

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Introduction
<b>Estimated Time</b>	50 minutes

### Student Outcome

The student will explain origins of the horse; how it has influenced American society; how it was reintroduced to the U.S.; and some of the types, sizes, colors, and breeds of horses.

### Learning Objectives

1. Describe the influence of the horse throughout history.
2. Identify how the horse returned to America.
3. Examine how the role of horses has changed from that of early America.
4. Identify the different horse types, sizes, colors, and breeds.

### Grade Level Expectations

SC/LO/3/A/9-11/b

SC/LO/3/C/9-11/b

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publication
  - a. G2780: Horse Registries and Associations
3. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplemental Information

1. Internet Sites
  - Breeds of Livestock (Dictionary). Oklahoma State University. Accessed June 4, 2007, from <http://www.ansi.okstate.edu/breeds/horses/>.
  - The Draft Horse in America*. Eastern Draft Horse Association. Accessed June 4, 2007, from <http://www.easterndraffhorse.com/History/draffhorseinamerica.htm>.
  - Horses & History. Accessed June 4, 2007, from <http://www.equinfinity.com/history.html>.
  - Loch, W. *Horse Registries and Associations*. University of Missouri-Columbia Extension Division agricultural publication, G2780. Accessed June 4, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02780.htm>.
  - Pavia, A. *How Horses Made America Great*. Accessed June 4, 2007, from [http://www.fund4horses.org/pdf/how\\_horses.pdf](http://www.fund4horses.org/pdf/how_horses.pdf).
2. Print
  - Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.

## Interest Approach

Show various pictures or slides showing horses involved in different activities. After students have had a few minutes to look over the pictures or slides, ask them to give further examples of equine activities.

## Communicate the Learning Objectives

1. Describe the influence of the horse throughout history.
2. Identify how the horse returned to America.
3. Examine how the role of horses has changed from that of early America.
4. Identify the different horse types, sizes, colors, and breeds.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>It is thought that the Chinese were the first to keep horses in herds for uses other than food. Horses have been many things to people – a source of food, a weapon of war in the conquering of enemies, transportation, a companion, etc. Whatever the use, there is no doubt that the horse has helped shape the course of human history.</i></p>	<p><b>Describe the influence of the horse throughout history.</b></p> <ol style="list-style-type: none"><li>1. Food source</li><li>2. Transportation</li><li>3. Power source</li><li>4. Companion</li></ol>
<p><b>Objective 2</b></p> <p><i>Almost since the beginning of time, horses have populated most of the world. However, in North America, they had vanished until they were reintroduced in the late 1400s by the Spanish Conquistadors.</i></p>	<p><b>Identify how the horse returned to America.</b></p> <ol style="list-style-type: none"><li>1. Spanish Conquistadors</li><li>2. Cortez</li><li>3. de Soto</li><li>4. Missionaries</li></ol>
<p><b>Objective 3</b></p> <p><i>When America was young and still unexplored, the horse was essential in providing transportation, power to pull plows, and companionship for the lonely cowhand on the trail. Almost everyone owned at least</i></p>	<p><b>Examine how the role of horses has changed from that of early America.</b></p> <p>In early America</p> <ol style="list-style-type: none"><li>1. Columbus's second voyage brought 25 horses</li><li>2. 1600s colonists brought horses when they settled</li><li>3. Spreading westward – Lewis &amp; Clark</li></ol> <p>Population rise until early 1920s and decrease until early 1960s</p>

Instructor Directions	Content Outline
<p><i>one horse. Today, the equine population is much less.</i></p>	<p>In America today – the recreational horse</p>
<p><b>Objective 4</b></p> <p><i>Horses come in a variety of types, colors, and sizes. Choosing a type and breed of horse depends on the owner's needs and how much money the individual wants to spend.</i></p>	<p><b>Identify the different horse types, sizes, colors, and breeds.</b></p> <p>Classifying horses by size, build, weight, and type (light, draft, or ponies)</p> <ol style="list-style-type: none"> <li>1. Ponies: Less than 14 hands and 500-900 pounds</li> <li>2. Light: 14-17 hands high and 900-1,400 pounds</li> <li>3. Draft: 14-17+ hands and 1,400+ pounds</li> </ol> <p>Color (black, brown, bay, and chestnut as common coat colors)</p> <p>Breeds and breed registries</p>
<p><b>Application:</b></p>	<p>Other activities</p> <ol style="list-style-type: none"> <li>1. Visit some local horse farms that have different breeds of horses. Have students look for the differences between breeds. Have them note the coloring of certain breeds and if there are characteristic colorings or other features that are unique to that breed. Explore the predictability of offspring coloring in horses as compared to other stock.</li> <li>2. Go to a horse show. Have students look for as many unique characteristics as they can find.</li> <li>3. View videos from the various breed associations.</li> <li>4. Students can research information on a particular breed. Breed association addresses are available by: <ol style="list-style-type: none"> <li>a) doing a computerized search, b) using the UMC Extension Guide G2780, or c) contacting the American Horse Council, 1616 H Street NW, 7<sup>th</sup> Floor, Washington, DC 20006 (202-296-4031).</li> </ol> </li> <li>5. Display the poster, "Guide to Horses" (available for purchase from Nasco).</li> <li>6. Students can create horse breed PowerPoint presentations.</li> </ol>
<p><b>Closure/Summary</b></p>	<p>There is no doubt that horses have had a very large impact on humanity. People have been fortunate to have domesticated an animal that is much more powerful than themselves. Today, the horse's popularity is on the increase with such sports as dressage, endurance events, and hunter jumping. With these events receiving a great</p>

Instructor Directions	Content Outline
	deal of notoriety in the Olympics, the number of horse owners will continue to increase.
<b>Evaluation: Quiz</b>	Answers: 1. c 2. a 3. c 4. d 5. b 6. d 7. b 8. a 9. c

EVALUATION

**Circle the letter that corresponds to the best answer.**

1. How was the horse first used?
  - a. Weapon
  - b. Pet
  - c. Food
  - d. Entertainment
  
2. Who first kept herds of horses for uses other than food?
  - a. Chinese
  - b. Scythians
  - c. Greeks
  - d. Italians
  
3. When was the horse reintroduced to America?
  - a. 1600s
  - b. 1500s
  - c. 1400s
  - d. 1300s
  
4. Who did **not** reintroduce horses to the United States?
  - a. Columbus
  - b. Conquistadors
  - c. Missionaries
  - d. Germans
  
5. The horse population increased in the U.S. until when?
  - a. 1910s
  - b. 1920s
  - c. 1930s
  - d. 1940s
  
6. In the U.S., when did the decrease in horse numbers and popularity stop?
  - a. 1930s
  - b. 1940s
  - c. 1950s
  - d. 1960s

7. How are horses classified?
  - a. Size and shape
  - b. Size, build, and weight
  - c. Build and shape
  - d. Color only
  
8. How large are light horses?
  - a. 14-17 hands and 900-1,400 pounds
  - b. Less than 14 hands and around 1,000 pounds
  - c. 14-17 hands and around 1,000 pounds
  - d. 14-17 hands and 1,400+ pounds
  
9. How large are draft horses?
  - a. 14-17 hands and 1,000 pounds
  - b. 12-14+ hands and 1,000 pounds
  - c. 14-17+ hands and 1,400 pounds or more
  - d. 10-12 hands and 1,000 pounds

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Psychology and Handling
<b>Estimated Time</b>	50 minutes

### Student Outcome

The student will identify different equine psychological traits, along with the proper handling and training techniques of the horse.

### Learning Objectives

1. Recognize ways horses react to people.
2. Recognize the signs of danger.
3. Identify horse manners.
4. Identify the unique characteristics of equine vision and hearing.
5. Determine foal handling techniques.
6. Identify basic training methods.

### Grade Level Expectations

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplemental Information

##### 1. Internet Sites

- The Basics of Horse Handling & Human Safety*. Southern Illinois University and Horsemen's Council of Illinois. Accessed June 5, 2007, from <http://www.horsemencouncil.org/pdfs/Basics%20of%20horse%20handlingW.pdf>.
- Bradley, M. *Practical Horse Psychology*. MU Extension. University of Missouri-Columbia. Accessed June 5, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02862.htm>.
- Ground Manners. Equusite.com. Accessed June 5, 2007, from <http://www.equusite.com/articles/ground/groundHome.shtml>.
- "How Horses See." *Horsewyse Magazine*, 2006. Accessed June 5, 2007, from <http://www.horsewyse.com.au/howhorsessee.html>.
- Psychology of the Horse*. 4-H Horse Project Manual. Accessed June 5, 2007, from [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/4h7933/\\$FILE/o\\_psychology.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/4h7933/$FILE/o_psychology.pdf).

##### 2. Print

- Campbell, J. R., M. D. Kenealy, and K. L. Campbell. *Animal Sciences: The Biology,*

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*Care, and Production of Domestic Animals*. 4th ed. New York: McGraw-Hill Companies, 2003.

- ❑ Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.
  - ❑ Frandson, R. D., W. L. Wilke, and A. D. Fails. *Anatomy and Physiology of Farm Animals*. 6th ed. Baltimore: Lippincott Williams and Wilkins, 2003.
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## Interest Approach

Most people get scared when they see a horse rear up and their first reaction is to jerk down on the lead rope. Have any of you seen a horse do this? Have you seen any other unusual or aggressive behavior? What do you think caused this behavior?

## Communicate the Learning Objectives

1. Recognize ways horses react to people.
2. Recognize the signs of danger.
3. Identify horse manners.
4. Identify the unique characteristics of equine vision and hearing.
5. Determine foal handling techniques.
6. Identify basic training methods.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>Animals – horses, in particular – seem to sense how a person is feeling. If a person has aggressive feelings, the horse might react in the same manner. If the person is very nervous or timid, the horse might be jumpy and hard to handle. This makes it important for the individual to be self-confident but have respect for the horse's power.</i></p>	<p><b>Recognize ways horses react to people.</b></p> <ol style="list-style-type: none"><li>1. Aggressive behaviors</li><li>2. Loyalty</li><li>3. Stubborn behaviors</li></ol>
<p><b>Objective 2</b></p> <p><i>Safety is very important to remember when handling a horse. The handler must be aware of the signals the horse is sending. Never become overconfident and let your guard down; that is an easy way to get you and/or the horse hurt.</i></p>	<p><b>Recognize the signs of danger.</b></p> <ol style="list-style-type: none"><li>1. Ear positions (forward: interest, backward: anger)</li><li>2. Eye positions (closed eyes with ears back: sleep)</li><li>3. Tail movement (annoyance)</li><li>4. Pawing the ground (dislike of something or boredom)</li></ol>
<p><b>Objective 3</b></p> <p><i>Horses have their own mannerisms and quirks. Some seem easier to work with than others. Some mannerisms are instinctive, while others are</i></p>	<p><b>Identify horse manners.</b></p> <p>Good manners</p> <p>Bad manners (vices)</p> <ol style="list-style-type: none"><li>1. Barn sour – doesn't want to leave the barn or wants to get back to it</li></ol>

Instructor Directions	Content Outline
<p><i>learned. It is important to understand the difference between the two.</i></p>	<ol style="list-style-type: none"> <li>2. Biting</li> <li>3. Bolting feed – can be discouraged by spreading the food out or placing a large, baseball-sized rock in the feed</li> <li>4. Cribbing – when a horse hooks its upper teeth on a solid object, extends its neck, and sucks in air</li> <li>5. Pawing – boredom</li> <li>6. Shying</li> <li>7. Weaving, stall walking, and wood chewing</li> </ol>
<p><b>Objective 4</b></p> <p><i>The horse's vision creates blind spots directly in front of the nose and behind the horse. It is these blind spots that make it dangerous to walk up on horses and surprise them. When approaching a horse, always approach from the side or at an angle so it can see you coming. It is a good idea to talk to horses so they also hear you coming.</i></p>	<p><b>Identify the unique characteristics of equine vision and hearing.</b></p> <ol style="list-style-type: none"> <li>1. Monocular vision</li> <li>2. Blind spots</li> <li>3. Night vision</li> <li>4. Excellent hearing</li> </ol>
<p><b>Objective 5</b></p> <p><i>The new foal can be fun and rewarding to handle. It is important to start working with foals as soon as possible. They will be easier to handle after they learn to trust you.</i></p>	<p><b>Determine foal handling techniques.</b></p> <ol style="list-style-type: none"> <li>1. Sacking at birth</li> <li>2. Haltering at 1-2 weeks</li> <li>3. Grooming</li> </ol>
<p><b>Objective 6</b></p> <p><i>There are probably more ideas about how to train a horse than any other topic dealing with horses. Training methods vary from trainer to trainer, and each has his/her own particular style of training. However, there are some basics involved in training a horse.</i></p>	<p><b>Identify basic training methods.</b></p> <ol style="list-style-type: none"> <li>1. Patience – most important characteristic</li> <li>2. Repetition</li> <li>3. Positive reinforcement</li> <li>4. Discipline – always prompt and never administered out of anger</li> <li>5. Discipline, reward, and timing</li> </ol>

Instructor Directions	Content Outline
<b>Application</b>	<p>Other activities</p> <ol style="list-style-type: none"> <li>1. Take a field trip to a local equine training facility and observe what methods of training they use.</li> <li>2. If possible, observe the birth of a foal. Have students take note of how the foal is handled.</li> <li>3. Take a field trip to a horse show and observe the horses' behavior.</li> <li>4. Invite a guest speaker to class who trains or works with horses.</li> </ol>
<b>Closure/Summary</b>	<p>To be able to successfully and safely handle a horse, the handler must have some understanding of the psychology of the horse. Working and training should start soon after birth. It is important that the foal gets to know and trust its handler(s) as soon as possible.</p>
<b>Evaluation: Quiz</b>	<p>Answers:</p> <ol style="list-style-type: none"> <li>1. c</li> <li>2. d</li> <li>3. b</li> <li>4. c</li> <li>5. b</li> <li>6. b</li> <li>7. b</li> <li>8. a</li> <li>9. d</li> <li>10. c</li> <li>11. a</li> <li>12. c</li> <li>13. a</li> <li>14. b</li> </ol>

## EVALUATION

Circle the letter that corresponds to the best answer.

1. How do horses react to people?
  - a. The same, no matter what
  - b. In a positive manner
  - c. Differently, depending on the horse
  - d. In a negative manner
  
2. What is indicated when a horse's ears are perked forward?
  - a. It is about to kick.
  - b. It is about to go to sleep.
  - c. It is angry at something.
  - d. It is interested in something.
  
3. What is indicated when a horse's ears are backward and eyes are relaxed?
  - a. It is about to kick.
  - b. It is about to go to sleep.
  - c. It is angry at something.
  - d. It is interested in something.
  
4. What is meant by barn souring?
  - a. The horse makes the barn smell sour.
  - b. The barn's condition makes the horse smell sour.
  - c. The horse refuses to leave the safety of the barn.
  - d. The horse refuses to enter the barn.
  
