and compare their results.
2. Using the piece of the flip chart paper, ask the groups to put the foods they have listed on their individual papers into categories based on food types. Then ask them to rank the categories relative to quantities (how much of a given food type) and importance (healthy vs. not-so-healthy).
 - » **Volunteer Tip:** Encourage the youth to develop their own organizational scheme for categorizing the food.
3. Once everyone has completed steps 1 and 2, ask them to compare their results with the *MyPlate handout*. What are some of their observations?
4. Based on the foods that they eat, ask each group to prepare a three-day menu that complies with the recommendations of the Human Food Pyramid.
5. Ask the groups to share and compare their three-day menus.

REFERENCES

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GENERAL SOURCE OF NUTRIENTS KEY

Note: The examples for each category are common sources for each nutrient listed.

List of Familiar Foods for Humans

Protein

- beef
- cheese
- chicken
- chili
- corn
- egg
- kidney beans
- milk
- peanuts
- pork
- salmon
- tuna fish

Carbohydrates

- brown rice
- corn
- pasta (processed)
- pretzel
- white bread
- white rice

- whole grain bagel
- whole grain pasta
- whole wheat bread

Fiber

- apple
- broccoli
- brown rice
- chili
- corn
- kidney beans
- oatmeal
- orange
- peach
- potato
- strawberry
- whole grain bagel
- whole grain pasta
- whole wheat bread

Calcium

- broccoli
- cheese
- low fat milk
- spinach
- whole milk
- yogurt (low fat, plain)

Vitamin C

- apple juice
- apple
- broccoli
- cucumber
- grapefruit juice
- grapes
- green beans
- lemon
- orange
- peaches
- potato

- spinach
- strawberry
- tomato

Vitamin A

- beef
- broccoli
- carrot
- cheese
- egg
- green beans
- milk
- peach
- spinach
- strawberry
- tomato

Fats and Oils

- avocado
- butter
- canola oil

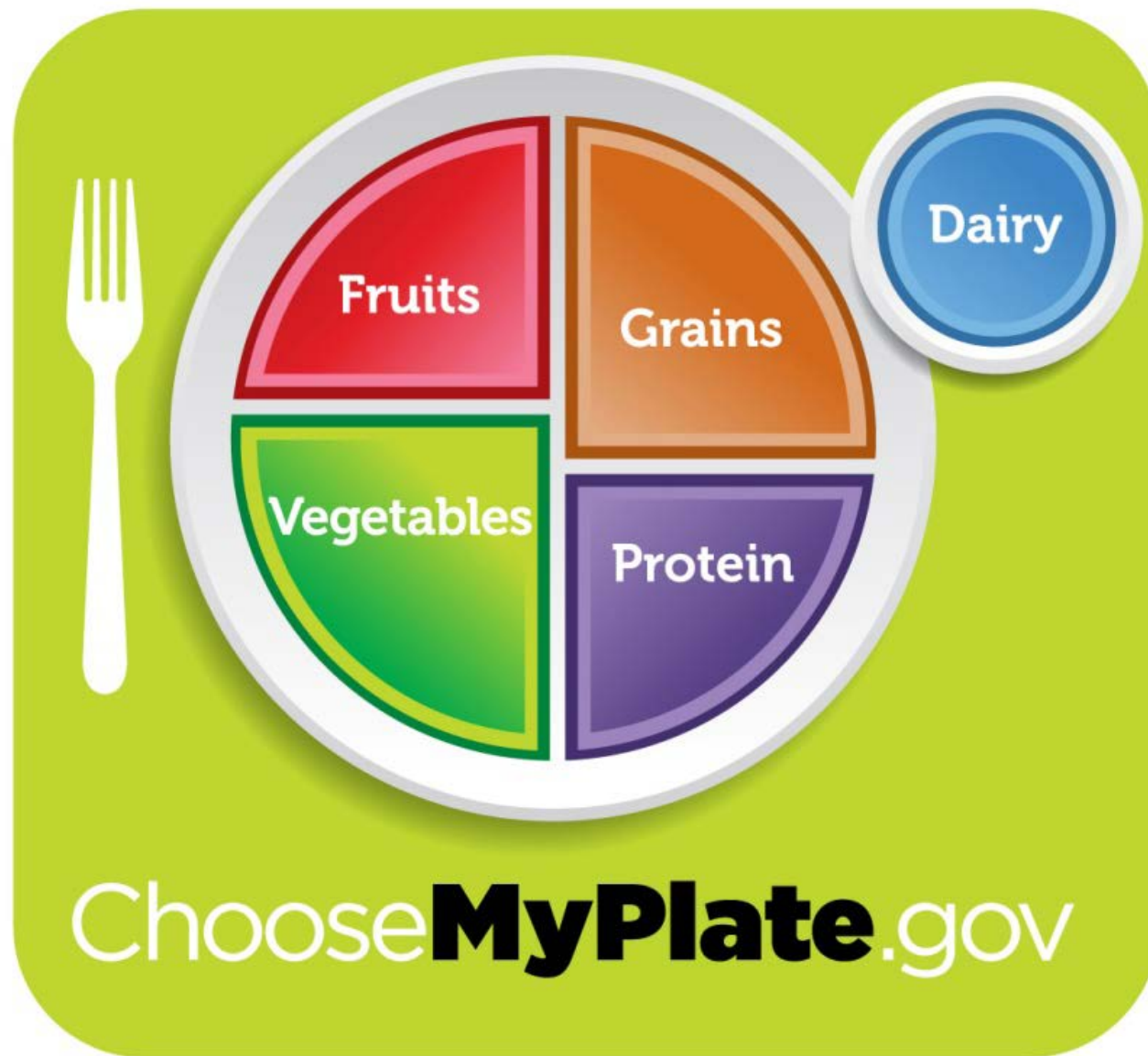
- coconut oil
- margarine
- peanuts
- salmon

Limited Nutritional Value

- chocolate
- deep-fried food
- donuts and other pastries with high sugar content
- ice cream
- other candy
- soda
- syrup

REFERENCE

Nutrition Data 2008.
www.nutritiondata.com



SAMPLE DIETS

Mark's diet:

- **Breakfast:** 3 pieces of white toast with butter
- **Lunch:** White rice with chopped spinach
- **Dinner:** White pasta with steamed carrots, apple juice

Jenny's diet:

- **Breakfast:** Eggs and sausage
- **Lunch:** Hotdog on a white bun
- **Dinner:** Steak with chicken, apple juice

Molly's diet:

- **Breakfast:** 2 pieces of whole wheat toast with butter, milk
- **Lunch:** Brown rice topped with peanuts, grapefruit juice
- **Dinner:** Whole wheat bagel with cheese, apple juice

Scott's diet:

- **Breakfast:** 2 donuts
- **Lunch:** 2 orders of French fries, one candy bar
- **Dinner:** Deep-fried chicken, broccoli, soda

Sydney's diet:

- **Breakfast:** Bacon, French toast (made with white bread) with lots of butter and syrup
- **Lunch:** Fried chicken strips, French fries
- **Dinner:** 4 slices of cheese pizza, chocolate cake

REFERENCE

<http://www.choosemyplate.gov>.

GENERAL FACTS ON NUTRIENTS HANDOUT

Carbohydrates

- **Function:** Carbohydrates provide energy to the body, especially to the brain and the nervous system.
- **Types and sources of carbohydrates:**
 - » **Simple carbohydrates:** Fruits, some vegetables, some dairy products, refined grains (processed flour), sugar, and corn syrup.
 - » **Complex carbohydrates:** Starchy vegetables, whole grains and cereals.
- **Possible effects:**
 - » **Too little:** Fatigue or lack of energy, malnutrition, and increased fat intake.
 - » **Too much:** Obesity.

Protein

- **Function:** Protein is an important source of energy and is essential for growth and organ function.
- **Sources:** meat, fish, eggs, cheese, beans, lentils, tofu, and nuts.
- **Possible effects:**
 - » **Too little:** Muscle loss, decrease in growth, decreased immunity (easier to get diseases or illnesses).
 - » **Too much:** Can cause high cholesterol and different types of diseases like gout.

Calcium

- **Function:** Calcium is a very important mineral because it makes up important structures like teeth and bones. It helps us grow and maintains our bodies. It also helps to prevent diseases like osteoporosis (weak bones).
- **Sources:** It is found in many types of foods, but is very abundant in dairy products. It is also found in green leafy vegetables (e.g., broccoli), some seafood (e.g., salmon), almonds, and dried beans.
- **Possible effects:**
 - » **Too much:** Normally no side effects appear, but if calcium intake is high over a long period of time it can cause the development of kidney stones.
 - » **Too little:** Deficiencies in calcium can lead to increased chance of broken bones or tooth decay.

Vitamin A

- **Function:** Vitamin A helps maintain healthy teeth, bones, soft tissue, and skin. It also helps promote good vision.
- **Sources:** Meats and animal products (milk, eggs), dark leafy green vegetables (e.g., spinach), and brightly colored vegetables (e.g., carrots) and fruits (e.g., cantaloupe).
- **Possible effects:**
 - » **Too little:** Vision problems; decreased resistance to disease.
 - » **Too much:** Can cause Vitamin A poisoning when consumed in very large amounts.

Vitamin C

- **Function:** Vitamin C is essential for normal growth and development. It is needed to make skin, scar tissue, heal wounds, and repair bone, cartilage and teeth. Since our body cannot make or store vitamin C, we must get it from foods we eat.
- **Sources:** Fruits and vegetables.
- **Possible effects:**
 - » **Too little:** Damaged hair, bleeding gums, rough and dry skin, easy bruising, slow healing of wounds, and nosebleeds.
 - » **Too much:** Vitamin C toxicity can occur which can lead to upset stomachs and diarrhea.

Fiber

- **Function:** Fiber is important in the diet because it helps us feel full after eating which can help with weight control. It also helps with digesting food and prevents constipation.
- **Types and sources of fiber:**
 - » **Soluble:** This type of fiber is slowly digested in the body and can lower cholesterol and help prevent heart disease. Sources of soluble fiber include oat bran, barley, nuts and seeds, beans, and some fruits and vegetables.
 - » **Insoluble:** This helps food pass through the stomach and intestines faster and adds bulk to the stool. Types of food high in insoluble fiber include wheat bran, vegetables, and whole grains.
- **Possible effects:**
 - » **Too little:** Constipation (difficulty passing bowel movements).
 - » **Too much:** Eating too much in a short period of time can cause gas, bloating, and cramps.

Fats and Oils

- **Function:** Fats and oils are a source of energy. There are essential fatty acids that our body cannot make so we must get them from our diet. Fats are like storage boxes, storing calories for when we do not have food to eat. Fat also helps insulate the body, maintains healthy hair and skin, and helps our body absorb different vitamins.
- **Types of fats:**
 - » **Saturated fats:** These types of fats tend to raise levels of LDL or “bad cholesterol” in a person’s blood. Increased levels of LDL can lead to heart disease. Saturated fats are found in some animal products (e.g., butter, cheese, ice cream) and fatty meats.
 - » **Unsaturated fats:** These types of fats tend to raise levels of HDL or “good cholesterol” in a person’s blood. They are found in most liquid vegetable oils.
- **Possible effects:**
 - » **Too little:** Hair loss or dull hair, brittle nails, and lack of cushioning for organs (Note: This is for unsaturated fats).
 - » **Too much:** Too much of saturated fats can cause heart disease, clogged arteries, and obesity.

Sweets

- **Function:** Quick source of energy
- **Sources:** Processed foods that have an excess of sugar (e.g., candy)
- **Possible effects:**
 - » **Too much sugar:** Can cause a “sugar high,” which is when a person gets a “rush” of energy for a period of time and then slows down with an energy “crash.” Dental decay, excess weight gain, and stomachaches can occur from eating too much sugar.

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ACTIVITY 3

Shopping by Chance for Pigs

BACKGROUND INFORMATION

Swine have long been domesticated and they rely on their owners for the type and quality of food they eat as well as the quality and amount of water they drink. Therefore it is important for owners to know what the essential nutrients for pigs are.

One misconception is that pigs can eat the same types of foods humans eat. With this understanding, many people think that feeding pigs table scraps is sufficient enough to meet their daily nutrient requirements. This is not true. In reality, the nutrient requirements for humans and pigs are different. Humans and pigs do need essential nutrients such as energy, protein, lysine, vitamins, and minerals in their diet, but the amounts of these nutrients differ for the two. Equally important is the fact that, just like humans, swine at different life stages require different types and quantities of nutrients.

Time Required

40–60 minutes

Concepts and Vocabulary

Essential nutrients, life stages of pigs

Life Skills

Communication, contributions to a group effort, cooperation, critical thinking, decision-making, keeping records, planning/organizing, problem solving, sharing, teamwork

Subject Links

Science, Language Arts, Math

State Content Standards

Science

- Fifth Grade:
 - » Investigation and Experimentation – 6g, 6h
- Sixth Grade:
 - » Investigation and Experimentation – 7d, 7e

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies – 1.2, 1.7, 1.8
- Fifth Grade:
 - » Reading Comprehension – 2.4
 - » Listening and Speaking Strategies – 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies – 1.5
 - » Speaking Applications – 2.5b

Math

- Fourth Grade:
 - » Statistics, Data Analysis, and Probability: 1.0
- Students organize, represent, and interpret numerical and categorical data and clearly communicate their findings – 1.1

Suggested Groupings

Work in pairs or small groups

Materials Needed

(* = Materials provided in curriculum)

- * *Pig Life Stage Cards*

- * *Pig Nutrient Requirements*
- * *Feed Cards*
- * *Nutrients Worksheet*
- * *Nutrient Comparison Graphs Worksheet*
- * *Facts about Nutrients*
- * *Appendix B: Pig Nutrient Requirements Tables* (Concept Application)
- * *Appendix C: Feed and Feed Ration Handouts* (Concept Application)
- Flip chart paper
- Markers or colored pencils
- Tape

Getting Ready

- Make 3 to 5 copies of each of the *Feed Cards* and staple identical cards together. Display the different *Feed Cards* on a table.
- Make enough copies of the *Pig Life Stage Cards* so each group gets a card. Additional copies may be needed later. Cut out the cards.
- Make enough *Pig Requirement Tables* for each group.
- Make enough copies of the *Nutrients Worksheet* for each group.
- Make enough copies of the *Appendix B: Swine Nutrient Requirements Tables* and *Appendix C: Feed and Feed Ration Handouts* for each youth (Concept Application).

OPENING QUESTIONS

1. **What do you know about the different types of food that pigs eat?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
2. **Recall what nutrients are essential for humans. What do you think some of the essential nutrients for pigs might be? How do you think pigs acquire these nutrients?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

PROCEDURE (EXPERIENCING): PART A

1. Pass out the *Nutrients Worksheet* to each group.
2. Each group of youth will have a pig from a specific life stage. Determine that by passing out a *Pig Life Stage Card* at random to each group. Have them write the life stage of the pig they received under Part A of the *Nutrients Worksheet*.
3. Explain the scenario to the youth: They are pig owners and their group is going to the store to buy a type of feed for their particular pig.
4. Have each group go to the “store” (table with feed labels) to pick out a feed for their pig. Once each group has decided on the feed they want, have them remove one label and take it back with them. Write this feed type they picked under Part A of the *Nutrients Worksheet*.

SHARING, PROCESSING, AND GENERALIZING

Ask each group to discuss why they chose the particular feed that they did. Ask the youth to please share their ideas verbally or write their thoughts and ideas on the paper provided.

PROCEDURE (EXPERIENCING): PART B

1. Pass out the *Pig Nutrient Requirements* to each group.
2. Have the youth determine the particular nutrient requirements for their pig and record the information down under Part B of the *Nutrients Worksheet*.
3. Next, have the youth compare the feed they chose with the nutrient requirements of their pig. Did the feed they chose meet the nutrient requirements of their pig? Why or why not? Have them fill out and write their responses under Part B of the *Nutrients Worksheet*. Pass out the *Facts about Nutrients* page to help them complete the *Nutrients Worksheet*.

SHARING, PROCESSING, AND GENERALIZING

As a group, have each group discuss their pig's diet and whether they met the pig's nutrient requirements. Have them also discuss potential benefits and possible drawbacks with respect to their pig's diet. Discuss ways each group can improve their pig's feed.

PROCEDURE (EXPERIENCING): PART C

1. For those groups that did not pick the correct diet, ask them to return to the “store” and shop for another diet that best meets their pig's requirements. Include any modifications that might be needed. Have them fill out and write their responses under Part C of the *Nutrients Worksheet*.
2. For those who picked the correct diet, have the youth go and choose appropriate diets for the other pigs listed in the *Pig Nutrient Requirements*.

3. Have them fill out the table in Part C of the *Nutrients Worksheet*.
4. **Note:** The youth who completed step 1 may now continue with steps 2 and 3. Wait until each group has completed at least one other pig before moving to the next section.

SHARING, PROCESSING, AND GENERALIZING

Have each group share the diets they picked for each pig and explain why they chose as they did. Have each group compare their findings, see if they are similar or different, and try to understand why.

PROCEDURE (EXPERIENCING): PART D

1. Using the *Nutrient Comparison Graphs Worksheet* and the *Pig Nutrient Requirements* handout, have the youth plot the nutrient requirements for each life stage as a line graph.
2. Once each group has completed graphing, have them look at the trends in nutrient requirements for each life stage. Have them share their thoughts and ideas either verbally or on the flip chart paper provided.

SHARING, PROCESSING, AND GENERALIZING

Follow the lines of thinking developed by the youth as they share and compare their thoughts and observations on the overall activity. If necessary, use more targeted questions as prompts to get to particular points. Specific questions might include

1. **Asking each group share their thoughts and ideas to the trends of each life stage.**
 2. **Asking the youth to share what they learned about different life stages of pigs.** Have them share their thoughts and ideas either verbally or on the flip chart paper provided.
 3. **Asking the youth to share what they learned about food labels.** Have them share their thoughts and ideas either verbally or on the flip chart paper provided.
 4. **Asking the youth to explain why they think it is important to read food labels.** Have them share their thoughts and ideas either verbally or on the flip chart paper provided.
- » **Volunteer Tip:** Notice on the different feed diets that crude fat and crude fiber are shown. Since it is complicated to calculate these specific requirements for pigs at different life stages, we have omitted them here to avoid confusion. However, it is important to recognize that both nutrients are extremely important in a pig's diet, so it is always important to take both the crude fat and crude fiber content of each feed and its relation to the

pig's life stage requirements into consideration for different pigs. Please consult a pig nutrition book or your local feed store to find the best diet for your pig.

