

National Museum of Racing and Hall of Fame

3rd Grade STEM Programming



Produced by the Education Department of the National Museum
of Racing and Hall of Fame - 2019
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Additional Credits



This STEM Packet would not have been possible without the help and support of the Saratoga Springs City School District. The National Museum of Racing and Hall of Fame extends a sincere thank you to the following individuals who lent their time, knowledge and expertise to ensure this project was a success.

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The National Museum of Racing and Hall of Fame would also like to thank long time education consultants Margaret Kuenzel, Charles Kuenzel and Dave Patterson for their assistance with the creation of this STEM programming.

Table of Contents

- Introduction2
 - NYS Science Learning Standards Lesson Overview
3LS1-1, 3LS3-1..... 3
 - A Day in the Life of a Thoroughbred
Racehorse.....4
 - A Day in the Life of a 3rd Grader in Saratoga.....5
 - Life Cycle of a Thoroughbred.....6
 - Life Cycle of a Human.....7
 - NYS Science Learning Standards Lesson Overview
3LS4-2, 3LS2-1.....8
 - Inherited Traits Chart.....9
 - Thoroughbred Colors & Markings 10-11
 - Punnett Square Activities.....12-13
 - Horse Anatomy (Conformation).....14-17
 - Horse Nutrition.....18-21
 - Energy Cycles.....22-23
 - Career Paths (CTE Standards).....24-25
 - Additional Teacher Information.....26-27
 - Additional Resources.....28
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Introduction

Welcome to the National Museum of Racing and Hall of Fame's 3rd grade STEM programming packet. Inside this packet you will find horse racing themed lessons and activities that follow New York State science learning standards for grade 3.

The activity sheets included in this packet can be used as class work, homework, or supplemental worksheets. Our goal is to provide additional resources for teachers in Saratoga Springs that adhere to New York State standards while introducing students to the sport of Thoroughbred racing.



Mission Statement:

The mission of the National Museum of Racing and Hall of Fame is to preserve and promote the history of Thoroughbred racing in America and honor the sport's most accomplished participants in the Official National Thoroughbred Racing Hall of Fame.



National Museum of Racing and Hall of Fame

Third Grade Lesson 3LS1-1, 3LS3-1,

- Life Cycle of a Horse
 - In Class Activity:
 - A Day in the Life of a Thoroughbred Racehorse handout
 - Discuss the different aspects of a racehorse's life throughout the day
 - Fill-in worksheet
 - How are our daily lives different from the daily lives of horses?
How are they similar?
 - Life Cycle handout - discuss the stages in a Thoroughbred's life
 - Videos available on Foalpatrol.com: *Social Filly*, *First Gallops*
 - Compare horse life cycle to that of humans
 - Baby, child, teenager, adult, senior
 - How are the life cycles similar? How are they different?
 - Activity: Create life cycle chart for humans
 - Students can fill in descriptions for each stage in a human's life

A Day in the Life of a Thoroughbred Racehorse

4 AM **Wake up and Eat**
Racehorses need a substantial meal before training so they have enough energy for a tough workout.



6 AM **Time to Train**
Each racehorse has a training regiment developed specifically for them. This training helps them prepare to race against other Thoroughbreds.



8 AM **Cool Down**
After exercising, horses must cool down properly in order to avoid injuries. A hotwalker is the person responsible for walking a horse after their training has finished for the day.



8:30 AM **Bath Time**
After a racehorse is finished cooling down, it's time for a bath! Horses need to bathe after exercising in order to keep their coat and skin clean and healthy.



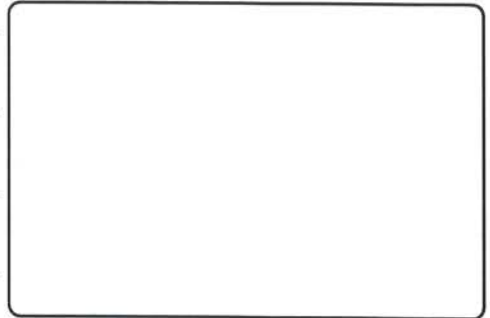
9 AM **Grazing in the Paddock**
After a long morning of training, racehorses relax in the paddock.



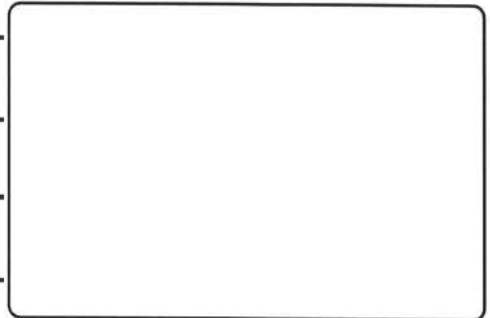
A Day in the Life of a 3rd Grader in Saratoga

What are you doing at each time listed below? Write your answers on the lines provided. In the box draw a picture of what you wrote.