5. How can a horse be stopped from bolting its feed?
  - a. Putting pea-sized rocks in with the feed
  - b. Putting baseball-sized rocks with the feed
  - c. Lumping the feed up
  - d. Withholding the feed
  
6. What kind of vision does a horse have?
  - a. 360 degree
  - b. Monocular
  - c. Binocular
  - d. Both binocular and monocular

7. Where are a horse's blind spots?
  - a. On its side and to the rear
  - b. Directly in front of its nose and to the rear
  - c. On either side of its head
  - d. On either side of its body
  
8. When should a foal be worked with?
  - a. As soon as possible
  - b. As soon as it is weaned
  - c. At six months of age
  - d. At 12 months of age
  
9. When should a foal be halter broken?
  - a. At one year of age
  - b. At six months of age
  - c. At two months of age
  - d. At two weeks of age
  
10. Which describes a vice in horses that involves sucking air and arching its neck?
  - a. Heaves
  - b. Air sucking
  - c. Cribbing
  - d. Cradling
  
11. What may be indicated when a horse continually paws the ground?
  - a. Boredom
  - b. Sore feet
  - c. Insect annoyance
  - d. Angry mood
  
12. What is usually meant when a horse swishes its tail?
  - a. Too hot
  - b. Too cold
  - c. Annoyance
  - d. Good mood
  
13. What is the most important quality for an effective trainer to have?
  - a. Patience
  - b. Loud voice
  - c. Plenty of energy
  - d. A lot of help
  
14. How should discipline be administered?
  - a. Out of anger
  - b. Promptly, but never out of anger
  - c. At the end of the training session
  - d. By someone else

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Conformation and Selection
<b>Estimated Time</b>	50 minutes

**Student Outcome**

The student will be able to identify the ideal selection and conformation traits of a horse and their importance when purchasing a horse.

**Learning Objectives**

1. Determine the ideal characteristics when selecting a horse.
2. Recognize the influence of a horse’s temperament on selection.
3. Describe the importance of balance and soundness.
4. Explain the use of performance records and pedigrees.

**Grade Level Expectations**

SC/EC/3/B/09-11/a                      SC/EC/3/C/09-11/b

**Resources, Supplies & Equipment, and Supplemental Information**

**Resources**

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publications
  - a. G2840: Unsoundness and Blemishes of Horses: Feet and Legs
  - b. G2842: Determining Age of Horses by Their Teeth
  - c. G2843: Leg Set: Its Effect on Action and Soundness of Horses
3. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

**Supplemental Information**

1. Internet Sites
  - ❑ Bradley, M. *Leg Set: Its Effect on Action and Soundness of Horses*. University of Missouri-Columbia Extension Division agricultural publication, G2843. <http://extension.missouri.edu/explore/agguides/ansci/g02843.htm>.
  - ❑ Equine Tooth Problems and Dental Care. KBR Horse Health Information. Accessed June 11, 2007, from <http://www.kbrhorse.net/hea/float.html>.
  - ❑ Loch, W. *Buying a Horse*. University of Missouri-Columbia Extension Division agricultural publication, G2835. Accessed June 11, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02835.htm>.
  - ❑ Loch, W. *Horse Conformation: Form to Function*. University of Missouri-Columbia Extension Division agricultural publication, G2837. Accessed June 11, 2007, from <http://extension.missouri.edu/xplor/agguides/ansci/g02837.htm>.
  - ❑ Loch, W. and M. Bradley. *Determining Age of Horses by Their Teeth*. University of Missouri-Columbia Extension Division agricultural publication, G2842. Accessed June 11, 2007, from

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<http://extension.missouri.edu/explore/agguides/ansci/g02842.htm>.

- ❑ Loch, W. and M. Bradley. *Unsoundness and Blemishes of Horses: Feet and Legs*. University of Missouri-Columbia Extension Division agricultural publication, G2840. Accessed June 11, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02840.htm>.

2. Print

- ❑ Campbell, J. R., M. D. Kenealy, and K. L. Campbell. *Animal Sciences: The Biology, Care, and Production of Domestic Animals*. 4th ed. New York: McGraw-Hill Companies, 2003.
  - ❑ Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.
  - ❑ Frandson, R. D., W. L. Wilke, and A. D. Fails. *Anatomy and Physiology of Farm Animals*. 6th ed. Baltimore: Lippincott Williams and Wilkins, 2003.
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## Interest Approach

Begin by asking students if they have ever heard of people who have been taken advantage of by disreputable car salespeople because they didn't know anything about cars. Then ask whether they think it could happen when buying a horse.

## Communicate the Learning Objectives

1. Determine the ideal characteristics when selecting a horse.
2. Recognize the influence of a horse's temperament on selection.
3. Describe the importance of balance and soundness.
4. Explain the use of performance records and pedigrees.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>Selecting a horse is kind of like buying a car; everyone wants four good tires, no flaws in the body, two bright headlights, good air intake, a sound motor, and a solid exhaust system. Of course, the emphasis will vary, depending on the owner's needs and skill level.</i></p>	<p><b>Determine the ideal characteristics when selecting a horse.</b></p> <p>General body condition—healthy and of normal weight</p> <p>Gender considerations—stallions only for experienced riders</p> <p>Leg structure—front hoofs aligned in a straight line with the shoulder</p> <p>Muscling appropriate for the breed</p> <p>Tooth structure—indicates age</p> <ol style="list-style-type: none"><li>1. Permanent teeth come in by age 4 ½ years.</li><li>2. Horses have one set of temporary and one set of permanent teeth.</li></ol> <p>Eye size and placement—large, wide-set eyes</p>
<p><b>Objective 2</b></p> <p><i>When selecting a horse, one of the first things to take into consideration is temperament. If a horse is temperamental and unpredictable or even aggressive, it is better to keep looking – even if it has everything else you are looking for. A good-looking horse that is uncontrollable will only cause injuries.</i></p>	<p><b>Recognize the influence of a horse's temperament on selection.</b></p> <ol style="list-style-type: none"><li>1. Small, narrowly set eyes are associated with poor eyesight and temperament problems.</li><li>2. A good-looking horse with a bad temperament is a poor mix.</li></ol>
<p><b>Objective 3</b></p>	<p><b>Describe the importance of balance and soundness.</b></p>

Instructor Directions	Content Outline
<p><i>While it is important for the horse to be as sound as possible, no horse is perfect. Look for a well-balanced horse, one with few imperfections and good proportions. Making sure a horse is sound (healthy) and free from defects is very important. If the horse is not sound, there can be greater problems in the future that can create large medical bills or problems that can't be corrected.</i></p>	<p>Balance (well developed and all parts blending together)</p> <p>Two categories of structure</p> <ol style="list-style-type: none"> <li>1. Blemishes</li> <li>2. Unsoundness/ defects</li> </ol> <p>Minor travel or gait defects correctable by shoeing</p> <p>Causes of unsoundness: an inherited trait or from some outside influence such as stress, strain, injury, or nutritional deficiency</p> <p>Hidden problems caused by disreputable dealers</p>
<p><b>Objective 4</b></p> <p><i>Performance records tell how the horse's ancestors performed and can help predict how well the animal will perform. A pedigree describes the horse's ancestry. Performance records tell how well past generations performed and can help predict how well an individual might do in the future. The Thoroughbred breed registry was the first to use performance records.</i></p>	<p><b>Explain the use of performance records and pedigrees.</b></p> <ol style="list-style-type: none"> <li>1. Recording genetic characteristics</li> <li>2. Breeding for excellence</li> <li>3. Show ring winnings</li> <li>4. Using with performance records</li> <li>5. Recording ancestors and their performance</li> </ol>
<p><b>Application:</b></p>	<p>Other activities</p> <ol style="list-style-type: none"> <li>1. Visit a breed registry or invite a representative to visit the class. Discuss the importance of registering a horse and the procedure for registering a horse.</li> <li>2. Have students access an interactive horse judging Web site to practice judging horses. The site, developed by the College of Agriculture at the University of Kentucky, is located at <a href="http://www.ca.uky.edu/Agripedia/AGMANIA/HORSE/INDEX.asp">http://www.ca.uky.edu/Agripedia/AGMANIA/HORSE/INDEX.asp</a>.</li> </ol>
<p><b>Closure/Summary</b></p>	<p>It is important to be able to distinguish between desirable and undesirable characteristics when choosing a horse, especially if the animal is for breeding purposes. Pedigrees and performance records can be valuable tools to use when selecting a horse.</p>

Instructor Directions	Content Outline
Evaluation: Quiz	Answers: 1. c 2. d 3. c 4. b 5. d 6. b 7. c 8. a 9. a 10. d 11. b 12. a 13. b

EVALUATION

**Circle the letter that corresponds to the best answer.**

1. Which is true when considering a horse's gender?
  - a. Never choose a stallion.
  - b. Only beginners such choose stallions.
  - c. Only experienced riders should choose stallions.
  - d. None of the above
  
2. How should a horse's front legs look?
  - a. Wider at the hoof
  - b. Slightly wider at the hoof
  - c. Slightly narrower at the hoof
  - d. In a straight line with the shoulder
  
3. Which describes ideal eyes of a horse?
  - a. Small and narrow set
  - b. Large and narrow set
  - c. Large and wide set
  - d. Small and wide set
  
4. What reveals a horse's age?
  - a. Its eyes
  - b. Its teeth
  - c. Its hair length
  - d. Hooves
  
5. How long does it take for a horse's permanent teeth to come in?
  - a. One year
  - b. Two and one-half years
  - c. Three years
  - d. Four and one-half years
  
6. How many teeth does a horse have?
  - a. Only one set
  - b. One set of temporary and one set of permanent
  - c. Two sets of temporary and one set of permanent
  - d. 50

7. What is typical of a horse with small, narrow-set eyes?
  - a. Good temperament
  - b. Better eyesight
  - c. Poor eyesight
  - d. Keener senses
  
8. Which is true of a horse with a poor temperament?
  - a. May cause injury
  - b. Makes no difference
  - c. Is just spirited
  - d. None of the above
  
9. Structure can be broken into which categories?
  - a. Blemishes and unsoundness
  - b. Blemishes and flaws
  - c. Flaws and unsoundness
  - d. Flaws and spots
  
10. Which can cause an unsoundness?
  - a. An inherited trait
  - b. From outside stress and strain
  - c. From nutritional deficiency
  - d. Any of the above
  
11. What do performance records tell?
  - a. How well the rider has done
  - b. How well a horse has performed
  - c. How well the rider will do
  - d. None of the above
  
12. Which was the first breed registry to use performance records?
  - a. Thoroughbred
  - b. Quarterhorse
  - c. Arabian
  - d. Standardbred
  
13. What is a pedigree?
  - a. Another name for hoof care
  - b. Record of a horse's ancestry
  - c. Another name for grooming
  - d. All of the above

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Genetics and Reproduction
<b>Estimated Time</b>	50 minutes

### Student Outcome

The student will understand the basic genetic characteristics and reproductive organs of mares and stallions.

### Learning Objectives

1. Describe the basic genetic characteristics.
2. Identify the reproductive organs of the mare.
3. Identify the reproductive organs of the stallion.
4. Describe the methods of reproduction.
5. Explain the process of parturition.
6. Identify dystocia and how can it be handled.
7. Discuss the importance of checking the afterbirth.
8. Identify colostrum and why is it important.

### Grade Level Expectations

SC/LO/3/B/09-11/d

SC/LO/3/E/09-11/a

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. Assignment Sheet
  -  AS 1 - Reproductive Part Identification
2. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
3. University of Missouri-Columbia Extension Division agricultural publications
  - a. G2790: Horse Breeding Arithmetic:  $2 + 2 = 1$
  - b. G2791: Genetics of Coat Color of Horses
4. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplies & Equipment

- Graph paper

#### Supplemental Information

1. Internet Sites
  - Extension More Mind Reach. Horse Reproduction. Accessed June 13, 2007, from <http://www.extension.org/category/horse+reproduction>.
  - The Stallion: Breeding Soundness Examination and Reproductive Anatomy*. Cooperative Extension Service. University of Kentucky. Accessed June 13, 2007, from <http://www.uky.edu/Ag/AnimalSciences/extension/pubpdfs/asc117.pdf>.
  - Dystocia or Difficult Birth. Scott Creek Horse Farm. Accessed June 13, 2007, from

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<http://www.scottcreek.com/Dystocia.htm>.

2. Print

- ❑ Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.
  - ❑ Frandson, R. D., W. L. Wilke, and A. D. Fails. *Anatomy and Physiology of Farm Animals*. 6<sup>th</sup> ed. Baltimore: Lippincott Williams and Wilkins, 2003.
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## Interest Approach

Divide students into groups of three or four. Have students tally their hair color, eye color, and whether their ear lobe is attached to their head or loose. Next, tally the class totals from the small groups and chart the results on graph paper. Discuss what causes these differences.

