

WHAT MAKES A HORSE A HORSE ?



Ha'át'íí Éí Łíí' Yee
Łíí' Nilí?

WHAT MAKES A HORSE, A HORSE ?

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First place winner of the prestigious ASBA "Golden Bell Award" for K-8 curriculum.

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A R.U.F.F. MISSION

1. Goal: Students living on the Navajo Reservation are very aware of the horse. Most of the students have horses around them. Interest levels are high concerning the horse, as the animal has held a place of honor and value in this culture.

Problem statement: Students love to discuss animals Learning should be fun and informative. All animals need proper care. Sometimes this does not happen.

2. Measurable behavioral objectives: Students will demonstrate understanding of the concept visually, in an oral text, and written test where applicable (age consideration)

3. Specific strategies which focus upon students needs: Leading questions that utilize the five senses. For example: How would a responsible livestock owner care for his herd? If any animal does not receive proper food, what can happen to them? Why was the height of a horse measured by using a man's hand? What is the standard width a hand is assumed to be? To what point is the horse measured to?

4. Awareness or readiness level: Students will respond to appropriate questions and answers.

5. Specific plan: (Materials needed): Paper, pencils, ruler. Have students trace their hand on a piece of paper. With the ruler, have them measure the width of the widest part of their hand. The standard acceptable width as a measuring tool for a man's hand is 4 inches. Theirs will be smaller, but they will still understand the process. Have them cut out the tracing. Explain to them that the early way of measuring the height of a horse, pony, donkey, or mule was to place a person's hand on the front leg down by the hoof of the animal. Place one hand directly above the other, counting the number of times needed, until the top most part of the animal's neck called the withers is reached. How many hand's did it take to reach the top? Have students measure different items in the room using "their" hands. They need to count the number of hands and multiply by the inches in width to reach the total.

6. Student practice (student activities): Start a discussion about responsible livestock ownership. What happens when too many animals graze in the same areas? Have the students create a chart containing the different foods that a horse would need to eat. At the end of each column, have them place the cost of each item. Ex: If a bale of hay costs \$5.50 per bale, and the horse eats 14 lbs. of hay per day, how much would it cost to keep this horse for a period of 30 days? What does a bale of hay weigh? Baling machines press the hay into rectangular bales that weigh from 50 to 100 pounds. Round balers roll hay into round bales weighting as much as 1 1/2 tons.

7. Checking for understanding (outcome based): Using the chart the student created, have them figure out, by adding the column numbers, what the amount would be to maintain one horse . Multiply this number for each horse that their family owns to get the total cost.

8. Specific affective and cognitive areas addressed: Students will complete a vocabulary list. Navajo words added for cultural enrichment.

9. Specific teaching strategies which include student involvement: After students have finished their math projects, have them write a short story about why they think people began to measure horses with their hands? Was it because there were no measuring tapes? Was it out of convenience?

10. Other (as applicable to lesson): Applicable from 4th to 7th grade, with teacher discretion.

What Makes A Horse A Horse?

Ha'át'íí éí kǫ́' yee kǫ́' nilí?

On the Navajo reservation, horses are used to herd sheep, goats, cattle, and other horses. The horse is also used in rodeos, na'ahóóhai, pleasure riding, and as a means of transportation. Horses are sometimes used in ceremonies. Horseflesh is still consumed by humans.



Did you know that a horse can move its eyes in different directions at the same time? Do you know what the frog is on a horse? What other animal has larger eyes than a horse? How much food does a horse need to eat to keep it healthy? Are horses very intelligent?

The riding of horses was not practical until a bridle, azáát'i'í (*head gear to control a horse*), and bit, azáá' si'ání (*part of a bridle that goes in a horse's mouth*), as controlling devices were invented. Horse's did not replace humans and oxen at heavy farm labor until the appearance of an efficient harness.

The horse is not as important as a means of transportation today. In most countries the train, called the iron horse, kó' na' ałbaqasii, and the automobile, chidí, which was also called the horse-less carriage, has replaced the horse almost entirely.

Horses perform in circuses, da'níl'í (*shows with feats of skill, animal acts, and clowns*), rodeos, na'ahóóhai (*contest of cowboy skills*) carnivals, hoł nída'ıbsaałı (*festival*), parades, alkée' da'íneéh (*a way to show things off*), and in horse shows, kǫ́' danıl'ı.

The Horses Body

The horse is well suited for working and running. Its wide nostrils, áchı́shtah (*either of the external openings of the nose*), help it breathe easily. Horses have a good sense of smell, yılchin (*the sense by which odors are perceived*), sharp ears, bijaa' (*organ of hearing*), and keen eyes, bináá' (*organ of sight*). They have strong teeth, biwoo (*one of the hard structures in the jaws for chewing*), and they are large herbivores, ch'il yılchozhii (*they feed on plants*), eating only grain, kǫ́' bidáá', and plants, ch'il, never meat, atsı'.