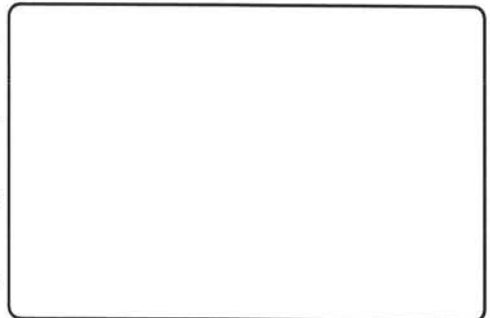
4 AM



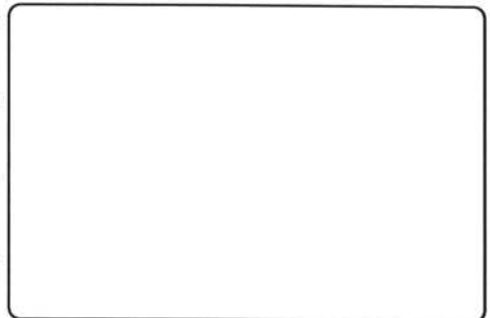
6 AM



8 AM



8:30 AM



9 AM



Foal



Baby horses are called foals. The official birthday of all Thoroughbreds is January 1st.

Mare & Stallion



A foal's mother is called a mare and its father is a stallion. Mares and stallions are bred to create more racehorses.

Weanling



Foals live with their mothers until they are about 6 months old. Until this time their main source of nutrition is their mother's milk.

2-Year-Old



At 2 years old Thoroughbreds start racing. When their racing careers end many Thoroughbreds retire to farms.

Life Cycle of a Thoroughbred

Yearling

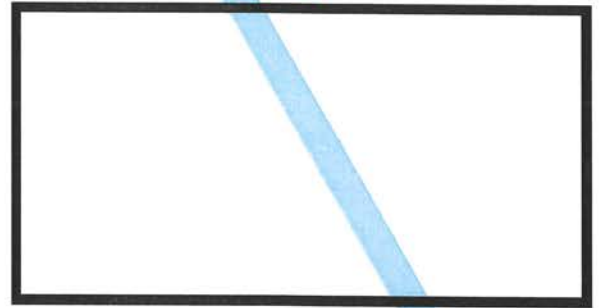
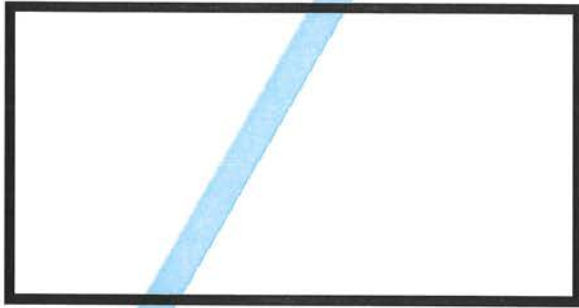


A yearling is a one-year-old horse. A male yearling is a colt, and a female yearling is a filly.

Baby



Senior



Child

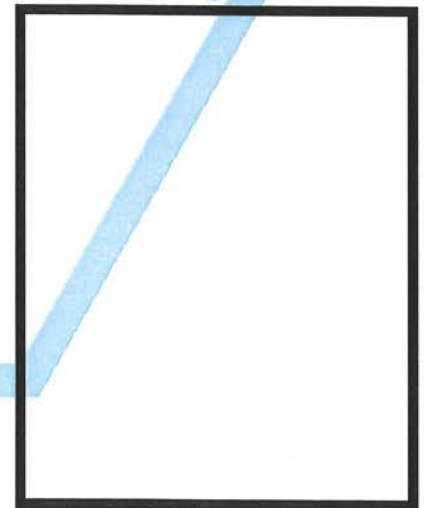
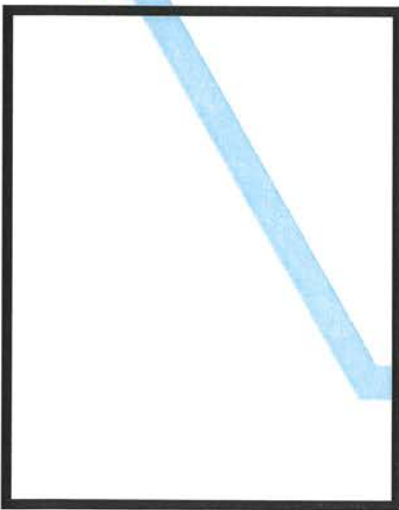


