

Junior's Family Tree

Inherited Traits of Animals



Objectives

1. Students will understand genetic make-up is received from both parents and is expressed by traits that can be predicted.
2. Students will acquire information by listening, observing and using community resources.
3. Students will practice fine motor coordination.

Materials

- ☑ "Meet Junior: A Quart of Paint" skit (one for each student)
- ☑ "Trait Summary for Junior's Relatives" (one for each student, one for each team)
- ☑ "Horse Template" (one for each team)
- ☑ "Family Tree Horse Template" (one for each student, one for each team, one overhead master)
- ☑ Crayons (this activity uses many red, brown and black colors)
- ☑ One large sheet of poster board or butcher paper

Background

Throughout history, many animals and plants have been bred to perpetuate certain traits. Horses, cows, tomatoes, corn and strawberries are just a few examples of living things that have been selectively bred by humans. Breeders of horses are very aware of horse family traits. The horse traits they breed for can be visual, such as hair coloring and muscularity, or intangible, such as temperament and health characteristics.

Traits are passed down through genes in cells. Genes are made of DNA molecules. Each parent contributes one-half of the genetic make-up of an offspring. Your students will learn more about cells, chromosomes and the details of heredity as they learn about the cell.

This lesson includes an interview with a horse breeder and encourages students to comprehend that certain traits are passed on from one generation to the next. The students will trace the family history of a horse named Junior and learn why he has the characteristics he does. Feel free to extend this activity to the students themselves by having them observe family traits of their own.

Activity Procedures

1. Choose four students (two girls and two boys) to play the roles in the skit, *Meet Junior: A Quart of Paint*. Have them read and act

Time: Two 40-minute sessions

Grade: Fifth

Core Standard:

V- Students will understand that traits are passed from the parent organisms to their offspring, and that sometimes the offspring may possess variations of these traits that may help or hinder survival in a given environment.

Objective 1- Using supporting evidence, show that traits are transferred from a parent organism.

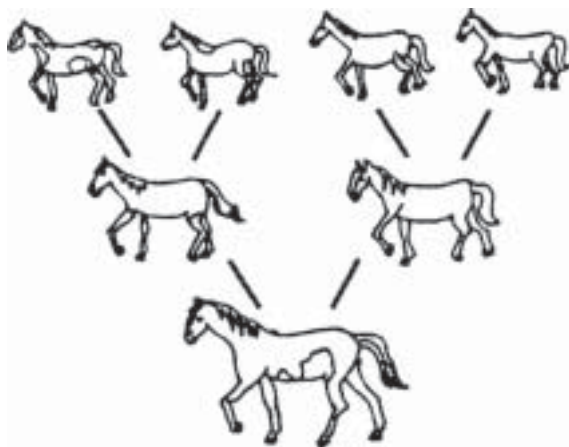


out the skit.

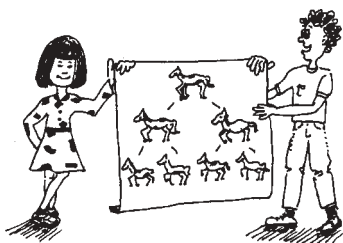
2. Give each student a copy of the skit and a "Trait Summary for Junior's Relatives" worksheet. Allow each student to read the skit and fill out his/her summary sheet individually.

Teaching Tip: For more directed student instruction, copy the trait summary worksheet and place asterisks in the boxes for characteristics for which they will need to use deductive reasoning. (See "Trait Summary Key") This activity is excellent for enhancing reading comprehension.

3. After students have completed their summaries, give each student a copy of the "Family Tree Horse Template." Have them color this sheet according to how they filled out the information in the summary.
4. When each student has completed his/her family tree, divide the students into seven groups. Give each team a "Horse Template." Assign each group a different member of Junior's family. The group must come to consensus on how to color their family member using their previously colored family trees. They may need to refer back to the skit for verification.
5. Direct the groups to label their horses with the horses' name, its relationship to Junior, and any invisible traits.



6. Show an overhead of the family tree template to discuss its organization as shown at right.
7. Post the large sheet of butcher or chart paper in an accessible location. Have each student team place their horse on the paper in the appropriate location to form a family tree. Ask the team to describe their horse's traits. Have students draw lines between the horses as appropriate to show lines of descent between generations.



8. As a class, discuss the similarities and differences in traits among the family members and how each trait may have been inherited. Point out to students that traits are inherited from both parents. However, these traits are not always expressed in every generation (such as the blue eyes that Junior and his maternal grandmother have).
9. Additional questions for discussion:

Questions for Investigation or Assessment:

1. List some careers (or jobs in your community) that might be influenced by understanding the heritable traits of animals. (Examples might include: animal breeders, county extension agents, veterinarians, chemists, farmers and ranchers)

- a. What traits were unique to Junior?
- b. If another animal were chosen would you be able to determine from which parent its traits may have been inherited?
How would you do it?
- c. Can you name other inherited traits that may not be visible?
- d. From which relatives did Junior get the black on his tail and mane?
- e. From which relatives did Junior get his white face?
- f. From which relatives did Junior get his temperament?