## Communicate the Learning Objectives

1. Describe the basic genetic characteristics.
2. Identify the reproductive organs of the mare.
3. Identify the reproductive organs of the stallion.
4. Describe the methods of reproduction.
5. Explain the process of parturition.
6. Identify dystocia and how can it be handled.
7. Discuss the importance of checking the afterbirth.
8. Identify colostrum and why is it important.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>Genes and how they mix determine an animal's characteristics. Groups of genes linked together make up chromosomes. In horses, there are 32 chromosome pairs, or 64 chromosomes in all.</i></p>	<p><b>Describe the basic genetic characteristics.</b></p> <ol style="list-style-type: none"><li>1. Physical traits, such as color, muscling, stamina, speed, etc.</li><li>2. Desirable traits</li><li>3. Undesirable combinations, such as lethal genes (albinism)</li><li>4. Chromosome pairs (32) and compatibility</li></ol>
<p><b>Objective 2</b></p> <p><i>A correctly functioning reproductive tract is important for a broodmare. A good knowledge of the reproductive tract can help identify any potential problems. Have students complete the female reproductive parts matching on AS 1.</i></p> <p> AS 1 - Reproductive Part Identification</p>	<p><b>Identify the reproductive organs of the mare.</b></p> <ol style="list-style-type: none"><li>1. Ovaries produce ova (eggs).</li><li>2. Fallopian tubes connect ovaries to the uterus.</li><li>3. Uterine horns are between fallopian tubes and the uterus.</li><li>4. The uterus is where the embryo attaches and grows.</li><li>5. The cervix muscle keeps out foreign material.</li><li>6. The vagina receives semen from the stallion and is the birth canal.</li></ol>
<p><b>Objective 3</b></p> <p><i>For the stallion to be productive in the breeding barn, a well-</i></p>	<p><b>Identify the reproductive organs of the stallion.</b></p> <ol style="list-style-type: none"><li>1. Penis</li><li>2. Urethra</li></ol>

Instructor Directions	Content Outline
<p><i>functioning reproductive system is vital. Have students complete the male reproductive parts matching on AS 1.</i></p> <p> AS 1 - Reproductive Part Identification</p>	<ol style="list-style-type: none"> <li>3. Cowper's gland, which produces fluids</li> <li>4. Prostate gland, which produces fluids</li> <li>5. Seminal vesicles, which produce fluids</li> <li>6. Vas deferens</li> <li>7. Epididymis</li> <li>8. Testicles, which produce sperm</li> <li>9. Scrotum</li> </ol>
<p><b>Objective 4</b></p> <p><i>Ask students to identify methods of breeding. Discuss reasons that hand breeding is the most practiced method with horses. Answers should include more accurate conception records, which greatly help in predicting the foaling date, and less chance of injury.</i></p>	<p><b>Describe the methods of reproduction.</b></p> <ol style="list-style-type: none"> <li>1. Natural (pasture) breeding: hard to predict foaling dates and higher chance of injury to mare and stallion</li> <li>2. Hand breeding: most practiced method</li> <li>3. Artificial insemination (AI): not widely used with horses; never used in the thoroughbred industry; steps include collection, evaluation, and insemination</li> </ol>
<p><b>Objective 5</b></p> <p><i>Parturition is the process of giving birth and is similar in most mammals. Most mares do not like an audience when foaling and will foal early in the morning. It is a good idea to be as inconspicuous as possible.</i></p>	<p><b>Explain the process of parturition.</b></p> <p>Waxing</p> <p>Udder and vagina muscle changes</p> <p>Three stages of birth</p> <ol style="list-style-type: none"> <li>1. Agitation and perhaps breaking of the water</li> <li>2. Labor and visible fetal membranes</li> <li>3. Presentation</li> </ol> <p>Afterbirth expulsion, usually within 2-3 hours</p>
<p><b>Objective 6</b></p> <p><i>Dystocia means having problems giving birth. Any time a mare strains or has contractions for an unusually long period of time; a veterinarian should be called to assist.</i></p>	<p><b>Identify dystocia and how can it be handled.</b></p> <p>Causes</p> <ol style="list-style-type: none"> <li>1. Abnormal presentation</li> <li>2. Unusually large foal</li> <li>3. Twins</li> </ol> <p>Veterinarian help</p>
<p><b>Objective 7</b></p> <p><i>Retained placenta can cause serious infections and make</i></p>	<p><b>Discuss the importance of checking the afterbirth.</b></p> <p>Retained placenta</p> <ol style="list-style-type: none"> <li>1. Consult a veterinarian.</li> </ol>

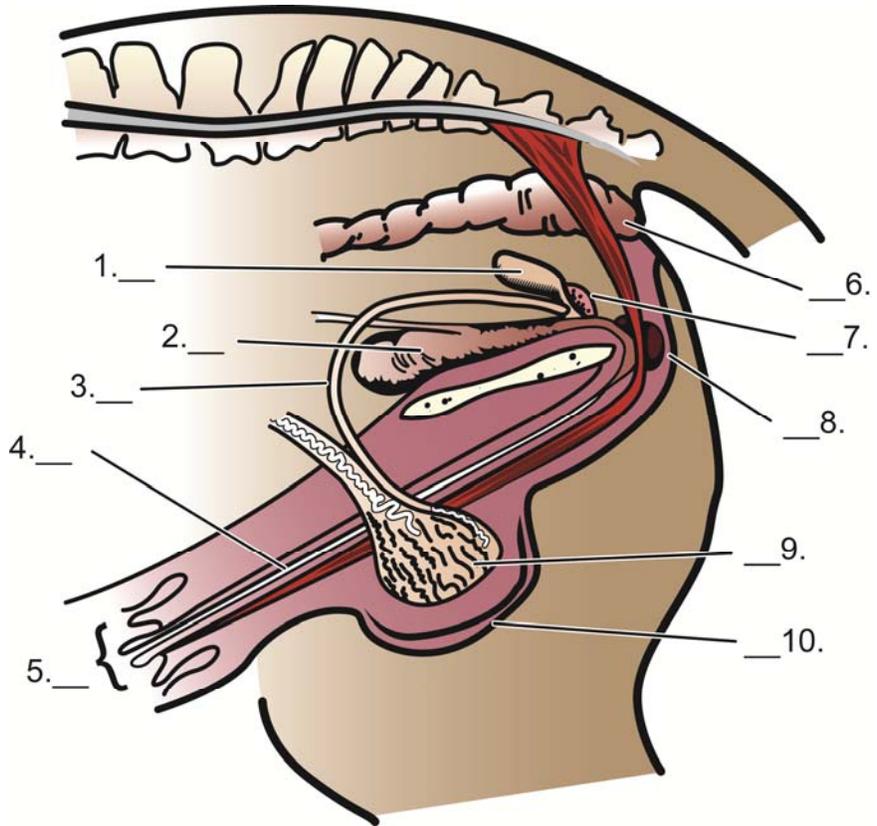
Instructor Directions	Content Outline
<p><i>rebreeding difficult or even impossible. When parturition has been completed and the afterbirth delivered, the afterbirth should be removed from the stall and inspected for possible retained placenta.</i></p>	<p>2. Do not try to pull the placenta yourself.</p> <p>Avoid foaling founder (laminitis)</p>
<p><b>Objective 8</b></p> <p><i>Ask students how colostrum differs from regular mare's milk.</i></p>	<p><b>Identify colostrum and why is it important.</b></p> <ol style="list-style-type: none"> <li>1. First milk lasts only 48 hours and is yellowish and thick.</li> <li>2. Colostrum is higher in protein and antibodies than regular milk.</li> </ol>
<p><b>Application</b></p> <p> AS 1 - Reproductive Part Identification</p>	<p>Answers to AS 1</p> <ol style="list-style-type: none"> <li>1. h</li> <li>2. a</li> <li>3. k</li> <li>4. j</li> <li>5. d</li> <li>6. f</li> <li>8. e</li> <li>9. c</li> <li>10. i</li> <li>11. g</li> <li>12. d</li> <li>13. a</li> <li>14. c</li> <li>15. g</li> <li>16. e</li> <li>17. h</li> <li>18. k</li> <li>19. l</li> <li>20. i</li> <li>21. b</li> <li>22. j</li> </ol> <p>Other activities</p> <ol style="list-style-type: none"> <li>1. If possible, observe an actual foaling or show a video of foaling.</li> </ol>
<p><b>Closure/Summary</b></p>	<p>Great care should be taken to assure the safety of the mare and the stallion during breeding. It is also</p>

Instructor Directions	Content Outline
	important that a clean, dry, draft-free area be provided to the mare during foaling. No other process on earth is more breathtaking and mystifying than the process of birth.
<b>Evaluation: Quiz</b>	Answers: 1. d 2. c 3. a 4. b 5. d 6. c 7. d 8. b 9. c 10. b 11. b 12. a 13. c 14. d 15. a 16. d

**Reproductive Part Identification**

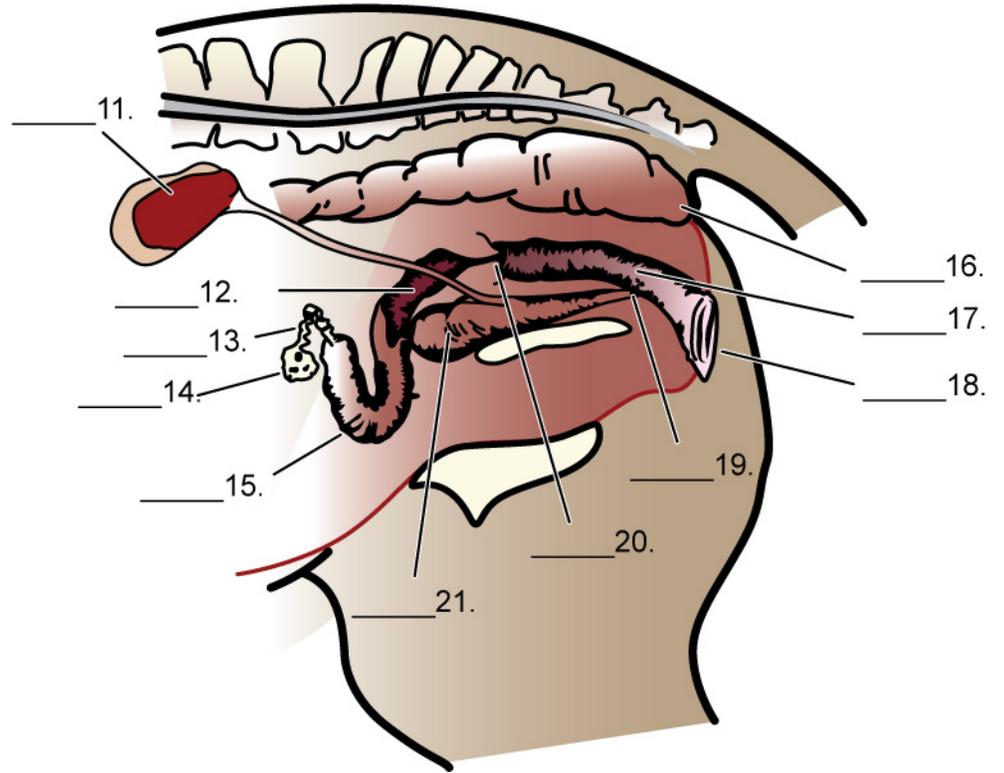
Match the male reproductive body parts on the left with the illustration.

- a. Bladder
- b. Cervix
- c. Cowper's gland
- d. Penis
- e. Prostate gland
- f. Rectum
- g. Scrotum
- h. Seminal vesicle
- i. Testicle
- j. Urethra
- k. Vas deferens



Match the female reproductive body parts below with the illustration that follows.

- a. Body of uterus
- b. Cervix
- c. Fallopian tube
- d. Kidney
- e. Left uterine horn
- f. Milk bag
- g. Ovary
- h. Rectum
- i. Urethra
- j. Urinary bladder
- k. Vagina
- l. Vulva



EVALUATION

**Circle the letter that corresponds to the best answer.**

1. What kind of gene combination causes the foal to die?
  - a. Bad
  - b. Co-dominate
  - c. Incomplete dominance
  - d. Lethal
  
2. How many pairs of chromosomes does the horse have?
  - a. 23
  - b. 28
  - c. 32
  - d. 64
  
3. What do the mare's ovaries produce?
  - a. Ova
  - b. Semen
  - c. Sperm
  - d. Placenta
  
4. The cervix is a strong muscle that performs what function?
  - a. Controls egg production
  - b. Keeps foreign matter out of the uterus
  - c. Serves as the birth canal
  - d. Transports ova to the uterus
  
5. After the ova are expelled from the ovary, what do they travel through?
  - a. Cervix
  - b. Uterus
  - c. Vagina
  - d. Fallopian tube
  
6. What do the stallion's testicles produce?
  - a. Fluids
  - b. Eggs
  - c. Sperm cells
  - d. None of the above

7. The sperm is mixed with fluid from where?
  - a. Seminal vesicles
  - b. Prostate gland
  - c. Cowper's gland
  - d. All of the above
  
8. What is the most commonly used method of breeding?
  - a. Artificial insemination
  - b. Hand breeding
  - c. Natural breeding
  - d. None of the above
  
9. What are the three steps in using AI?
  - a. Collection, evaluation, and parturition
  - b. Insemination, evaluation, and parturition
  - c. Collection, evaluation, and insemination
  - d. Collection, parturition, and evaluation
  
10. What process is parturition?
  - a. Artificial insemination
  - b. Giving birth
  - c. Servicing the mare
  - d. Natural breeding
  
11. How soon after the foal's birth is the afterbirth usually expelled?
  - a. 1-2 hours
  - b. 2-3 hours
  - c. 3-4 hours
  - d. 4-5 hours
  
12. What color is colostrum?
  - a. Yellowish
  - b. Bluish
  - c. Reddish
  - d. Greenish
  
13. As compared to regular milk, which is true about colostrum?
  - a. Produced after regular milk
  - b. Lower in protein
  - c. Higher in antibodies
  - d. Not as important

14. What is dystocia?

- a. The process of giving birth
- b. The first milk let-down
- c. The results of lethal genes
- d. When a mare has difficulty giving birth

15. Which is **not** a cause of dystocia?

- a. Improper grooming
- b. Improper diet
- c. High birth weights
- d. Multiple births

16. What can a retained placenta cause?

- a. Mottled coat
- b. Nasal infection
- c. Multiple births
- d. Laminitis

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Herd Health
<b>Estimated Time</b>	50 minutes

### Student Outcome

The student will understand what is involved in a herd health program and why it is important.

### Learning Objectives

1. Explain the importance of developing a herd vaccination program.
2. Identify common diseases that horses are vaccinated for.
3. Identify common ailments, their treatment, and prevention.
4. Discuss the importance of proper dental care.
5. Discuss the importance of parasite control.
6. List the basic steps in first aid to use with a horse.

### Grade Level Expectations

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. PowerPoint Slide
  - PPt 1 - Internal Parasites (Roundworms)
2. Activity Sheet
  - AS 1 - Microscope Use
3. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
4. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplies & Equipment

- Compound microscope and supplies (see the list on AS 1)

#### Supplemental Information

1. Internet Sites
  - Basic First Aid for Horses. InfoHorse.com. Accessed June 14, 2007, from <http://www.infohorse.com/html/equinefirstaid.asp>.
  - Horse Diseases. Horse-Diseases.com. Accessed June 14, 2007, from <http://www.horse-diseases.com/>.
  - Kunz, J. *Always Look a Gift Horse in the Mouth*. Animal Forum.com. Accessed June 14, 2007, from <http://www.animalforum.com/hdentalhealth.htm>.
  - MacAllister, C. *Equine Vaccination Programs*. Oklahoma Cooperative Extension Service. Accessed June 14, 2007, from <http://osuextra.okstate.edu/pdfs/F-9119web.pdf>.

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- ❑ Sample Vaccination Programs. Horse Health USA, Accessed June 14, 2007, from <http://www.horsehealthusa.com/cgi-local/SoftCart.exe/vaccines/vacchart.html?E+scstore>.
  - ❑ Sojka, Janice. *Parasite Control in Horses*. Purdue University. Accessed June 14, 2007, from <http://ag.ansc.purdue.edu/nielsen/www495/notes/Unit7bParasites.html>.

2. Print

- ❑ Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.
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## Interest Approach

Provide several pictures of horses suffering from various illnesses. Ask students for any personal experiences with their own animals and illnesses they have encountered.