Adult



Life Cycle of a Human

Teenager





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Third Grade Lesson 3LS4-2, 3LS2-1

- 3rd Grade Science
- Hereditary/Inherited Traits Lesson
 - In Class Activity:
 - Break students into groups to observe and record on the Inherited Traits Chart the following traits: earlobes (attached/detached), eye color, hair color and tongue rolling.
 - In Class Discussion:
 - These features come from your parents. Animals also have features that come from their parents.
 - With Color & Markings handout discuss how types of traits/features appear in Thoroughbred horses as well.
 - Video available on foalpatrol.com: *Color Change*
 - Learn the colors of horses and the types of marking that appear on their faces.
 - In Class Activity:
 - Identify horses based on their color
 - Discuss likeness to hair color in children and their parents
 - Activities following Punnett square lessons
 - Explore the activity sheets regarding coat color in horses and eye color in humans.
 - Opportunity to further discuss genetics and how certain traits are biological.



With the help of your group, find out which traits you have! Write down your answers in the box. Fill in the other boxes with the answers for each member of your group.

Inherited Traits Chart

Are your earlobes attached or detached?					
What is your eye color?					
What is your hair color?					
Can you roll your tongue?					

Thoroughbred Colors



Black



Bay
(Brown)



Chestnut



White



Gray

Thoroughbred Markings



Star



Stripe



Snip



Blaze

Match the Colors to the Correct Horse!



Black



Bay
(Brown)



Chestnut



White



Gray



Horse Color Punnett Square

Based on the information below, create a Punnett square for the coat color of the foal of Gracie Cakes and Roberto Swerve.

Black is dominant and Chestnut is recessive

Black coat = B

Chestnut coat = b

Gracie Cakes



Sire (Gracie's Dad) : Chestnut
Dam (Gracie's Mom) : Chestnut

Roberto Swerve



Sire (Roberto's Dad) : Black
Dam (Roberto's Mom) : Chestnut

Eye Color Punnett Square

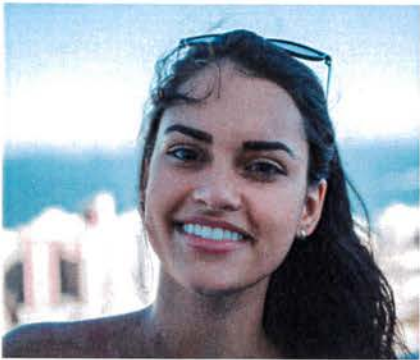
Based on the information below, create a Punnett square for the eye color of the child of Marie and John.