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the concept of life stages of different pigs and the term essential nutrients have been introduced or discovered by the youth. The goal is to have the youth develop concepts and terms through their own exploration and define terms using their own words.

CONCEPT APPLICATION

Ask youth who do have a pig to . . .

- Determine the life stage of their pig.
- Use the *Pig Nutrient Requirements* (from the activity) and *Appendix B: Pig Nutrient Requirements Tables* to figure out what their pig's nutritional requirements are.
- Go online and research how to obtain the essential nutrients for their pig.
 - » **Volunteer Tip:** Included in this publication is *Appendix C: Feed and Feed Ration Handouts* that youth can use with reference to their own pigs.

Ask youth who do not have a pig to . . .

- Choose a pig at a particular life stage that they might want.
- Use *Appendix B: Pig Nutrient Requirements Table* to figure out what the nutritional requirements are for that particular pig.
- Go online and research how to obtain the essential nutrients for their chosen pig.

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PIG LIFE STAGE CARDS

Print one-sided on heavy paper and cut out along dashed lines.



Early Weaned Pig



Finishing Pig



Growing Pig



Late Gestation Sow



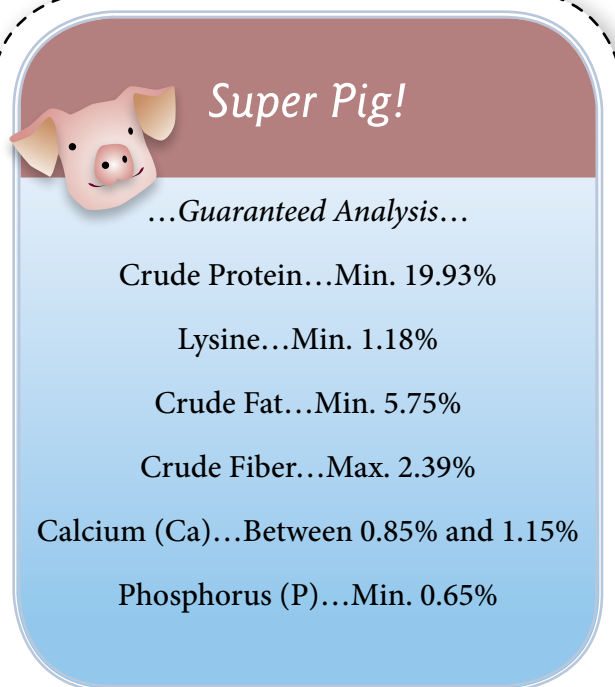
Lactating Sow

PIG NUTRIENT REQUIREMENTS

(Note: These are approximations of the daily requirements needed for each pig).

Pig type	Nutrients			
	Crude protein	Lysine	Calcium	Phosphorus
Early weaned pig (under 40 lb)	24.5%	1.43%	0.85%	0.68%
Growing pig (40 lb to 125 lb)	19.5%	1.05%	0.65%	0.55%
Finishing pig (125 lb to 260 lb)	14.5%	0.68%	0.48%	0.42%
Late-gestation sow	12.5%	0.55%	0.75%	0.65%
Lactating sow	17%	0.95%	0.75%	0.65%

FEED CARDS (Note: The ingredients are from actual feeds but the names of the feeds are fictional.)



Super Pig!

...Guaranteed Analysis...

Crude Protein...Min. 19.93%

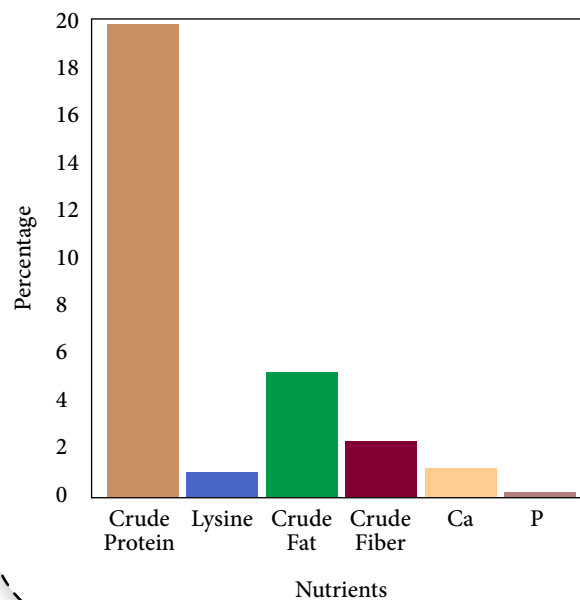
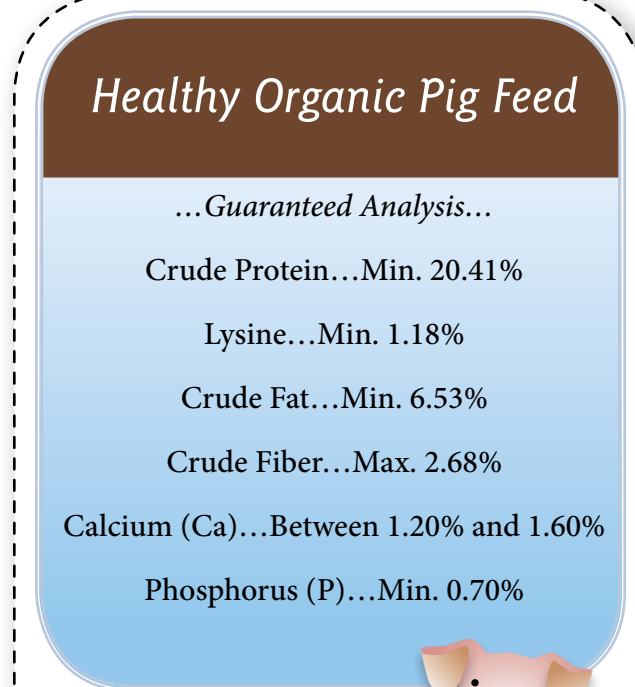
Lysine...Min. 1.18%

Crude Fat...Min. 5.75%

Crude Fiber...Max. 2.39%

Calcium (Ca)...Between 0.85% and 1.15%

Phosphorus (P)...Min. 0.65%

Healthy Organic Pig Feed

...Guaranteed Analysis...

Crude Protein...Min. 20.41%

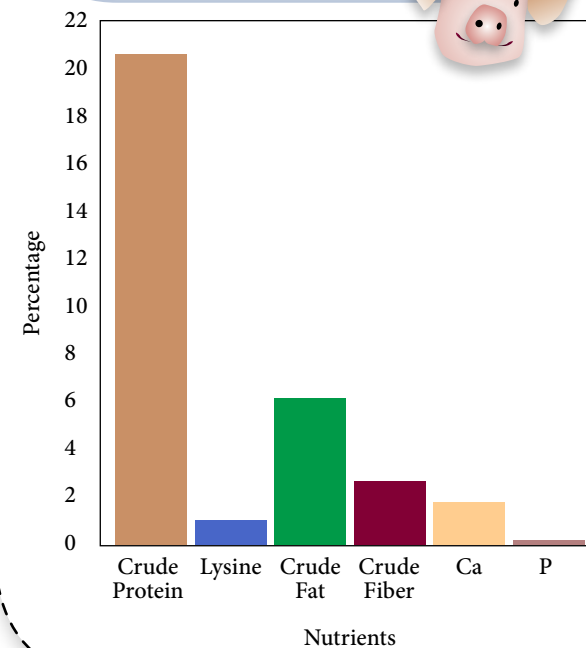
Lysine...Min. 1.18%

Crude Fat...Min. 6.53%

Crude Fiber...Max. 2.68%

Calcium (Ca)...Between 1.20% and 1.60%

Phosphorus (P)...Min. 0.70%



Complete Diet for Your Swine

...Guaranteed Analysis...

Crude Protein...Min. 13.50%

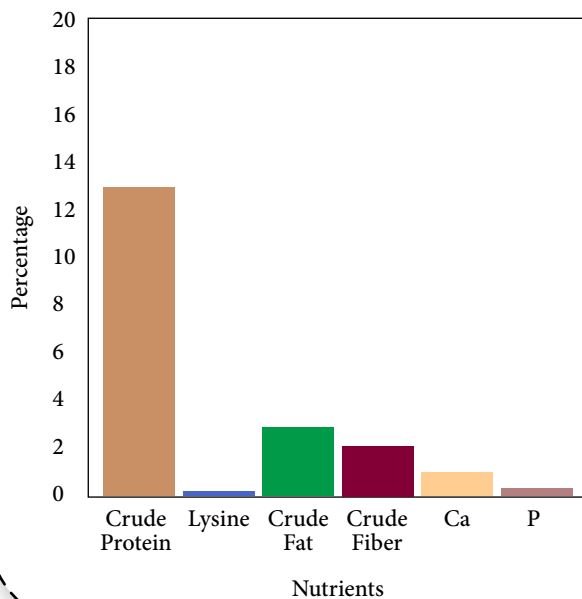
Lysine...Min. 0.60%

Crude Fat...Min. 3.20%

Crude Fiber...Max. 2.20%

Calcium (Ca)...Between 1.20 and 1.50%

Phosphorus (P)...Min. 0.83%



All Around Pig Feed Fit to feed YOUR pig!

...Guaranteed Analysis...

Crude Protein...Min. 16.10%

Lysine...Min. 0.80%

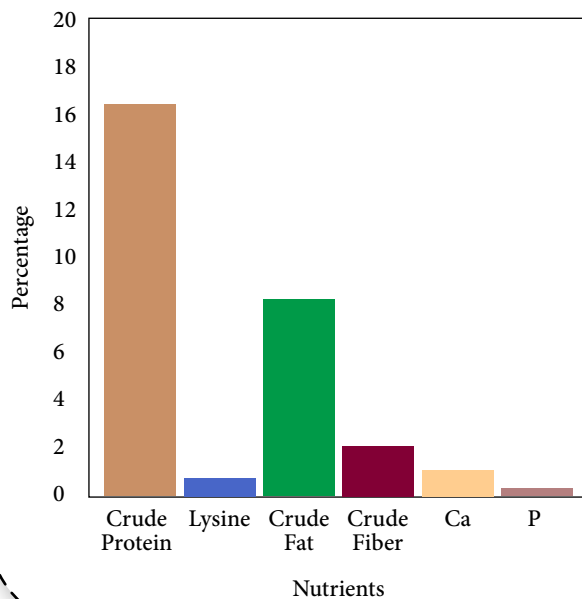
Crude Fat...Min. 8.30%

Crude Fiber...Max. 2.30%

Calcium (Ca)...Between 1.05 and 1.35%

Phosphorus (P)...Min. 0.69%

Recommended by veterinarians!



KING of all Pig Feeds Fit for a King!

...Guaranteed Analysis...

Crude Protein...Min. 20.06%

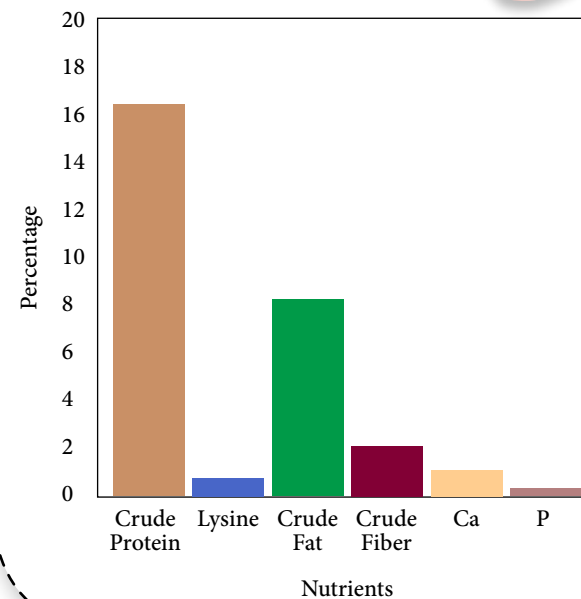
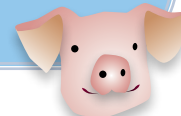
Lysine...Min. 1.20%

Crude Fat...Min. 5.41%

Crude Fiber...Max. 2.33%

Calcium (Ca)...Between 0.78% and 1.08%

Phosphorus (P)...Min. 0.73%



Pellets for Pigs

...Guaranteed Analysis...

Crude Protein...Min. 14.0%

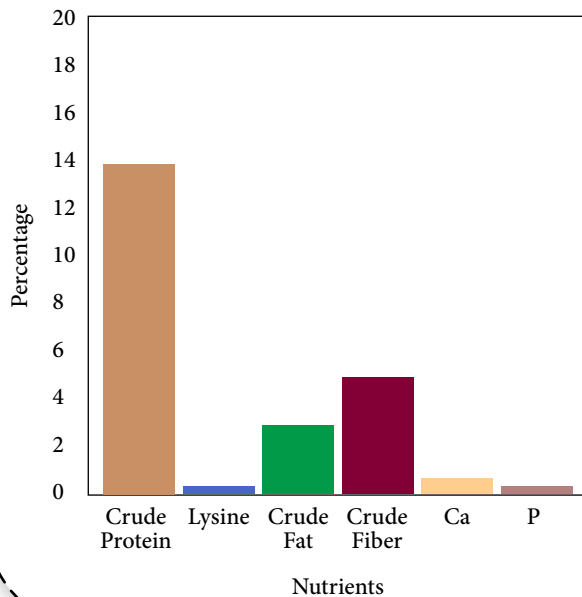
Lysine...Min. 0.60%

Crude Fat...Min. 3.0%

Crude Fiber...Max. 5.50%

Calcium (Ca)...Between 0.60 and 1.10%

Phosphorus (P)...Min. 0.50%



Cracked Corn

...Guaranteed Analysis...

Crude Protein...10.00%

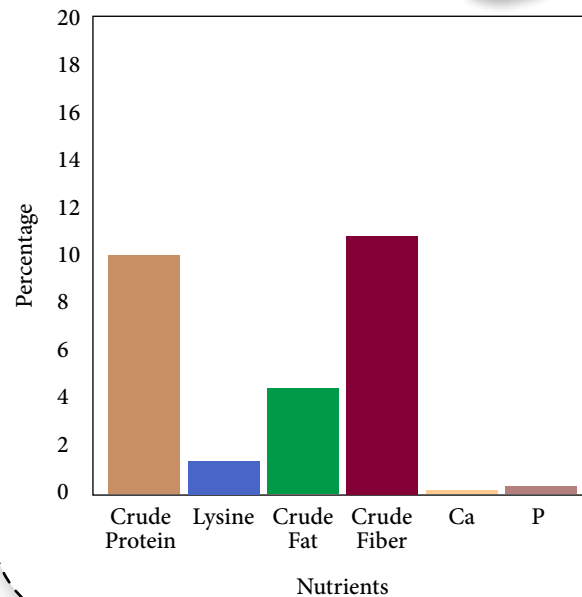
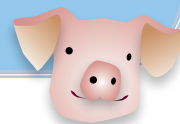
Lysine...1.45%

Crude Fat...4.10%

Crude Fiber...11.00%

Calcium (Ca)...0.03%

Phosphorus (P)...0.32%



Natural Nutrition Rolled Corn for Swine

...Guaranteed Analysis...

Crude Protein...9.00%

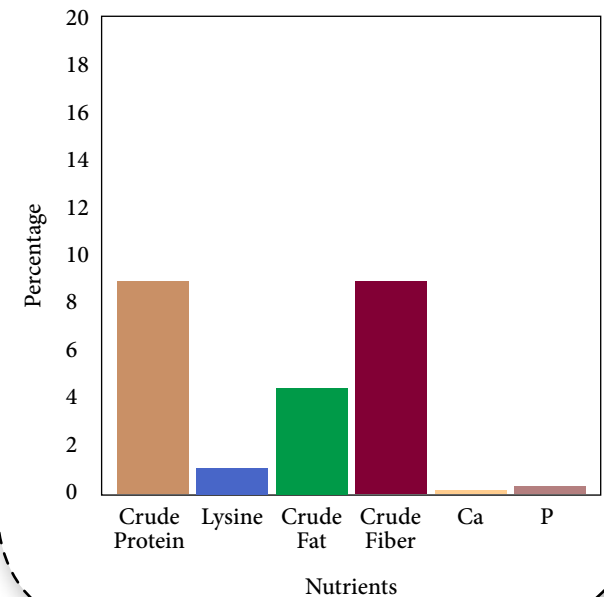
Lysine...1.50%

Crude Fat...4.10%

Crude Fiber...9.00%

Calcium (Ca)...0.02%

Phosphorus (P)...0.29%



Energy! Strength! Alfalfa Hay [Mid Bloom]

...Guaranteed Analysis...

Crude Protein...17.00%

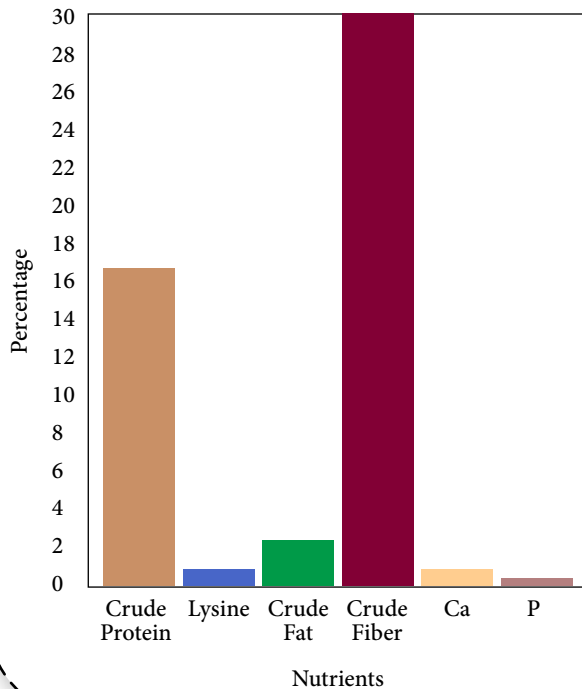
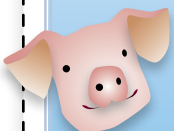
Lysine...1.37%

Crude Fat...2.30%

Crude Fiber...30.00%

Calcium (Ca)...1.40%

Phosphorus (P)...0.24%



Soybean Meal

...Guaranteed Analysis...