Long muscular legs give the horse the strength to pull heavy loads. A horse's long neck, ak'os, (*part of the body joining the head to the shoulders*), places their large eyes up where they can easily survey the horizon for danger.



The horse uses its legs and hoofs as their chief weapons. The kick of a horse can seriously injure a human being or an animal. Long slender lower legs carry its weight on a single toe. This combined with the heavily muscled upper legs gives the horse the ability to run at fast speeds. Along with their great lung, *ajéyilzólíi, (two spongy, saclike respiratory organs in most vertebrates occupying the chest cavity and functions to remove carbon with oxygen)*, capacity, this increases their endurance.



Horses have four common gaits, *dooltał (walking or running)*; the walk, trot, pace, and gallop.

The walk is a four-beat gait. The feet hit the ground as follows: (1) right fore-foot, (2) left hind foot, (3) left forefoot, (4) right hind foot.

The trot is a two-beat gait. The feet hit as follows. (1) right forefoot, (2) left forefoot and right hind foot.

The gallop is a three-beat gait. The feet hit as follows: (1) left hind foot, (2) left fore foot and right hind foot and right hind foot.

The pace is like the trot. It is used mostly in harness racing. In the pace the horse moves the legs on the same side of the body at the same

time. The pace can be a very uncomfortable riding gait.

Teeth

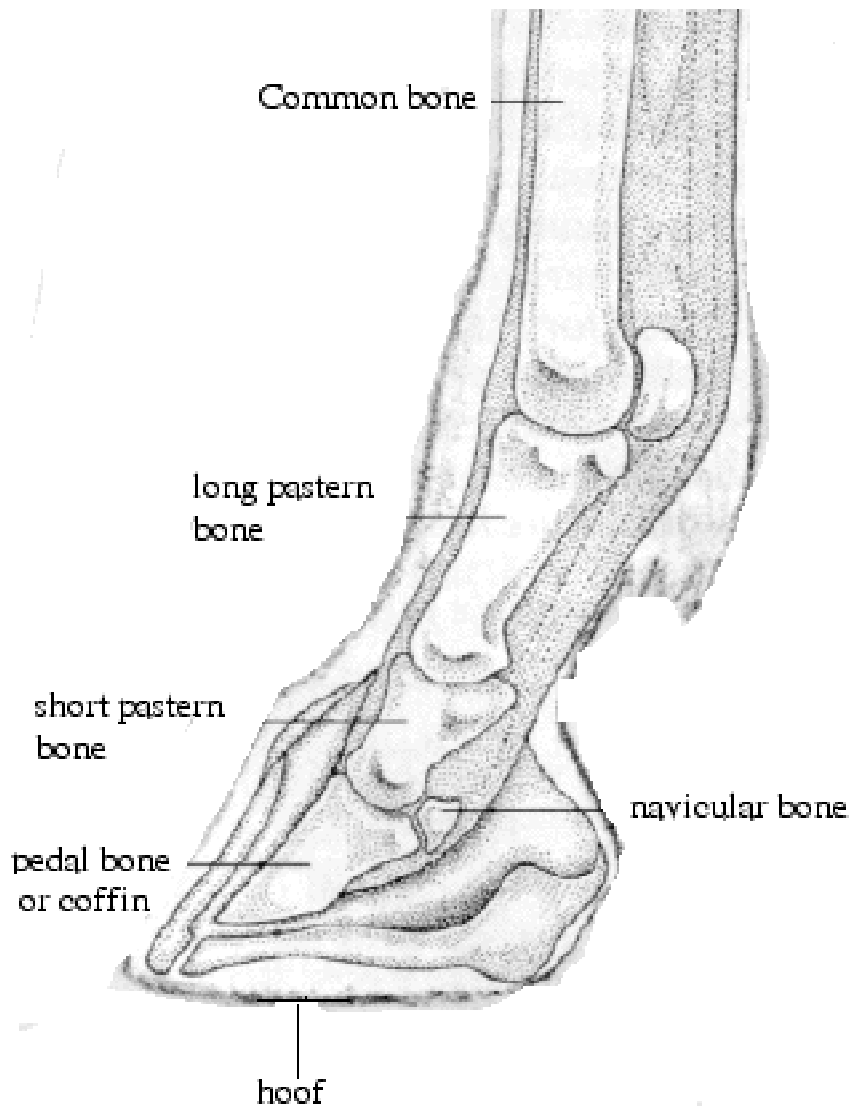


Most male horses, *híkka'ii*, have 40 teeth and females or mares, *híitsa'ii*, have 36. The molars called back biwoo grind food as the horse chews. These awoo have no nerves and never stop growing. Teeth, *awoo' (hard bonelike structures in the upper and lower jaws of human beings and many kinds of animals)*, are the hardest parts of the body.