## Communicate the Learning Objectives

1. Explain the importance of developing a herd vaccination program.
2. Identify common diseases that horses are vaccinated for.
3. Identify common ailments, their treatment, and prevention.
4. Discuss the importance of proper dental care.
5. Discuss the importance of parasite control.
6. List the basic steps in first aid to use with a horse.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>Unlike the earlier part of this century, many diseases are preventable today by using vaccines. There is no reason for a horse to suffer a disease such as tetanus when a simple vaccination can prevent it.</i></p>	<p><b>Explain the importance of developing a herd vaccination program.</b></p> <ol style="list-style-type: none"><li>1. Economics involved</li><li>2. Types of vaccines</li><li>3. Providing maximum protection against diseases</li></ol>
<p><b>Objective 2</b></p> <p><i>There are several types of vaccines used today, and each has its own effectiveness. A veterinarian who is knowledgeable in equine medicine can recommend preventive measures for common diseases in the area.</i></p>	<p><b>Identify common diseases that horses are vaccinated for.</b></p> <ol style="list-style-type: none"><li>1. Influenza</li><li>2. Sleeping sickness (EEE, WEE, and/or VEE)</li><li>3. Tetanus (lockjaw)</li><li>4. Viral rhinopneumonitis (Rhino)</li><li>5. Strangles (distemper)</li><li>6. Rabies (where recommended)</li><li>7. Potomac Horse Fever – symptoms of fever, depression, loss of appetite, colic, edema (swelling) of the underline (belly), diarrhea.</li></ol>
<p><b>Objective 3</b></p> <p><i>There are many ailments that a horse can contract.</i></p>	<p><b>Identify common ailments, their treatment, and prevention.</b></p> <ol style="list-style-type: none"><li>1. Colic – symptoms include pawing at the ground, looking nervously at the flanks, continually lying down and getting back up, rolling, sweating, constipation, and the absence of normal intestinal sounds</li><li>2. Equine Infectious Anemia (EIA or swamp fever) – serious blood disease</li></ol>

Instructor Directions	Content Outline
	3. Salmonella – symptoms resemble those of colic
<p><b>Objective 4</b></p> <p><i>Providing regular dental care is important. As a horse's teeth wear, sharp edges can form, causing cuts or sores in the mouth that interfere with mastication. Have students review the section in Lesson 3 that deals with teeth.</i></p>	<p><b>Discuss the importance of proper dental care.</b></p> <p>Aging process changes</p> <ol style="list-style-type: none"> <li>1. Floating teeth (filing off sharp edges)</li> <li>2. Normal wear vs. problems</li> </ol> <p>Weight and conditioning maintenance</p>
<p><b>Objective 5</b></p> <p><i>Parasites are a constant problem for any animal. Treatment or prevention must be taken to protect the animal from contracting a serious illness from parasites. Use Ppt 1 to show the infestation of an intestine by roundworms, or show photos from other resources of an infected horse. Have students complete AS 1.</i></p> <p><input type="checkbox"/> Ppt 1 - Internal Parasites (Roundworms)</p> <p><input type="checkbox"/> AS 1 - Microscope Use</p>	<p><b>Discuss the importance of parasite control.</b></p> <ol style="list-style-type: none"> <li>1. Control internal parasites by deworming and keeping environment clean.</li> <li>2. Control external parasites by keeping environment clean and using insecticide.</li> </ol>
<p><b>Objective 6</b></p> <p><i>First aid is the quick, immediate, and temporary assistance given to a sick or injured animal. Remember that professional assistance should be sought as soon as possible, and that even a relatively minor incident can lead to deadly complications. When unsure about an injury's seriousness, contact a veterinarian.</i></p>	<p><b>List the basic steps in first aid to use with a horse.</b></p> <ol style="list-style-type: none"> <li>1. Medical equipment (first aid kit)</li> <li>2. Bleeding – controlled by first applying gauze and pressure to the wound</li> <li>3. Foot punctures</li> <li>4. Bites and stings</li> <li>5. Swelling, strains, and sprains</li> <li>6. Founder</li> </ol>
<p><b>Application</b></p>	<p>Answers to AS 1</p>

Instructor Directions	Content Outline
<p>AS 1 - Microscope Use</p>	<p>PART C</p> <ol style="list-style-type: none"> <li>1. It seemed to move to the left. It seemed to move in the opposite direction.</li> <li>2. It is actually moving from the bottom to the top.</li> <li>3. It may move out of the field of view because of its original position in the field of view.</li> <li>4. The magnification rate reduces the light.</li> <li>5. Low power is usually 100x magnification.</li> <li>6. High power magnifies the image anywhere from 400X to 440X, depending on the microscope being used.</li> </ol> <p>PART D</p> <ol style="list-style-type: none"> <li>1. As you change the focus of the lens, one strand will go out of focus, and another one then comes into sharp focus.</li> <li>2. The greater the depth of field, the more of the specimen that will be in focus. As the resolution of the lens changes, the depth of focus also change.</li> <li>3. As the objective is switched to high power, the focusing ability is greatly narrowed. The depth of field is reduced, and the focusing range is very narrow and hard to focus.</li> </ol> <p>Other activities</p> <ol style="list-style-type: none"> <li>1. Visit an equine hospital.</li> <li>2. Invite a veterinarian to visit the class.</li> <li>3. If possible, obtain samples of various preserved parasites.</li> <li>4. Develop a herd health program.</li> <li>5. Create basic first aid kits to distribute to horse owners.</li> </ol>
<p>Closure/Summary</p>	<p>Whether a person has two horses or 20, managing their health is extremely important. Knowing what is normal for each animal is vital to early diagnosis and treatment of any illness or injury.</p>
<p>Evaluation: Quiz</p>	<p>Answers:</p> <ol style="list-style-type: none"> <li>1. a</li> <li>2. c</li> <li>3. c</li> <li>4. b</li> </ol>

Instructor Directions	Content Outline
	5. d 6. c 7. a 8. d 9. a 10. d 11. c 12. a 13. a

## Lesson 5: Herd Health

Name \_\_\_\_\_

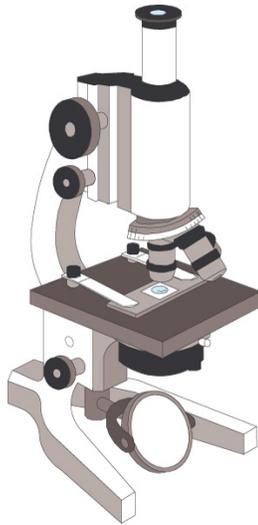
**Microscope Use**

**Objectives:** Students will identify parts of the microscope, adjust the microscope and prepare slides to study different materials that affect agriculture.

**Activity Length:** Preparation time: 20 min.  
Class time: 50 min.

**Materials and Equipment:**

Compound microscope  
Cloth or paper towel  
Medicine dropper  
Lens paper  
Scissors  
Dish soap  
Glass slide  
Coverslip  
Horse hair  
Small hoof pieces  
Small manure samples  
Rubber gloves  
Probe  
Water  
Absorbent cotton

**PART A: Microscope parts and handling****Procedure:**

1. To move the microscope, place one hand beneath the base and firmly grasp the arm of the microscope with the other hand.
2. Place the microscope on the table with the arm toward you and the stage away from you. The base should be about 8-10 cm from the table's edge.
3. As directed by the instructor, identify the parts of the microscope.

**Vocabulary Terms:**

*Arm* - supports the body tube.

*Base* - supports the microscope.

*Body tube* - maintains a set distance between the eyepiece and objective lens.

*Coarse focus* - moves the body tube up and down.

*Coverslip* - thin piece of glass or plastic that is placed over the specimen on the slide.

*Diaphragm* - regulates light from the mirror or light source.

*Eyepiece* - contains lenses for magnification.

*Fine focus* - focuses and sharpens the image.

*Mirror or light* - provides light to illuminate specimen.

*Nosepiece* - contains high- and low-power objective lenses.

*Objective (lens)* - the microscope lens nearest to the object observed; focuses light to form the image of the object.

*Resolution* - capability of a microscope to provide fine detail.

*Slide* - small glass or plastic plate used to mount objects to be examined under a microscope.

*Stage* - supports the slide being viewed.

*Stage clips* - holds the slide in place on the stage.

*Turret* - rotating wheel on which objective lenses are mounted.

*Working distance* - space between the lens and the top of the coverslip.

## PART B: Preparing wet-mount slide

### Procedure:

NOTE: Specimens observed through a microscope are placed on a glass slide. A coverslip is placed over the specimen on the slide. Water is usually placed between the slide and the coverslip.

1. Rinse a slide in soapy water. Gently wipe both sides of the slide with a clean paper towel.
2. To prevent smudges, always handle slides by the edge rather than the flat surface.
3. Place the horse hair or manure sample in the center of the slide. (Use rubber gloves when handling manure.) Use a medicine dropper to place a drop of water in the center of the slide.
4. Place the coverslip at a 45-degree angle over the drop of water and the paper. With the probe, gently lower the coverslip into position on the slide.
5. If air bubbles are present, gently tap the coverslip directly over the air bubbles with the eraser of a pencil.
6. Clip the slide to the stage with the stage clips.

## PART C: Focusing the microscope

### Procedure:

1. Using the coarse focus, raise the body tube of the microscope until the objective lens is 2-3 cm above the opening in the stage.
2. Revolve the nosepiece so the low-power objective (10X) "clicks" and locks directly in line with the body tube.
3. Adjust the diaphragm so the greatest amount of light is coming through the opening in the stage.
4. Looking from the side, use the coarse focus to lower the body tube as far as it will go without hitting the slide. **Do not force the body tube.**
5. Look through the eyepiece. Using the coarse adjustment, focus until the object comes into view.
6. Use the fine focus knob to bring the object into proper focus.
7. Sketch the object as you see it under low power.
8. Move the slide toward your right.
9. Move the slide away from the microscope arm. Recenter the slide.
10. Rotate the turret to the high-power lens and focus with the fine-focus knob.
11. Compare your observations of the object under high and low power.
12. Sketch the object under high power.

13. Compute the total magnification image by multiplying the eyepiece magnification by the magnification of the objective lens. The magnification rate of the lenses of your microscope should be imprinted on the barrel of the lens.

**Key Questions:**

1. What happened to the first object when you moved the slide to the right? \_\_\_\_\_  
\_\_\_\_\_ Away from the microscope arm?  
\_\_\_\_\_
2. If you see a living organism moving from the top to the bottom of the field of view, what do you know about the organism's direction of travel? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. How did the first object change position upon switching to high power? \_\_\_\_\_  
\_\_\_\_\_
4. Why did the field of view get dimmer as you switched to high power? \_\_\_\_\_  
\_\_\_\_\_
5. What is the total magnification of the image with the microscope on low power? \_\_\_\_\_  
\_\_\_\_\_
6. What is the total magnification of the image with the microscope on high power? \_\_\_\_\_

PART D: Resolving power and depth of focus

**Procedure:**

1. Prepare a wet mount of a small hoof scraping.
2. Observe the hoof piece with low power and then with higher power.
3. Sketch the piece as observed in the field of view with both powers.

**Key Questions:**

1. How can you decide which hoof piece overlays another? \_\_\_\_\_  
\_\_\_\_\_
2. In microscope observations, why is it important to resolve power and depth of focus problems? \_\_\_\_\_  
\_\_\_\_\_
3. How does the focusing ability change when the objective is switched from low to high power? \_\_\_\_\_  
\_\_\_\_\_

**Supplemental References:**

*Agriscience Activity Manual*. Pierre: South Dakota Curriculum Center, 1994.

Lee, J. S., and D. L. Turner. *Introduction to World AgriScience and Technology (Activity Manual)*. Danville, IL: Interstate Publishers, Inc., 1994.

Thompson, Greg. *Agricultural Science Lab Activities*. University of Missouri-Columbia: Instructional Materials Laboratory, 1994.

EVALUATION

**Circle the letter that corresponds to the best answer.**

1. What can be done to prevent horses from contracting certain diseases?
  - a. Vaccinate against them.
  - b. Don't have horses.
  - c. Put goats with the horses.
  - d. Keep mares and geldings separated.
  
2. Which are three diseases for which horses are commonly vaccinated?
  - a. Influenza, sleeping sickness, and measles
  - b. Influenza, sleeping sickness, and mumps
  - c. Sleeping sickness, tetanus, and influenza
  - d. Tetanus, mumps, and influenza
  
3. For what diseases should horses be vaccinated?
  - a. Everything that there is a vaccine for
  - b. For every disease common to the U.S.
  - c. According to veterinarian recommendations
  - d. None of the above
  
4. Which describes the process of floating a horse's teeth?
  - a. Washing them with water
  - b. Filing them
  - c. Pulling them
  - d. None of the above
  
5. What is another name for strangles?
  - a. Choking disease
  - b. Strangling disease
  - c. Breathing disease
  - d. Distemper
  
6. What does EIA (swamp fever) affect in horses?
  - a. Liver
  - b. Lung
  - c. Blood
  - d. Heart

7. Lockjaw is another name for which disease?
  - a. Tetanus
  - b. Rabies
  - c. Sleeping sickness
  - d. Influenza
  
8. What does Potomac horse fever cause?
  - a. A fever
  - b. Loss of appetite
  - c. Diarrhea
  - d. All of the above
  
9. What are the two classifications of parasites?
  - a. Internal and external
  - b. Internal and intestinal
  - c. External and extraterrestrial
  - d. None of the above
  
10. How are internal parasites controlled?
  - a. Using a dewormer
  - b. Keeping stalls clean
  - c. Dragging the fields
  - d. All of the above
  
11. Which describes first aid?
  - a. Quick and immediate aid instead of a veterinarian
  - b. Quick and immediate aid until the arrival of a veterinarian
  - c. Quick and temporary aid of an injured animal
  - d. Permanent aid of an animal
  
12. What is the first step to take when an animal is bleeding?
  - a. Stop or control the bleeding.
  - b. Call the veterinarian.
  - c. Put a bandage on.
  - d. None of the above
  
13. When should a veterinarian be called?
  - a. When unsure about an injury's seriousness
  - b. Every day
  - c. For all injuries
  - d. None of the above

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Hoof Care
<b>Estimated Time</b>	50 minutes

### Student Outcome

The student will be able to identify the various structures of the hoof, along with care of the hoof and associated health problems.

### Learning Objectives

1. Identify the structures of the hoof.
2. Examine the hoof for various conditions.
3. Discuss the proper time to trim the hoof.
4. Discuss various methods of shoeing.
5. List types of hoof abnormalities.

### Grade Level Expectations

### Resources, Supplies & Equipment, and Supplemental Information

#### References

1. PowerPoint Slides
  - PPT 1 - External Parts of the Foot (Side View)
  - PPT 2 - External Parts of the Foot (Bottom View)
  - PPT 3 - Internal Parts of the Foot
2. Assignment Sheets
  - AS 1 - External Parts of the Foot
  - AS 2 - Internal Parts of the Foot
3. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
4. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplies & Equipment

- Hoof model
- Photographs/slides of diseased hoofs

#### Supplemental Information

1. Internet Sites
  - American Farrier's Association. Accessed June 15, 2007, from <http://www.americanfarriers.org>.
  - About Hoof Care, Horse Shoeing and Farriers. Horses and Horse Information. Accessed June 18, 2007, from <http://www.horses-and-horse-information.com/horseshoes.shtml>.
  - No Hoof—No Horse. Accessed June 18, 2007, from <http://www.nohoof->

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[nohorse.com/pictures.html](http://nohorse.com/pictures.html).

❑ Natural Hoof Care. Accessed June 18, 2007, from <http://www.naturalhoofcare.net>.