Crude Protein...50.00%

Lysine...0.97%

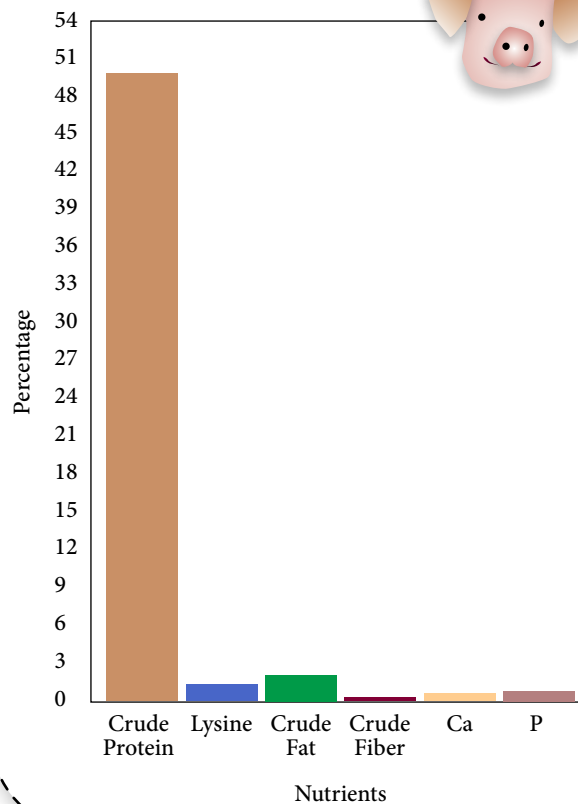
Crude Fat...1.80%

Crude Fiber...0.60%

Calcium (Ca)...0.39%

Phosphorus (P)...0.71%

Guaranteed to fly you to first place!



Cottonseed Meal

...Guaranteed Analysis...

Crude Protein...47.00%

Lysine...0.72%

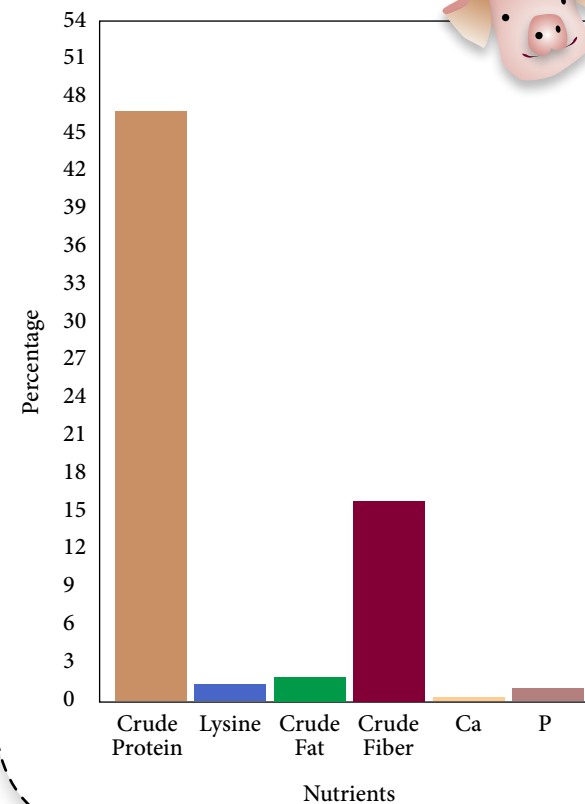
Crude Fat...1.30%

Crude Fiber...15.00%

Calcium (Ca)...0.22%

Phosphorus (P)...1.30%

All natural and great tasting!
Your pigs will LOVE it!



Oat Grain

...Guaranteed Analysis...

Crude Protein...47.00%

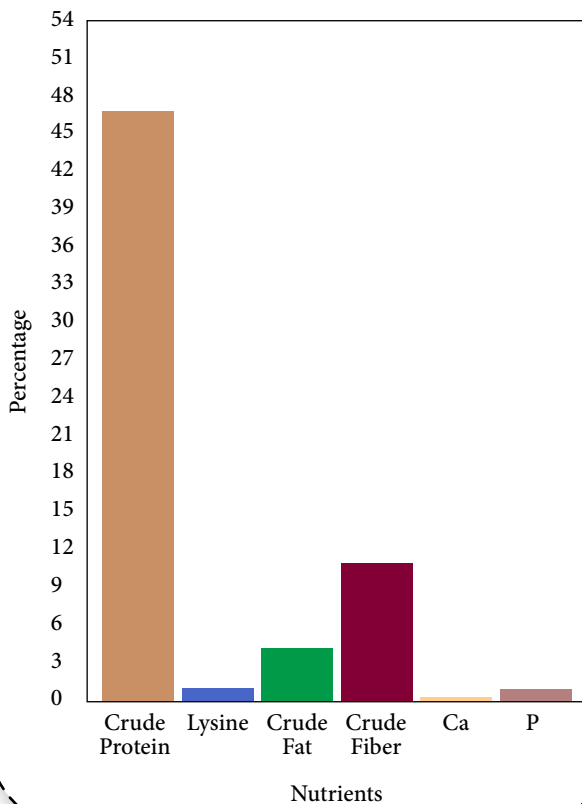
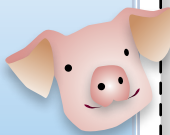
Lysine...0.55%

Crude Fat...4.90%

Crude Fiber...11.00%

Calcium (Ca)...0.05%

Phosphorus (P)...0.40%



NUTRIENTS WORKSHEET

Part A:

Life Stage of Pig: _____

Feed Type: _____

Part B:

Pig Nutrient Requirements

Crude Protein: _____

Lysine: _____

Calcium: _____

Phosphorus: _____

Feed Nutrients

Crude Protein: _____

Lysine: _____

Calcium: _____

Phosphorus: _____

Based on your understanding of your pig's nutritional needs, determine if you believe the feed you chose:

Sufficiently meets pig's dietary requirements, (please explain).

Doesn't sufficiently meet pig's dietary requirements, (please explain).

Unable to determine, (please explain). _____

Potential Benefits of the feed you chose: _____

Potential Drawbacks of the feed you chose: _____

What might you do to improve your pig's feed? (please explain). _____

Part C:

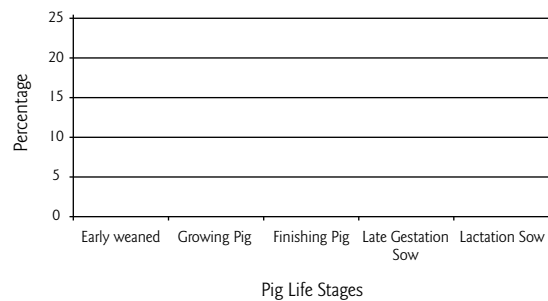
Of the feeds available, which diet best meets your pig's requirements? Please explain. Include any modifications you might have for the feed. _____

Life stage of pig	Feed type	Why did you choose this feed?
Early weaned pig		
Growing pig		
Finishing pig		
Late gestation sow		
Lactating sow		

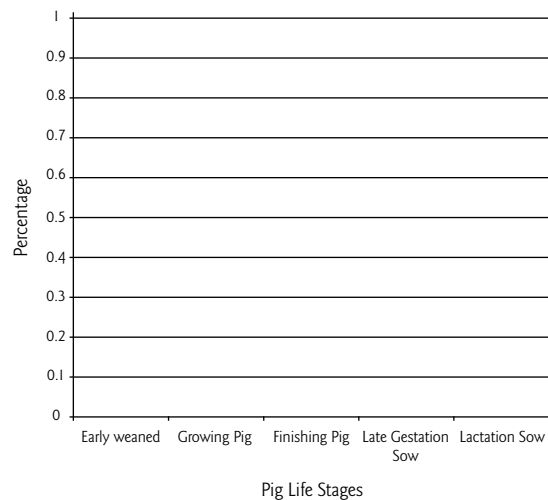
Part D:

Please use *Pig Nutrient Requirements* worksheet to complete each graph below as a bar graph

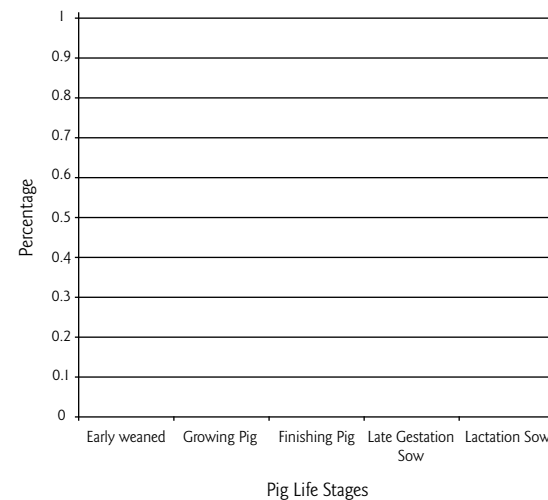
Crude Protein



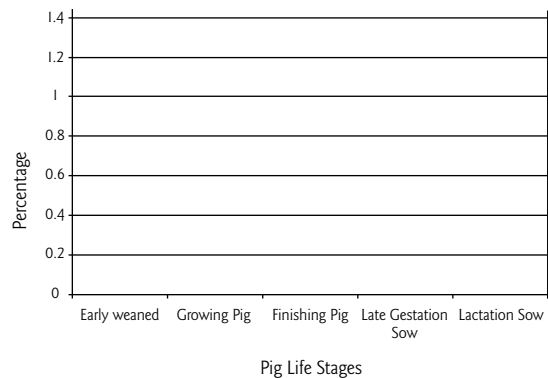
Calcium



Phosphorus



Lysine



FACTS ABOUT NUTRIENTS

Lack of Nutrients

- **Lack of Protein:** In general, this can cause a reduction in muscle gain and poor feed conversion. Different life stages have different symptoms. In growing and finishing pigs, the carcass is fatter. In lactating sows, milk production is reduced and weight loss occurs.
- **Lack of Lysine:** This can lead to a reduction in body weight, smaller muscles, and a declined growth rate.
- **Lack of Calcium:** This can lead to reduced growth and poor bone mineralization, which can cause diseases like rickets, osteomalacia (softening of the bone), and paralysis in the hind legs.
- **Lack of Phosphorus:** This can lead to reduced growth and poor bone development, which can cause diseases like rickets, osteomalacia (softening of the bone), and paralysis in the hind legs.

Excess of Nutrients

- **Excess Protein:** If a pig is fed an excess of protein, it is not just expensive; it is also an inefficient source of energy. Usually pigs can tolerate high levels of protein. Minor symptoms that may occur include mild diarrhea.
- **Excess Lysine:** In general, an excess of amino acids can lead to toxicity or imbalance in amino acids, depending on which amino acid is in excess. For lysine, it can cause antagonism. If a pig eats a lot of lysine, that decreases the amount of arginine available in its system.

- **Excess Calcium:** An excess amount of calcium can reduce a pig's performance. It can also increase a pig's need for other minerals and vitamins such as zinc and vitamin K.
- **Excess Phosphorus:** An excess amount of phosphorus can reduce a pig's performance.

OTHER IMPORTANT NUTRIENTS

Fat

- **Lack of Fat:** A lack of fat has indirect effects on the pig. Mainly it reduces the production of essential fatty acids, which can cause hair loss, skin problems, and an unthrifty appearance.
- **Excess Fat:** A decreased feed intake with over 10% fat can cause health problems in pigs.

Fiber

- **Lack of Fiber:** Fiber is important for a lactating sow. It has a laxative effect that helps keep her regular and comfortable during lactation.
- **Excess Fiber:** An excess of fiber can make the diet less digestible and reduce animal performance (for instance, gain and feed efficiency).

RECOMMENDATIONS TO IMPROVE PIG FEED

- Look at other feed types and see if there is one that better matches the type of pig you have.
- Combine different types of feed to meet your pig's nutrient requirements.
- Add supplements to the feed when there is a lack of particular vitamins or minerals.

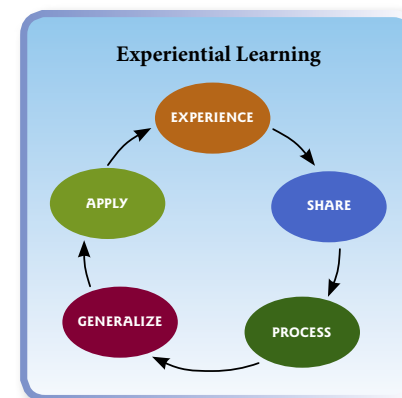
GLOSSARY

- **Balanced diet:** Eating the right types of food in the right amounts to maintain a healthy body.
- **Basic nutrients:** Substances that help maintain a healthy body. These include carbohydrates, proteins, vitamins and minerals.
- **Care:** Having concern for someone or something, which leads to tending or overseeing that person or thing.
- **Competition:** A struggle between individuals for food, space, and other important requirements for survival.
- **Direct contact:** Physical contact between an ill person or animal and a healthy person or animal.
- **Disease:** An abnormal condition that affects the normal function and health of an organism, decreasing the health of that organism.
- **Disease prevention:** Taking the necessary steps to prevent humans and/or animals from getting sick.
- **Disease transmission:** To transfer a disease from one person or animal to another.
- **Dominant:** Having influence, control, and authority over others.
- **Environmental needs of humans and swine:** The things that both humans and swine need in their home or living area to help them survive and live comfortably.
- **Essential nutrients:** Nutrients that humans and animals must have to live and function properly.
- **Germs:** A microorganism that has the potential to cause diseases.
- **Health care monitoring:** Closely observing an animal's health, behavior and activity everyday to determine what is normal or abnormal about your animal.

- **Illness:** Being unhealthy or in poor health.
- **Indirect contact:** When an uninfected person or animal touches the contaminated surface (e.g., table top) of an inanimate object (e.g., food dish).
- **Life stages of swine:** Swine are categorized in different stages of development or life stages. Swine at each life stage have different nutritional requirements to grow and stay healthy.
- **Olfactory receptors:** Structures that aid with an individual's sense of smell. The more receptors you have, the better your sense of smell.
- **Prenasal bone:** A bone found in the snout of pigs. This bone allows them to use their nose to dig for food in the ground.
- **Preventative health care:** The act of maintaining the health of humans and animals by preventing them from catching an illness or disease.
- **Responsibility:** Being accountable for one's actions or behaviors.
- **Rooting:** The act of pulling out or removing items from under the ground.
- **Rooting-disk:** A disk found in the snout of pigs that is very sensitive, allowing them to explore the surrounding environment.
- **Social dominance:** In a group, there are individuals that lead and have authority over others in the group.
- **Social hierarchy:** A system where individuals are ranked from top to bottom according to authority or importance.
- **Social order:** A system in place that keeps a group stable and functioning.
- **Subordinate:** Belonging to a lower level or rank in a group.
- **Tactile receptors:** Structures that aid with someone or something's ability to feel and touch items in the environment. The more receptors you have, the better your sense of touch.
- **Wallowing:** To roll around in the mud.

APPENDIX A

The activities in this curriculum were designed around inquiry and experiential learning. Inquiry is a learner-centered approach in which individuals are problem solvers investigating questions through active engagement, observing and manipulating objects and phenomena, and acquiring or discovering knowledge. Experiential learning (EL) is a foundational educational strategy used in 4-H. In it, the learner has an experience phase of engagement in an activity, a reflection phase in which observations and reactions are shared and discussed, and an application phase in which new knowledge and skills are applied to a real-life setting. In 4-H, an EL model that uses a five-step learning cycle is most commonly used. These five steps—Experiencing, Sharing, Processing, Generalizing, and Applying—are part of a recurring process that helps build learner understanding over time.



For more information on inquiry, EL, and the five-step learning cycle, please visit the University of California Science, Technology, and Environmental Literacy Workgroup's Experiential Learning website, <http://www.experientiallearning.ucdavis.edu/default.shtml>.

APPENDIX B

Pig Nutrient Requirements Tables (Adapted from the Nutrient Requirements of Swine, published by the National Research Council, 1998.)

Growing Pigs Allowed Ad Lib Feed Access

	Body weight (kg)					
	3-5	5-10	10-20	20-50	50-80	80-120
Average wt in range (kg)	4	7.5	15	35	65	100
DE content of diet (kcal/kg)	3,400	3,400	3,400	3,400	3,400	3,400
ME content of diet (kcal/kg)	3,265	3,265	3,265	3,265	3,265	3,265
Estimated feed intake (g/day)	250	500	1,000	1,855	2,575	3,075
Crude protein (%)	26.0	23.7	20.9	18.0	15.5	13.5
Lysine (%)	1.50	1.35	1.15	0.95	0.75	0.60
Ca (%)	0.90	0.80	0.70	0.60	0.50	0.45
P (%)	0.70	0.65	0.60	0.50	0.45	0.40

Gestating Sows

	Body weight at breeding (kg)					
	125	150	175	200	200	200
	Gestation weight gain (kg)					
	55	45	40	35	30	35
	Anticipated pigs in litter					
	125	150	175	200	200	200
DE content of diet (kcal/kg)	3,400	3,400	3,400	3,400	3,400	3,400
ME content of diet (kcal/kg)	3,265	3,265	3,265	3,265	3,265	3,265
Estimated feed intake (kg/day)	1.96	1.84	1.88	1.92	1.80	1.85
Crude protein (%)	12.9	12.8	12.4	12.0	12.1	12.4
Lysine, (%)	0.58	0.57	0.54	0.52	0.52	0.54
Ca (%)	0.75	0.75	0.75	0.75	0.75	0.75
P (%)	0.65	0.65	0.65	0.65	0.65	0.65

Lactating Sows

	Post-farrowing weight (kg)					
	175	175	175	175	175	175
	Anticipated lactational weight change (kg)					
	0	0	0	-10	-10	-10
	Daily weight gain of pigs (g)					
	150	200	250	150	200	250
DE content of diet (kcal/kg)	3,400	3,400	3,400	3,400	3,400	3,400
ME content of diet (kcal/kg)	3,265	3,265	3,265	3,265	3,265	3,265
Estimated feed intake (kg/d)	4.31	5.35	6.40	3.56	4.61	5.66
Crude protein (%)	16.3	17.5	18.4	17.2	18.5	19.2
Lysine (%)	0.82	0.91	0.97	0.89	0.97	1.03
Ca (%)	0.75	0.75	0.75	0.75	0.75	0.75
P, %	0.65	0.65	0.65	0.65	0.65	0.65

Boars

DE content of diet (kcal/kg)	3,400
ME content of diet (kcal/kg)	3,265
Estimated feed intake (kg/d)	2
Crude protein (%)	13.0
Lysine (%)	0.60
Ca (%)	0.75
P (%)	0.60

APPENDIX C

Feed and Feed Ration Handouts

Feedstuff	Protein %	Lysine %	Relative to SBM	Max inclusion rate
Plant protein sources				
Soybean meal, 44%	43.8	2.83	100	20
Soybean meal, de-hulled	47.5	3.02	100	20
Canola meal	35.6	2.08	91	10
Cottonseed meal	41.4	1.72	65	8
Linseed meal	33.6	1.24	57	5
Peanut meal	49.1	1.66	53	10
Animal protein sources				
Blood cells, spray dried	92.0	8.51	144	3
Blood plasma, spray dried	78.0	6.84	246	6
Blood meal, spray or ring dried	88.8	.45	131	3
Milk, dried skim	34.6	2.86	129	20
Fish meal	62.9	4.81	119	5
Whey, dried	12.1	0.90	116	35
Meat meal	54	3.07	88	5
Meat and bone meal	51.5	2.51	76	5
Feather meal, hydrolyzed	84.5	2.08	38	2

Feedstuff	Protein %	Lysine %	Relative to SBM	Max inclusion rate
Grain by product Sources				
Wheat bran	15.7	0.64	63	5
Brewers grains	26.5	1.08	63	15
Corn gluten feed	21.5	0.63	46	10
Distillers grain with solubles	27.7	0.62	35	20
Corn gluten meal	60.2	1.02	26	5
Grain sources				
Barley	11.3	0.41	56	—
Oats	11.5	0.40	54	—
Wheat	11.5	0.38	51	—
Corn	8.3	0.26	49	—
Grain Sorghum	9.2	0.22	37	—

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SWINE : From the Animal's Point of View

4

SUBJECT OVERVIEW AND BACKGROUND INFORMATION

There are several factors that can contribute to the deterioration of a pig's health, but diseases in these animals usually do not occur "out of nowhere." Illnesses and diseases frequently happen when a pig experiences stress, has a poor diet, is exposed to other pigs that are ill, consumes contaminated food or water, or is housed in an inappropriate environment (i.e., too hot, unsanitary). Some common diseases are pneumonia, pseudo rabies (mad itch), and swine dysentery. Swine can also have external parasites such as lice and mange mites or internal parasites that live inside the pig's body.