Brown is dominant and Blue is recessive

Brown Eyes = B

Blue Eyes = b

Marie



Marie's Mom : Brown Eyes
Marie's Dad : Blue Eyes

John



John's Mom: Blue Eyes
John's Dad : Blue Eyes

Anatomy of a Thoroughbred

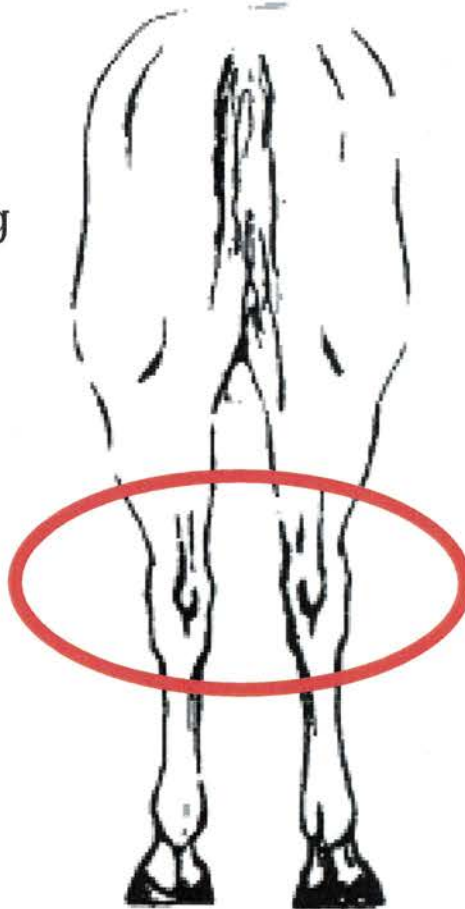


Bird Town
Photograph courtesy
of Gainesway Farm

A Horse's Hock

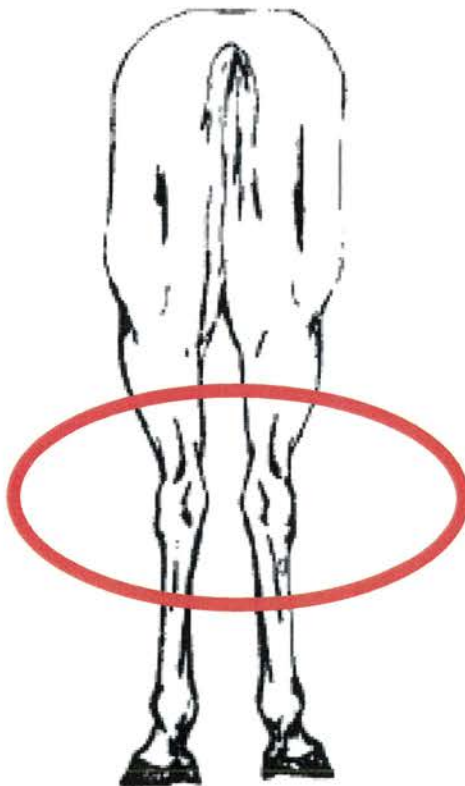
A horse's hock is similar to the ankle joint on a human skeleton. The hock is essential for propelling a horse forward.

Since the hock is essential to a speedy and healthy racehorse, an owner must make sure to purchase a horse with sturdy and properly aligned hocks.

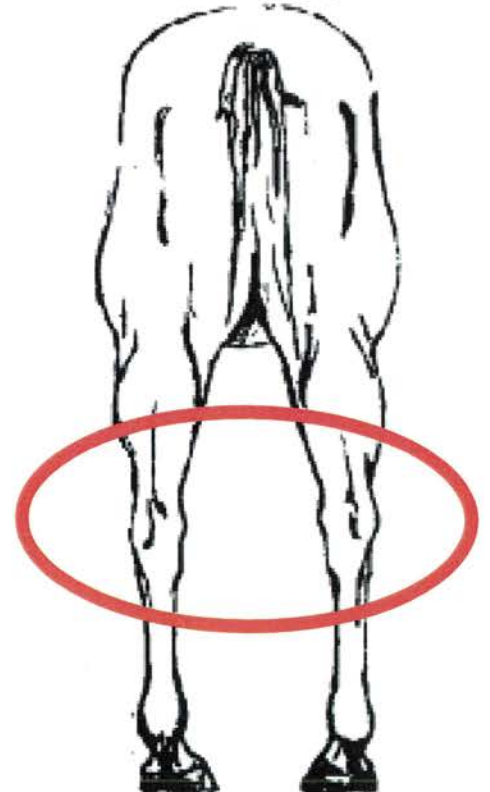


Ideal

Cow-Hocked



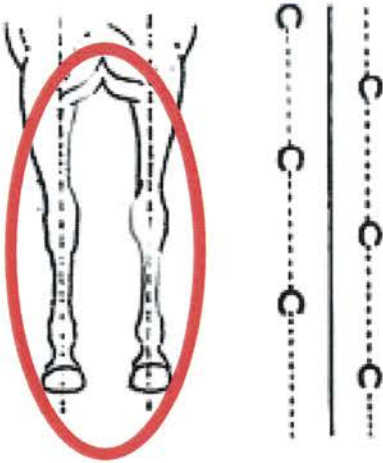
Bow-Legged



Take a close look at the three examples of hocks pictured here. Why is the one above "ideal" compared to the others?

Front Legs

Long, straight front legs are essential for a Thoroughbred to maximize energy and efficiency while running on the track.

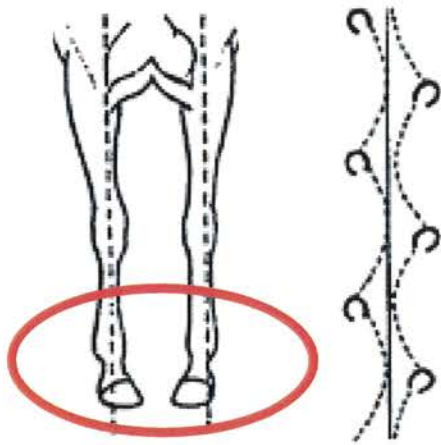


Ideal

To the left is an example of an ideal set of front legs for a Thoroughbred. Next to the legs is the path these legs create. The easy, straightforward motion of the path demonstrates the horse isn't wasting energy.

