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

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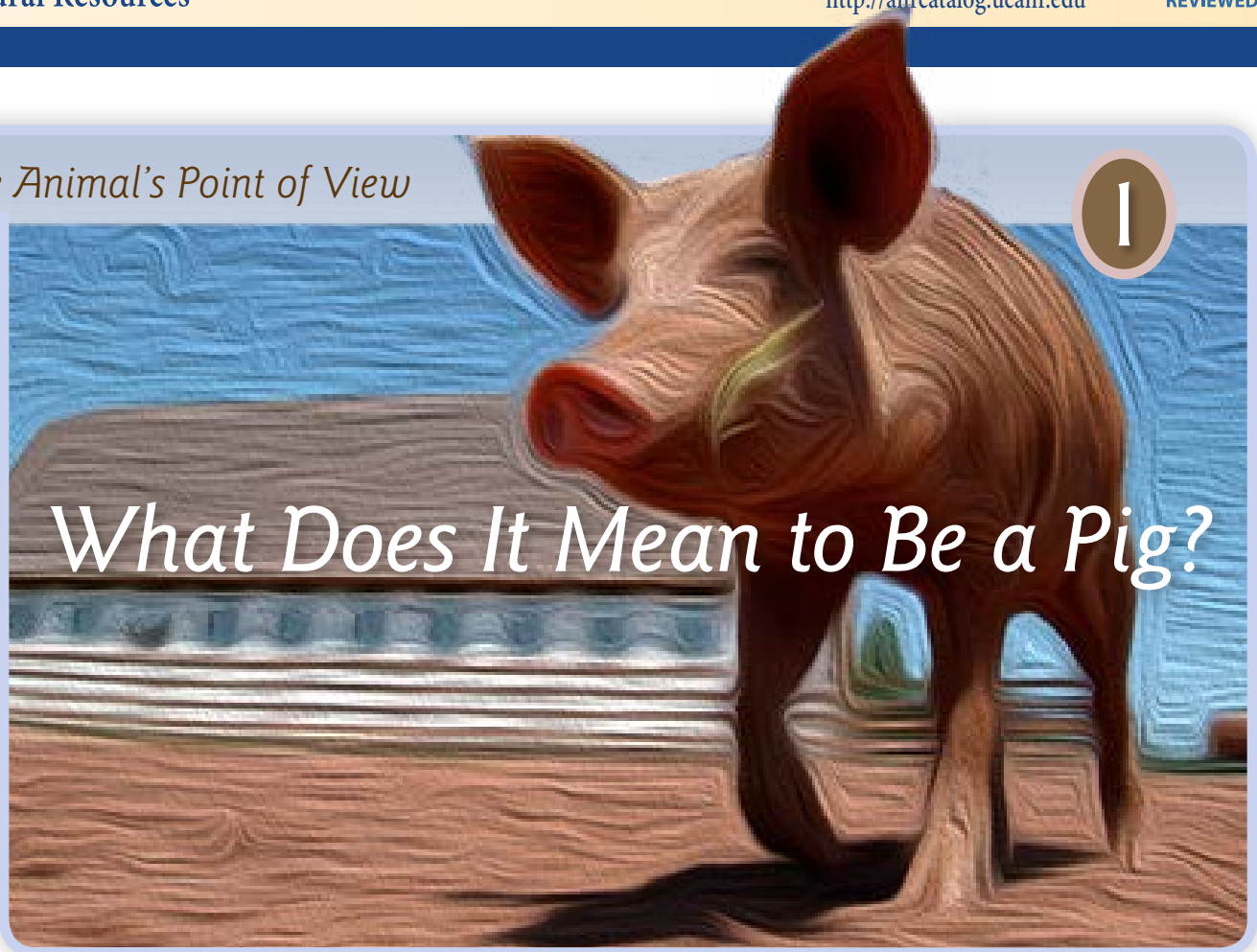

What Does It Mean to Be a Pig?

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!

References

Grandin, T. 2009. Comfortable quarters for pigs in research institutions. Animal Welfare Institute. http://awionline.org/pubs/cq02/Cq-pigs.html.