Similar to humans, swine need to have some basic living standards met in order to stay healthy. Having the right diet is crucial to a pig's health. A pig that is malnourished is more vulnerable to disease. The immune system of a malnourished animal has a harder time fighting off pathogens (e.g., disease-causing bacteria or viruses) than that of a well-nourished animal, so disease is more likely to take over the underfed pig's body and bring about still more health problems. A healthy diet can prevent myriad diseases.



Pig Disease: What You Need to Know

MARTIN H. SMITH, Cooperative Extension Youth Curriculum Development Specialist, University of California, Davis; **CHERYL L. MEEHAN**, Staff Research Associate, UC Davis; **JUSTINE M. MA**, Program Representative, UC Davis; **NAO HISAKAWA**, Student Assistant, Veterinary Medicine Extension, UC Davis; **H. STEVE DASHER**, 4-H Youth and Community Development Advisor, UC Cooperative Extension, San Diego County; **JOE D. CAMARILLO**, 4-H Youth and Community Development Advisor, UCCE, Madera County; and UC Davis Undergraduate Curriculum Development Teams.

Partially funded through a grant from the Wells Fargo Foundation.

The content in this curriculum is designed to introduce youth to swine behavior, needs and care. Additional emphases include life skills and positive youth development. This is not a guide to raising swine for market or exhibition.

In addition, the practice of good hygiene can prevent a health disaster. By keeping the pig's environment, food, and water as clean as possible, you cut down the chances that bacteria or other pathogens will thrive. Maintenance of the correct temperature in a pig's environment contributes significantly to its health. Overheating can cause dehydration and heatstroke—which can result in death. If kept in too cold an environment, a pig can become ill or, in extreme cases, get frostbite and die. Housing the pig in a low-stress environment is a way of protecting its health. Stressors vary, but a few examples are excess noise and crowded conditions—too many pigs housed in too small an area. When a pig is scared or stressed, its activity level and appetite will probably change.

Though there are many diseases and illnesses that can attack swine, the youth who care for them can take an active role in disease prevention simply by monitoring their pigs on a daily basis. There are several indicators that youth can watch for: the quality of the feces, the pig's activity level, its appetite, and its skin.

Concepts and Vocabulary

- **Direct contact:** Physical contact between an ill person or animal and a healthy person or animal.
- **Disease:** An abnormal condition that affects the normal functioning and health of an organism, decreasing the health of that organism.
- **Disease prevention:** Taking the necessary steps to prevent humans or animals from getting sick.
- **Disease transmission:** The transfer of a disease from one person or animal to another.
- **Germs:** Microorganisms that have the potential to cause diseases.

- **Health care monitoring:** Close observation of an animal's health, behavior, and activity every day to determine what is normal or abnormal about the animal.
- **Illness:** The condition of being unhealthy or in poor health.
- **Indirect contact:** When an uninfected person or animal touches a contaminated surface of an inanimate object (e.g., table top, food dish).
- **Preventive health care:** Actions that maintain the health of humans and animals by preventing them from becoming ill in the first place.

Life Skills

Communication, contributions to group effort, cooperation, critical thinking, decision making, disease prevention, keeping records, problem solving, sharing, teamwork

Subject Links

Science, Language Arts

Overview of Activities

This section of the curriculum begins with the activity “How Fast Can Germs Spread?” In this activity, youth will be exposed to the concept of the dissemination of diseases and germs. By spreading glitter from one youth to several others in a short period of time, it mimics the alarmingly fast rate at which a germ can be disseminated. Not only does this activity show youth a common characteristic of contagious diseases, it stresses the significance of practicing good hygiene. When the youth wash their hands after the activity, they can see that the bits of glitter (or “germs”) have been removed.

In the next activity, “Is My Pig Sick?,” youth will have an opportunity to experience and learn when, why, and how pigs can get sick. Each youth will represent a pig as they play

a modified version of musical chairs. The names of different pig diseases will be read out and the youth (playing pigs) will determine whether in their own condition they are able to withstand each disease. If they cannot, they will be sent to the veterinary clinic where they will learn how to get better and things to watch out for that can inhibit their progress.

In the final activity, “My Pig's Health,” youth are separated into small groups. Each group is given five daily journal entries related to a particular pig, and they are to observe and record important health facts from those journals. After reviewing all five entries for their group, the groups will be given a list of pig disease descriptions. Based on their notes, each group will come up with a suggested diagnosis for their pig and an explanation of how they reached their diagnosis. Some diseases have similar symptoms, so the activity will teach the youth that they cannot always diagnose their pigs on their own and that professional veterinary care is important. Disease symptoms can be ambiguous. It's important to know when to consult a professional in order to find out what is actually affecting your animal's health.

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FACTS ABOUT SWINE

DISEASE

Basic Facts

- A healthy pig should have:
 - » Big and healthy appetite
 - » Body temperature of around 102.5°F
 - » Smooth, shiny coat
 - » Tightly curled tail
- An unhealthy pig may have:
 - » Decreased appetite
 - » Rough hair coat
 - » Lots of coughing
 - » Dull look in its eyes
 - » Diarrhea
 - » Inactivity
 - » Lameness

Prevention of Diseases

- The best solution to swine diseases is prevention. Measures to take to decrease the risk of infection include:
 - » Routine health procedures, which include vaccination, monitoring on a regular basis, and feed additives to ensure that no nutrient is deficient

- » When bringing home a new pig, making sure the pig has had a complete check up and is infection-free
 - » Always washing hands before and after handling your pig
 - » Maintaining a clean and well-managed environment for your pig
- Pigs are prone to stress that may be caused when you vaccinate, change the pig's environment, or add a new pig. When pigs are stressed, they eat less, grow slower, and are more susceptible to diseases. Therefore it is important to try to minimize or avoid stress in a pig.

The Diseases

Like any animal, a pig can be affected by many diseases. Listed below are a few diseases that pigs may face. If your pig exhibits any of the symptoms or signs listed below or has unusual behavior, seek veterinary help immediately.

- **Pseudorabies or Aujeszky's Disease.** This is a contagious disease caused by a virus. It causes inflammation of the brain and the spinal chord, and also respiratory tract infection. It can be spread directly from animal to animal or by means of other inanimate objects such as clothing and feed. The symptoms differ according to pig's age; young piglets may show fever, muscle twitching, convulsions, and

paralysis, and the usual result is death. For adolescent pigs, respiratory signs such as coughing and sneezing may be present, but death is much less likely. In adults, reproductive problems such as stillbirth and giving birth to weak piglets may result. There is no treatment for this virus, so prevention of the disease (i.e., by means of vaccination or strict sanitation) is essential.

- **Swine Dysentery.** This is caused by bacteria and affects mostly post-weaning pigs. The bacteria can be transmitted through pig-to-pig contact or on feces, clothing, or on other animals (i.e., rats and mice). Symptoms include diarrhea, loss of coordination, dehydration, and weakness. Although swine dysentery may result in death if left untreated, proper treatment that includes disinfecting the area can restore the pig's health.
- **Mycoplasma Pneumonia.** This disease is caused by bacteria. It is very contagious and can be transmitted through the air, but can also be transmitted as a result of poor management, such as poor water flow, dusty feed, and drafty conditions. Symptoms include coughing, fever, difficulty in breathing, and reduced appetite. Antibiotics can be given to minimize the effects but vaccination and proper management are more efficient.

- **Swine Influenza (Swine Flu).** This is a contagious disease caused by a virus and can be transmitted to humans. Infected pigs may be inactive, have decreased feed intake, and have a fever. There is no cure—only treatments that will decrease the effect of the influenza. For prevention, it is important to minimize stress for the pigs, to vaccinate, and to use other proper management techniques.
- **Mange Mites.** This is the effect of a mite that is an external parasite of pigs. The mites can be transmitted not only from pig to pig but also from pigs to humans. The affected area of skin becomes dry and leathery, and as the pig rubs its body against objects to relieve itchiness the skin may become raw. Infected swine may also have a reduced growth rate. Mange mites may result in the pig's death if not treated. Mange can be treated with proper medication.
- **Foot and Mouth Disease.** This disease is very contagious because it can easily spread via the wind and can infect many animals. Infected animals will show signs of

lameness and blisters or vesicles around the mouth and snout area and around the legs and hooves. They are inactive and are usually lying down. There is currently no cure for the disease. Infected animals should be euthanized in order to prevent spread of the disease. The best way to prevent the spread of this disease to your pigs is to minimize the amount of outside exposure to your pigs, disinfect all equipment and clothing that may be in contact with your pigs, and keep the facility and the pigs' living area clean and disinfected.

- **Gastric Ulcers.** This disease causes damage of the stomach lining. Symptoms of this disease will vary depending on the type of pig and the severity of the disease. General symptoms include pale skin, vomiting, weight loss, loss of appetite, teeth grinding, lack of energy, and dark-colored droppings. The ulcers can occur if there is a lack of essential nutrients in the diet. Certain types of foods can also cause ulcers. Stress can also cause gastric ulcers. To prevent

this disease, feed your pigs a well-balanced diet and maintain a clean and stress-free environment.

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ACTIVITY 1

How Fast Can Germs Spread?

BACKGROUND INFORMATION

Germs are tiny organisms that can cause disease. They are generally spread by direct contact (e.g., touching) with an infected organism (e.g., animal or human) or indirect contact with an object (e.g., food dish, water trough) that an infected animal used. Most germs are spread through the air via sneezes or coughs, but they can also be spread through sweat, saliva, and blood. Germs are everywhere; they can adhere to objects (e.g., doorknobs, money) and body parts (e.g., hands), and can be spread by touching something that is contaminated (e.g., by shaking hands with someone who has touched an infected animal). This is why good sanitation (e.g., hand washing) is important in disease prevention.

Time Required

25–40 minutes

Concepts and Vocabulary

Disease prevention, disease transmission, direct contact, germs, indirect contact

Life Skills

Communication, cooperation, disease prevention, problem solving, sharing

Subject Links

Language Arts

State Content Standards

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies – 1.7, 1.8
- Fifth Grade:
 - » Listening and Speaking Strategies – 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies – 1.5
 - » Speaking Applications – 2.5a, 2.5b

Materials Needed

(* = Materials provided in curriculum)

- Glitter
- * Pig Cards
- Vacuum or broom recommended (for cleanup at the end)

Getting Ready

- Prepare the *Pig Cards* so the volunteer and each youth get a card.
- Sprinkle one color of glitter on the floor in different places around the room.
- Put another color of glitter on a few of the chairs where the youth will be sitting.
- **Volunteer ONLY:** Put a third color of glitter on your right hand, but don't let anyone see that you are doing so. Do this only after you have passed the *Pig Cards* out to the youth.

OPENING QUESTIONS

1. What are some ways you can tell if you are sick? Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
2. What are some ways you might be able to tell if a pig is sick? Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
3. What do you know about different ways you can get sick? What do you know about different ways a pig might get sick? Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
4. What are some ways you think diseases can be spread from one human to another? From one pig to another? Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

PROCEDURE (EXPERIENCING)

1. Provide each youth with a Pig Card.
2. Volunteer tip: Discuss the rules for this game:
 - Everyone will pretend to be the pig on the Pig Card they have. The volunteer and the youth move around the room shaking hands with other “pigs,” introducing themselves by name and breed, and sharing the fun facts about themselves that they find on their Pig

Cards. The goal of the game is to get each participant to shake hands with several other “pigs,” but not with all of them. Additionally, youth will learn interesting information about a few other pig breeds.

3. The “Volunteer pig” will start the game by introducing himself or herself to one “youth pig,” and the game will proceed from there.

SHARING, PROCESSING, AND GENERALIZING

Follow the lines of thinking developed by the youth as they share and compare their thoughts and observations; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

1. What did you learn about different breeds of pig? Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
2. What do you know about disease or illness prevention? Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
3. When the youth look at their own hands, what do they notice about them? Please explain. Have them try to associate the glitter with germs. Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

4. When the youth look at their feet and clothes, what do they notice about them? Please explain. Have them try to associate the glitter with germs. Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
5. Ask the youth to share what happened during the activity. What did they learn about spreading germs? Where did the germs come from? Does anyone know how he or she got the germs? Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
6. How might all of this relate to getting sick or staying well? What did you learn about becoming sick? Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
7. At the end of discussion, have the youth wash their hands with soap to get rid of the “germs.”

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the concepts and terms “direct contact,” “disease prevention,” “disease transmission,” “germs,” and “indirect contact” have been introduced. (Note: The goal is to have the youth develop these concepts through their own exploration and define the terms using their own words.)

CONCEPT APPLICATION

Ask the youth to think of things they could do at home (e.g., washing hands; wiping down counter tops; cleaning door handles) that would help reduce their risk of contracting and spreading diseases.

Ask the youth to consider ways to reduce the risk that their animal (4-H project animal or pet) will contract and spread diseases (e.g., cleaning food and water bowls).

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Swine Cards

Name: Porkser
Breed: Yorkshire

Facts: During World War I, the oils and fats from this pig were used to make ammunition and food. At that time, the cost of lard and muscle were the same.



Name: Danny
Breed: Devon Closewool

Facts: This breed has a long and lean body and does not have noticeable excess fat or wrinkles. It has very high fertility and provides excellent care to its young.



Name: Harold
Breed: Hereford

Facts: To be registered as a Hereford, a pig must have a white face, at least two of its feet must be white at least one inch above the heel, and its coloring must be either light or dark red.



Name: Sir Lancelot
Breed: Berkshire

Facts: Due to its excellent carcass quality, this pig was favored by upper class English farmers and even by the Royal family.



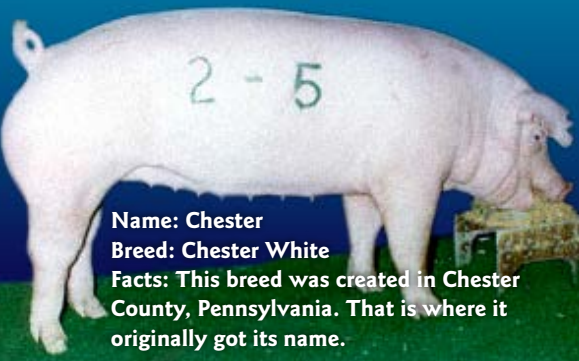
Name: Zu
Breed: Fengjing

Facts: Pigs of this breed grow slowly and produce a lot of fat, making them very good to eat. They can resist some diseases and can eat a lot of roughage.



Name: Jin
Breed: Jinhua

Facts: The Jinhua breed has a white body with a black head and rump. It is known for the quality of its meat, having a thin skin, fine bones, and tender meat.



Name: Chester
Breed: Chester White
Facts: This breed was created in Chester County, Pennsylvania. That is where it originally got its name.

Name: Gracie
Breed: Gloucestershire Old Spots

Facts: These pigs are white with black spots. Due to genetic selection for more of a white coat, there are usually only one or two black spots on a pig.



Name: Kelly
Breed: Kele

Facts: Kele pigs originated in a higher-altitude area in southwest China, where environmental conditions are harsh and constantly changing. Their physical characteristics allow them to perform well in this type of environment.

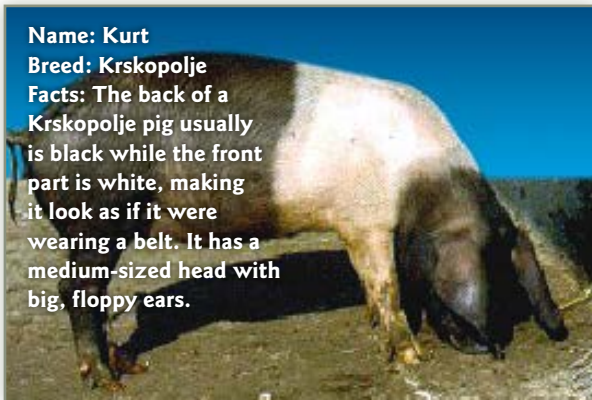


Print one-sided on heavy paper and cut out along dashed lines.

Name: Kurt

Breed: Krskopolje

Facts: The back of a Krskopolje pig usually is black while the front part is white, making it look as if it were wearing a belt. It has a medium-sized head with big, floppy ears.



Name: Moria

Breed: Mora Romagnola

Facts: This breed is native to the Ravenna province in Italy. As of this writing, there are only 18 surviving animals of the breed in a single herd in Faenaz, Ravenna. Conservation research is being conducted in Europe to preserve this breed.