Extensions/Adaptations/Integration

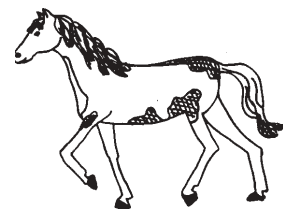
1. Have the students do the activity individually rather than in groups.
2. Discuss that human traits are passed on from one generation to the next. Have students give examples of traits they have inherited from their ancestors. Remember that inherited traits are not always visual but may include traits such as health and temperament. Discuss how family members feel about the traits they have inherited. Have their feelings about their traits changed over time?

Additional Resources

“Where’d You Get Those Genes”, additional lesson plans from the California Agriculture in the Classroom.

www.agclassroom.org/ca

Teacher Notes:



Meet Junior: A Quart of Paint

Heather, Jose, Zamen, and Kuan are studying heredity in their fifth grade science class. They have been assigned, as a team, to investigate and report on the family traits of an animal one of them owns. They have decided to learn about Kuan's horse, Junior, and have met at her family's ranch.

Kuan: Lots of horses are almost all one color on their face, body, legs and even their mane and tail. Here's my horse, Junior. I like him because he has areas of white that make him unique. What traits do you see that he has?

Zamen: His body is black with white patches and he has white legs.

Kuan: Right. He's called a Paint.

Jose: Junior's tail is white with a black tip and his mane is white with a black forelock, which is the part that hangs down on his forehead.

Heather: His face is all white, but his ears are black.

Kuan: A white face is called a "bald" face on horses.

Zamen: His eyes are blue.

Kuan: One thing that doesn't show just by looking at him is his well-mannered but lively personality.

Jose: Kuan, do you know who Junior's mother and father are?

Kuan: Yes, his mother is right over there. Her name is "Fancy Lady".

Heather: Her body, face and mane are black colored but she has white legs.

Zamen: Her tail is white with a black tip.

Jose: She has brown eyes. What's her personality like, Kuan?

Kuan: She is very gentle.

Heather: Who is Junior's father, Kuan?

Kuan: His father is "Blazing Away". He's in the separate pasture over there. He's a very calm horse.

Jose: Now he's a different color - a light reddish brown.

Kuan: That color is called sorrel.

Jose: His mane and tail are the same color as his body.

Heather: He has a white stripe on his sorrel face that runs between his eyes down to his nose.

Kuan: That white stripe is called a blaze.

Heather: Oh! That's how he got his name!

Zamen: He has brown eyes, just like Junior's mother. That's a surprise, since Junior's eyes are blue.

Kuan: Yes, blue eyes are a trait that appears and disappears in Junior's family tree. His father's mother is "Pretty Gal". She's over there under the tree.

Jose: She's a dark red color with a black mane and tail.

Zamen: Her legs are black except that she looks like she's wearing little white socks. She has brown eyes, too.

Kuan: She's very gentle. But Junior's father's father is a bit wild and difficult to work with. His name is "Daredevil", and he's in the pasture with Junior's father.

Heather: He's sorrel with white socks just on his hind legs.

Zamen: He has brown eyes, too, just like most of the horses in Junior's family tree.

Jose: What about Junior's grandparents on his mother's side?

Kuan: Junior's mother's mother is right over there. Her name is "Spotted Beauty". We liked to ride her when we were younger because she was so gentle.

Jose: She has a black body with white patches and black mane and tail.

Heather: She has a white face and four white legs.

Kuan: "High Stepper" is the father of Junior's mother. He's also very gentle.

Zamen: He's sorrel with four white socks on his lower legs.

Heather: He has brown eyes, too.

Jose: Now that we have all of the information about Junior's family tree, it's time to see if we can figure out who he inherited each of his traits from. I'm really interested in where he got those blue eyes!

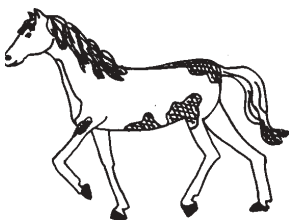
Trait Summary for Junior's Relatives

Key

Note: Traits in parentheses are inferred from the information presented in the skit.

Trait	Junior	Mother	Father
<i>Horse's name</i>	Junior	Fancy Lady	Blazing Away
<i>Body color</i>	Black	Black	Sorrel-light reddish brown
<i>Face color</i>	White, black ears	Black	Sorrel with white blaze
<i>Leg color</i>	White	White	(Sorrel)
<i>Tail color</i>	White, black tip	White, black tip	Sorrel
<i>Mane color</i>	White, black forelock	Black	Sorrel
<i>Eye color</i>	Blue	Brown	Brown
<i>Temperament</i>	Well-mannered and lively	Gentle	Calm

Trait	Father's Mother	Father's Father	Mother's Mother	Mother's Father
<i>Horse's name</i>	Pretty Gal	Daredevil	Spotted Beauty	High Stepper
<i>Body color</i>	Dark Red	Sorrel	Black with white patches	Sorrel
<i>Face color</i>	(Dark Red)	(Sorrel)	White	(Sorrel)
<i>Leg color</i>	Black with four white socks	Sorrel with white socks on hind legs	White	Sorrel with four white socks
<i>Tail color</i>	Black	(Sorrel)	Black	(Sorrel)
<i>Mane color</i>	Black	(Sorrel)	Black	(Sorrel)
<i>Eye color</i>	Brown	Brown	(Blue)	Brown
<i>Temperament</i>	Gentle	Wild	Gentle	Gentle