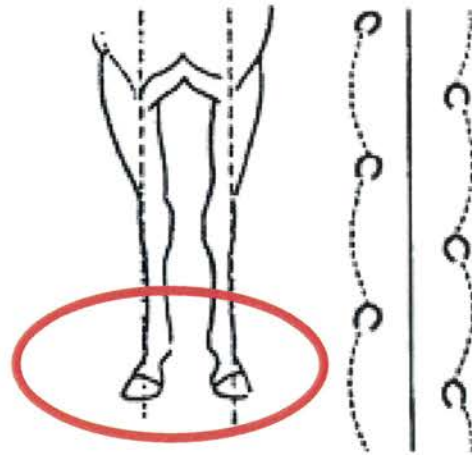
Pigeon-toed

Below is an example of a "pigeon-toed" horse, meaning the hooves are pointed inward. The tracks show the path this horse creates when it walks forward.



Splay-footed

Below is an example of a "splay-footed" horse, meaning the hooves are pointed outward. The tracks show the path this horse creates while moving forward.



Why do you think a "pigeon-toed" or "splay-footed" horse uses more energy moving forward than the "ideal" horse?

Horse's Head



Ideal Head

When racing, the head of a Thoroughbred racehorse is equally important as its legs. This is because the ideal head allows for a clear line of sight and balances the horse as it moves forward. The head must be proportionally sized to the rest of the horse's body in order to maintain proper balance.

Why do you think it's important for a Thoroughbred racehorse to have excellent balance?



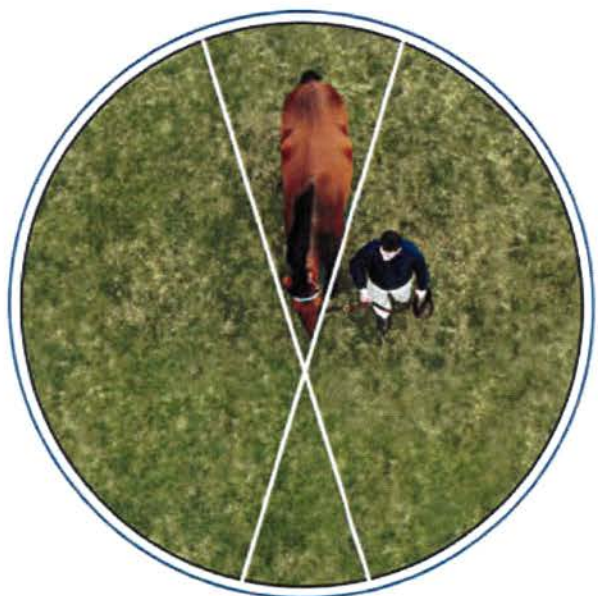
A horse with smaller, close-set eyes will have a limited field of vision compared to a horse with larger, proportionally correct eyes. It is important for a racehorse to have a clear field of vision while racing on the track.

Standard field of vision for a horse



A horse with a limited field of vision may also be quicker to panic if unsure about their surroundings. It is important for a horse to be calm and centered on the track, so a horse with limited eyesight would not make an ideal racehorse.

Area covered by the horse's right eye



Area covered by the horse's left eye

Area covered by both the horse's eyes

Photo courtesy of Godolphin Racing

WHAT DO HORSES EAT?



FROM BIRTH TO SIX MONTHS OF AGE, FOALS DRINK THEIR MOTHER'S MILK.



FOLLOWING THAT, HORSES EAT A BALANCED DIET OF GRASS, HAY, GRAIN AND WATER.





Horse Nutrition

A balanced diet for horses should consist of grass or hay, water, grain mix, salt and occasional treats.