Name: Nelly

Breed: Ningxiang

Facts: Ningxiang pigs are raised primarily for their lard. Their color pattern is described as "black clouds overhanging snows with a silver ring around the neck."



Name: Larry

Breed: Large Black

Facts: The Large Black breed is known for its big, droopy ears—so big, fact, that they usually cover most of the pig's face, blocking its sight. The pig's difficulty in seeing is believed to contribute to its calm behavior.



Name: Mei

Breed: Meishan

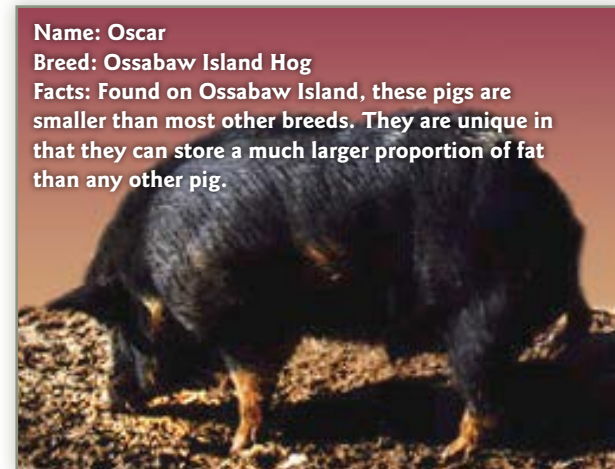
Facts: Meishan pigs are known for their wrinkled face and skin. They are also known for the large litter sizes of 15-16 offspring.



Name: Oscar

Breed: Ossabaw Island Hog

Facts: Found on Ossabaw Island, these pigs are smaller than most other breeds. They are unique in that they can store a much larger proportion of fat than any other pig.



Name: Maggie

Breed: Mangalitsa

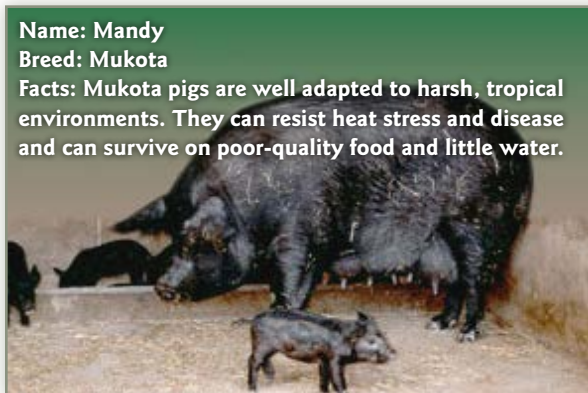
Facts: Mangalitsa is a strong breed that is able to resist disease and stress. Its powerful legs and hooves allow it to move through any type of terrain.



Name: Mandy

Breed: Mukota

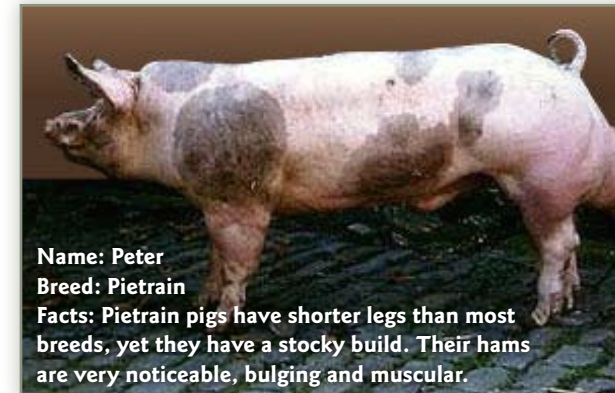
Facts: Mukota pigs are well adapted to harsh, tropical environments. They can resist heat stress and disease and can survive on poor-quality food and little water.



Name: Peter

Breed: Pietrain

Facts: Pietrain pigs have shorter legs than most breeds, yet they have a stocky build. Their hams are very noticeable, bulging and muscular.





Print one-sided on heavy paper and cut out along dashed lines.



Name: Spots
Breed: Spots

Facts: Spots pigs feed really well, mature early, and produce many offspring.



Name: Vernon
Breed: Vietnamese Potbelly

Facts: Vietnamese Potbelly is considered a dwarf breed. Many people want them as pets, but don't realize that they will not always stay small and cute. They grow to up to 100 lb and don't like to be picked up or held.



Name: Vanessa
Breed: Ba Xuyen

Facts: Ba Xuyen pigs have adapted to live in saltwater zones. They have proportional areas of black and white on their body.



Name: Tammy
Breed: Tamworth

Facts: The Tamworth pig has a smooth and firm body. This breed is used for bacon.



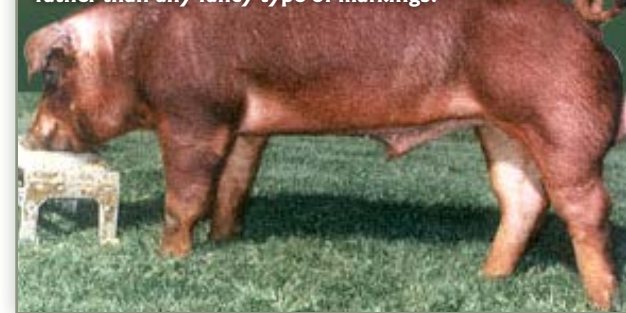
Name: Ariel
Breed: Arapawa Island

Facts: It is believed that whalers and early farmers introduced this breed to Arapawa Island, off New Zealand, in the middle 19th century.



Name: David
Breed: Duroc

Facts: Duroc pigs range in color from light golden yellow to dark red. Pork producers prefer the simple red color rather than any fancy type of markings.



Name: Trevor
Breed: Turopolje

Facts: Found in woodlands, Turopolje pigs predominately eat acorns. For protein, they find and eat worms and larvae found in wood.



Name: Betty
Breed: Bazna

Facts: Bazna pigs are not picky or demanding in the type of food they eat. They can eat roots, pasture, potatoes, corn, and food wastes.



Name: Hairy
Breed: Hezuo

Facts: Hezuo pigs have long, coarse, dense bristles. They have a slow growth rate and produce few offspring.





Name: Ken
Breed: Kunekune
Facts: Found in New Zealand, all of the Kunekune pigs found in the country are descendants of 18 original pigs. Now they number over 5,000.



Name: Lacey
Breed: Lithuanian Native
Facts: This breed is close to extinction, so the remaining specimens are now at the Lithuanian Institute of Animal Science. About 160 pigs are there, and they are restricted to breed within the group.



Name: Marissa
Breed: Mong Cai
Facts: The Mong Cai breed is desirable because it produces many offspring, it can adapt to eating poor-quality food, and it can resist diseases.



ACTIVITY 2

Will My Pig Get Sick?

BACKGROUND INFORMATION

There are more than 140 diseases and conditions that can affect domestic pigs. Many of these are related to management or environmental factors such as stress, environmental cleanliness, environmental temperature, and quality of diet.

Though there are many diseases and illnesses, youth can take an active role in disease prevention by simply monitoring their pig on a daily basis: thoroughly evaluating its environment (e.g., housing), its diet, and its history (e.g., age, medical records, origin). There are several indicators that youth can watch for: the quality of the pig's feces, the pig's activity level, its appetite, and its skin. Because the origin of a disease is not always easy to identify, the more information you can provide your veterinarian, the better. In this way, you will help ensure that your pig receives the proper treatment and has the best chance for a full recovery.

Time Required

40–60 minutes

Concepts and Vocabulary

Preventive Health Care

Life Skills

Critical thinking, decision making, disease prevention, keeping records, problem solving, sharing

Subject Links

Language Arts

State Content Standards

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies – 1.7, 1.8
- Fifth Grade:
 - » Listening and Speaking Strategies – 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies – 1.5
 - » Speaking Applications – 2.5a, 2.5b

Suggested Grouping

Individuals or pairs

Materials Needed

(* = Materials provided in curriculum)

- Seven tables with 3–5 chairs each (enough chairs to accommodate the entire group; one chair per child)
- One CD, cassette, or digital music player; one music CD or tape
- One six-sided die
- * Pig Characteristic cards
- * Pig Illness cards
- * Veterinary Procedure cards
- * Health Care Log (Concept Application)
- Three (3) containers (e.g., large bowls; paper bags)
- Flipchart paper
- Markers
- Tape

Getting Ready

- Organize the tables and chairs around the room so the youth can move freely between them.
- Using a piece of paper and a marker, randomly assign a number (1–6) to each of the tables.
- Place the seventh table off to the side of the room (in a corner or against the wall) and label it “Veterinary Hospital.”
- Copy enough *Pig Characteristic* cards so each youth gets one card. Cut the cards out and place them in one of the containers.
- Cut out the *Pig Illness* cards and place them in a second container.
- Make at least 2 copies of the *Veterinary Procedure* cards. Cut the cards out and place them in a third container on the “Veterinary Hospital” table.

OPENING QUESTIONS

Working in small groups, ask the youth the following:

1. **What are some things that humans can do to avoid getting sick?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
2. **How can some of the things listed in the previous question also be applied to pigs to help them remain healthy?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

PROCEDURE (EXPERIENCING)

1. Have each individual or pair choose one *Pig Characteristic* card at random from the container. This will be their pig for this activity.
2. Explain to the youth that they are going to play a modified game of “Musical Chairs.” They are to move around the room and between the tables while the music is playing; when the music stops, they are to find a chair and sit down.
3. The volunteer rolls the die and announces the number (1–6) that has been rolled.
4. The volunteer now draws one of the *Pig Illness* cards out of the bowl. Explain to the youth that one of the pigs at that numbered table has this illness, and some of the others may contract the disease, depending on the pig’s health and environment.
5. The volunteer reads the information on the *Pig Illness* card that he or she has drawn. Have the youth read their *Pig Characteristic* card and determine if their pig will contract the disease or not. Those youth whose pigs contract this illness must relocate to the Veterinary Hospital table; those whose pig do not become ill will remain at their table and play the next round of “Musical Chairs.”
6. Before the start of the next round, each of the youth at the Veterinary Hospital table draws one *Veterinary Procedure* card. If a card contains the appropriate information to cure their pig, the youth will place the card back into the container and leave the Veterinary Hospital table to play the next round. If not, the youth will place the card back into the container and draw another *Veterinary Procedure* card at the end of the next round.
7. Continue playing the game until the volunteer has used all of the *Pig Illness* cards.
8. Repeat the game if you like.

SHARING, PROCESSING, AND GENERALIZING

Review all the pig illnesses that have just been introduced to see what the youth remember and understand. Then discuss, following the lines of thinking developed through the general thoughts, observations, and questions raised by the youth. If necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

1. **What did you learn about pig illnesses from this activity? Please explain.** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
2. **What were some common factors that caused the spread of disease?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
3. **What are some things one could do to slow down or stop diseases from spreading?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
4. **If your friend were getting a pig, what are some things you would tell him or her that would help keep their pig healthy and happy?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the term “preventive health care” has been introduced or discovered by the youth. (Note: The goal is to have the youth discover the concepts and terms on their own. It helps if they can define terms and concepts using their own words.)

CONCEPT APPLICATION

- For youth who own their own pig, have them develop a health care log that includes:
 - » A checklist for adequate housing (e.g., proper temperature, sanitation).
 - » Dietary monitoring (e.g., type of food, amount of food, feeding schedule).
 - » Observations of behavior.
 - » Observations of appearance.
 - » Veterinary updates (e.g., dates of check-ups, dates of vaccines).Ask the youth to discuss their health care log with each other and share ideas.
- For youth who do not own a pig, have them develop a health care log for another household pet that they may own.

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Pig Characteristic Cards

Pig Name: Agatha
Age: Young pig
Environment: Clean environment
Diet: Proper diet
Stress: High stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Wilbur
Age: Young pig
Environment: Dirty environment
Diet: Proper diet
Stress: High stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Mary
Age: Young pig
Environment: Clean environment
Diet: Proper diet
Stress: Low stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Fred
Age: Older pig
Environment: Clean environment
Diet: Proper diet
Stress: High stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Thompson
Age: Older pig
Environment: Dirty environment
Diet: Proper diet
Stress: High stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Violet
Age: Older pig
Environment: Clean environment
Diet: Proper diet
Stress: Low stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Bertha
Age: Young pig
Environment: Clean environment
Diet: Inappropriate diet
Stress: High stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Babe
Age: Young pig
Environment: Dirty environment
Diet: Inappropriate diet
Stress: High stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Ms. Piggy
Age: Young pig
Environment: Clean environment
Diet: Inappropriate diet
Stress: low stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Porky
Age: Older pig
Environment: Clean environment
Diet: Inappropriate diet
Stress: High stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Stud
Age: Older pig
Environment: Dirty environment
Diet: Inappropriate diet
Stress: High stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Dacio
Age: Older pig
Environment: Clean environment
Diet: Inappropriate diet
Stress: Low stress level
Environment Temperature: Environment provides proper temperature
Pig Name: Earl

Pig Characteristic Cards, continued

Age: Young pig
Environment: Dirty environment
Diet: Proper diet
Stress: Low stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Hector
Age: Young pig
Environment: Clean environment
Diet: Proper diet
Stress: High stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Karl
Age: Young pig
Environment: Dirty environment
Diet: Proper diet
Stress: High stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Gabe
Age: Older pig
Environment: Dirty environment
Diet: Proper diet
Stress: Low stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Nancy
Age: Older pig
Environment: Clean environment
Diet: Proper diet
Stress: High stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Debbie
Age: Older pig
Environment: Dirty environment
Diet: Proper diet
Stress: High stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Gabby
Age: Young pig
Environment: Dirty environment
Diet: Inappropriate diet
Stress: Low stress level
Environment Temperature: Environment provides proper temperature

Pig Name: George
Age: Young pig
Environment: Clean environment
Diet: Inappropriate diet
Stress: High stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Pablo
Age: Young pig
Environment: Dirty environment
Diet: Inappropriate diet
Stress: High stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Ernst
Age: Older pig
Environment: Dirty environment
Diet: Inappropriate diet
Stress: Low stress level
Environment Temperature: Environment provides proper temperature

Pig Name: Hammy
Age: Older pig
Environment: Clean environment
Diet: Inappropriate diet
Stress: High stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Handsome
Age: Older pig
Environment: Dirty environment
Diet: Inappropriate diet
Stress: High stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Characteristic Cards, continued

Pig Name: Princess
Age: Young pig
Environment: Clean environment
Diet: Proper diet
Stress: Low stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Fred
Age: Older pig
Environment: Clean environment
Diet: Inappropriate diet
Stress: Low stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Mary-Ann
Age: Young pig
Environment: Dirty environment
Diet: Inappropriate diet
Stress: Low stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Maggie
Age: Older pig
Environment: Clean environment
Diet: Proper diet
Stress: Low stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Romeo
Age: Young pig
Environment: Dirty environment
Diet: Proper diet
Stress: Low stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Wilma
Age: Older pig
Environment: Dirty environment
Diet: Inappropriate diet
Stress: Low stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Juliet
Age: Young pig
Environment: Clean environment
Diet: Inappropriate diet
Stress: Low stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Name: Susie
Age: Older pig
Environment: Dirty environment
Diet: Proper diet
Stress: Low stress level
Environment Temperature: Environment provides improper temperature regulation

Pig Illness Cards - suggestion: print on a thick colored paper

Pseudorabies or Aujeszky's Disease. This important disease of pigs is caused by a herpes virus. The virus can remain hidden in nerves of the pig in a carrier state for long periods of time and then be reactivated. This disease can affect both young and older pigs and periods of stress can activate the virus. The disease can be spread by nose-to-nose contact or can live a short time in manure on gates and boots. All those with high stress and dirty environments must proceed to the Veterinary Table.

Gastric Ulcers. Erosion and ulceration of the lining of the stomach is a common condition in growing pigs. It occurs around the area where the food pipe (esophagus) enters the stomach. Pigs with a balanced diet will not develop ulcers because a variety of nutrients will prevent the degradation of the stomach wall. Improper temperature regulation in the environment can contribute to the condition. All younger pigs with either an inappropriate diet or an environment that provides improper temperature regulation must proceed to the Veterinary Table.

Peritonitis. Peritonitis is inflammation of the peritoneum, the shiny membrane that covers all the internal surfaces in the abdomen. Peritonitis can affect both young and old pigs. Symptoms include abdominal pain and loss of condition or growth. Contributing factors include improper nutrition or stress. All pigs with an inappropriate diet or high stress level must proceed to the Veterinary Table.

Frostbite. In this condition, the skin and surface tissues are damaged by low temperatures. Symptoms include lesions that are bright red, swollen, or painful. Frostbite can affect pigs of any age if they are not provided with protection from cold temperatures. All pigs with improper temperature regulation in their environment must proceed to the Veterinary Table.

Swine Dysentery. This disease is caused by a bacterium. It is spread by many organisms, including flies, so keeping the environment clean is essential to preventing this disease. Clean environments will not attract as many disease-spreading organisms. Pigs with a dirty environment must proceed to the Veterinary Table.

Campylobacter. This is a bacterial infection that causes loss of body condition, dehydration, and sometimes diarrhea in piglets. This infection is found where pens are dirty and wet. All younger pigs with a dirty environment must proceed to the Veterinary Table.

Botulism. The bacteria that cause Botulism grow in decaying vegetable matter and produce a poison that will make pigs sick when they eat the material. Botulism can affect both young and old pigs. Symptoms include weakness and breathing difficulties. Keep the environment clean and free from old, decaying feed to prevent this condition. All those with a dirty environment must proceed to the Veterinary Table.

Pneumonia. This is an infection of the respiratory system that most commonly affects younger pigs. Symptoms include coughing, loss of condition, and fever. Poor environments and high stress levels can all contribute to the occurrence of the disease. Young pigs with a dirty environment and high stress level should proceed to the Veterinary Table.

Cold. Colds are caused by viruses and symptoms include coughing and nasal discharge. Pigs with a low stress level and a proper diet will be able to fight this disease off because their immune system will have enough nutrients and energy to fight the virus. All pigs with a high stress level or inappropriate diet must proceed to the Veterinary Table.

Eclampsia. This is a condition caused by low levels of calcium in the bloodstream. Symptoms include trembling, convulsions, and distress. Eclampsia does not affect younger pigs. Those with a proper diet will have enough calcium in their diet to prevent this disease. All older pigs with an improper diet must proceed to the Veterinary Table.