2. Print

❑ Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.

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## Interest Approach

Use a hoof model with a cutaway section that shows the inner structures of the hoof. Also, display photographs of injured and diseased hoofs. Ask students if they have had any experiences with lame horses.

## Communicate the Learning Objectives

1. Identify the structures of the hoof.
2. Examine the hoof for various conditions.
3. Discuss the proper time to trim the hoof.
4. Discuss various methods of shoeing.
5. List types of hoof abnormalities.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>The hoof is a complex structure. It consists of four major bones that provide support and locomotion. These bones are the cannon, pastern, coffin, and navicular. Use PPT 1 through 3 to aid the discussion. Then have students complete AS 1 and 2.</i></p> <ul style="list-style-type: none"><li><input type="checkbox"/> PPT 1 - External Parts of the Foot (Side View)</li><li><input type="checkbox"/> PPT 2 - External Parts of the Foot (Bottom View)</li><li><input type="checkbox"/> PPT 3 - Internal Parts of the Foot</li> <li><input type="checkbox"/> AS 1 - External Parts of the Foot</li><li><input type="checkbox"/> AS 2 - Internal Parts of the Foot</li></ul>	<p><b>Identify the structures of the hoof.</b></p> <ol style="list-style-type: none"><li>1. Cannon</li><li>2. Pastern</li><li>3. Coffin</li><li>4. Navicular</li><li>5. Cornet band</li><li>6. Hoof wall</li><li>7. Frog</li><li>8. Cleft</li><li>9. Heel</li></ol>
<p><b>Objective 2</b></p> <p><i>Regular inspection of the hoof is important to the horse's health. There is an old saying: "A horse is only as good as its feet." Stress to students the importance of good care for the horse's feet.</i></p>	<p><b>Examine the hoof for various conditions.</b></p> <ol style="list-style-type: none"><li>1. Thrush</li><li>2. Chipping</li><li>3. Drying out</li><li>4. Cracks</li><li>5. Prevention</li><li>6. Maintenance</li></ol>

Instructor Directions	Content Outline
	7. Cleaning
<p><b>Objective 3</b></p> <p><i>The outer wall of the hoof grows about 3/8" per month. If the horse is kept in a barn or doesn't have adequate room to run and naturally keep hoofs worn down, they will need monthly trimming by the owner.</i></p>	<p><b>Discuss the proper time to trim the hoof.</b></p> <ol style="list-style-type: none"> <li>1. Nipping</li> <li>2. Filing</li> <li>3. Quicking</li> <li>4. Rules of thumb</li> </ol>
<p><b>Objective 4</b></p> <p><i>In the wild, horses do not need trimming or shoeing. Shoeing is the result of the domestication of the horse and its resulting uses. Proper shoeing is vital to the horse's health and should be done by a qualified farrier. Improper shoeing can lead to serious problems.</i></p>	<p><b>Discuss various methods of shoeing.</b></p> <p>NOTE: Whichever method is used, shoeing should only be done by a skilled farrier.</p> <p>Methods</p> <ol style="list-style-type: none"> <li>1. Hot shoeing involves heating a horseshoe and shaping and sizing it to the hoof's shape.</li> <li>2. Cold shoeing shapes and sizes the shoe without heating it.</li> </ol> <p>When shoeing is necessary</p> <ol style="list-style-type: none"> <li>1. When trail riding to protect the hoof from excessive wear</li> <li>2. For corrective measures, such as stance or gait defects, hoof wall cracks, stone bruises, and tendonitis</li> </ol> <p>Natural Hoof Care</p> <ol style="list-style-type: none"> <li>1. The care and use of barefooted horses</li> <li>2. A natural alternative to shoeing</li> </ol>
<p><b>Objective 5</b></p> <p><i>The hoof is the most important part of a horse's body. Abnormalities must be treated quickly, or there is the risk of permanent damage or even death.</i></p>	<p><b>List types of hoof abnormalities.</b></p> <ol style="list-style-type: none"> <li>1. Lameness - any disorder that causes the horse to have sensitive or sore hooves. Treatment depends on the exact condition.</li> <li>2. Stone bruise - a bruising of the sole that can lead to an abscess. This condition is caused by impact with a hard object, such as a stone.</li> <li>3. Founder (laminitis) - a condition that can be caused by several things, such as overfeeding of grain or lush legume or fescue, watering while the animal is hot, or</li> </ol>

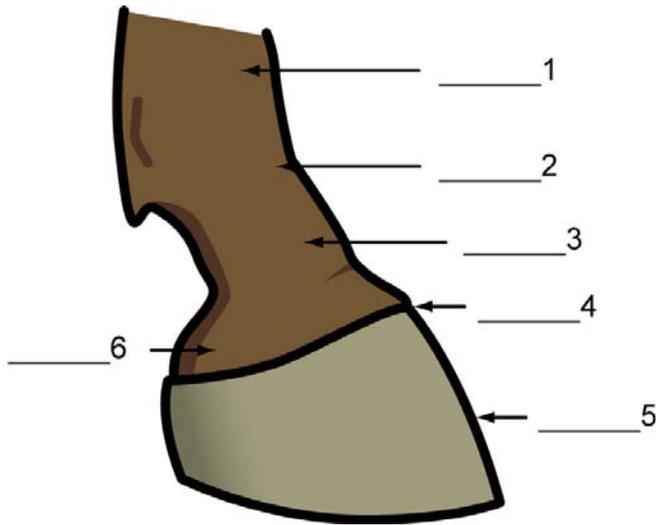
Instructor Directions	Content Outline
	<p>inflammation of the uterus after the mare has foaled. In founder, the laminae become inflamed.</p> <p>4. Naviculitis - inflammation of the navicular bone. In some cases, the bone can rotate downward. This disease's cause is difficult to determine and difficult to treat. Treatment involves special shoeing or in some cases nerve deadening by a veterinarian.</p> <p>5. Hoof cracks - vertical cracks in the outer surface of the hoof wall. This can be caused by excess drying and can be prevented by using hoof dressing.</p> <p>6. Thrush - caused by anaerobic bacteria that grows around the frog and produces a foul odor. Unsanitary stalls are usually the cause of this disease, and it can be treated easily with bleach or an over-the-counter drug. Prevention (by keeping stalls clean and dry) is the best solution.</p>
<p><b>Application:</b></p> <p> AS 1 - External Parts of the Foot</p> <p> AS 2 - Internal parts of the Foot</p>	<p>Answers to AS 1</p> <ol style="list-style-type: none"> <li>1. a</li> <li>2. d</li> <li>3. f</li> <li>4. b</li> <li>5. e</li> <li>6. g</li> <li>7. d</li> <li>8. a</li> <li>9. f</li> <li>10. e</li> <li>11. c</li> <li>12. g</li> </ol> <p>Answers to AS 2</p> <ol style="list-style-type: none"> <li>1. e</li> <li>2. d</li> <li>3. c</li> <li>4. g</li> <li>5. a</li> <li>6. f</li> <li>7. h</li> <li>8. b</li> </ol> <p>Other activities</p>

Instructor Directions	Content Outline
	<ol style="list-style-type: none"> <li>1. Have students pick out and clean a hoof.</li> <li>2. Arrange for a farrier to demonstrate shoeing.</li> <li>3. If accessible, arrange for students to visit a veterinarian clinic or hospital and evaluate horses for hoof abnormalities.</li> <li>4. Bring in samples of different horseshoes and relate how they help correct various problems.</li> <li>5. Check with a local veterinarian for a hoof from a deceased horse. This hoof can be used to show the relationship of hoof parts to each other and effects of naviculitis or laminitis.</li> <li>6. Research Natural Hoof Care as an alternative method to correct hoof problems.</li> </ol>
<b>Closure/Summary</b>	<p>The hoof is an important structure that makes or breaks a horse. Regular inspections should be done; cleaning, trimming, and shoeing should be done when needed.</p>
<b>Evaluation: Quiz</b>	<p>Answers:</p> <ol style="list-style-type: none"> <li>1. b</li> <li>2. c</li> <li>3. d</li> <li>4. b</li> <li>5. a</li> <li>6. a</li> <li>7. Any two of the following: <ol style="list-style-type: none"> <li>a. Lameness - any disorder that causes the horse to have sensitive or sore hooves. Treatment depends on the exact condition.</li> <li>b. Stone bruise - a bruising of the sole that can lead to an abscess. This condition is caused by impact with a hard object, such as a stone.</li> <li>c. Founder (laminitis) - a condition that can be caused by several things, such as overfeeding of grain or lush legume, watering while the animal is hot, or inflammation of the uterus after the mare has foaled. In founder, the laminae become inflamed.</li> <li>d. Naviculitis - inflammation of the navicular bone. In some cases, the bone can rotate downward. This disease's cause is difficult to determine and difficult to treat. Treatment involves special shoeing or in some cases nerve deadening by a veterinarian.</li> </ol> </li> </ol>

Instructor Directions	Content Outline
	<ul style="list-style-type: none"> <li>e. Hoof cracks - vertical cracks in the outer surface of the hoof wall. This can be caused by excess drying and can be prevented by using hoof dressing.</li> <li>8. Cold shoeing is done with preformed shoes, while hot shoeing involves making the shoe from scratch in a forge.</li> <li>9. Thrush is a fungus cause by wet conditions. It has a distinguishable odor and can be prevented by keeping stalls clean and dry. Treatments include a mild chlorine bleach solution.</li> <li>10. d</li> <li>11. a</li> <li>12. f</li> <li>13. e</li> <li>14. g</li> <li>15. c</li> </ul>

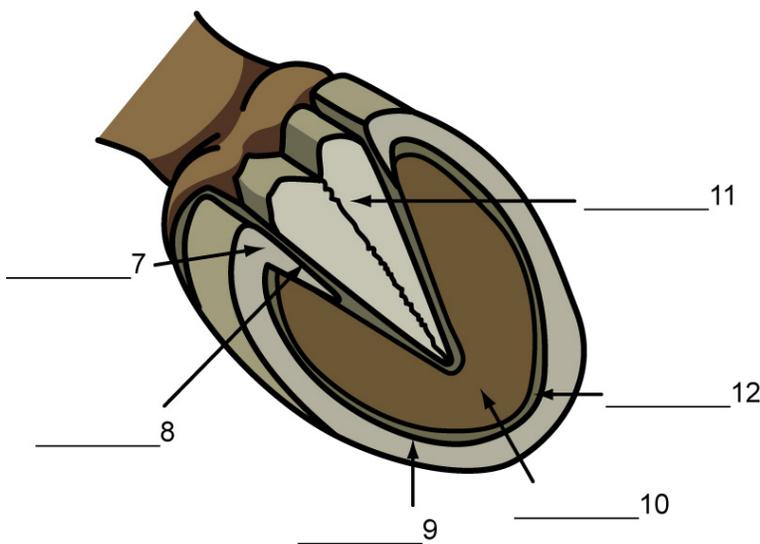
**External Parts of the Foot**

Match the foot parts on the right with the illustration on the left.



- a. Cannon
- b. Coronary band
- c. Deep flexor tendon
- d. Fetlock
- e. Hoof wall
- f. Pastern
- g. Perioplic ring

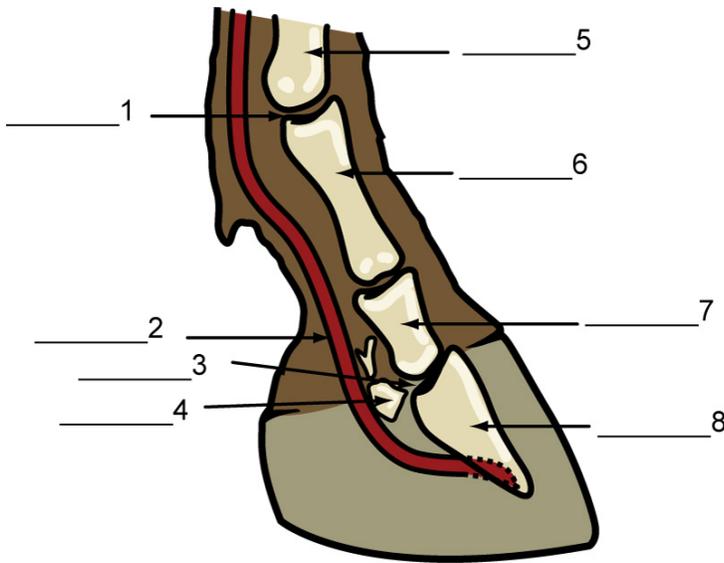
Match the foot parts on the right with the illustration on the left.



- a. Bar
- b. Coffin joint
- c. Frog
- d. Heel
- e. Sole
- f. Wall
- g. White line (lamina)

### Internal Parts of the Foot

Match the foot parts on the right with the illustration on the left.



- a. Cannon bone
- b. Coffin bone
- c. Coffin joint
- d. Deep flexor tendon
- e. Fetlock joint
- f. Long pastern
- g. Navicular bone
- h. Short pastern
- i. White line (lamina)

EVALUATION

**Circle the letter that corresponds to the best answer.**

1. What should be looked for when inspecting a horse's hoof?
  - a. Worms
  - b. Chipping
  - c. Signs of weight gain
  - d. Poor coat
  
2. What is a major cause of thrush?
  - a. Poor diet
  - b. Bad hay
  - c. Wet stall
  - d. Excess weight
  
3. How often should horses have their hoofs trimmed?
  - a. Twice a year
  - b. Once a year
  - c. Twice a month
  - d. Once a month
  
4. About how much does a horse's hoof grow?
  - a. 1/8" per month
  - b. 3/8" per month
  - c. 1" per month
  - d. 3" per year
  
5. Why should shoeing be done?
  - a. Protect the hoof from excessive wear
  - b. Add flair while showing
  - c. Add sound when horses walk
  - d. Increase their height
  
6. Why should corrective shoeing be done?
  - a. Correct defects
  - b. Prevent founder
  - c. Stop thrush
  - d. For pastured horses

**Complete the following short answer questions.**

7. Other than thrush, list two hoof abnormalities. Describe symptoms and causes of each.

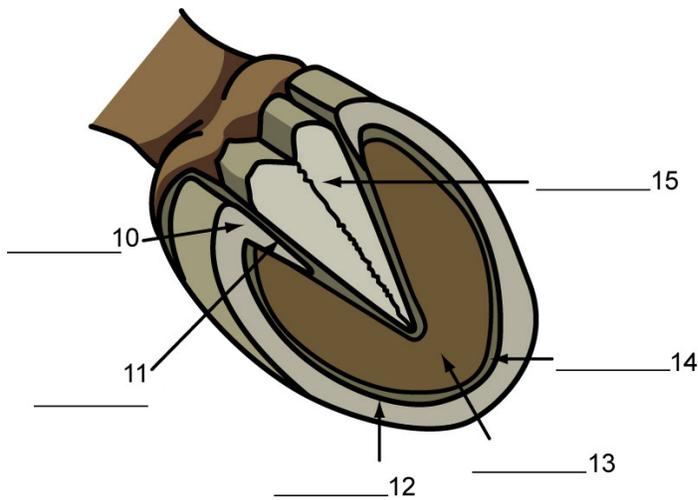
a.

b.