Sometimes the molars grow unevenly and must be filed down so the horse can chew properly. This is called "floating the teeth". Foals, *lé'éyázhí*, are born toothless but soon get two upper and two lower front teeth by the age of four months. The first upper premolar on each side called the "wolf tooth," is very small and frequently does not grow in.

The *azée'si'ání* needs to rest in spaces between the horse's incisors and molars. At the age of 1 year, the horse has six pairs of upper and lower incisors. At 5 years a horse has 12 pairs of incisors and is said to have a full mouth. The incisors are used in conjunction with the lips, *bidaa*, in grasping, *jiisitgo (take or seize firmly)*, food. The premolars and molars are nearly identical in structure having rough flat surfaces



World Bood Encyclopedia Illustrated by Noel Sickles and Patricia Wynne

A horse has a single toe. It is formed by the pastern bones and the pedal bone. Horses walk on the tip of their toes. Each toe is covered by a hard strong hoof.

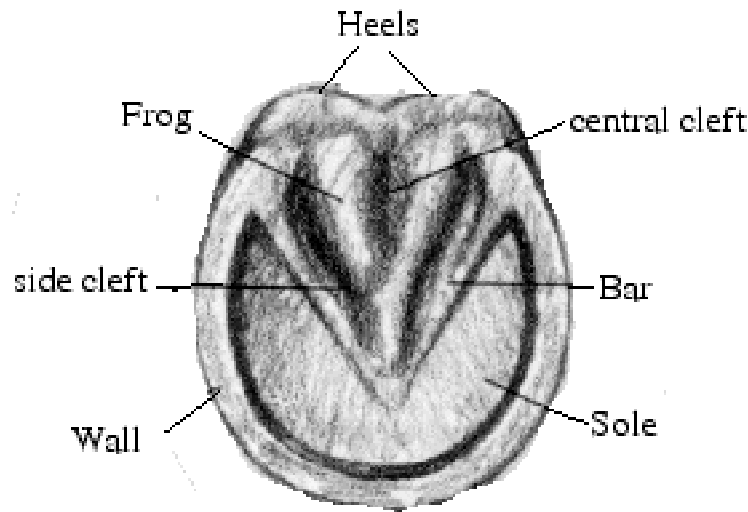


Illustration by Noel Sickles

The Bottom of a Horse's Hoof

The external features of a horse's foot are indicated in this illustration. The horse has a skeletal and muscular structure that is well adapted for running. Horse's legs are long, thin, and they have large strong muscles in the top portion. This fact enables them to run and move very quickly with hardly any effort. They can gallop and leap using long strides.

The Hoof



A horse's hoof , **ḥīḥ'** **behéshgaan**, is specially adapted for running. The frog acts as a shock absorber, cushioning the blow when the **ḥīḥ'** **behéshgaan** strikes the ground. The hock, although high on the leg, is anatomically comparable to the human ankle.



The horses **ḥīḥ'** **behéshgaan** are horny structures, similar to fingernails, that enclose the third joint of the single toe. The parts of the **ḥīḥ'** **behéshgaan** are the

wall and, on the bottom, the frog, sole, and bars. A horse's legs and feet easily become diseased if not cared for properly.

Some common disease of the legs and feet include thrush, navicular, laminitis, and arthritis.

Thrush is an infection of the frog. It can be prevented by providing clean, dry bedding for a horse. To treat thrush veterinarians apply medication to the affected frog.

Navicular is a disease of the foot

bone that causes a horse's legs to become stiff and sore. It is treated with corrective shoeing and drugs.

Laminitis, also called founder, is an inflammation of the foot. Horses can founder themselves by overeating *tsaaskaal*. Its symptoms include lameness, hot feet, and increased pulse rate. Laminitis is treated by applying medication and soaking the foot in warm water.

Reproduction And Life Cycles



The female is called a *híitsa'ii* the male a stallion, *híichogii*, and the castrated male a gelding, *híi ká'ii*. The majority of work and riding horses are *híi ká'ii* and are usually castrated between 1 and 2 years of age.



The newborn is called a foal, *lé'éyázhí*, the male a colt, *lé'éyázhí biká'ígíí*, and the female a filly, *híitsa'ii yázhí*.