Heat stress. This is a condition caused by high temperatures and poor ventilation. Symptoms include panting, weakness, and vomiting. Those with proper environmental temperature will not succumb to this condition because they never become too hot. All pigs with improper environmental temperature must proceed to the Veterinary Table.



Pig Illness Cards, continued - suggestion: print on a thick colored paper

Obesity. This is a condition in which pigs become overweight from improper feeding methods. Obesity can lead to other health problems such as cardiac conditions and sterility. All pigs with an inappropriate diet must proceed to the Veterinary Table.

Foot and Mouth Disease (FMD). This disease causes small vesicles (blisters) to appear on a pig's nose, lips, and feet. As a result of these vesicles, your pig may begin to drool, champ its jaws, and display lameness. The vesicles burst within 24 hours and at that point become highly infectious, spreading rapidly. This disease can be transmitted from other pigs and from contaminated clothing and equipment. All those with a dirty environment must proceed to the Veterinary Table.

Veterinary Procedure Cards

The vet explains what you need to change about your pig's diet and gives you the proper medication. You comply and this cures your pig.

RETURN TO THE GAME.

The vet explains to you how to better regulate your pig's environmental temperature and gives you the proper medication. You comply and your pig is cured.

RETURN TO THE GAME.

The vet explains to you how to better regulate your pig's environmental temperature and gives you the proper medication. You do not comply and your pig is not cured.

STAY IN THE VETERINARY HOSPITAL.

The vet gives you the proper medication and you follow all of his or her advice perfectly so your pig is cured quickly.

RETURN TO THE GAME.

The vet explains what you need to change about your pig's diet and gives you the proper medication. You do not comply and your pig is not cured.

STAY IN THE VETERINARY HOSPITAL.

The vet explains what you need to change about your pig's hygiene and the cleanliness of its environment and in addition gives you the proper medication. You comply and your pig is cured.

RETURN TO THE GAME.

The vet explains what you need to change about your pig's hygiene and the cleanliness of its environment and gives you the proper medication. You do not comply and your pig is not cured.

STAY IN THE VETERINARY HOSPITAL.

The vet explains to you what you need to do to maintain a low stress level for your pig and gives you the proper medication. You comply and your pig is cured.

RETURN TO THE GAME.

The vet explains to you what you need to do to maintain a low stress level for your pig and gives you the proper medication. You do not comply and your pig is not cured.

STAY IN THE VETERINARY HOSPITAL.

HEALTH CARE LOG

Date: _____

Pig Name: _____

Breed: _____

Gender: _____

Age: _____

Feeding Behavior: _____

General Behavior: _____

Coat/Covering: _____

Skin: _____

Eyes: _____

Ears: _____

Movement: _____

Veterinary Updates: _____

Other: _____

ACTIVITY 3

Raising a Healthy Pig

BACKGROUND INFORMATION

The health of a pig depends on its owners. They are the ones who determine what a pig eats, the condition of its living environment, and many other factors that can promote good health or lead to illness. It is also the owner's responsibility to be observant and aware of a pig's health in order to prevent it from contracting diseases and illnesses. Disease can be caused by feeding a pig unhealthy or contaminated food or providing a dirty living environment, or it could be due to the pig's genetics. By feeding a pig healthy food, keeping its housing environment clean, and being aware of the pig's health and behavior, owners can hope to prevent the development of disease and provide comfort and good welfare.

Time Required

45–60 minutes

Concepts and Vocabulary

Disease, illness, health care monitoring

Life Skills

Teamwork, contributions to group effort, sharing, cooperation, communication, keeping records, critical thinking, problem solving, decision making

Subject Links

Science, Language Arts

State Content Standards

Science

- Sixth Grade:
 - » Investigation and Experimentation - 7d

Language Arts

- Fourth Grade
 - » Reading Comprehension – 2.3
 - » Listening and Speaking Strategies – 1.7
- Fifth Grade:
 - » Reading Comprehension – 2.3, 2.4
 - » Listening and Speaking Strategies – 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies – 1.5
 - » Speaking Applications – 2.5b

Suggested Groupings

Five small groups

Materials Needed

(* = Materials provided in curriculum)

- * *Health Assessment Journal Entries* (5 Pigs)
- * *Pig Disease Descriptions*
- * *Health Assessment Summary*
- * *Health Assessment Report*
- Flipchart paper
- Markers or writing utensils

Getting Ready

- Divide the youth into small groups of 3 to 5.
- Provide each group with an adequate amount of flipchart paper and markers or writing utensils.
- Prepare one set of *Health Assessment Journal Entries* (one pig; five journal entries) for each group.
- Make one copy of the *Health Assessment Summary* for each group.
- Make enough copies of the *Pig Disease Information* so each group can have a set.
- **Note:** Do not distribute *Pig Disease Descriptions* worksheet until the end of the activity.
- Make one copy of the *Health Assessment Report* for each individual (Concept Application).

OPENING QUESTIONS

1. **What are some ways you can tell if someone is sick? What are some signs or symptoms that you might notice? Please describe.** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
2. **What do you know about ways you get sick? What do you know about ways animals get sick?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

3. **Animals cannot speak, so they cannot tell us if they are not feeling well. What are some signs or symptoms that would help you to determine if an animal is sick? Please explain.** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

PROCEDURE (EXPERIENCING)

- » **Volunteer Tip:** Set up the following scenario for the youth:

Each group represents the owners of a particular pig (a different pig for each group; provided by the volunteer). The groups are given daily journal entries of observations that have been made of their pigs. Based on the entries in their journals, the job of the youth is to look for important changes in the pig's health or behavior that might suggest a health concern.

- » **Volunteer Tip:** Provide each group the journal entries one day at a time. Do not give them the next day's entry until they have completed their work on the entry from the previous day.
1. Each group of pig owners is given Journal Entry 1 from their *Health Assessment Journals*. Have each group read their journal entry and record important facts from the journal entry on the *Health Assessment Summary*.
 2. Once the groups have completed recording and organizing the information from Journal Entry 1, take away Journal Entry 1 and provide them with Journal Entry 2. Again, ask them to read their journal entry and record important facts from the journal entry on the *Health Assessment Summary*.
 3. Continue this process one entry at a time for Journal Entry 3, Journal Entry 4, and Journal Entry 5.
 4. At this point, pass out copies of the *Pig Disease Descriptions* and have each group review their *Health*

Assessment Summary and determine which disease(s) their pig might have. Have them write their suggested diagnosis and the evidence that led them to their conclusion on their *Health Assessment Summary*, which they would provide their veterinarian.

SHARING, PROCESSING, AND GENERALIZING

Ask each group to share the results from their *Health Assessment Summary* and their suspected diagnosis. Follow the lines of thinking developed through the general thoughts, observations, and questions raised by the youth. If necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

1. **When you were reading the journal entries, when did you begin thinking that it would be important to seek the care of a veterinarian?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
 - » **Volunteer Tip:** Have each group go back to their journal entries and ask them when they would have taken the pig to the veterinarian.
2. **What do you think might happen if you wait too long to seek veterinary care?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
3. **What might some of the consequences be if you don't monitor your pig's health on a daily basis?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
4. **Based on your understanding, what are good signs to indicate that a pig is healthy?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

Check the suspected diagnosis from each group against the answer key provided below. If there are any discrepancies, talk with the group about how they came up with their diagnosis and come to a conclusion based on their thoughts and ideas.

Swine Disease Diagnosis Key (Do Not Show This to Participating Youth)

- Fred – Mange Mites
- Lucy – Normal
- Harriet – Gastric Ulcers
- Rocky – Foot and Mouth Disease
- Herman – Porcine Reproductive and Respiratory Syndrome

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the concept of health care monitoring has been introduced or discovered by the youth. (Note: The goal is to have the youth develop concepts through their own exploration and define terms using their own words.)

CONCEPT APPLICATION

- Have youth who own pigs write daily observations of their pigs on the *Health Assessment Report*. Have them share their entries with the other youth on a regular basis.
- Youth who do not own pigs can use the *Health Assessment Report* for a different type of domesticated animal (e.g., dog; cat) that they may have at home or that a friend or neighbor might have. Have them share these entries with other youth and compare these entries with those for a pig. How are the similar? How are they different?

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Health Assessment Journals

Print one-sided on heavy paper and cut out along dashed lines.



Journal A

Pig Name: Fred

Gender: Male

Age: 2 years

Journal A, Entry 1: Today Fred went to bathe in the sun around noon after playing with his favorite toy, a 14-lb red bowling ball. The temperature was 99°F. I played the radio very loud today while he was napping and lounging around. Fred did spend some time wallowing in the mud. He ate all of his alfalfa cubes and all of his raw vegetables. Since today was really hot, he drank water throughout the day. When I gave him a green apple as a snack, he oinked very loudly and happily took the apple from my hand.

Pig's Name: Fred, **Gender:** Male, **Age:** 2 years

Journal A, Entry 2: My friend from school, who also has a Yorkshire named Francine, was having a yard sale today. I stopped to see if there was anything worth buying. Then I saw the perfect gift for Fred, a bright green 15 lb bowling ball that used to belong to Francine. I paid for the bowling ball and surprised Fred later that day with his gift. Fred seemed very excited when he saw the bowling ball and played with the green bowling ball the entire day. While he was playing, I poured more water in his water bowl and added more ice because it was around 95°F today. Around 3 PM, I hosed him off with some water, and he then rolled around in the dirt. Fred took a nap, lying next to his new bowling ball. Looking at what he ate today, I saw he ate all of his alfalfa cubes except for one and he ate all of his raw vegetables.

Pig's Name: Fred, **Gender:** Male, **Age:** 2 years

Journal A, Entry 3: When I went to visit Fred today around 10 AM, he was completely covered in wet mud. He even brought the green bowling ball in the mud and was playing with it. He pushed his bowling ball out of the mud a few minutes later and plopped under a tree and took a nap. While taking a nap, he would occasionally scratch his skin with his hind legs and then go back to sleep. A plane flew over, making a really loud noise, causing him to wake up. Around 1:30 PM, the temperature was 98°F. When I checked on Fred, I noticed he ate all of his food. I later gave him a carrot as a treat. He ate half of his carrot. Fred did not finish his raw vegetables, leaving out a few leaves of romaine lettuce. When I was about to go into the house, I noticed that Fred was rolling around on his back on the gravel pathway.

Health Assessment Journals, continued

Print one-sided on heavy paper and cut out along dashed lines.

Pig's Name: Fred, **Gender:** Male, **Age:** 2 years

Journal A, Entry 4: Today, I didn't see Fred playing with his bowling ball. Instead, he seemed to spend the majority of his time next to the tree, rubbing against it. He would occasionally wallow in the mud, but immediately afterwards he would go back to the tree and scratch himself against it. It was very hot today, over 100 °F! So I took out the inflatable pool and filled it with cold water. Fred immediately went into the pool and splashed around in it, and eventually took a nap in the pool. I gave him a pear for a treat, and he immediately ate it. He drank some water and then headed back to the tree.

Pig's Name: Fred, **Gender:** Male, **Age:** 2 years

Journal A, Entry 5: Today when I went to check on Fred, he was lying next to the tree but wasn't scratching against it. When I came closer to Fred, I noticed his skin was red and raw. Patches of hair were missing near his rump and he had many open cuts around the sides of his body. I tried to get him to get up but he wouldn't move. Then I noticed that he had small tiny bumps on his legs. It was still over 100 °F so I filled up the inflatable pool again, but he wouldn't go in it. I noticed that he barely ate any of his food, so I fed him an apple as a snack and he slowly ate it. All of a sudden, he got up and started scratching against the tree again, taking off more skin.



Journal B

Pig Name: Lucy

Gender: Female

Age: 8 months

Journal B, Entry 1: Today, Lucy was very playful and active. She ate all of the cucumbers, lettuce, cabbage, spinach, and peppers I fed her. After eating the vegetables, I feed her an apple, and then she walked out to the backyard to take a nap. I noticed her water bowl was low, so I filled it back up. The temperature today was hot, but Lucy was acting her normal self. I heard snorting and sniffing noises as Lucy walked around the house and into the backyard area.

Pig Name: Lucy, **Gender:** Female, **Age:** 8 months

Journal B, Entry 2: Today while eating, Lucy would eat some of her pig food, take a drink of water, then eat some more again. She did this throughout her entire meal. Later in the day, I fed Lucy some apples and bananas as a snack. She ate all the apples but didn't eat any of the bananas. In the evening, Dad was making some dinner and accidentally dropped a piece of raw meat on the floor. Before he could pick it up from the floor, Lucy runs into the kitchen and snatches the meat off the floor and eats it. For the rest of the night, Lucy was very happy, running around and playing with her toys. Lucy fell asleep next to the couch that night.

Health Assessment Journals, continued

Print one-sided on heavy paper and cut out along dashed lines.

Pig Name: Lucy, **Gender:** Female, **Age:** 8 months

Journal B, Entry 3: Today was a very hot day, so I decided to fill the kiddie pool with cold water for Lucy to wade around in. Lucy had a great time playing in the kiddie pool. She urinated in the pool so I had to drain it and re-fill it again. When I went to check on her food later that day, I noticed that she ate all of her vegetables except for the cabbage. I tried to get her to eat the cabbage but she refused to eat it so I threw it away. While playing around with Lucy, I noticed many flies and insects hovering around her, so that was when I decided it was a good time to go inside the house.

Pig Name: Lucy, **Gender:** Female, **Age:** 8 months

Journal B, Entry 5: I noticed lots of hair around the house and realized that Lucy was shedding. I did a really good sweep through and around the house to try to get all of the hair. Later that afternoon, I helped my mom plant some daffodils. When I went to put the gardening tools back in the shed, Lucy snuck over to the garden and ate five of the daffodils. Luckily I had some extra daffodils, so I replanted them. Today was cooler than the previous days so I decided to remove the wading pool. Before I could empty it, Lucy jumped in the pool and started playing in it. She looked so happy so I decided not to remove the pool. Lucy ate all her food today. For the rest of the afternoon, Lucy took a nap under a tree.

Pig Name: Lucy, **Gender:** Female, **Age:** 8 months

Journal B, Entry 4: Today I got home late from my friend's house so I was late feeding Lucy. Lucy was sitting next to her food bowl squealing at me when I came to feed her. Once I put the food in her food bowl, she stopped squealing and quickly ate her food. She ate all of her food in record time, less than 10 minutes! After eating her food, she started to squeal again. She had enough food so I ignored her, and she eventually stopped. Later on that night, I fed her a snack, apologizing to her for not feeding her on time today. While I was reading a book, Lucy sat next to me and started nudging at my leg, a sign that she wanted to be petted. I started to pet her and noticed that she had less hair than in the beginning of summer.

Health Assessment Journals, continued

Print one-sided on heavy paper and cut out along dashed lines.



Journal C

Pig Name: Harriet

Gender: Female

Age: 3 years

Journal C, Entry 1: Today I purchased a Hampshire pig and named her Harriet. I brought her home today, transporting her to my house in a small crate. I heard her squeal throughout the very long trip home. Once I got home, I introduced her to her new living space in the house and the backyard where she could roam. I filled up her food bowl with pig food from the store and filled her water bowl with clean, cold water. She didn't eat or drink immediately, sniffing around her new home and getting used to the sights and smells. After eating all of the food and drinking all of the water, Harriet went to her corner of the house and fell asleep.

Pig Name: Harriet, **Gender:** Female, **Age:** 3 years

Journal C, Entry 2: Harriet seemed a little off today. I don't know what it was but she just didn't look well. Her skin looked paler than yesterday and she seemed very tired and lazy. She didn't explore her new home as much today. I checked her food bowl and noticed that she didn't eat all of her food. I checked her water bowl and realized I had forgotten to refill it since yesterday. I quickly refilled the water bowl and Harriet immediately drank from it. I tried to get Harriet to eat more of her food but she refused. She walked outside to the backyard and took a nap under a tree.

Pig Name: Harriet, **Gender:** Female, **Age:** 3 years

Journal C, Entry 3: Harriet does not look well today. Her skin is paler and now she has started grinding her teeth. I checked her temperature today but it seemed normal. I noticed she was having a difficult time breathing. I checked the thermometer inside the house and noticed it was two degrees warmer than yesterday. I thought Harriet might feel better if she went outside so I slowly got her to go outside. Once she got to the grass, she immediately started eating some grass and plopped down. I wanted to move her under the shade but she wouldn't move. I looked at her food bowl and noticed she ate very little of her pig food. I changed and refilled her water.

Health Assessment Journals, continued

Print one-sided on heavy paper and cut out along dashed lines.

Pig Name: Harriet, **Gender:** Female, **Age:** 3 years

Journal C, Entry 4: Today Harriet started to vomit. The vomit was yellow. I could tell that Harriet had lost some weight since I brought her home a few days ago. I checked her food bowl and she still didn't eat much, but I noticed she was drinking water. I checked the thermometer in the house and it was three degrees cooler than yesterday. Outside, there were large clouds in the sky and there were more bees buzzing around in the backyard than before. Harriet didn't look like she was getting better. She was extremely tired and lazy, not moving from her spot the entire day.

Pig Name: Harriet, **Gender:** Female, **Age:** 3 years

Journal C, Entry 5: Today, I noticed that Harriet's droppings were a dark, black-red color. Harriet still had not eaten much of her food, only eating a few bites. She has now stopped drinking her water. She is not active and mainly lies down because she is very tired. She continuously vomits throughout the day and still seems to have a hard time breathing. She is still grinding her teeth and looks very thin. I checked her temperature but it still appears to be normal. Harriet's skin is still very pale.



Journal D

Pig Name: Rocky

Gender: Male

Age: 4 years

Journal D, Entry 1: Today is the day before the big pig show for Rocky. Rocky and I have been preparing for this show for the past month, and we are both really excited for it. Rocky spent a good portion of his day in the mud pool, wallowing and playing in the mud. He ate all of his food and drank all of his water, so I had to refill his water bowl. In the early evening, I gave him a bath and a good scrub down. I did one last examination of him, and he looked great. His eyes, nose, ears, and mouth were all clear and clean. His skin and coat looked smooth and shiny and his hooves looked clean. I gave him a small treat before heading off to bed.

Health Assessment Journals, continued

Print one-sided on heavy paper and cut out along dashed lines.