8. What is the main difference between hot shoeing and cold shoeing?

9. Give a complete description of thrush, what causes it, and how it is prevented.

**Match the hoof parts on the right with the illustration on the left.**



- a. Bar
- b. Cannon bone
- c. Frog
- d. Heel
- e. Sole
- f. Wall
- g. White line (lamina)

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Nutrition
<b>Estimated Time</b>	50 minutes

### Student Outcome

The student will understand parts of the horse's digestive tract and what the different nutritional requirements are for different horses.

### Learning Objectives

1. Describe the anatomy and function of the simple digestive tract.
2. Identify causes of colic.
3. Discuss how the nutritional needs for foals, yearlings, two-year-olds, breeding stock, and mature horses is determined.
4. Discuss the factors that affect digestion.
5. Discuss the importance of water.
6. Identify different feed types.
7. Determine when to feed and what types of feed to use.
8. Identify nutrition-related problems.

### Grade Level Expectations

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publications
  - a. G2807: Feeding Horses
3. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplies & Equipment

- Variety of horse feed samples that could include oats, pasture grass, alfalfa, pelleted horse feed, sweet feed, and horse supplements.

#### Supplemental Information

1. Internet Sites
  - Feeding and Nutrition. All About Horses. Accessed June 25, 2007, from <http://www.allabouthorses.com/site/health/feeding.html>.
  - Horse Nutrition 101. Accessed June 26, 2007, from <http://home.att.net/~horsenutrition101>.
  - Loch, W. *Feeding Horses*. University of Missouri Extension Publication agricultural publications, G2807. Accessed June 25, 2007, from <http://extension.missouri.edu/xplor/agguides/ansci/g02807.htm>.
  - Basic Horse Nutrition*. University of Kentucky Cooperative Extension Service.

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Accessed June 26, 2007, from

<http://www.uky.edu/Ag/AnimalSciences/pubs/asc114.pdf>.

- ❑ Ralston, S. L. *Diagnosis of Nutritional Problems in Horses*. Rutgers Cooperative Extension. Accessed June 26, 2007, from

<http://www.anslab.iastate.edu/Class/AnS415/Nutproblems.pdf>.

- ❑ *Drought Related Nutrition Problems Threaten Midwest Horses*. Research at MU. University of Missouri. Accessed June 26, 2007, from

[http://research.missouri.edu/news/stories/070614\\_horses.htm](http://research.missouri.edu/news/stories/070614_horses.htm).

2. Print

- ❑ Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.

## Interest Approach

Obtain a variety of feed samples (oats, pasture grass, alfalfa, pelleted horse feed, sweet feed, and supplements). Have the students compare the feeds by texture, smell, and appearance.

## Communicate the Learning Objectives

1. Describe the anatomy and function of the simple digestive tract.
2. Identify causes of colic.
3. Discuss how the nutritional needs for foals, yearlings, two-year-olds, breeding stock, and mature horses is determined.
4. Discuss the factors that affect digestion.
5. Discuss the importance of water.
6. Identify different feed types.
7. Determine when to feed and what types of feed to use.
8. Identify nutrition-related problems.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>The digestive tract includes everything from the mouth to the rectum. Understanding how the horse's digestion takes place is an important part of being able to feed it properly.</i></p>	<p><b>Describe the anatomy and function of the simple digestive tract.</b></p> <p>Differences between horses and other livestock</p> <ol style="list-style-type: none"><li>1. The capacity of the horse's stomach is 8-16 quarts, as compared to the cow's (about 200 quarts) and the pig's (about 6-8 quarts).</li><li>2. A cow has a four-chambered stomach, while the horse and hog have only one.</li><li>3. Therefore, the horse's digestive tract more closely resembles the pig's.</li><li>4. Horses have a larger cecum than cattle or hogs.</li></ol> <p>Where digestion takes place</p> <ol style="list-style-type: none"><li>1. Mouth (mastication)</li><li>2. Stomach</li><li>3. Small intestine</li><li>4. Cecum (water gut) – fermentation</li><li>5. Large intestine</li><li>6. Enzymes from liver and pancreas</li></ol>
<p><b>Objective 2</b></p> <p><i>Colic is the number one killer of horses. While some horses can be saved with surgery, others are lost. Great horses like the Kentucky Derby winner Unbridled and the Appaloosa</i></p>	<p><b>Identify causes of colic.</b></p> <ol style="list-style-type: none"><li>1. Overfeeding</li><li>2. Ingestion of sand</li><li>3. Parasites or worms</li><li>4. Irregular feeding schedule</li><li>5. Sudden changes in feed</li></ol>

Instructor Directions	Content Outline
<p><i>champion Apache were lost to colic. It can affect young winning show horses to old family pets. Colic can happen even in the best and cleanest barns, so it is important for all horse owners to understand the causes of colic and take steps to prevent it.</i></p>	<ol style="list-style-type: none"> <li>6. Moldy or rotten feed</li> <li>7. Twisted intestines</li> </ol>
<p><b>Objective 3</b></p> <p><i>Nutritional requirements differ from horse to horse. A foal requires different amounts of nutrients than does a yearling, two-year-old, or a mature animal. It also makes a difference whether or not animals are breeding, pregnant, working, or just out to pasture.</i></p>	<p><b>Discuss how the nutritional needs for foals, yearlings, two-year-olds, breeding stock, and mature horses is determined.</b></p> <ol style="list-style-type: none"> <li>1. By the horse's size and age</li> <li>2. By work load and breeding status</li> <li>3. By stress level and quality of feed</li> <li>4. By weather conditions</li> </ol>
<p><b>Objective 4</b></p> <p><i>The horse's digestive system, unlike the cow's, is designed to take in small amounts of feed at a nearly constant rate. The horse's stomach empties completely in about 24 hours, while a cow's takes about three times as long.</i></p>	<p><b>Discuss the factors that affect digestion.</b></p> <ol style="list-style-type: none"> <li>1. Stress</li> <li>2. Feed quality</li> <li>3. Efficiency of digestion (30 percent)</li> </ol>
<p><b>Objective 5</b></p> <p><i>Of all the nutrients required by the horse, water is probably the most important and least expensive one. Horses consume 10-12 gallons of water per day, depending on the temperature and how active they have been. Water intake should be limited before and after heavy exercise.</i></p>	<p><b>Discuss the importance of water.</b></p> <p>Functions throughout the body</p> <p>Water supply requirements</p> <ol style="list-style-type: none"> <li>1. Cleanliness</li> <li>2. Freshness</li> <li>3. Free choice availability</li> </ol>
<p><b>Objective 6</b></p> <p><i>There are two main types of feeds:</i></p>	<p><b>Identify different feed types.</b></p> <ol style="list-style-type: none"> <li>1. Grains</li> </ol>

Instructor Directions	Content Outline
<p><i>grains and hay (roughage). Oats and corn are the most commonly fed grains. In hay, a horse needs only about 1 percent of its body weight daily.</i></p>	<ol style="list-style-type: none"> <li>2. Hay (roughage)</li> <li>3. Supplements</li> <li>4. Minerals</li> <li>5. Vitamins</li> </ol>
<p><b>Objective 7</b></p> <p><i>Today, more and more feeds are premixed to save the customer's time. This means, however, that the horse is getting the nutrients the manufacturer produces, instead of what it really needs.</i></p>	<p><b>Determine when to feed and what types of feed to use.</b></p> <p>Availability</p> <p>Cost of feed stuff</p> <p>Requirements and needs of the animal</p> <ol style="list-style-type: none"> <li>1. Age</li> <li>2. Health conditions</li> </ol>
<p><b>Objective 8</b></p> <p><i>In the wild, the horse ate many small meals instead of one or two meals a day, as owners prefer to feed. The wild horse had few nutrition-related difficulties, while domesticated horses are prone to many digestion problems. Colic and founder are the most common digestion difficulties but are easily prevented.</i></p>	<p><b>Identify nutrition-related problems.</b></p> <ol style="list-style-type: none"> <li>1. Laminitis (founder)</li> <li>2. Colic</li> <li>3. Epiphysis</li> <li>4. Vitamin deficiency (such as rickets)</li> <li>5. Toxic plants</li> <li>6. Blister beetles in alfalfa hay</li> <li>7. Tying up</li> </ol>
<p><b>Application</b></p>	<p>Other activities</p> <ol style="list-style-type: none"> <li>1. Use feed samples from the interest approach and quiz students.</li> <li>2. Obtain feed tags from several types of equine feed and discuss the ingredients and uses for each.</li> <li>3. Obtain models or digestive tracts of a horse and cow. Compare the structures.</li> <li>4. Have students do research and report on current issues in equine nutrition or nutrition-related problems.</li> </ol>
<p><b>Closure/Summary</b></p>	<p>In the wild, the horse was able to take care of all its needs and usually had few problems. The domesticated horse depends on people to provide all its nutritional needs. It is the responsibility of the owner to make sure the horse has the proper nutrition at all times.</p>

Instructor Directions	Content Outline
Evaluation: Quiz	Answers: 1. c 2. b 3. a 4. d 5. d 6. c 7. a 8. c 9. c 10. c 11. a 12. a 13. b 14. a 15. d

EVALUATION

**Circle the letter that corresponds to the best answer.**

1. Where does fermentation take place?
  - a. Stomach
  - b. Liver
  - c. Cecum
  - d. Large intestine
  
2. Approximately how much does a horse's stomach hold?
  - a. 5-10 quarts
  - b. 8-16 quarts
  - c. 55 quarts
  - d. 5 gallons
  
3. What does colic mean?
  - a. Abdominal discomfort
  - b. Tooth decay
  - c. Founder
  - d. None of the above
  
4. How often do horses naturally eat?
  - a. 2 times a day
  - b. 3 times a day
  - c. 4 times a day
  - d. Almost continually
  
5. How are nutritional requirements determined?
  - a. By the horse's size and age
  - b. By work load and breeding status
  - c. By stress level and quality of feed
  - d. All the above
  
6. How much time does the horse's stomach take to empty?
  - a. 6 hours
  - b. 12 hours
  - c. 24 hours
  - d. 72 hours

7. How much of its food can a horse break down?
  - a. 30 percent
  - b. 40 percent
  - c. 50 percent
  - d. 70 percent
  
8. What is the cheapest and most important nutrient?
  - a. Grains
  - b. Hay
  - c. Water
  - d. Minerals
  
9. The horse will drink as many as \_\_\_\_ gallons per day.
  - a. 5
  - b. 8
  - c. 12
  - d. 20
  
10. After a horse has been working hard and is hot, what should be done?
  - a. Let it drink as much as it wants.
  - b. Don't let it drink at all.
  - c. Let it have only small amounts of water.
  - d. None of the above
  
11. What are the two most common feeds for horses?
  - a. Oats and corn
  - b. Oats and rice
  - c. Corn and rice
  - d. Oats and milo
  
12. How much hay should a horse be fed per day?
  - a. 1 percent of its body weight
  - b. 5 percent of its body weight
  - c. 10 percent of its body weight
  - d. 50 percent of its body weight
  
13. What are the two most common diseases related to nutrition?
  - a. Epiphysis and worms
  - b. Colic and founder
  - c. Colic and worms
  - d. Founder and worms

14. What two nutrition-related problems are easy to avoid?

- a. Colic and founder
- b. Colic and worms
- c. Founder and worms
- d. Epiphysis and colic

15. Which is unimportant when determining which feeds are used?

- a. Availability
- b. Cost of feed stuff
- c. Health conditions
- d. Brand name

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Equipment and Facilities
<b>Estimated Time</b>	50 minutes

### Student Outcome

The student will become familiar with various types of equipment, facilities, and their proper care and use.

### Learning Objectives

1. Identify various types of tack and their uses.
2. Discuss how to properly fit and adjust tack.
3. Identify different bits and their uses.
4. Identify different types of reins.
5. Identify other essential equine equipment and their uses.
6. Discuss the cost of equipment and facilities.

### Grade Level Expectations

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. Assignment Sheet
  -  AS 1 - Identifying Tack Parts
2. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
3. University of Missouri-Columbia Extension Division agricultural publication
  - a. G2844: Haltering and Tying Horses
  - b. G2845: Choosing, Assembling and Using Bridles
4. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.
5. Ensminger, M. E. *Horses and Horsemanship*. 6th ed. Danville, IL: Interstate Publishers, Inc., 1990.

#### Supplies & Equipment

- Various pieces of tack including bits, reins, halter, saddle, blanket, spurs, bridles

#### Supplemental Information

1. Internet Sites
  - Loch, W. *Choosing, Assembling and Using Bridles*. University of Missouri-Columbia Extension Division agricultural publication, G2845. Accessed June 29, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02845.htm>.
  - Loch, W. *Haltering and Tying Horses*. University of Missouri-Columbia Extension Division agricultural publication, G2844. Accessed June 29, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02844.htm>.

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2. Print

- ❑ Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.
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## Interest Approach

Have several pieces of tack on display. Ask students if they know the use of each piece.

