



# Animal Science

## Merit Badge Workbook

This workbook can help you but you still need to read the merit badge pamphlet.

The work space provided for each requirement should be used by the Scout to make notes for discussing the item with his counselor, not for providing the full and complete answers. Each Scout must do each requirement.

No one may add or subtract from the official requirements found in **Boy Scout Requirements** (Pub. 33216 – SKU 34765).

The requirements were last issued or revised in 2007 • This workbook was updated in June 2012.

Scout's Name: \_\_\_\_\_ Unit: \_\_\_\_\_

Counselor's Name: \_\_\_\_\_ Counselor's Phone No.: \_\_\_\_\_

<http://www.USScouts.Org> • <http://www.MeritBadge.Org>

Please submit errors, omissions, comments or suggestions about this **workbook** to: [Workbooks@USScouts.Org](mailto:Workbooks@USScouts.Org)  
Comments or suggestions for changes to the **requirements** for the **merit badge** should be sent to: [Merit.Badge@Scouting.Org](mailto:Merit.Badge@Scouting.Org)

1. Name four breeds of livestock in each of the following classifications: horses, dairy cattle, beef cattle, sheep, hogs. Tell their principal uses and merits. Tell where the breeds originated.

### Horses

Breed	Principal uses and merits.	Where the breed originated.
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

### Dairy cattle:

Breed	Principal uses and merits.	Where the breed originated.
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

### Beef cattle:

Breed	Principal uses and merits.	Where the breed originated.
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Sheep:

Breed	Principal uses and merits.	Where the breed originated.
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Hogs:

Breed	Principal uses and merits.	Where the breed originated.
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

2. List five diseases in each of the classifications in requirement 1. Also list five diseases of poultry. Describe the symptoms of each disease and explain how each is contracted and how it could be prevented.

Horses

Disease	Symptoms	How it's contracted	How it's prevented
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Dairy cattle:

Disease	Symptoms	How it's contracted	How it's prevented
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Beef cattle:

Disease	Symptoms	How it's contracted	How it's prevented
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Sheep:

Disease	Symptoms	How it's contracted	How it's prevented
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Hogs:

Disease	Symptoms	How it's contracted	How it's prevented
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Poultry:

Disease	Symptoms	How it's contracted	How it's prevented
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. Explain the major differences in digestive systems of ruminants, horses, pigs, and poultry.

Ruminants \_\_\_\_\_  
\_\_\_\_\_

Horses \_\_\_\_\_  
\_\_\_\_\_

Pigs \_\_\_\_\_  
\_\_\_\_\_

Poultry \_\_\_\_\_  
\_\_\_\_\_

Explain how the difference structure and function among these four types of digestive tracts affect the nutritional management of these species.

Ruminants \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Horses \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Pigs \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Poultry \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Select one type of animal -  beef cow,  dairy cow,  horse,  sheep,  goat, or  hog, or a  poultry flock – and tell how you would properly manage it. Include in your discussion nutritional (feeding) concerns, housing, disease prevention, waste control/removal, and breeding programs if appropriate.

Nutritional (feeding) concerns: \_\_\_\_\_  
\_\_\_\_\_

Housing: \_\_\_\_\_  
\_\_\_\_\_

Disease prevention: \_\_\_\_\_  
\_\_\_\_\_

Waste control/removal: \_\_\_\_\_  
\_\_\_\_\_

Breeding programs \_\_\_\_\_  
\_\_\_\_\_

5. Explain the importance of setting clear goals for any animal breeding program. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Tell how purebred lines of animals are produced. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Explain the practice of crossbreeding and the value of this practice.

Practice: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Value: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## 6. Complete ONE of the following options:

*(Use the blank lines after the Avian Option for any written answers for any of these options)*

 BEEF CATTLE OPTION

- a. Visit a farm or ranch where beef cattle are produced under any of these systems:
  - 1. Feeding market cattle for harvest;
  - 2. Cow/calf operation, producing feeder cattle for sale to commercial cattle feeders;
  - 3. Producing purebred cattle for sale as breeding stock to others. Talk with the operator to learn how the cattle were handled, fed, weighed, and shipped. Describe what you saw and explain what you learned. If you cannot visit a cattle ranch or farm, view a video from a breed association, or research the Internet (with your parent's permission) for information on beef cattle production. Tell about your findings.
- b. Sketch a plan of a feedlot to include its forage and grain storage facilities, and loading chute for 30 or more fattening steers, or sketch a corral plan with cutting and loading chutes for handling 50 or more beef cows and their calves at one time.
- c. Make a sketch showing the principal wholesale and retail cuts of beef. Tell about the U.S. Department of Agriculture (USDA) dual grading system of beef. Tell the basis of each grade in each system.
- d. Define the following terms: bull, steer, bullock, cow, heifer, freemartin, heiferette, calf.