Pig Name: Rocky, **Gender:** Male, **Age:** 4 years

Journal D, Entry 2: Today is the big day! Rocky and I got up early and headed off to the fair. When we got there, there were already a lot of people there. I signed in and got information about the day and where to house Rocky. While walking to Rocky's pen, Rocky accidentally stepped and fell in a pile of poop. Luckily I still had a few hours before showing Rocky so we quickly walked over to the wash area. I forgot to bring my brush so I asked another kid if I could borrow her brush. I gave Rocky a good scrub down and thanked the girl for letting me borrow the brush. The show went really well. Rocky placed first! We got home late and I gave Rocky his favorite treat before going to bed.

Pig Name: Rocky, **Gender:** Male, **Age:** 4 years

Journal D, Entry 4: Today, I noticed that the blisters had popped around his face and legs. Rocky didn't seem like his normal self. He was not very active and spent most of the day lying on the grass under the tree. When I put food in his food bowl, it took him a really long time to reach the bowl. It looked like he was in pain while walking. He didn't even stand when he ate. He just plopped in front of the food bowl and ate from the ground. While he was feeding, I did a quick examination of Rocky. More blisters showed up around his hooves and his nose. After he was done eating, it looked like he was drooling a bit. Then he slowly walked back to the front porch and fell asleep on the ground.

Pig Name: Rocky, **Gender:** Male, **Age:** 4 years

Journal D, Entry 3: I went to check up on Rocky and noticed that he had small little bumps or blisters around his legs and mouth. However, it didn't seem to affect his daily activity. He still ate very well when I fed him in the afternoon and he drank a lot of his water. He wallowed in the mud for a good part of the afternoon and then took a nap under a tree. When it was time for dinner, I noticed that he seemed to walk a little slower to his food dish. I just figured he was still a little tired from his nap.

Pig Name: Rocky, **Gender:** Male, **Age:** 4 years

Journal D, Entry 5: Rocky looked really bad today. When I came to check up on Rocky, he did not move to greet me. I wanted to examine the blisters around his nose and hooves. The blisters around his nose popped, and when I tried to get him up to look at his hooves, he squealed loudly and dropped to the floor. I didn't want to hurt him so I decided not to move him. I noticed he didn't eat any of his food or drink any of his water from the morning. So I moved his food and water bowl to right in front of him and hand fed him the food. He only ate a little bit and had a hard time drinking because he couldn't get up. Rocky seemed really tired and fell asleep immediately afterwards.

Health Assessment Journals, continued

Print one-sided on heavy paper and cut out along dashed lines.



Journal E

Pig Name: Herman

Gender: Male

Age: 5 years

Journal E, Entry 1: Herman was really energetic today. When I came to give him food and clean his living area, he came up to me very excited and nudged his head against my leg and started to pull on my pant leg. This was his way of telling me that he was happy to see me and that he wanted a treat. So I gave him an apple, and he happily chewed on it while I cleaned his bedding. After feeding him and changing his bedding, I sat under the tree to take a nap. Herman loves taking naps with me so he walked over and slept next to me.

Pig Name: Herman, **Gender:** Male, **Age:** 5 years

Journal E, Entry 2: When I went to feed Herman today, he didn't greet me like he usually does. Curious, I went looking for him and I saw him rooting near the fence. He dug a big hole and was practically halfway under the fence! On the other side of the fence was a pond that Herman has always been fascinated with. I quickly got him out of the fence and refilled the hole with soil. Afraid that Herman might have hurt himself while digging the hole, I did a quick look over of him. I didn't see any scratches on his body and his eyes and nose looked clear. Going back to my chores, I saw that his bedding looked clean so I didn't change it. I noticed that he ate all of his food and drank most of his water, so I refilled them both.

Pig Name: Herman, **Gender:** Male, **Age:** 5 years

Journal E, Entry 3: Today when I went to check up on Herman, he was nowhere to be found. When I checked the fence, I saw that the hole reappeared but was now bigger. I then heard some splashing and knew at once that Herman got to the pond. I ran over to the pond and saw Herman happily splashing and wallowing in the muddy pond. There were many birds in the pond and most of them either flew off or got out of the pond. It took me a while to get him out of the pond but eventually I got him out. I now put bricks in front and in back of the hole so Herman can't get through.

Health Assessment Journals, continued

Print one-sided on heavy paper and cut out along dashed lines.

Pig Name: Herman, **Gender:** Male, **Age:** 5 years

Journal E, Entry 4: After school, I immediately went to check on Herman and the fence. I saw that the fence was still intact but when I saw Herman, he was acting a bit odd. He didn't seem his usual excited self. He was lying on his side when I came to see him but didn't get up to greet me. I looked at his food bowl and he had eaten most of his food. His water bowl was a little low so I refilled it. When I was cleaning his living area, Herman finally got up and started following me. I would occasionally hear him cough while I was working. Looking tired, he found some shade next to a bale of hay and took a nap for the rest of the afternoon.

Pig Name: Herman, **Gender:** Male, **Age:** 5 years

Journal E, Entry 5: Herman was acting especially odd today. I heard him constantly cough when I went to check on him. He didn't get up at all the entire time I was with him. He just lay on his bedding. Worried, I checked his face and body for anything unusual. His eyes and nose looked okay. His ears, however, looked a little blue. The entire time I was examining him, he was coughing. I gave him some water to help with the cough but it didn't seem to make it better.

Pig Disease Descriptions

Mange Mites: Mange is a disease of the skin caused by two types of mite (parasites). It is the most common disease among pigs. It is uncomfortable and irritating for pigs, causing them to rub their bodies against each other or against anything they can find, damaging the skin. Pigs can get mange mites if they are in close contact with infested pigs or are in contact with recently contaminated surfaces. Signs and symptoms include:

- Scratching
- Ear wax buildup, sometimes forming plaques
- Irritation on the skin from rubbing or scratching
- Poor growth
- Tiny, red, pimple-like bumps on the skin
- Lesions, scabs, hair loss, abrasions all over a pig's body

The best method of prevention is excellent management of pigs and housing. The strict practice of making sure that new pigs are mange-mite-free can prevent an entire group of pigs from getting infected. The herd can be sprayed periodically with an oily liquid containing phosmet, which kills and prevents the spread of mange mites. There are no vaccines that can prevent mange mites. Treating the disease is costly: the infected pigs would need repeated medical treatments. If anything looks abnormal—excessive scratching, for example—seek veterinary advice immediately!

Gastric Ulcer: Gastric ulcers cause damage to the stomach wall. They are less common in piglets, but more common for adult pigs. The ulcers are located around where the food pipe (esophagus) connects to the stomach. These ulcers may bleed and cause the pig to digest its own blood. Severe cases can lead to death. The real cause of these ulcers is unknown, but it is most likely they are caused by the diet. Ulcers can

occur if too little protein, fiber, vitamin E, and zinc are in the diet. Ulcers can also occur if there is too much wheat, iron, copper, calcium, fat, and milk in the diet. In addition, feeding finely ground meal or pellets, feeding cereals that are high in moisture, or having an irregular feeding schedule can lead to ulcers. The pig's surrounding environment is also important. Changes in temperature, lack of food, water, or space, transportation, or pneumonia can also cause the development of gastric ulcers. Symptoms of a pig that might have gastric ulcers include:

- Pale skin
- Breathlessness
- Tiredness or weakness
- Vomiting
- Grinding teeth
- Dark-colored droppings
- Weight loss
- Loss of appetite

With proper husbandry, gastric ulcers can be prevented. Have a clean and adequate living space for your pig. Feed it a regular and balanced diet. Increase straw or hay in the diet. Do not feed finely ground foods. Also try to reduce the stress in your pig's environment. If your pig exhibits any of the symptoms above, seek veterinary advice immediately!

Peritonitis: Peritonitis affects the thin layer of tissue that covers the abdomen, causing it to become inflamed. In piglets it can cause death; in adult pigs it can produce many of the same symptoms as gastric ulcers. The causes of peritonitis include mating, gastric ulcers, injury to the abdomen or liver, and bacteria or parasite infection. Symptoms of this disease include:

- Loss of appetite
- Increased or normal temperature
- Loss of weight
- Laziness or tiredness
- Pale skin
- Discharge from the vulva while mating

Ways to prevent peritonitis from occurring include keeping the pig's living space clean, monitoring a pig's health during mating times, and keeping the pig safe from injury. If you observe any of these changes to your pig's appearance or behavior, seek veterinary help immediately!

Porcine Reproductive and Respiratory Syndrome (PRRS, also known as mystery swine disease, blue ear disease): This syndrome is caused by a virus that attacks and kills the defense cells (macrophages) in the lungs. This impairs the pig's immunity and allows more bacteria and viruses to invade and affect the pig. Factors that contribute to this disease include contact with infected pigs (via nasal secretions, saliva, urine, feces, etc.), airborne transmission, and contact with contaminated clothing, shoes, and equipment. It can even be transmitted through birds, particularly the mallard duck. Signs and symptoms include:

- Respiratory problems
- Continuous coughing
- Discoloration of the ears (turning a blue color)
- Decreased appetite within a one- to two-week period
- May have an increase in temperature
- Lethargy

A major way to prevent pigs from becoming infected with PRRS is to prevent the virus from entering your farm. That

means practicing good sanitation and having regular animal check-ups so as to keep infected pigs from infecting others in the herd. Unfortunately, there is no effective treatment program for this disease. For general disease detection (not just for PRRS detection), you should be on the lookout for these symptoms on a regular basis. If any of these symptoms occurs, seek veterinary attention immediately!

Foot and Mouth Disease (FMD): This disease is very devastating to producers because it is so contagious and spreads so rapidly among pigs. The disease produces small vesicles (little blisters) on a pig's nose, lips, and feet. As a result of these vesicles, your pig may begin to drool, clamp its jaws, and display lameness. The vesicles burst within 24 hours. FMD can be transmitted from other pigs and on contaminated clothing and equipment. Thus, it is important to observe good sanitation practices. For example, consider having only one exit and entrance to your pigs' area and keep them away from other animals, as they may also contribute to this disease. Also disinfect your clothing and shoes each time you come into contact with your pigs and disinfect any equipment (wheels, e.g.). There is no effective treatment for this disease; pigs found with this disease should be destroyed. Signs and symptoms include:

- Sudden lameness
- Blisters on hoof, snout, and lips
- Painful to walk (i.e., squeals when walking, preference to lie down)

Sudden lameness and pain when walking are quite obvious in a pig. If you find a pig with these signs it should be removed immediately from the rest of your herd. Upon removing it, check closely for vesicles (blisters), since they are very small. Because there is no cure and because it is highly infectious, pigs found with these vesicles should immediately be destroyed—but make sure to seek veterinary advice before taking any action.

Swine Dysentery: This disease is caused by bacteria and affects a pig's intestines. It leads to diarrhea, poor growth, and death. Since it affects growth, this disease is expected to show up in growing pigs, although it can also appear in full-grown pigs. A common means of transmission for this disease is contact with an infected pig's feces. Rodents can also be carriers of the disease. Prevention is also a good way to keep this disease from attacking your pigs. Good sanitation practices are important. Swine dysentery can be treated with antibiotics. Signs and symptoms include:

- Diarrhea that is porridge-like and khaki to brown in color
- Reduced appetite, which will affect growth
- Animal seems depressed

Watching your pig carefully is important because you will need to see which feces belong to which pig if you have more than one pig. If your pig's behavior seems abnormal, seek veterinary advice.

Greasy Pig Skin Disease: This disease is probably the most common skin disease in pigs and is caused by bacteria. It is typically seen in weaned pigs and is visible as a black, greasy, hairy appearance. The consequences are most serious in younger pigs. It can occur in suckling piglets as young as 3–4 days, and can be lethal at that age. Symptoms include:

- Lesions on the skin, particularly behind the face and eyes
- Brown areas throughout the skin where the infection is located
- Wrinkled or flaking skin in large areas
- Dehydration
- Black and greasy skin

Proper husbandry and housing can help prevent this disease. Some examples include installing flooring that prevents abrasions, placing equipment such as feeding troughs in areas or installing them in ways that make it less likely your pig will

injure itself, and properly clipping your pig's teeth at birth. If anything along these lines looks abnormal in your pig, seek veterinary advice immediately!

Swine Influenza: This is a common problem throughout pig production worldwide. It is caused by a virus and spreads very quickly. Many pigs can become infected with the disease, but few die from the disease. It can be spread easily via pig-to-pig contact and bird and human contact. The clinical signs will vary depending on the type of pig and the strength of its immune system. Symptoms include:

- Flu-like symptoms
- Lack of appetite
- Coughing
- Discharge from the eyes or nose
- Spasms
- Fever
- Sluggishness

If a pig is infected, separate it from the rest of the herd, give it antibiotics to prevent secondary bacterial infections (antibiotics have no effect on viruses) and reduce any type of stress it may feel. Disease prevention steps include reducing movement of the herd and keeping a clean and sanitary facility. Consider vaccinating pigs against swine influenza. If you see any of the symptoms above in your pig, seek veterinary advice immediately!

HEALTH ASSESSMENT SUMMARY

Pig Name: _____

Breed: _____

Gender: _____

Age: _____

Feeding Behavior: _____

General Symptoms

Is there anything you notice that you should be concerned about?

Journal Entry 1: _____

Journal Entry 2: _____

Journal Entry 3: _____

Journal Entry 4: _____

Journal Entry 5: _____

Suspected Diagnosis: _____

(Use the *Pig Disease Descriptions*)

Observations

1. Explain which symptoms from the above journal helped you indicate a problem, and why. _____

2. What other observations do you think might be important?

3. Why do you think recording daily observations of your pig would be helpful in monitoring your pig's health?

HEALTH ASSESSMENT REPORT

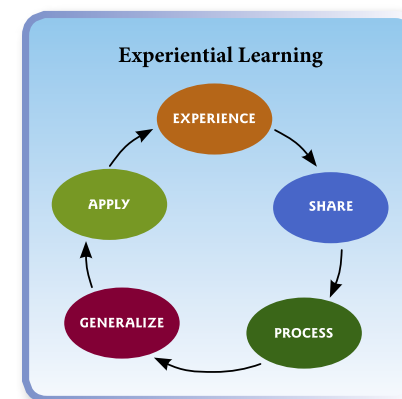
Day	Activity	Behavior	Housing	Other (specify):	Other:	Other:
Monday						
Tuesday						
Wednesday						
Thursday						
Friday						

GLOSSARY

- **Balanced diet:** Eating the right types of food in the right amounts to maintain a healthy body.
- **Basic nutrients:** Substances that help maintain a healthy body. These include carbohydrates, proteins, vitamins and minerals.
- **Care:** Having concern for someone or something, which leads to tending or overseeing that person or thing.
- **Competition:** A struggle between individuals for food, space, and other important requirements for survival.
- **Direct contact:** Physical contact between an ill person or animal and a healthy person or animal.
- **Disease:** An abnormal condition that affects the normal function and health of an organism, decreasing the health of that organism.
- **Disease prevention:** Taking the necessary steps to prevent humans and/or animals from getting sick.
- **Disease transmission:** To transfer a disease from one person or animal to another.
- **Dominant:** Having influence, control, and authority over others.
- **Environmental needs of humans and swine:** The things that both humans and swine need in their home or living area to help them survive and live comfortably.
- **Essential nutrients:** Nutrients that humans and animals must have to live and function properly.
- **Germs:** A microorganism that has the potential to cause diseases.
- **Health care monitoring:** Closely observing an animal's health, behavior and activity everyday to determine what is normal or abnormal about your animal.
- **Illness:** Being unhealthy or in poor health.
- **Indirect contact:** When an uninfected person or animal touches the contaminated surface (e.g., table top) of an inanimate object (e.g., food dish).
- **Life stages of swine:** Swine are categorized in different stages of development or life stages. Swine at each life stage have different nutritional requirements to grow and stay healthy.
- **Olfactory receptors:** Structures that aid with an individual's sense of smell. The more receptors you have, the better your sense of smell.
- **Prenasal bone:** A bone found in the snouts of pigs. This bone allows them to use their nose to dig for food in the ground.
- **Preventative health care:** The act of maintaining the health of humans and animals by preventing them from catching an illness or disease.
- **Responsibility:** Being accountable for one's actions or behaviors.
- **Rooting:** The act of pulling out or removing items from under the ground.
- **Rooting-disk:** A disk found in the snout of pigs that is very sensitive, allowing them to explore the surrounding environment.
- **Social dominance:** In a group, there are individuals that lead and have authority over others in the group.
- **Social hierarchy:** A system where individuals are ranked from top to bottom according to authority or importance.
- **Social order:** A system in place that keeps a group stable and functioning.
- **Subordinate:** Belonging to a lower level or rank in a group.
- **Tactile receptors:** Structures that aid with someone or something's ability to feel and touch items in the environment. The more receptors you have, the better your sense of touch.
- **Wallowing:** To roll around in the mud.

APPENDIX

The activities in this curriculum were designed around inquiry and experiential learning. Inquiry is a learner-centered approach in which individuals are problem solvers investigating questions through active engagement, observing and manipulating objects and phenomena, and acquiring or discovering knowledge. Experiential learning (EL) is a foundational educational strategy used in 4-H. In it, the learner has an experience phase of engagement in an activity, a reflection phase in which observations and reactions are shared and discussed, and an application phase in which new knowledge and skills are applied to a real-life setting. In 4-H, an EL model that uses a five-step learning cycle is most commonly used. These five steps—Experiencing, Sharing, Processing, Generalizing, and Application—are part of a recurring process that helps build learner understanding over time.



For more information on inquiry, EL, and the five-step learning cycle, please visit the University of California Science, Technology, and Environmental Literacy Workgroup's Experiential Learning website, <http://www.experientiallearning.ucdavis.edu/default.shtml>.

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SWINE : *From the Animal's Point of View*

5

SUBJECT OVERVIEW AND BACKGROUND INFORMATION

There is a lot to know about the raising of and caring for a pig. Having a pig is a big responsibility and you need to understand its behavior, housing requirements, nutritional needs, and aspects of its health care in order to prevent injury or disease. Knowledge of these essential facts is the foundation to becoming a successful pig caretaker. By applying this knowledge carefully and thoughtfully, you can properly maintain the health and well-being of your pig and ensure it a high quality of life.

Concepts and Vocabulary

- **Care:** Having concern for someone or something, which leads to tending or overseeing that person or thing.
- **Responsibility:** Being accountable for one's actions or behaviors.

Life Skills

Critical thinking, decision making, disease prevention, problem solving, sharing

Subject Links

Science, Language Arts

Overview of Activity

This activity, entitled *Pig Responsibility*, provides different scenarios that involve issues relating to caring for and raising a pig. Youth will need to use the knowledge they have gained from the previous publications in this curriculum as they read the scenarios and answer questions concerning the proper care of pigs. Youth will discuss, reflect, and suggest alternative solutions for each scenario.