## Communicate the Learning Objectives

1. Identify various types of tack and their uses.
2. Discuss how to properly fit and adjust tack.
3. Identify different bits and their uses.
4. Identify different types of reins.
5. Identify other essential equine equipment and their uses.
6. Discuss the cost of equipment and facilities.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>Western riding has its history in the days of the cowboy riding the range for ranch work. English riding has developed from pleasure and sport riding. The type of tack to use depends on what the owner wants the horse to do. Point out any unusual features or characteristics of the various types of tack. Provide opportunity for students to examine the pieces on display. Discuss various styles of tack on the market and their price differences. Have students complete AS 1.</i></p> <p> AS 1 - Identifying Tack Parts</p>	<p><b>Identify various types of tack and their uses.</b></p> <p>Styles</p> <ol style="list-style-type: none"><li>1. Western (show use vs. work)</li><li>2. English (show use vs. work)</li></ol> <p>Halters and bridles</p> <ol style="list-style-type: none"><li>1. Communicate cues to the horse</li><li>2. No bit on a halter</li></ol> <p>Saddles</p> <ol style="list-style-type: none"><li>1. The Western saddle has a high pommel and cantle.</li><li>2. English saddles look almost flat.</li></ol> <p>Saddle pads</p> <p>Blankets</p> <p>Splints</p> <p>Spurs</p>
<p><b>Objective 2</b></p> <p><i>Tack must be properly fitted to both horse and rider. Improperly fitted equipment can be hazardous and cause injuries to the rider and/or horse. Select different pieces of tack, and demonstrate the adjustments. Have students practice with the tack so they can become familiar with it. Discuss</i></p>	<p><b>Discuss how to properly fit and adjust tack.</b></p> <p>Animal size</p> <ol style="list-style-type: none"><li>1. Girth - Girth straps should be tightened firmly.</li><li>2. Height of withers - The saddle's gullet should be above the horse's withers without rubbing them.</li><li>3. Throat latch strap - Should be loose enough to allow two or three fingers between it and the horse's jaw</li><li>4. Overall size - Pony, horse, draft (frequently not interchangeable)</li></ol>

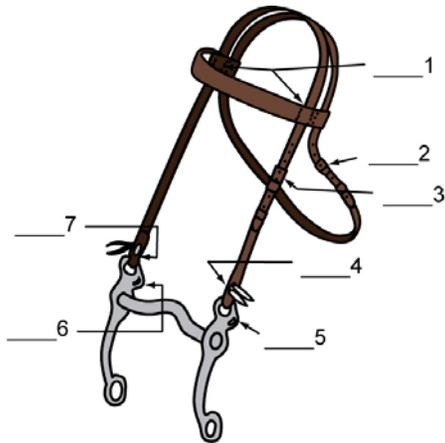
Instructor Directions	Content Outline
<p><i>the costs involved in purchasing tack and why it should be purchased.</i></p>	<p>Style of equipment</p>
<p><b>Objective 3</b></p> <p><i>Bits are the mechanical means from which cues are communicated to the horse from the rider. Ask students to explain the parts of different bits and how they work.</i></p>	<p><b>Identify different bits and their uses.</b></p> <p>Work by acting on pressure points on the horse's head</p> <p>The smaller the diameter, the harsher the bit</p> <p>Types</p> <ol style="list-style-type: none"> <li>1. Snaffle</li> <li>2. Curb</li> <li>3. Pelham</li> <li>4. Rearing</li> <li>5. Hackamore</li> <li>6. Bosal</li> </ol>
<p><b>Objective 4</b></p> <p><i>Reins are the connection between the bit and the rider. Discuss the different types of reins and how they work with the bit.</i></p>	<p><b>Identify different types of reins.</b></p> <ol style="list-style-type: none"> <li>1. Split reins</li> <li>2. Single reins</li> <li>3. Double reins (with certain bits)</li> <li>4. Multiple reins (for teams of horses)</li> </ol>
<p><b>Objective 5</b></p> <p><i>It is important to have proper equipment when caring for horses; every horse owner should have some basic equipment. Have students relate back to the field trip, if taken, to create a list of necessary equipment. Discuss costs and importance of these items.</i></p>	<p><b>Identify other essential equine equipment and their uses.</b></p> <p>Feeding</p> <ol style="list-style-type: none"> <li>1. In containers</li> <li>2. On the ground (not recommended because of parasites)</li> </ol> <p>Grooming</p> <p>First aid (scissors, gauze, vet wrap, rolled cotton, antiseptic, crepe bandage, vet thermometer, alcohol, iodine, a clean bucket, and twitch)</p> <p>Transportation</p>
<p><b>Objective 6</b></p> <p><i>Owning a horse is not an inexpensive venture. The type of equipment and facilities chosen will have a large impact on cost.</i></p>	<p><b>Discuss the cost of equipment and facilities.</b></p> <ol style="list-style-type: none"> <li>1. Fencing (safety)</li> <li>2. Feeding</li> <li>3. Watering</li> <li>4. Shelter</li> </ol>

Instructor Directions	Content Outline
	5. Upkeep 6. Travel vs. stationary 7. Familiarization and use of new equipment before buying it
<b>Application:</b>   AS 1 - Identifying Tack Parts	Answers to AS 1 1. a 2. h 3. d 4. b 5. c 6. g 7. f 8. k 9. d 10. h 11. j 12. b 13. i 14. c 15. e 16. g  Other activities 1. Take a field trip to a local equine supply dealer, and have students observe facilities and equipment used and available. 2. Visit a farm or ranch where horses are raised, and have students observe how the operation is set up and operated. 3. Study the various types of equipment and quiz students.
<b>Closure/Summary</b>	Equine equipment and facilities vary a great deal. It is important to understand the different types and uses of equipment, along with the costs involved in owning a horse.
<b>Evaluation: Quiz</b>	Answers: 1. b 2. c 3. a 4. d

Instructor Directions	Content Outline
	<ol style="list-style-type: none"><li>5. c</li><li>6. d</li><li>7. b</li><li>8. c</li><li>9. b</li><li>10. a</li><li>11. c</li><li>12. a</li><li>13. Answers will vary, but should indicate that the trailer soundness, the number of horses being hauled, and amount of travel done are important factors.</li><li>14. Five of the following: scissors, gauze, vet wrap, rolled cotton, antiseptic, crepe bandage, vet thermometer, alcohol, iodine, a clean bucket, and twitch</li></ol>

**Identifying Tack Parts**

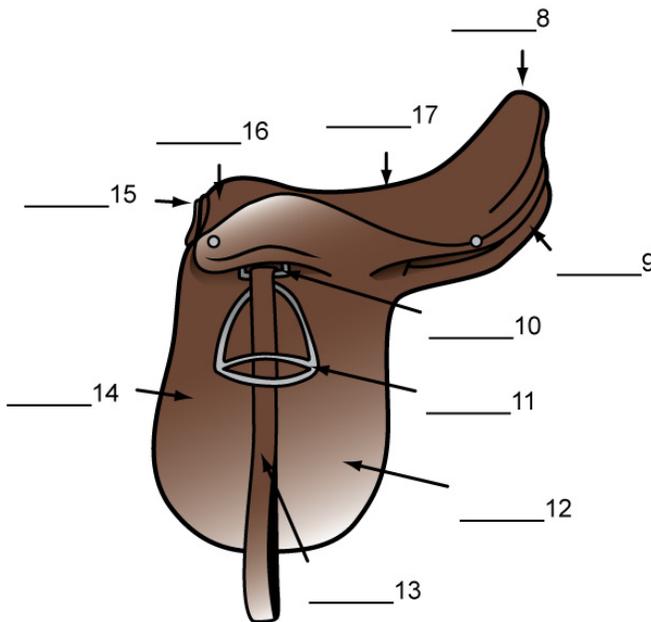
**Match the bridle parts on the right with the illustration on the left.**



- a. Browband
- b. Left curb bit attachment
- c. Left curb chain hook
- d. Left curb headstall cheekpiece
- e. Right bridoon cheekpiece
- f. Right curb bit attachment
- g. Right curb chain hook
- h. Throatlatch

**Credit:** *Choosing, Assembling, and Using Bridles (G2845)*

**Match the saddle parts on the right with the illustration on the left.**



- a. Cantle
- b. Flap
- c. Knee pad or knee roll
- d. Panel
- e. Pommel
- f. Seat
- g. Skirt
- h. Stirrup bar
- i. Stirrup leather
- j. Tread or stirrup iron

**Credit:** *Equine Management and Production* © 1994, Curriculum and Instructional Materials Center, Oklahoma Department of Vo-Tech. Used with permission.

## EVALUATION

**Circle the letter that corresponds to the best answer.**

1. Which describes the halter and bridle?
  - a. Communicate directions to the rider
  - b. Communicate cues to the horse
  - c. Have no real use
  - d. Made only of leather
  
2. What is the main difference between a bridle and halter?
  - a. Appearance only
  - b. Materials used to make them
  - c. Bridles have bits.
  - d. Halters have bits.
  
3. What are two main styles of tack?
  - a. Western and English
  - b. Western and European
  - c. European and English
  - d. English and Australian
  
4. What is the main difference between Western and English saddles?
  - a. None
  - b. In name only
  - c. Materials used to make them
  - d. High pommel and cantle (Western)
  
5. When the throat latch is adjusted properly, how much space should be between it and the horse's jaw?
  - a. One finger's space
  - b. One to two fingers' space
  - c. Two or three fingers' space
  - d. Four or five fingers' space
  
6. How should the gullet of the saddle rest?
  - a. Behind the withers
  - b. Above and resting on the withers
  - c. In front of the withers
  - d. Above the withers without rubbing them

7. On which of the horse's pressure points do bits act?
  - a. Neck
  - b. Head
  - c. Withers
  - d. Chest
  
8. Which describes a small-diameter bit?
  - a. Softer on the horse's mouth
  - b. Harder to use
  - c. Harsher on the horse's mouth
  - d. Longer lasting
  
9. How many basic types of reins are there?
  - a. One
  - b. Two
  - c. Three
  - d. Four
  
10. Which is a poor feeding place?
  - a. On the ground
  - b. In a five-gallon bucket
  - c. In a variety of containers
  - d. In commercial containers
  
11. Which is a poor watering container?
  - a. Five-gallon bucket
  - b. Commercial waterer
  - c. One-gallon bucket
  - d. Stock tank
  
12. What is most important when purchasing new equipment?
  - a. Knowing how the equipment works
  - b. Buying it as soon as it is available
  - c. Waiting a year
  - d. Renting it first

**Complete the following short answer questions.**

13. What three factors are important when considering a trailer purchase?
  - a.
  - b.
  - c.

14. List five things that a first aid kit should contain.

a.

b.

c.

d.

e.

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Handling Horses
<b>Estimated Time</b>	50 minutes

**Student Outcome**

The student will become familiar with the proper methods of handling a horse, including how to lead, lunge, mount and dismount, and safely trailer a horse.

**Learning Objectives**

1. Describe the proper methods of leading a horse.
2. Identify the purpose of lunging.
3. Discuss the methods of safe mounting and dismounting.
4. Identify the different types of equitation.
5. Discuss restraints and their use.
6. Describe the proper method of haltering.
7. Describe why and how a horse is groomed.
8. Explain safe procedures when putting a horse in a trailer.
9. Discuss any local, state, and federal regulations involving horses.

**Grade Level Expectations**

**Resources, Supplies & Equipment, and Supplemental Information**

**Resources**

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. University of Missouri-Columbia Extension Division agricultural publications
  - a. G2881: Saddling, Bridling and Riding the Western Horse
  - b. G2844: Haltering and Tying Horses
3. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

**Supplies & Equipment**

- Lead rope, halter, twitch, English and Western saddles

**Supplemental Information**

1. Internet Sites
  - KBR/ Trail Blazer/ LRTC (outdoor safety and survival section). KBR Horse Net. Accessed July 3, 2007, from <http://www.whmentors.org/saf/safety.html>.
  - Loch, W. *Haltering and Tying Horses*. University of Missouri-Columbia Extension Division agricultural publication, G2844. Accessed June 29, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02844.htm>.
  - Loch, W. and B. Ballenger. *Saddling, Bridling, and Riding the Western Horse*. University of Missouri Extension Division agricultural publication, G2881. Accessed

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July 3, 2007, from

<http://extension.missouri.edu/explore/agguides/ansci/g02881.htm>.

2. Print

- ❑ Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.
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## Interest Approach

Invite a local saddle club representative, breed association representative, or other local equine expert to discuss horse handling with the class.

1. Describe the proper methods of leading a horse.
2. Identify the purpose of lunging.
3. Discuss the methods of safe mounting and dismounting.
4. Identify the different types of equitation.
5. Discuss restraints and their use.
6. Describe the proper method of haltering.
7. Describe why and how a horse is groomed.
8. Explain safe procedures when putting a horse in a trailer.
9. Discuss any local, state, and federal regulations involving horses.

Instructor Directions	Content Outline
<b>Objective 1</b>  <i>Properly leading a horse is an important safety issue. If the handler does not lead the horse in a safe and secure manner, injuries can result to the handler and/or the horse.</i>	<b>Describe the proper methods of leading a horse.</b>  <ol style="list-style-type: none"><li>1. Walking to the horse's left</li><li>2. Lead ropes</li><li>3. Length of rope</li><li>4. Holding the rope (in right hand with excess coiled in left hand)</li><li>5. Tying a lead rope</li></ol>
<b>Objective 2</b>  <i>Lunging is a method of training and exercise for both the unbroken horse and the trained horse. It provides exercise to help in muscle development, as well as providing an excellent training method.</i>	<b>Identify the purpose of lunging.</b>  <ol style="list-style-type: none"><li>1. Space required</li><li>2. Reasons for lunging a horse</li><li>3. Working the horse in both directions</li></ol>
<b>Objective 3</b>  <i>Mounting and dismounting a horse is simple, but it is important to do it in a safe manner. Make sure the equipment is in good condition. A worn girth or stirrup can break and cause injury to the rider and/or horse.</i>	<b>Discuss the methods of safe mounting and dismounting.</b>  <ol style="list-style-type: none"><li>1. Checking equipment first</li><li>2. Mounting on the left side</li><li>3. Dismounting by reversing mounting procedure</li></ol>
<b>Objective 4</b>	<b>Identify the different types of equitation.</b>

Instructor Directions	Content Outline
<p><i>The wonderful thing about equitation (process of riding) is that there are different styles, such as Western and English.</i></p>	<ol style="list-style-type: none"> <li>1. Western</li> <li>2. English</li> </ol>
<p><b>Objective 5</b></p> <p><i>Sometimes it becomes necessary to restrain the horse in order to provide some sort of treatment. This is accomplished in different ways, depending on the reason for the restraint and on how well the horse responds to restraints.</i></p>	<p><b>Discuss restraints and their use.</b></p> <ol style="list-style-type: none"> <li>1. Using a halter and lead rope</li> <li>2. Gripping the neck</li> <li>3. Twisting an ear</li> <li>4. Twitch (device attached to upper lip)</li> <li>5. Sideline</li> <li>6. Hobbles</li> </ol>
<p><b>Objective 6</b></p> <p><i>Always approach a horse from the side or at an angle. Never approach it straight on or from the rear because it can't see well in those areas. Use equipment that is in good shape and fits properly. Approach with caution, and in general, make the horse aware of your approach.</i></p>	<p><b>Describe the proper method of haltering.</b></p> <ol style="list-style-type: none"> <li>1. Confidence</li> <li>2. Proper angle</li> <li>3. Proper equipment</li> <li>4. Halters in the pasture</li> </ol>
<p><b>Objective 7</b></p> <p><i>Part of properly caring for and handling a horse is grooming. The frequency of grooming depends on the how often the horse is ridden, the environment, and whether or not the horse is stabled. Grooming helps maintain the horse's health, keeps parasites controlled, and helps teach the horse manners.</i></p>	<p><b>Describe why and how a horse is groomed.</b></p> <p>Grooming</p> <p>Clipping hair</p> <p>Braiding mane and tail</p> <p>Washing</p> <p>Blanketing</p> <p>Daily grooming vs. for show</p> <p>Health care</p> <ol style="list-style-type: none"> <li>1. Picking out hooves</li> <li>2. Checking for injury</li> </ol>