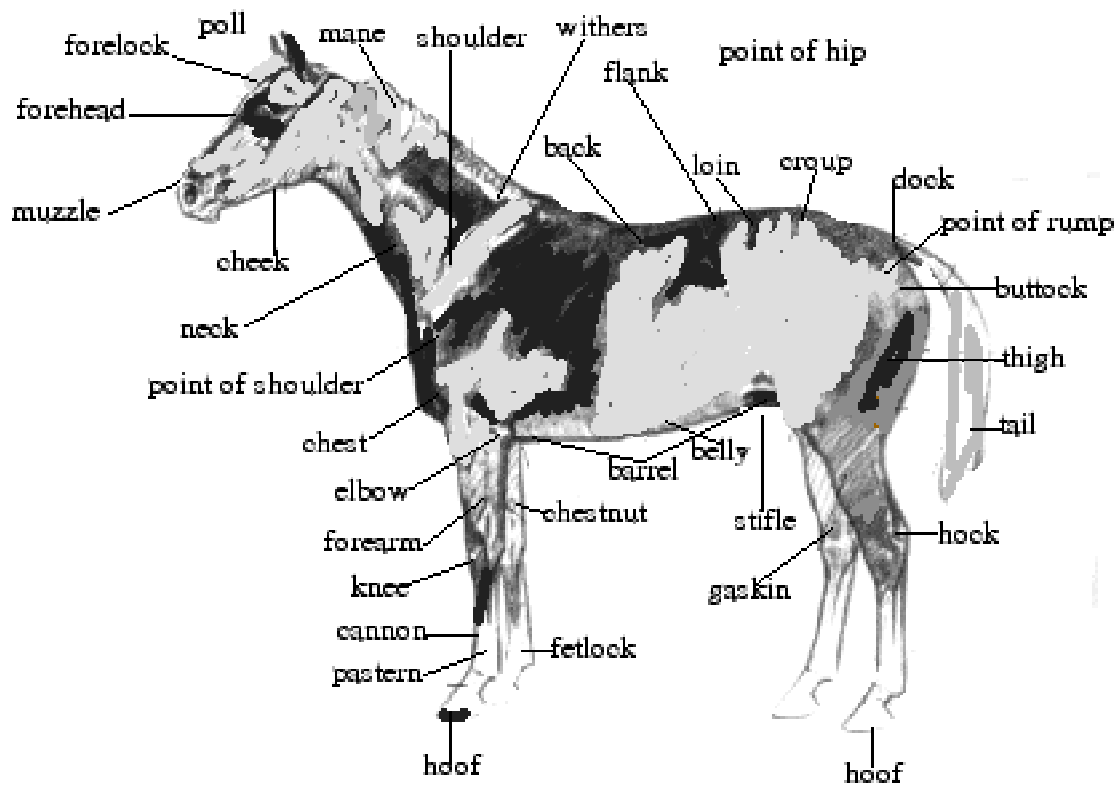
Puberty occurs at 15 to 24 months. *híitsa'ii* remain fertile which means that they are able to foal for life, but advancing age increases the chance of injury or change leading to sterility. *híitsa'ii* more than 25 years of age can often foal, *lé'éyázhí*, normally.

híichogii in their twenties often breed *híitsa'ii* but fertility of the *híichogii* decreases with advanced age. The *híitsa'ii* undergoes a 21-day estrus cycle from March or April through September or October. *híitsa'ii* are in estrus an average of 6 or 7 days of each 21-day cycle.



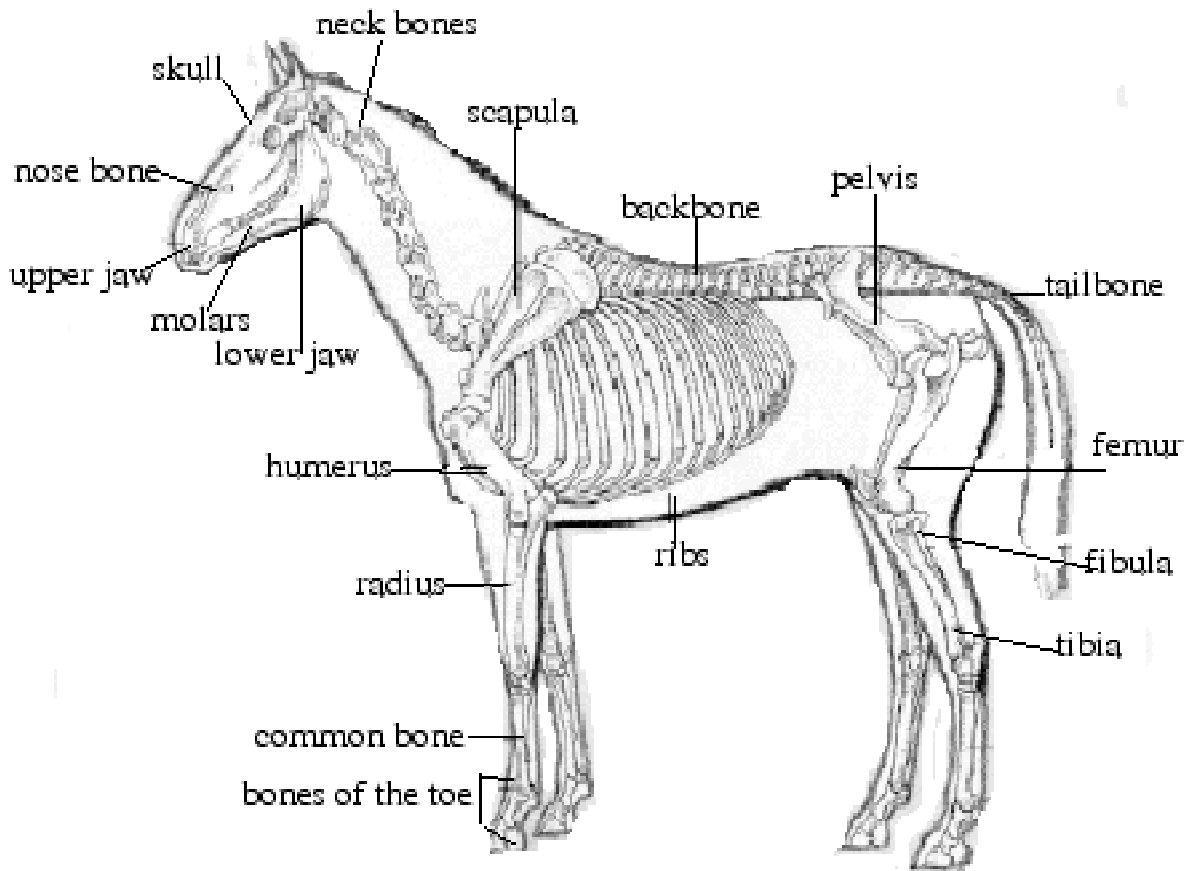
Gestation, *yiltsá* (*the period of development in the uterus from conception until birth; pregnancy*), is an average of 338 days with a range of 325 to 400 days (10 to 14 months). Usually a single *lé'éyázhí* is born. *lé'éyázhí* can stand shortly after birth and within a few hours they are able to run. The legs of a newborn *lé'éyázhí* seem much too long for its body. As the *lé'éyázhí* matures, its legs grow more slowly than the rest of the body. When twins are conceived, usually one is absorbed early in *yiltsá* or both are aborted in mid to late *yiltsá*. Live twins are unusual but it can happen. *lé'éyázhí* are weaned naturally around 6 months of age. The life span is 20 to 30 years and occasionally up to 40 years.