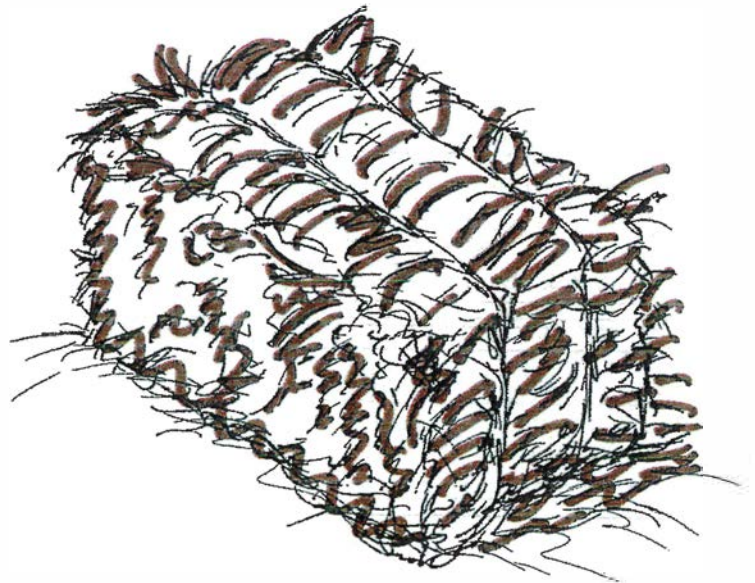
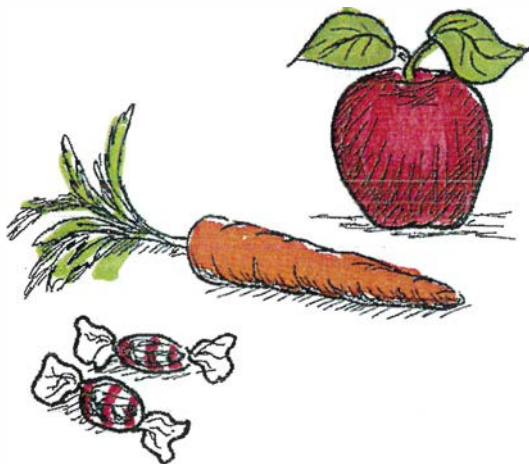
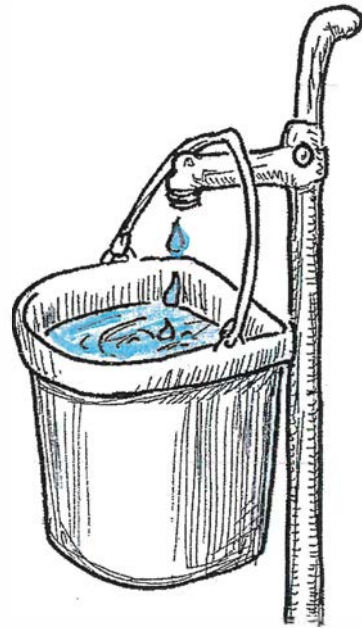
Fresh grass or hay should make up a majority of a horse's diet. This has high fiber and is full of protein, vitamins and minerals. Most horses can lead healthy lives on grass or hay alone. A full-grown horse (1,000 pounds) will eat 15-20 pounds of hay each day.

Water is a very important part of a horse's diet. Typically, a horse will drink 10-12 gallons of water a day.

A blend of grains and feed supplement can be added to the diet as the horse's training, work and activity is increased. This will help with muscle and bone development.

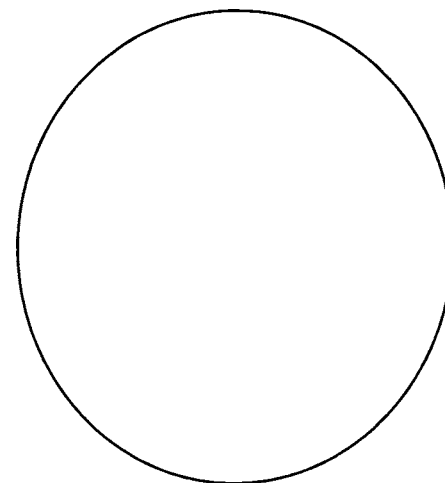
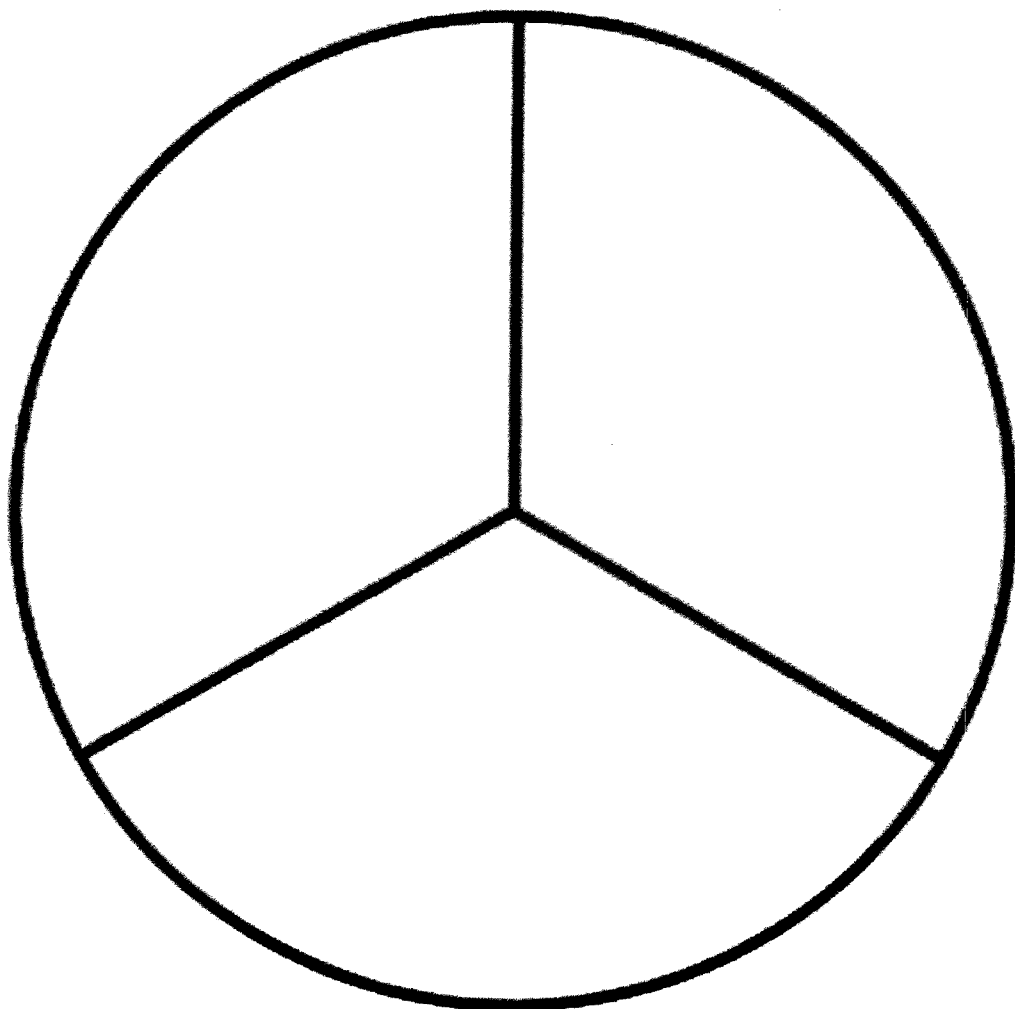
Salt blocks offer horses extra salt and minerals when they need it. The blocks are left out for horses to lick when they want.