McGlone, J. J. 2003. Managing heat stress in the outdoor pig breeding herd. www.depts.ttu.edu/porkindustryinstitute/research/MANAGING%20HEAT%20STRESS%20IN%20OUTDOOR%20PIGS.htm.

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University of California Cooperative Extension. 2014. Foothill farming: Swine. http://ucanr.edu/sites/placernevadasmall farms/Livestock/Swine/.

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.

References

Grandin, T. 2009. Comfortable quarters for pigs in research institutions. Animal Welfare Institute. http://awionline.org/pubs/cq02/Cq-pigs.html.

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University of California Cooperative Extension. 2014. Foothill farming: Swine. http://ucanr.edu/sites/placernevadasmall farms/Livestock/Swine/.

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?

References

Grandin, T. 2009. Comfortable quarters for pigs in research institutions. Animal Welfare Institute. http://awionline.org/pubs/cq02/Cq-pigs.html.

United States Department of Health and Human Services. n.d. Pigs. http://ori.hhs.gov/education/products/ncstate/pig.htm.

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 ¾ 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 ¾ 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.

References

McGlone, J. J. 1999. Managing heat stress in the Outdoor pig breeding herd. www.depts.ttu.edu/porkindustryinstitute/research/MANAGING%20HEAT%20STRESS%20IN%20OUTDOOR%20PIGS.htm.

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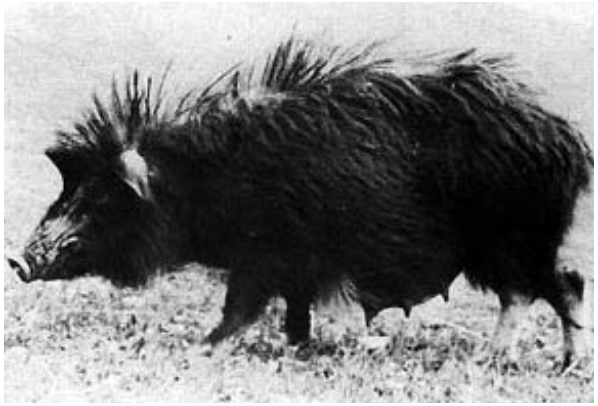
Breeds of Swine

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.

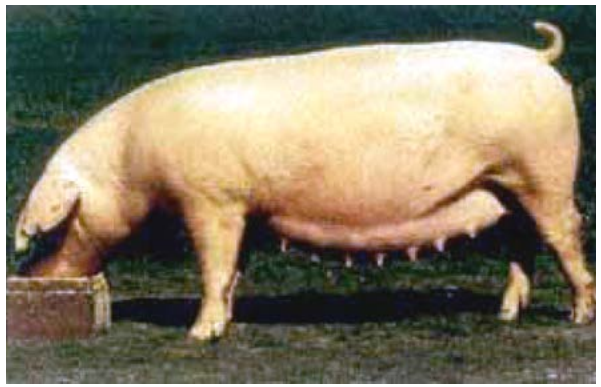
Name: Mangalitsa [a.k.a. Wollschwein (German), Mangulica, Mangulac, Mangalita, Mangaliza, Mangalica, Hungarian Curly Coat, Porc laineux des Pacages, Wollhaariges]. **Origin/Location:** Originated in the former Austria-Hungary and has spread throughout Europe. **Characteristics:** Mangalitsa swine are 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: 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: 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: 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: 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: 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 1 (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 1 (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

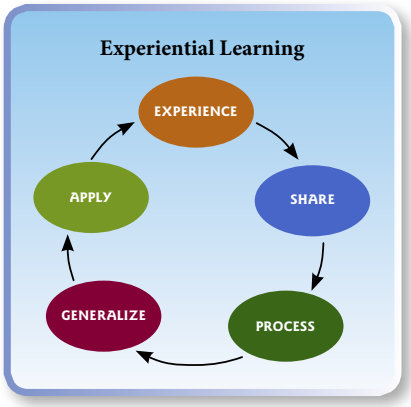
Name: John
Gender: Male
Weight: 35 kg (77 lb)
Age: 1 year
Breed: Tibetan

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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