The Body of a Horse



The external features of a horse are shown in the illustration above. The horse has a musculature and skeletal structure that is well suited for running. Its legs are long and thin having large muscles. These muscles which are located in the upper area of the leg allows the horse to move very quickly.

The Skeleton of a Horse



The internal anatomical features of a horse are shown here. The long slender legs bears all of the horse's weight on a single toe. This is combined with the muscled upper legs which makes the horse a fast runner. Great lung capacity increases the horse's endurance.

Diseases



Horse owners, **biíí' ílínígíí** can prevent many medical problems by feeding their animals good food and giving them a safe place to sleep.

A horses living quarters should be kept clean and they need exercising daily. Horses should be

examined by a veterinarian at least twice a year. **Biíí' ílínígíí** should watch for any changes in the condition or behavior of their horses and call a veterinarian if their horse appears to be ill.

Signs of illness include loss of appetite, lack of vigor, mucous or bloody discharges from the **bináá'** or

bichíŋh swellings or sores on the body and hot legs or feet.



Horses should always be vaccinated, **naafniih bich'ááh baa'o'ootsih**, (*to inoculate with a vaccine in order to produce immunity to an infectious disease*), against disease.

Respiratory diseases include influenza, rhinopneumonitis, pneumonia, bronchial asthma, chronic bronchitis, emphysema, and laryngeal hemiplegia (roaring).

Other specific infectious diseases include salmonellosis, streptococcal lymphadenitis (strangles or distemper.)

Internal Parasites



Colic, **abid diniih**, can also be caused by intestinal parasites called worms. The presence of worms in horses can cause one or more of the following symptoms.

Dull listless appearance.

Dry rough coat.

Bowel disorders.

Colic

Occasional lameness.

Skin conditions such as jack-sores.

Loss of appetite or performance.

These internal parasites are placed

into different groups. Strongyles, large and small, ascarids, bots, and pinworms.

Strongyles

About 40 species of strongyles are less than an inch in length and they are referred to as small strongyles. Three other species of large strongyles may be as long as two inches.