Treats are a special reward for good behavior. Carrots and apples are typical but shouldn't be a consistent part of a horse's diet.



Horse Nutrition

Place the horse feeds in the appropriate area of the plate.



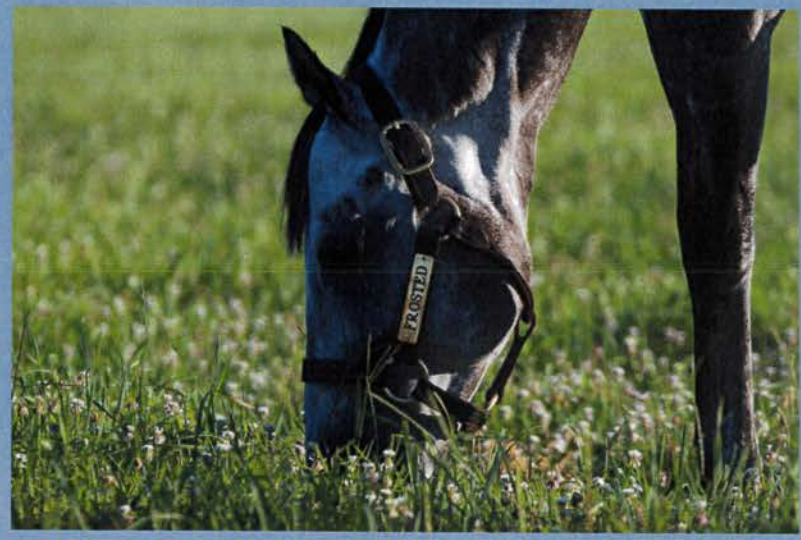


ENERGY



Air & Water
create plant
matter

PHOTOSYNTHESIS



Horses use energy for:



Motion

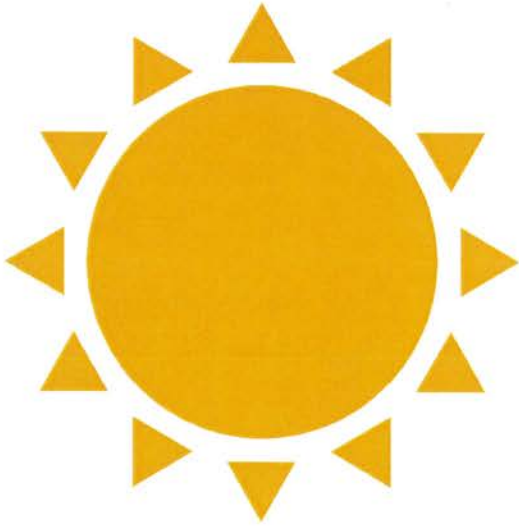


Repair



Growth





In your own words, explain how energy from the sun provides energy for a racehorse.