Trait Summary for Junior's Relatives

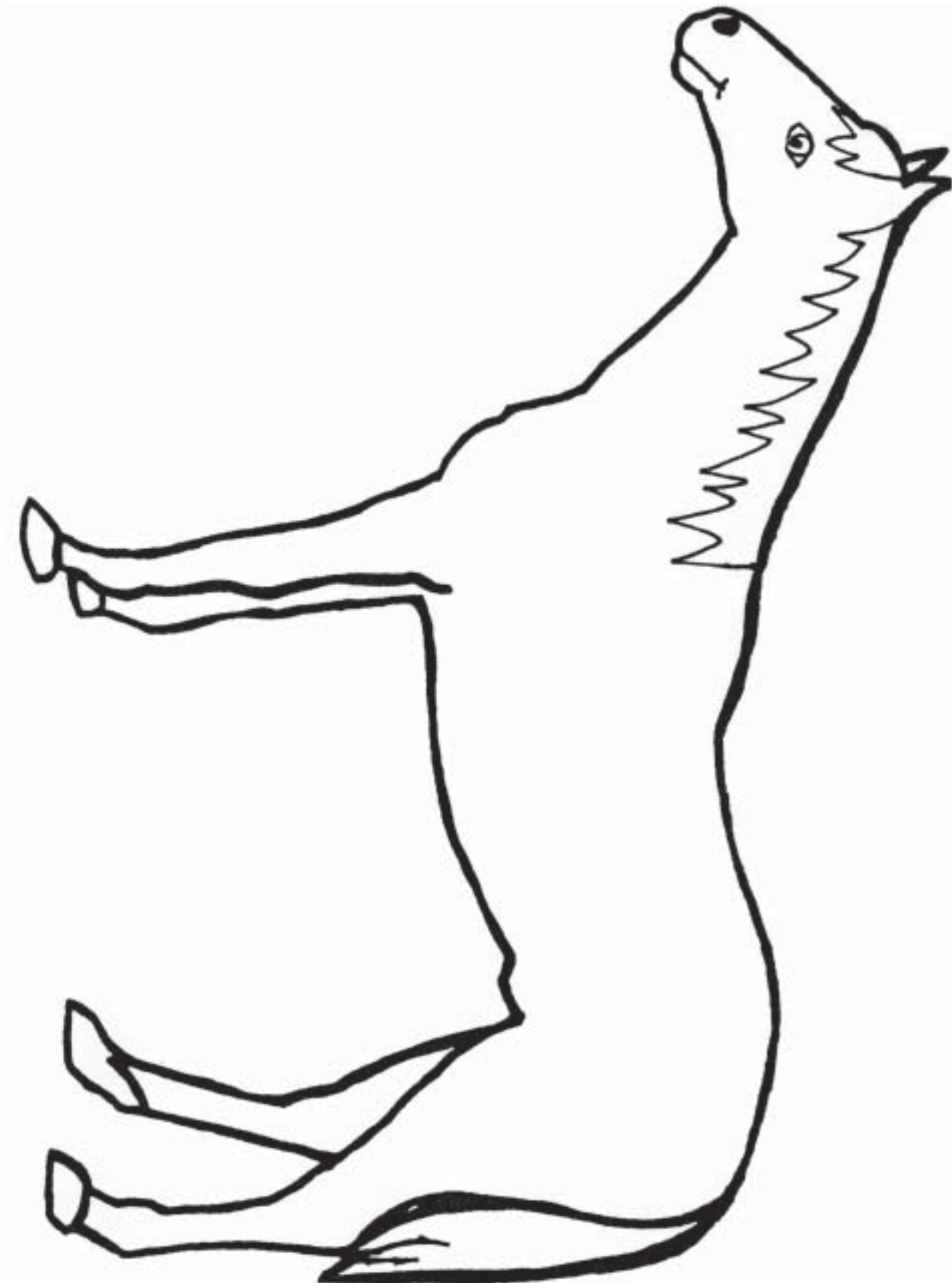
As you listen and read the skit, fill in the charts below with as many facts as you can about the traits of Junior and his relatives.



Trait	Junior	Mother	Father
<i>Horse's name</i>			
<i>Body color</i>			
<i>Face color</i>			
<i>Leg color</i>			
<i>Tail color</i>			
<i>Mane color</i>			
<i>Eye color</i>			
<i>Temperament</i>			

Trait	Father's Mother	Father's Father	Mother's Mother	Mother's Father
<i>Horse's name</i>				
<i>Body color</i>				
<i>Face color</i>				
<i>Leg color</i>				
<i>Tail color</i>				
<i>Mane color</i>				
<i>Eye color</i>				
<i>Temperament</i>				

Horse Template



Family Tree Horse Template