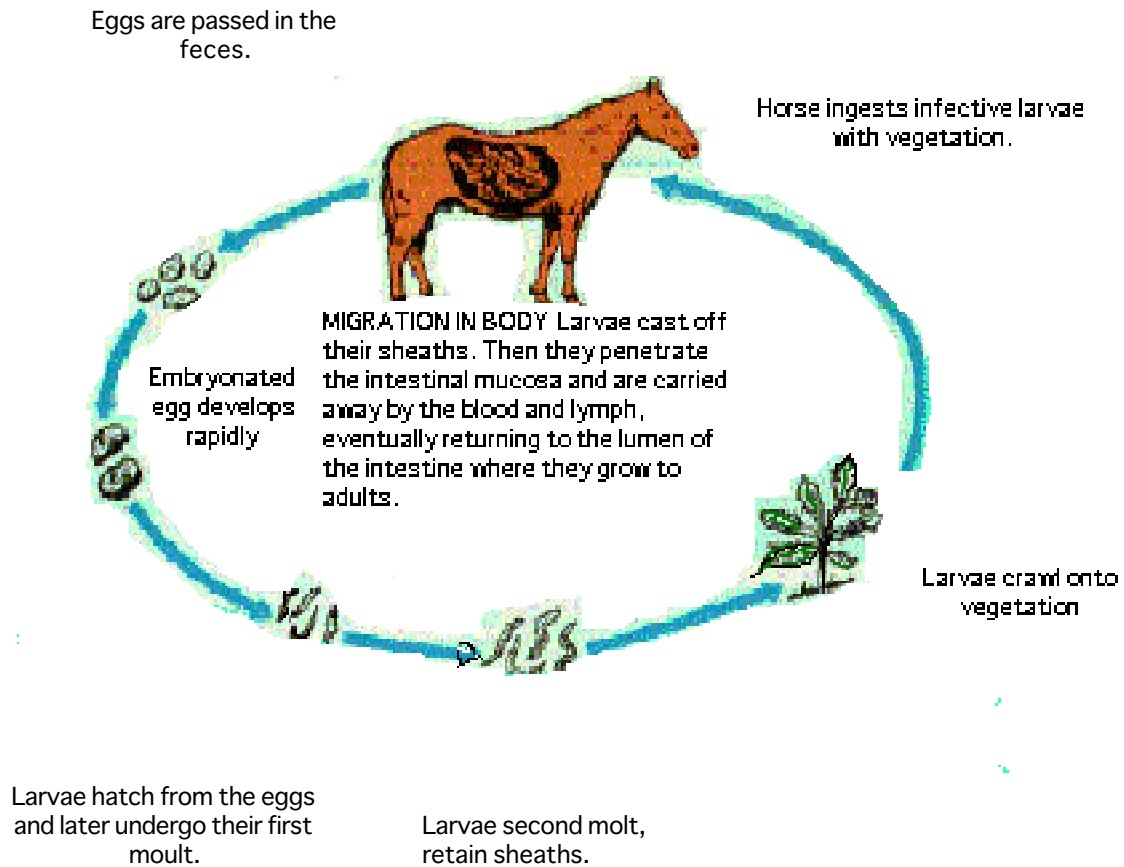
The large group of strongyles is often referred to as bloodworms, redworms, and palisade worms. These are the ones which cause the most severe and destructive effects in horses. Large strongyles cause inflammation of special arteries called mesenteric arteries. This is the most common cause of **abid diniih**.




These worms are found in the cecum, (blind gut) and in the large bowel. Adults are found in great numbers here and also attach themselves to the intestinal wall to feed from the horse's blood.

The immature forms of these worms called larvae can work their way through the intestinal wall and into the blood vessels. Then they move on from there to various other organs including the liver, **azid**, heart, **ajéí**, and lungs, **ajéíylzólíi**. When these strongyles travel through the horse's body they destroy healthy functional tissue.

The Life Cycle of Strongyles




 If the horse is not treated for these worms, death can occur from weakened areas that sometime rupture. The horse then dies from internal bleeding that can not be stopped.

Occasionally these worms can cause a vessel to be completely plugged from clots of blood that become free floating chunks. When this happens, death is caused from the tissue or organ that cannot receive blood. * It is believed that the

majority of **abid diniih** results from the disturbance of the blood stream by the larvae of these worms.

Ascarids

 The ascarid or common roundworm lives in the small intestine of the horse. They can reach the length of 15 inches and reach the diameter of a lead pencil. Seldom are horses 4 to 5 years of age affected but **ké'áyázhí** can develop a cough become subject to fever, pneumonia

and other effects resulting from ascarid larvae. The intestine can become partially or completely blocked which can produce **abid diniih** resulting in death.

Bots



In the late summer months the bot fly or the nit fly is the horse's No. 1 enemy. The bot fly will deposit eggs on the hair of the horse around its **chin**, **biyaasts,iin**, and on its legs.

These eggs are ready to hatch after about 7 days. Hatching however, does not take place until they are rubbed by the warm, moist **bidaa** of the horse. These embryos of the bot fly may lie on the horse's hair for as long as two months waiting for this to happen.

After the horse rubs its **bidaa**, on the eggs, The bots start burrowing through the **gums**, **awótsín**, **tongue**, **atsoo'**, or other close parts. They move towards their home in the horse's stomach. Mature bots are very plump and are about three-quarters of an inch in length.

After 8 to 11 months of living at the expense of the horse, the bot worms are passed in the droppings. Upon reaching the outside world the bot worm undergoes a transformation and again become a bot fly. The cycle is then repeated.

Pinworms

This is a parasite that is often seen around the rectum and in the droppings of the horse. These tiny worms cause a great deal of irritation and make the horse want to rub **its tail**, **bitsee'**. This can lead to **atsee'** hair loss and spoil the looks and actions of attractive horses.