 DAIRYING OPTION

- a. Tell how a cow or a goat converts forage and grain into milk. Explain the differences in feeds typically used for dairy cows versus those fed to beef cows.
- b. Make a chart showing the ingredients in cows' milk or goat's milk. Chart the amount of each ingredient.
- c. Explain the requirements for producing grade A milk. Tell how and why milk is pasteurized.
- d. Tell about the kinds of equipment used for milking and the sanitation standards that must be met for dairy farms.
- e. Define the following terms: bull, cow, steer, heifer, springer, buck, doe, kid.
- f. Visit a dairy farm or a milk processing plant. Describe what you saw and explain what you learned. If you cannot visit a dairy farm or processing plant, view a video from a breed or dairy association, or research the Internet (with your parent's permission) for information on dairying. Tell about your findings.

 HORSE OPTION

- a. Make a sketch of a useful saddle horse barn and exercise yard.
- b. Tell about the history of the horse and the benefits it has brought to people. Using the four breeds of horses you chose in requirement 1, discuss the different special uses of each breed.
- c. Define the following terms: mare, stallion, gelding, foal, colt, filly; mustang, quarter horse, draft horse, pacer, trotter; pinto, calico, palomino, roan, overo, tobiano.
- d. Visit a horse farm. Describe what you saw and explain what you learned. If you cannot visit a horse farm, view a video from a breed association, or research the Internet (with your parent's permission) for information on horses. Tell about your findings.
- e. Outline the proper feeding of a horse doing light work. Explain why the amount and kind of feed will change according to the kind of horse and the work it does. Describe what colic is, what can cause it, and its symptoms.

SHEEP OPTION

- a. Make a sketch of a live lamb. Show the location of the various wholesale and retail cuts.
- b. Discuss how wools are sorted and graded.
- c. Do ONE of the following:
  - 1. Raise a lamb from weaning to market weight. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records for review by your counselor.
  - 2. Visit a farm or ranch where sheep are raised. Describe what you saw and explain what you learned. If you cannot visit a sheep farm or ranch, view a video from a breed association, or research the Internet (with your parent's permission) for information on sheep. Tell about your findings.
- d. Describe some differences between the production of purebred and commercial lambs. Then select two breeds that would be appropriate for the production of crossbred market lambs in your region. Identify which breed the ram should be.
- e. Define the following terms: wether, ewe, ram, lamb.

 HOG OPTION

- a. Make a sketch showing the principal wholesale and retail cuts of pork. Tell about the recommended USDA grades of pork. Tell the basis for each grade.
- b. Outline in writing the proper feeding programs used from the breeding of a gilt or sow through the weaning of the litter. Discuss the growth and finishing periods from the breeding of a gilt or sow through the weaning of the litter. Discuss the feeding programs for the growth and finishing periods.
- c. Do ONE of the following:
  - 1. Raise a feeder pig from weaning to market weight. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records for review by your counselor.
  - 2. Visit a farm where hogs are produced, or visit a packing plant handling hogs. Describe what you saw and explain what you learned. If you cannot visit a hog production unit or packing plant, view a video from a packer or processor, or research the Internet (with your parent's permission) for information on hogs. Tell about your findings.
- d. Define the following terms: gilt, sow, barrow, boar.

 AVIAN OPTION

- a. Make a sketch of a layer house or broiler house showing nests, roosts, feeders, waterers, and means of ventilation. Explain how insulation, ventilation, temperature controls, automatic lights, and other environmental controls are used to protect birds from heat, cold, and bad weather.
- b. Explain why overcrowding is dangerous for poultry flocks.
- c. Tell about the grading of eggs. Tell how broilers (fryers) are graded. Describe the classes of chicken meat.
- d. Do ONE of the following:
  - 1. Manage an egg-producing flock for five months. Keep records of feed purchased, eggs sold, medication, vaccination, and mortality. Present your records for review by your counselor.
  - 2. Raise 20 chicks from hatching. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records for review by your counselor.
  - 3. Visit a commercial avian production facility. Describe what you saw and explain what you learned. If you cannot visit a commercial facility, view a video from a poultry association, or research the Internet (with your parent's permission) for information on poultry production. Tell about your findings.
- e. Define the following terms: hen, rooster, chick, capon, tom, poult.