Pig Care and Responsibility



The content in this curriculum is designed to introduce youth to swine behavior, needs and care. Additional emphases include life skills and positive youth development. This is not a guide to raising swine for market or exhibition.

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UC DAVIS
VETERINARY MEDICINE



ACTIVITY 1

Pig Responsibility

BACKGROUND INFORMATION

Owning an animal is an important responsibility. Domesticated animals depend on us to provide for their needs, such as safe and comfortable housing, healthy and nutritious food, and proper veterinary care. When we make the commitment to care for one or more animals, these responsibilities become a part of our everyday activities.

Time Required

45 to 60 minutes

Concepts and Vocabulary

Care, responsibility

Life Skills

Sharing, critical thinking, problem solving, decision making, disease prevention

Subject Links

Science, Language Arts

State Content Standards

Science

- Sixth Grade:
 - » Investigation and Experimentation: 7d

Language Arts

- Fourth Grade:
 - » Listening and Speaking Strategies: 1.7, 1.8
- Fifth Grade:
 - » Reading Comprehension: 2.4
 - » Listening and Speaking Strategies: 1.5
- Sixth Grade:
 - » Listening and Speaking Strategies: 1.5
 - » Speaking Applications: 2.5a, 2.5b

Suggested Grouping

Pairs or small groups

Materials Needed

(* = *Materials provided in curriculum*)

- * *Pig Responsibility Stories*
- Flip chart paper
- Pens, pencils, or markers

Getting Ready

- Divide the youth into small groups.
- Make sure there are enough sheets of flip chart paper and writing utensils for each group.
- Make enough copies of the *Pig Responsibility Stories* for each group to have a story.

OPENING QUESTIONS

Have the youth work in pairs or small groups. Pose and discuss the following questions:

1. **What does being a “responsible animal owner” mean to you?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
2. **What types of things do you think a responsible owner should do for his or her animal?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
3. **What types of needs do you think pigs have, and how do you think an owner can best meet those needs?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.
4. **Describe some situations where you think it might be hard for an owner to keep up with pig care responsibilities. What might be the consequences of this?** Ask the youth to share their ideas verbally or write their thoughts and ideas on the paper provided.

PROCEDURE (EXPERIENCING)

Inform the youth that they are going to review a story about youth who are in situations where they have to make decisions about how they are going to care for their pigs.

Give each group of youth one of the *Pig Responsibility Stories* below. Encourage them to discuss their answers to the follow-up questions together and then record their ideas on paper. Once the small groups of youth have discussed their stories, they will present their ideas to the larger group as a whole.

SHARING, PROCESSING, AND GENERALIZING

Follow the lines of thinking developed by the youth as they share and compare their thoughts and observations; if necessary, use more targeted questions as prompts to get to particular points. Specific questions might include:

1. **Can you think of an example where you have had to make a difficult decision about caring for your pig?**
Please describe the situation.
2. **What are some ways that youth can learn to make the most responsible decisions about caring for their pigs?**
3. **Have you ever known someone who was not a responsible animal owner? What caused you to be concerned about the way that they cared for their animal? What, if anything, did you do in that situation?**

CONCEPTS AND TERMS

At this point, volunteers need to ensure that the concepts of care and responsibility have been introduced to or discovered by the youth. (Note: The goal is to have the youth develop concepts through their own exploration and define terms using their own words.)

CONCEPT APPLICATION

- For youth who have a project animal or pets, ask the youth to review how they take care of their animals. Is the care they are providing sufficient for the needs of their animals? Would they deem the care they are providing to be sufficient and appropriate for the needs of the animals? If not, what needs to be changed in order for the animals to receive sufficient and appropriate care?
- For youth who do not have a project animal or pet, ask the youth to observe and review a friend's animal. Remind them to make sure to ask permission from the owner before observing the animal. Does the youth believe that the care being provided is sufficient for the needs of the animal? If not, what needs to be changed in order for the animal to receive sufficient care?

REFERENCES

- McGlone, J. et al. 2010. Guide for the care and use of agricultural animals in research and teaching (3rd ed.). Federation of Animal Science Societies. www.fass.org.
- Farley, J. L., and W. J. van Riet (eds.). n.d. Swine care practices. California Pork Industry Group and University of California Cooperative Extension. www.vetmed.ucdavis.edu/vetext/local-assets/pdfs/pdfs_animal_welfare/swinecareprax.pdf.

PIG RESPONSIBILITY STORIES

What Should Alan Do?

Alan and his family have just moved from their former home in the city to a small rural town about 50 miles away from a major city. Alan was a bit nervous moving to such a small town because he wasn't sure what to do with his spare time and he was afraid he wouldn't make any friends. At school, he saw a flyer on joining a pig club and raising pigs. It seemed interesting so he decided to talk to his parents about it. Later that night, Alan told his parents about the club. They thought it was a great idea and that Alan should join it. The only requirement was that he needed to take full responsibility for a pig. Excited, Alan started to do some research on how to get a pig and how to raise it.

The first pig meeting was great. Alan met a lot of really cool people, and he started to feel like he was fitting in. Alan started hanging out with people from the club, and they helped him prepare for getting a pig. They helped build a pig shelter and a fence around the area where the pig would be housed. While putting up the fence, one of Alan's friends pointed out some feral pigs roaming around the outskirts of Alan's property. Alan remembered from his research that pigs are social animals. Unfortunately, he didn't have enough money to buy more than one pig, so he decided to leave a small opening in the fence so his pig could interact with the feral pigs.

Later that week, Alan picked out a pig at an auction. He bought a 3-year-old Yorkshire pig that he named Porky. Alan was really excited and brought Porky to his new home. Alan did a great job taking care of Porky. He always made sure Porky's home and enclosure were clean. He always fed Porky and gave him clean water before going to school and after school. Alan wanted to make sure Porky was mentally stimulated while Alan was at school, so he bought lots of toys for Porky to play with and bought a kiddie-pool that he filled with mud so Porky could wallow in it.

One day after coming back from his club meeting, Alan noticed that the feral pigs were inside the fence and were interacting with Porky and eating food from Porky's food trough. Porky looked like he was having fun, so Alan let the feral pigs stay. When the feral pigs left, Alan refilled Porky's water and food trough and played with Porky for the remainder of the afternoon.

A few days later, Alan noticed that Porky wasn't as active as he usually was. He didn't eat all his food in the food trough and was laying down most of the time when Alan went to check up on him. Alan also noticed that Porky was coughing a bit. It appeared as though he had the flu. So Alan made sure Porky had enough food and water and added extra bedding to make sure Porky was comfortable.

The pig club planned to visit each club member's home to see everyone's pigs and evaluate each pig's housing. Alan was really excited because he felt Porky's housing was great and he wanted to show off Porky. Porky still was sick, but seemed better than he had been a few days before, so Alan thought it was okay for people to visit Porky. The visit was a success and everyone liked Porky and his housing.

A week later at the club meeting, a few youth mentioned that their pigs appeared to be sick. Some reported that their pigs were not eating, were coughing, and were just very lazy. Alan noticed that these symptoms were very similar to Porky's symptoms. However, he wasn't sure if he should tell the club leader—he was afraid the other pigs might have gotten sick because of Porky. He didn't want to get kicked out of the club. He finally felt like he had friends and he didn't want to lose them.

Questions for Discussion

1. What, if anything, do you think is wrong with Porky?
2. What do you think could have caused the problem?
3. Is Alan meeting his responsibilities as a pig owner? Why or why not?
4. Who could Alan talk to for help in deciding what to do?
5. If you were in Alan's situation, what would you do and why?
6. What could Alan have done to avoid this situation?

What Should Diane Do?

Diane loves pigs. Everything in her room revolves around pigs, from the bed sheets to her stuffed animals. Diane has always begged her parents for a pet pig but they always said no. However, on Diane's 7th birthday, her parents surprised her with a piglet. Diane was so happy and couldn't stop thanking her parents. Diane named her piglet Gracie.

Diane and Gracie became quick friends and were practically inseparable. Gracie at first slept in Diane's room until Diane was able to clean out her parent's old barn. While Diane was cleaning the barn, Gracie would constantly follow Diane around and watch with great curiosity. Diane went shopping for Gracie, buying tons of bedding, food, toys, and feeders. Once Diane got everything organized and arranged for Gracie, Diane took Gracie to her new home. Gracie seemed really excited, sniffing everything and adjusting to her new home. The rest of that afternoon Diane and Gracie played together and took a nap together under a tree.

After reading some books about pigs, Diane learned that pigs like to wallow. So her next project was to build a mud pool for Gracie. One afternoon, Diane dug a pig hole near the barn and filled it with mud and water. While Diane was doing this, Gracie was sleeping under a tree. When Diane was done with the wallowing hole, she called Gracie to come over. Gracie did a running start and jumped into the hole. Gracie just loved it!

As the months started to go by, it got colder and colder. Diane was afraid Gracie might get sick from the cold so she added more bedding in Gracie's stall. One day, Diane's friend Kathy asked Diane if she could keep her pig Lori at Diane's barn, since she was going out of town for a little while. Diane happily accepted and let Lori stay in another stall at the other

end of the barn. Diane didn't let Gracie and Lori play together because she noticed that Lori had some diarrhea and she didn't want Gracie to get diarrhea too.

A few days later, Kathy came to pick up Lori. Unfortunately, Diane had been feeling a little sick so she hadn't cleaned out Lori's stall. After Kathy and Lori left, Diane brought Gracie into the house because it started to snow. In fact there was so much snow that the part of the barn that housed Gracie collapsed. After the snow stopped, Diane decided it was safe to put Gracie in the far end of the barn in the stall that Lori had used. A few days later, Diane was feeling back to her normal self. She went to check on Gracie and noticed that her feces were watery and covered in mucus. Gracie hadn't been eating all of her food the past few days, but Diane had just figured it was because of the cold weather. However, today, Gracie looked especially weak and thin. Diane didn't know what to do. She wanted to ask her parents for help, but she didn't want them to think she was unable to take care of Gracie on her own.

Questions for Discussion

1. What, if anything, do you think is wrong with Gracie?
2. What do you think could have caused the problem?
3. Is Diane meeting her responsibilities as a pig owner? Why or why not?
4. If you were in Diane's situation, what would you do and why?
5. What could Diane have done to avoid this situation?

What Should Gary Do?

Gary has always been an overachiever. He always participates in many extra curricular activities, even when he might not have the time for it. His best friend told him about a foster project where a person takes care of a pig for a few months and then helps adopt it out. The project focuses on responsibility and learning how to care for a pig. Gary thought it sounded like a great experience and thought the skills he would learn would be great to know later in life. Gary asked his parents if it was okay to foster a pig. They were a little hesitant at first because they were not sure he would have time to foster a pig. Gary convinced them, however, saying that yes he would have time to take care of a pig.

He went to the foster project headquarters and talked with the person in charge about fostering a pig. The person in charge had Gary sign a few documents and gave him a booklet on how to raise a pig. The agency offered pig classes, but Gary decided not to take them because he didn't have time and because he thought the handout would be sufficient on its own. That night, after doing his homework, Gary read the booklet and started to prepare for the foster pig.

With the help of his best friend, Gary prepared the pig's housing in the backyard. He also went out and got all of the basic necessities for raising a pig. The next day, he went to pick up his foster pig. It was a one-year-old male Duroc named Bob. Bob was a little uncomfortable at first in his new home. He didn't eat much the first few days, but later started to adjust and eventually became very comfortable in his home, eating very well and enjoying life.

In the beginning, Gary took really good care of Bob. He fed him daily and changed Bob's water every day. When the bedding appeared dirty, Gary would change it. Gary also got an inflatable pool and filled it with dirt and mud for Bob to wallow in. Since Gary had other activities he had to go to, he didn't have much time to play with Bob.

As the weeks passed, Gary started to get really busy. One week, he had three different projects he had to help put together for clubs he belonged to. He was swamped and sometimes would not have time to clean Bob's feeders or bedding. He would just dump out the loose old food and put fresh food in the feeder without scrubbing it out. He would only change the water when it appeared dirty. He would also just put new bedding over the old bedding. At times, he was so busy that he asked his little brother to help feed and take care of Bob. But his brother would sometimes forget to feed Bob and refill his water bowl.

After a few very busy weeks, Gary started to check up on Bob more often and interact with him. One day, Gary noticed that Bob was just lying on his bedding. When Gary went up to Bob to get him up, Bob didn't move; he just lay there. Gary noticed that Bob had a lot of saliva running from his mouth and that he seemed to be having a hard time breathing. Gary was really worried about Bob, but didn't know what to do.

Questions for Discussion:

1. What, if anything, do you think is wrong with Bob?
2. What do you think could have caused the problem?
3. Is Gary meeting his responsibilities as a pig owner? Why or why not?
4. Who could Gary talk to for help in deciding what to do?
5. If you were in Gary's situation, what would you do and why?
6. What could Gary have done to avoid this situation?

What Should Tony Do?

Tony's family is big on pigs. His mom and dad and brothers and sisters have all participated in raising and showing pigs. They even created a pig club for the local neighborhood. The entire family has enjoyed the experience of raising pigs and Tony was next in line to experience it. So for Tony's 15th birthday, Tony's parents bought him his first pig, a 1-year-old sow that Tony named Harriet.

Tony felt lucky to have a family that was already knowledgeable about how to raise and show pigs, but he didn't always want to look to his family for help. Tony wanted to prove to his family that he could be a great pig caretaker without any help, whether it was a matter of asking for advice or asking for money. Tony went to the club meetings his parents held, but most of the time he was on his own taking care of Harriet.

A show was coming up and Tony wanted to win first place. He thought he had a good chance of winning because Harriet looked great and was well taken care of. Tony always made sure Harriet's home was clean and comfortable. Tony noticed big stacks of hay in the corner of his parent's farm so he decided to feed the hay to Harriet to save some money. He would clean and change Harriet's water every day.

About one week before the show, Tony wanted Harriet to be energized for the event. He heard from a friend that feeding a high-energy, low-protein diet will do the trick to help boost Harriet's energy. Tony's friend had already won many shows, so Tony was really excited with this advice and started to feed Harriet this new diet right away.

The day of the show was very hectic. Tony woke up late for the show and quickly got everything together in time to be picked up by his friend's parents. They loaded Harriet into the trailer with the other pigs and started on the road. The fair was about 2 hours away so they didn't make any stops along the way. Even though there

was an accident on the road, they made it to the fair just in time. However, because Tony came in late, there were no individual pens available for Harriet. The only place he could put her was in a crowded pen. Eventually, things started to calm down and the day turned out to be very successful. Harriet placed first in her division, and Tony was very happy. His parents were really proud of Tony when he told them the news.

Tony was so proud of Harriet that he fed her lots of little treats when he got home. A few days later, Tony noticed that Harriet was not eating as much as she usually did. He also noticed that she produced some vomit near her water bowl. Tony thought the treats were the cause so he stopped feeding her the treats.

The next day, Harriet did not look good. She appeared very weak and did not get up when Tony came near. He saw that she had not eaten the night before and hadn't drunk any of her water. Her skin looked pale, and he noticed that her feces looked dark and bloody. While Tony was cleaning Harriet's pen, he noticed that she would occasionally grind her teeth. Tony was really worried about Harriet but wasn't sure if he should ask his parents for help because he didn't want to appear to be a bad caretaker.

Questions for Discussion

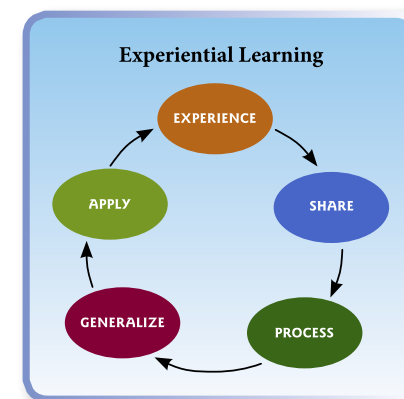
1. What, if anything, do you think is wrong with Harriet?
2. What do you think could have caused the problem?
3. Is Tony meeting his responsibilities as a pig owner? Why or why not?
4. Who could Tony talk to for help with this decision?
5. If you were in Tony's situation, what would you do and why?
6. What could Tony have done to avoid this situation?

GLOSSARY

- **Balanced diet:** Eating the right types of food in the right amounts to maintain a healthy body.
- **Basic nutrients:** Substances that help maintain a healthy body. These include carbohydrates, proteins, vitamins and minerals.
- **Care:** Having concern for someone or something, which leads to tending or overseeing that person or thing.
- **Competition:** A struggle between individuals for food, space, and other important requirements for survival.
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- **Preventative health care:** The act of maintaining the health of humans and animals by preventing them from catching an illness or disease.
- **Responsibility:** Being accountable for one's actions or behaviors.
- **Rooting:** The act of pulling out or removing items from under the ground.
- **Rooting-disk:** A disk found in the snout of pigs that is very sensitive, allowing them to explore the surrounding environment.
- **Social dominance:** In a group, there are individuals that lead and have authority over others in the group.
- **Social hierarchy:** A system where individuals are ranked from top to bottom according to authority or importance.
- **Social order:** A system in place that keeps a group stable and functioning.
- **Subordinate:** Belonging to a lower level or rank in a group.
- **Tactile receptors:** Structures that aid with someone or something's ability to feel and touch items in the environment. The more receptors you have, the better your sense of touch.
- **Wallowing:** To roll around in the mud.

APPENDIX

The activities in this curriculum were designed around inquiry and experiential learning. Inquiry is a learner-centered approach in which individuals are problem solvers investigating questions through active engagement, observing and manipulating objects and phenomena, and acquiring or discovering knowledge. Experiential learning (EL) is a foundational educational strategy used in 4-H. In it, the learner has an experience phase of engagement in an activity, a reflection phase in which observations and reactions are shared and discussed, and an application phase in which new knowledge and skills are applied to a real-life setting. In 4-H, an EL model that uses a five-step learning cycle is most commonly used. These five steps—Experiencing, Sharing, Processing, Generalizing, and Application—are part of a recurring process that helps build learner understanding over time.



For more information on inquiry, EL, and the five-step learning cycle, please visit the University of California Science, Technology, and Environmental Literacy Workgroup's Experiential Learning website, <http://www.experientiallearning.ucdavis.edu/default.shtml>.

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