Coat and Coat Markings

The horse's body is covered by a coat of hair. A healthy glowing coat gives a beautiful appearance. A thick winter coat grows every autumn and is shed every spring. Horses never shed the hair of the **mane**, **atsiigha'**, or **atsee'**. The horse has **thin skin**, **bikágí átt'áá'í**, and its hair grows in even lengths except for the long coarse hairs of the **atsiigha'** and the **atsee'**.



If the **atsiigha'** or **atsee'** becomes too thick, some people pull out some of the horse's hair to make it look better. Pulling the hair does not hurt because the animal has no nerves at the roots of its hair. However if a horse's whole tail is cut short this is very painful to the horse, because the tail bone has been severed. Please don't do this.



A horse uses its **atsee'** to brush off insects and therefore a long tail is

beneficial to the horse.



A horse also has special muscles for twitching its skin, **híí' bikágí**, to get rid of insects.

The fetlock, **biké'il**, above the **híí' behéshgaan** is so named because of the tuft of hairs on its rear surface. These hairs are more developed in the draft breeds and are called feathers.



Sweat glands, **akááz táziil híínígíí**, on the surface of the horse's body help the animal stay cool.

How Are Horses Measured?



Horse raisers, **híí' neinił'ą'í** measure the height of a horse in hands, from the ground to the highest point of the withers, **báásdzita'**, (*ridge between the shoulder bones*)



A hand equals 4 inches, the average width of a man's hand. If a horse is said to stand 14.2 hands, that means it is 58 in. high.

A PONY stands 10 to 14.2 hands (approximately 100-150 cm) and weighs 300 to 850 lb (135-380 kg).

A LIGHT HORSE stands 14.2 to 17 hands (147-175 cm) and weighs 800 to 1,300 lb (360-590 kg).

A DRAFT HORSE stands 15.2 to 19 hands (160-190 cm) and weighs 1,500 to 2,600 lb (700-1200 k)

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9. "**The Bottom of Horses Hoof**" Illustration by Noel Sickles taken from the 1988 Edition of the World Book Encyclopedia page 335
10. "**The Foot of a Horse** " taken from the 1988 Edition of the World Book Encyclopedia Illustrated by Noel Sickles and Patricia Wynne page 336
11. "**The Body of a Horse**" Adapted from a drawing by Paul Brown from the Horse @ 1943 used with permission of Charles Scribner's Sons. Also used in World Book Encyclopedia 1988 Edition page 335.
12. "**The Skeleton of a Horse**" Illustration by Noel Sickles and Patricia J. Wynne from the World Book Encyclopedia 1988 Edition page 336.



= thematic unit ties in with: Mathematics, biology, language, culture, art, reading.

Possible Questions for Consideration:

1. What type of food does a horse eat? How do we classify this? Omnivore, Herbivore, or Carnivore?
2. The horse is a large animal. Why do you think they become so easily frightened?
3. Why do horses need salt in their diet?
4. Do humans require salt for the same reasons? How about other animals? Why does an animal like to lick your skin, especially if you are sweating?
5. Can you tell how a horse is feeling by its actions? Give an example?
6. Are horses very intelligent?
7. What other animal has larger eyes than a horse?
8. Does the horse move its eyes independently or together?
9. How much food should a working horse have to eat?
10. What is a gait? How many gaits does a horse have?
11. What is colic? What is most common reason for colic?
12. How many teeth does a male horse have? How many does a female have?
13. What is the frog on a horse?
14. Does a horse have feeling in its mane or its tail? Do other animals have feeling in their tails? Is it OK to cut an animal tail off?

15. Are horses very intelligent?
16. Can a horse remember something that happened to it?
17. How do you teach a horse to do something?
18. Some people put shoes on their horses. Are these like the shoes that you wear?
19. What is a gestation period?
20. How many times can a mare have a baby?
21. What is a newborn horse called?
22. What is a baby male horse called?
23. What is a baby female horse called?
24. How does a horse use its tail?
25. When a horse twitches its skin, what is it doing?
26. What is the horse's chief weapon for defense?
27. When a horse's teeth grow unevenly and it can no longer chew, what can be done to help it?
28. How do you tell when a horse is aged?
29. What is a cud-chewing animal?
30. Do horses need to be fed every day? How often?
31. Why should hay and grain be placed in a rack or manger?
32. What happens if a horse eats too many oats?
33. What are cleats on some horse shoes used for? Are cleats used in

peoples shoes?

34.How can you prevent a horse from getting colic?

35. Why should horses be vaccinated? What is a vaccination?

36.What do sweat glands do? Do horses sweat?

37.How did some horse owners measure horses? Do they still do this? Why?

38. What does a hand equal in inches?

Vocabulary words for **What Makes A Horse, A Horse?** English with Navajo words added for cultural enrichment. Please find the definition and use each word in a sentence.