Instructor Directions	Content Outline
<p><b>Objective 8</b></p> <p><i>There are safeguards that should be taken into consideration when handling a horse. One of these precautions involves getting your horse into the trailer.</i></p>	<p><b>Explain safe procedures when putting a horse in a trailer.</b></p> <ol style="list-style-type: none"> <li>1. Leg wraps</li> <li>2. Trailer (equipment) safety</li> <li>3. Loading</li> <li>4. Unloading</li> </ol>
<p><b>Objective 9</b></p> <p><i>Owning a horse is a big responsibility. Not only must an individual know how to care for a horse, but he/she must be aware of local, state, or federal laws governing horse ownership.</i></p>	<p><b>Discuss any local, state, and federal regulations involving horses.</b></p> <ol style="list-style-type: none"> <li>1. Blood tests (Coggins)</li> <li>2. Liability</li> <li>3. Health checkup</li> </ol>
<p><b>Application:</b></p>	<p><b>Other activities</b></p> <ol style="list-style-type: none"> <li>1. Go to a local training facility and observe their training methods.</li> <li>2. Go to a horse show and watch how exhibitors handle horses during different events.</li> <li>3. Invite a local trailer dealer to point out safety innovations and different styles of trailers.</li> <li>4. Bring in grooming tools and a horse and demonstrate how to properly groom.</li> <li>5. Bring in a horse and demonstrate the proper steps of care and handling. Let students practice.</li> <li>6. Research English and Western riding and present the findings to the class.</li> </ol>
<p><b>Closure/Summary</b></p>	<p>Safety is the most important part of handling a horse. Improper handling can result in injury to the handler, the horse, or both.</p>
<p><b>Evaluation: Quiz</b></p>	<p>Answers:</p> <ol style="list-style-type: none"> <li>1. b</li> <li>2. a</li> <li>3. d</li> <li>4. c</li> <li>5. b</li> <li>6. b</li> <li>7. a</li> <li>8. d</li> <li>9. a</li> </ol>

Instructor Directions	Content Outline
	10. d 11. d 12. b 13. c 14. a

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EVALUATION

**Circle the letter that corresponds to the best answer.**

1. Where should the handler walk when leading a horse?
  - a. To the horse's right
  - b. To the horse's left
  - c. Ahead of the horse
  - d. Behind the horse
  
2. When leading a horse, how should the lead rope be held?
  - a. In the right hand with the excess in the left hand
  - b. In the left hand with the excess in the right hand
  - c. In the left hand with the excess falling to the ground
  - d. In the right hand with the excess falling to the ground
  
3. What is lunging?
  - a. When the horse suddenly jumps forward
  - b. When the horse suddenly jumps to the side
  - c. When the horse suddenly jumps to the rear
  - d. A method of exercise and training
  
4. When or how should a horse be lunged?
  - a. In the morning
  - b. In the cool of the evening
  - c. In both directions
  - d. In only one direction
  
5. How is dismounting done?
  - a. As quickly as possible
  - b. By reversing the mounting process
  - c. As slowly as possible
  - d. From the rear
  
6. What is equitation?
  - a. The art of saddle making
  - b. The process of riding
  - c. Done only in English style riding
  - d. Done only in Western riding

7. Why are restraints used?
  - a. As a method of control
  - b. Only in emergencies
  - c. As often as possible
  - d. As a method of punishment
8. What is a twitch?
  - a. Nervous reaction of the horse
  - b. Nervous reaction of the rider
  - c. Part of the saddle
  - d. Mechanical device used as a restraint
9. How should a horse be approached when trying to halter it?
  - a. From the side
  - b. From the rear
  - c. From the front
  - d. Very quietly
10. What does grooming do for the horse?
  - a. Helps maintain its health
  - b. Cuts down on parasites
  - c. Teaches it horse manners
  - d. All of the above
11. What is important to do when grooming a horse?
  - a. Pick out the hooves.
  - b. Check horse for injuries.
  - c. Spray for flies.
  - d. All of the above
12. Which is a safety precaution to remember when trailering a horse?
  - a. Take along some lunch.
  - b. Check the trailer before leaving.
  - c. Have a strong bridle and reins.
  - d. None of the above
13. Which applies to in-state travel with a horse?
  - a. There are no regulations to worry about.
  - b. No one can keep you from competing at the local level.
  - c. There can be local regulations on health and safety.
  - d. There are some regulations, but no one checks them.

14. Which applies to out-of-state travel with horses?
- a. Check on applicable state regulations.
  - b. Another state's regulations don't apply.
  - c. There are no state regulations concerning horses.
  - d. There are different state regulations, but no one ever checks.

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Equine Science
<b>Lesson</b>	Career Opportunities
<b>Estimated Time</b>	50 minutes

### Student Outcome

The student will learn that the equine industry has many career opportunities.

### Learning Objectives

1. Identify career opportunities that are available in the equine industry.
2. Discuss owning horses for a hobby.
3. Discuss emerging technologies in the equine industry.
4. List options for marketing horses.

### Grade Level Expectations

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. *Equine Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1995.
2. *Equine Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplemental Information

1. Internet Sites
  - American Horse Council. Accessed July 3, 2007, from <http://www.horsecouncil.org/>.
  - Equine Jobs. Natural Horsemanship Training Center. Accessed July 3, 2007, from <http://www.naturalhorsetraining.com/EquineJobs.html>.
  - Horse Career Possibilities – Choose Your Path. University of Nebraska-Lincoln. Accessed July 3, 2007, from <http://animalscience.unl.edu/horse/careers.htm>.
2. Print
  - Ensminger, M. E., and C. J. Hammer. *Equine Science*. 8<sup>th</sup> ed. Upper Saddle River, NJ: Pearson Education, Inc., 2004.

## Interest Approach

Ask students to name as many different occupations involving horses as they can. List these on the board.

## Communicate the Learning Objectives

1. Identify career opportunities that are available in the equine industry.
2. Discuss owning horses for a hobby.
3. Discuss emerging technologies in the equine industry.
4. List options for marketing horses.

Instructor Directions	Content Outline
<p><b>Objective 1</b></p> <p><i>There are two types of careers available in the horse industry: primary and secondary careers. There are also a large number of careers in which a person works indirectly with horses.</i></p>	<p><b>Identify career opportunities that are available in the equine industry.</b></p> <ol style="list-style-type: none"><li>1. Primary careers deal with horses directly.</li><li>2. Secondary careers work with horses indirectly.</li><li>3. Experience is especially important in primary careers.</li></ol>
<p><b>Objective 2</b></p> <p><i>Owning a horse is expensive. Many people own horses as a hobby and do not make enough money from them to pay expenses. Others might earn part of their income from breeding, stabling, or training horses, but income is often needed from other sources, as well.</i></p>	<p><b>Discuss owning horses for a hobby.</b></p> <ol style="list-style-type: none"><li>1. Horse ownership as a hobby</li><li>2. To maintain desired standard of living</li></ol>
<p><b>Objective 3</b></p> <p><i>In today's society, technology continues to increase at a rapid pace, which provides new ways to care for horses.</i></p>	<p><b>Discuss emerging technologies in the equine industry.</b></p> <ol style="list-style-type: none"><li>1. Medical care</li><li>2. Breeding</li><li>3. Training</li></ol>
<p><b>Objective 4</b></p> <p><i>There are several ways to market horses. Knowing the various ways is important in order to make the most profit.</i></p>	<p><b>List options for marketing horses.</b></p> <ol style="list-style-type: none"><li>1. As breeding stock</li><li>2. As yearlings</li><li>3. To European and Asian markets</li></ol>

Instructor Directions	Content Outline
<b>Application:</b>	<p>Other activities</p> <ol style="list-style-type: none"> <li>1. Research and report on a primary or secondary career in the equine industry.</li> <li>2. Invite individuals involved in the equine industry to speak to the class.</li> </ol>
<b>Closure/Summary</b>	<p>The equine industry offers many career opportunities, ranging from assistant trainers to veterinarians. If a person is interested in a career in the horse industry, he or she should learn as much about that area as possible by talking to professionals and equine organizations.</p>
<b>Evaluation: Quiz</b>	<p>Answers:</p> <ol style="list-style-type: none"> <li>1. Primary and secondary</li> <li>2. Answers will vary but could include the following: veterinarian, jockey, farrier, auctioneer, equine sales representative, equipment builder, breeder.</li> <li>3. A supporting career is a business venture that provides additional income to pay for equine expenses.</li> <li>4. Answers will vary but could include the following: medical treatment, artificial insemination, equine swimming pools.</li> <li>5. Answers will vary but could include the following: selling breeding stock, selling yearlings, or selling meat to European and Asian markets.</li> </ol>

EVALUATION

**Complete the following short answer questions.**

1. What are the two types of career opportunities?
  - a.
  - b.
2. List four different equine careers.
  - a.
  - b.
  - c.
  - d.
3. What is a supporting career?
4. What are two new technologies?
  - a.
  - b.
5. What are two marketing options for a horse breeder?
  - a.
  - b.

# Agricultural Science I

**Curriculum Guide:** *Equine Science*

**Unit Objective:**

Students will demonstrate an understanding of the requirements for care of equine livestock by designing a health maintenance, hoof care, and feeding plan for a horse.

**Show-Me Standards:** 1.8, SC3

**References:**

Equine Nutrition. Accessed March 12, 2003, from <http://www.worldzone.net/recreation/virtuallyhorses/nutrition.html>.

*Equine Science*. University of Missouri-Columbia, Instructional Materials Laboratory, 1995.

*FBMA: Horse Management for Adults* (CD). Farm Business Management Analysis, University of Missouri, Agricultural Education Department, 2002.

The Horse.com. Accessed March 12, 2003, from <http://www.thehorse.com>.

Students will use additional outside sources to complete this activity.

**Instructional Strategies/Activities:**

- Students will engage in study questions in lessons 1 through 10.
- Students will complete AS 5.1, Microscope Use; AS 6.1, External Parts of the Foot; and AS 6.2, Internal Parts of the Foot.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. 4 (4), p. 20 (1), p. 27 (2), p. 38 (2), p. 53 (4), p. 71, p. 81 (2), p. 93 (1), and p. 100 (1, 2).

**Performance-Based Assessment:**

Students will work in teams of three to design a health maintenance, hoof care, and feeding plan for a horse. The plan should be presented in the form of tables that cover health maintenance, hoof care, and nutrition.

Assessment will be based on the quality of the information presented in the tables and how thoroughly the tables address their respective areas. Spelling also will be a consideration in the assessment.



## Equine Science Instructor Guide

**The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.**

1. Students will work in teams of three to design a health maintenance, hoof care, and feeding plan for an actual or imaginary horse.
  - a. The team must identify the breed of the horse.
  - b. After establishing the breed, the team must then identify the basic characteristics of the horse, such as age, sex, activity level, etc.
2. After addressing the horse's breed and characteristics in a brief introductory paragraph, students should present the plan in the form of three tables.
  - a. Tables should cover the areas of health maintenance, hoof care, and nutrition.
  - b. Tables should be presented in a simple, two-column format. Column one should state the issue, condition, or management practice to be addressed and column two should state the solution, treatment (including frequency and/or amount, if applicable), or procedure for the item in column one. (See form on p. 7.)
3. Students may use material found in the unit or discussed in class as a starting point but must use additional outside material to complete their tables. Students may not use the source material word for word and must provide a complete bibliography of their sources along with their tables.
4. Regarding health maintenance, students should cover the following areas:
  - A vaccination schedule against diseases for which vaccines exist (e.g., influenza, sleeping sickness, tetanus, Rhino, and distemper)
  - Treatment or solutions for common ailments (e.g., colic, Equine Infectious Anemia, Potomac Horse Fever, and salmonella infection)
  - Dental care
  - Parasites (internal and external)
  - Treatment for common injuries or problems (e.g., wounds, foot punctures, bites and stings, strains, sprains, swelling, and founder)
5. Regarding hoof care, students should cover the following areas:
  - Hoof inspection
  - Trimming the hoof
  - Shoeing

- Hoof abnormalities (e.g., founder, stone bruise, naviculitis, thrush, and hoof cracks)
6. Regarding nutrition, students should cover the following areas:
- Nutritional requirements (These should take into account such factors as size, age, and work load.)
  - Water requirements
  - Feed types (e.g., grains, roughage, supplements, minerals, and vitamins)
  - Nutrition-related problems (e.g., colic, founder, epiphysis, vitamin depletion or excess, toxic plant consumption, and tying up syndrome)
7. Assessment will focus on the quality of the information presented in the tables and how well the tables address their respective areas. Spelling also will be a consideration in the assessment.

## Equine Science Student Handout

1. Work in teams of three to design a health maintenance, hoof care, and feeding plan for an actual or imaginary horse.
  - a. Identify the breed of the horse.
  - b. After establishing the breed, identify the basic characteristics of the horse, such as age, sex, activity level, etc.
  
2. After addressing the horse's breed and characteristics in a brief introductory paragraph, present the plan in the form of three tables.
  - a. Tables should cover the areas of health maintenance, hoof care, and nutrition.
  - b. Tables should be presented in a simple, two-column format. Column one should state the issue, condition, or management practice to be addressed and column two should state the solution, treatment (including frequency and/or amount, if applicable), or procedure for the for the item in column one.
  
3. You may use material found in the unit or discussed in class as a starting point but must use additional outside material to complete the tables. You may not use the source material word for word and must provide a complete bibliography of the sources along with your tables.
  
4. Regarding health maintenance, cover the following areas:
  - A vaccination schedule against diseases for which vaccines exist (e.g., influenza, sleeping sickness, tetanus, Rhino, and distemper)
  - Treatment or solutions for common ailments (e.g., colic, Equine Infectious Anemia, Potomac Horse Fever, and salmonella infection)
  - Dental care
  - Parasites (internal and external)
  - Treatment for common injuries or problems (e.g., wounds, foot punctures, bites and stings, strains, sprains, swelling, and founder)
  
5. Regarding hoof care, cover the following areas:
  - Hoof inspection
  - Trimming the hoof
  - Shoeing
  - Hoof abnormalities (e.g., founder, stone bruise, naviculitis, thrush, and hoof cracks)

6. Regarding nutrition, cover the following areas:
  - Nutritional requirements (These should take into account such factors as size, age, and work load.)
  - Water requirements
  - Feed types (e.g., grains, roughage, supplements, minerals, and vitamins)
  - Nutrition-related problems (e.g., colic, founder, epiphysis, vitamin depletion or excess, toxic plant consumption, and tying up syndrome)
  
7. You will be assessed on the quality of the information presented in the tables and how well the tables address their respective areas. Spelling also will be a consideration in the assessment.

## Table for:

Health Maintenance    Hoof Care    Nutrition

(Check one)

Health Issue, Condition, or Management Practice	Solution, Treatment, or Procedure



# Agricultural Science I

## Equine Science Scoring Guide

Names \_\_\_\_\_

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
<u>Health Maintenance:</u> Vaccinations	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Common Ailments	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Dental Care	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Parasites	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Common Injuries or Problems	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
<u>Hoof Care:</u> Inspection	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Trimming	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Shoeing	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Abnormalities	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	

<u>Nutrition:</u> Requirements	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Water Requirements	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Feed Types	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Related Problems	How well and how thoroughly is this point addressed?	Failed	Poor	Fair	Good	Excellent	X 1.75	
Technical Considerations	Spelling errors	6 or more errors	5 errors	4 errors	2-3 errors	0-1 error	X 2.25	
<b>TOTAL</b>								

**Final Assessment Total \_\_\_\_\_/100 pts.**

**Comments:**