What do horses use energy for?



Career Paths in Thoroughbred Racing

CTE_ Cdos Standard 1: Career Development/ Elementary

Farm Manager – Farm managers oversee the daily operations of the farm. They make sure the horses on the farm are fed and cared for properly.

Veterinarian – A doctor for animals, veterinarians treat and heal diseased or injured animals. A veterinarian makes sure racehorses are healthy and capable of racing.

Owner – The person who purchased the Thoroughbred racehorses. The owner pays for everything the horses need, from food to veterinarian visits! An owner can be a single person, or a group of people who purchased a horse together.

Breeder – A person who raises and sells horses. A breeder is very knowledgeable about ideal horse characteristics and tries to create the best racehorses with these qualities.

Farrier – The person who is responsible for taking care of a racehorse's hooves. This involves fitting them with shoes and trimming and maintaining their hooves.

Jockey – An elite athlete who rides Thoroughbred horses during a race. A jockey can ride in multiple races a day, for multiple trainers.

Sports Agent – Just like other professional athletes, jockeys have sports agents who assist them with riding contracts and make sure jockeys ride the best possible horses.



Exercise Rider – This person is responsible for exercising a racehorse every morning on the track. They receive instructions from a trainer as to how they should exercise each horse.

Hotwalker – A hotwalker walks a horse around an area after the horse has finished exercising. This is done to ensure the horse is cooled down properly and helps avoid injury.

Groom – A groom is responsible for the day-to-day care of a racehorse. This includes feeding, bathing, and generally watching out for the well-being of the horses in their care. Grooms pay special attention to their horses, often being the first to alert a veterinarian if something seems wrong with a horse's behavior or physical health.

Trainer – Just like sports teams have coaches, racehorses have trainers who are responsible for their day-to-day training regimens. Trainers usually begin as assistant trainers, learning under experienced trainers first. A trainer decides what type of food a horse eats, its feeding schedule, its exercise routine and its grooming regimen. A trainer must be extremely knowledgeable in order to perform these duties well for every horse in their care.



Additional Teacher Information

- The genetics of Thoroughbred coat colors
 - Black is dominant over Chestnut.
 - The bay color is a result of the agouti allele. The agouti allele acts on black colored hairs, lightening them on the body but NOT on the mane, tail and legs.
 - Grey horses are born with a coat color, but they have a gene which turns the hair grey. This is comparable to how a human's hair greys with age.
 - White Thoroughbreds are VERY rare.
 - Only 149 of the 2.1 million Thoroughbreds registered with the Jockey Club are white.
- Human eye color genetics
 - Brown is dominant over both green and blue.
 - Green is dominant over blue.
 - Blue is always recessive.
- Thoroughbred anatomy
 - Horses have 205 bones that make up their skeletons.
 - A typical adult horse has 40 permanent teeth.
 - The neck is the most flexible part of a horse's spine.
 - Horses don't have collarbones. The front legs are not attached to the rest of the skeleton.
 - A horse's hind quarters can propel it up to 45 miles an hour.
- Conformation
 - Conformation refers to the overall shape and structure of a horse. General balance of the horse in regard to the body's proportions is also important in conformation.
 - Different parts of the horse have an "ideal" shape or development. How a horse's body develops as it grows determines if it has a good or bad conformation.
 - Please show the conformation video provided by Old Tavern Farm to your students. This video discusses the importance of conformation using a real racehorse as an example.



- FoalPatrol.com videos available
 - Nutrition - <https://vimeo.com/323819512>
 - Bathing - <https://vimeo.com/360315064>
 - Conformation - <https://vimeo.com/362558578>
 - Foal Coat coloring change - <https://vimeo.com/341610509>
 - Growth and Development Evaluation for Foal - <https://vimeo.com/331067410>
 - Foal nursing & eating grass - <https://vimeo.com/325718627>
 - Foal learns to stand - <https://vimeo.com/325206030>
 - Foal outside with mare - <https://vimeo.com/324323680>
 - A Day in the Life of Frosted (a retired racehorse) - <https://vimeo.com/321299346>
 - Foal and mother bonding after birth - <https://vimeo.com/321066649>
 - Foal and mother 24 hours after birth - <https://vimeo.com/321066649>

Additional Resources



<https://www.foalpatrol.com/>



<https://www.godolphinkids.co.uk/>



<https://www.jockeyclub.com>



<https://www.americasbesttracing.net>

EQUIBASE

<https://www.equibase.com>

BLOODHORSE

<https://www.bloodhorse.com>



<https://www.horseloversmath.com>