1. What Makes a horse, a horse?	Ha'át'íí éí kǫ́' yee kǫ́' nilí?	page 1
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3. bit	azéé' si'ání	page 5
4. iron horse	kó' na'ałbaasii	page 5
5. automobile	chidí	page 5
6. circus	da'níl'í	page 5
7. rodeos	na'ahóóhai	page 5
8. carnivals	hoł nída'íbaań	page 5
9. parades	ałkéé' da'íneéh	page 5
10. horse shows	kǫ́' daníl'í	page 5
11. its eye	bináá	page 5
12. nostrils	áchííshstah	page 5
13. smell	yilchin	page 5
14. its ears	bijaa'	page 5
15. its teeth	biwóó	page 5
16. herbivores	ch'il yilchozhii	page 5
17. grain	kǫ́' bidáá'	page 5

18. plants	ch'il	page 5
19. meat	atsi'	page 5
20. neck	ak'os	page 5
21. wide-set eyes	bináá' ał'ąą sinil	page 6
22. two eyes	naaki bináá'	page 6
23. one eye	t'áá łá'í bináá'	page 6
24. shy	naalyiz	page 6
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26. pointed ears	bijaa' hááheets'óóz	page 6
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28. sense of smell	yilchin	page 6
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30. sense of touch	yee ákonízin	page 6
31. light horses	łíí' ászóólígíí	page 6
32. thin skin	bikágí áłt'ąą'í	page 6
33. heavy horses	łídííl	page 6
34. lung	ajéiyilzólii	page 7
35. gaits	dooltał	page 7
36. male horse	łíí' ká'ii	page 7
37. mare	łíísa'ii	page 7

38. foal	lé'éyázhí	page 7
39. lips	bidaa	page 7
40. grasping	jiisiłgo	page 7
41. grass	tł'oh	page 8
42. hay	tł'oh ałch'ı' be'estł'ónígíí	page 8
43. gathers	ałhą'ájílééh	page 8
44. it bites	adiłhash	page 8
45. chew	yi'aał	page 8
46. cud	ná'át'aał	page 8
47. forage	nahodidá	page 8
48. cud chewing	ná'át'aał	page 8
49. its stomach	bibid	page 8
50. enormous	ayóí áníldíł	page 8
51. rack	dah na'aztą	page 8
52. manger	biyi' baná'áljoł	page 8
53. sand	séí	page 8
54. sand colic	séí abid diniih	page 8
55. moldy hay	tł'oh dláád silı'ígíí	page 9
56. dusty hay	tł'oh łeezh bitah	page 9

57. sticks	tsin	page 9
58. thorns	tsin bitsah	page 9
59. rubbish	doo aaníi da	page 9
60. oats	tsaaskaal	page 9
61. bran	áłástsii baa hanooldee'	page 9
62. clean water	tó doo bááh chinígíí	page 9
63. water	tó	page 9
64. salt	t'áá áshííhii	page 9
65. sweat	átásiil	page 9
66. box of salt	áshííh sits'aa' bee	page 9
67. solid salt (salt block)	áshííh dik'ánígíí	page 9
68. (horse) shoes	híí' bikee	page 9
69. cleats for horse shoes	híí' bikee doo yee diteehígíí	page 9
70. horse's hoofs	híí' behéshgaan	page 11
71. stallion	híí'chogii	page 12
72. castrated male	híí kạ'ii	page 12
73. colt	lé'éyázhí biká'ígíí	page 12
74. filly	híí'tsa'ii yázhí	page 12
75. gestation	yiltsá	page 12
76. horse owners	bihíí' ílínígíí	page 13

77. vaccinated	naafniih bich'ááh baa'o'ootsih	page 13
78. colic	abid diniih	page 15
79. liver	azid	page 15
80. lungs	ajéiyilzólíi	page 15
81 its chin	biyaasts,iin	page 17
82 gums	awótsín	page 17
83. tongue	atsoo'	page 17
84. tail	atsee'	page 17
85. its tail	bitsee'	page 17
86. mane	atsiigha'	page 17
87 it's skin	ḥíí' bikágí	page 18
88. fetlock	biké'il	page 18
89. sweat glands	akááz táziil ífínígíí	page 18
90. withers	báásdzita'	page 18
91. horse raisers	ḥíí' neiniłt'ą'í	page 18



Dear Parent,

We are currently working on a thematic unit dealing with The RUFF Program in attempting to help integrate learning by providing you with discussion topics for home and school transfer.

1. Did you know that horses require salt in their diet? Do humans require salt? Why do your tears taste salty?
2. When we say a horse has a frog, do you think we mean it is a pet toad or what?
3. Is there any evidence that a horse is smart enough to “think”?
4. Would a horse be a practical pet?

Please attempt to communicate with your child concerning these issues this week. If there are any questions, please do not hesitate to call me.

Sincerely,

Your child's teacher

FOR MORE **R.U.F.F. "MISSIONS"**

contact:

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