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7. Find out about three career opportunities in animal science.

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

Pick one and find out the education, training, and experience required for this profession.

Career: \_\_\_\_\_

Education: \_\_\_\_\_

Training: \_\_\_\_\_

Experience: \_\_\_\_\_

\_\_\_\_\_

Discuss this with your counselor, and explain why this profession might interest you. \_\_\_\_\_

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**Requirement resources can be found here:**  
[http://www.meritbadge.org/wiki/index.php/Animal\\_Science#Requirement\\_resources](http://www.meritbadge.org/wiki/index.php/Animal_Science#Requirement_resources)

## Important excerpts from the [‘Guide To Advancement’](#), No. 33088:

Effective January 1, 2012, the *‘Guide to Advancement’* (which replaced the publication *‘Advancement Committee Policies and Procedures’*) is now the *official* Boy Scouts of America source on advancement policies and procedures.

- **[ Inside front cover, and 5.0.1.4 ] — Unauthorized Changes to Advancement Program**  
***No council, committee, district, unit, or individual has the authority to add to, or subtract from, advancement requirements.***  
(There are limited exceptions relating only to youth members with disabilities. For details see section 10, “Advancement for Members With Special Needs”.)
- **[ Inside front cover, and 7.0.1.1 ] — The [‘Guide to Safe Scouting’](#) Applies**  
Policies and procedures outlined in the *‘Guide to Safe Scouting’*, No. 34416, apply to all BSA activities, including those related to advancement and Eagle Scout service projects. [Note: Always reference the online version, which is updated quarterly.]
- **[ 7.0.3.1 ] — The Buddy System and Certifying Completion**  
Youth members must not meet one-on-one with adults. Sessions with counselors must take place where others can view the interaction, or the Scout must have a buddy: a friend, parent, guardian, brother, sister, or other relative —or better yet, another Scout working on the same badge— along with him attending the session. When the Scout meets with the counselor, he should bring any required projects. If these cannot be transported, he should present evidence, such as photographs or adult certification. His unit leader, for example, might state that a satisfactory bridge or tower has been built for the Pioneering merit badge, or that meals were prepared for Cooking. If there are questions that requirements were met, a counselor may confirm with adults involved. Once satisfied, the counselor signs the blue card using the date upon which the Scout completed the requirements, or in the case of partials, initials the individual requirements passed.
- **[ 7.0.3.2 ] — Group Instruction**  
It is acceptable—and sometimes desirable—for merit badges to be taught in group settings. This often occurs at camp and merit badge midways or similar events. Interactive group discussions can support learning. The method can also be attractive to “guest experts” assisting registered and approved counselors. Slide shows, skits, demonstrations, panels, and various other techniques can also be employed, but as any teacher can attest, not everyone will learn all the material.

There must be attention to each individual’s projects and his fulfillment of *all* requirements. We must know that every Scout — actually and *personally*— completed them. If, for example, a requirement uses words like “show,” “demonstrate,” or “discuss,” then every Scout must do that. It is unacceptable to award badges on the basis of sitting in classrooms *watching* demonstrations, or remaining silent during discussions. Because of the importance of individual attention in the merit badge plan, group instruction should be limited to those scenarios where the benefits are compelling.

- **[ 7.0.3.3 ] — Partial Completions**  
Scouts need not pass all requirements with one counselor. The Application for Merit Badge has a place to record what has been finished — a “partial.” In the center section on the reverse of the blue card, the counselor initials for each requirement passed. In the case of a partial completion, he or she does not retain the counselor’s portion of the card. A subsequent counselor may choose not to accept partial work, but this should be rare. A Scout, if he believes he is being treated unfairly, may work with his Scoutmaster to find another counselor. An example for the use of a signed partial would be to take it to camp as proof of prerequisites. Partials have no expiration except the 18th birthday.