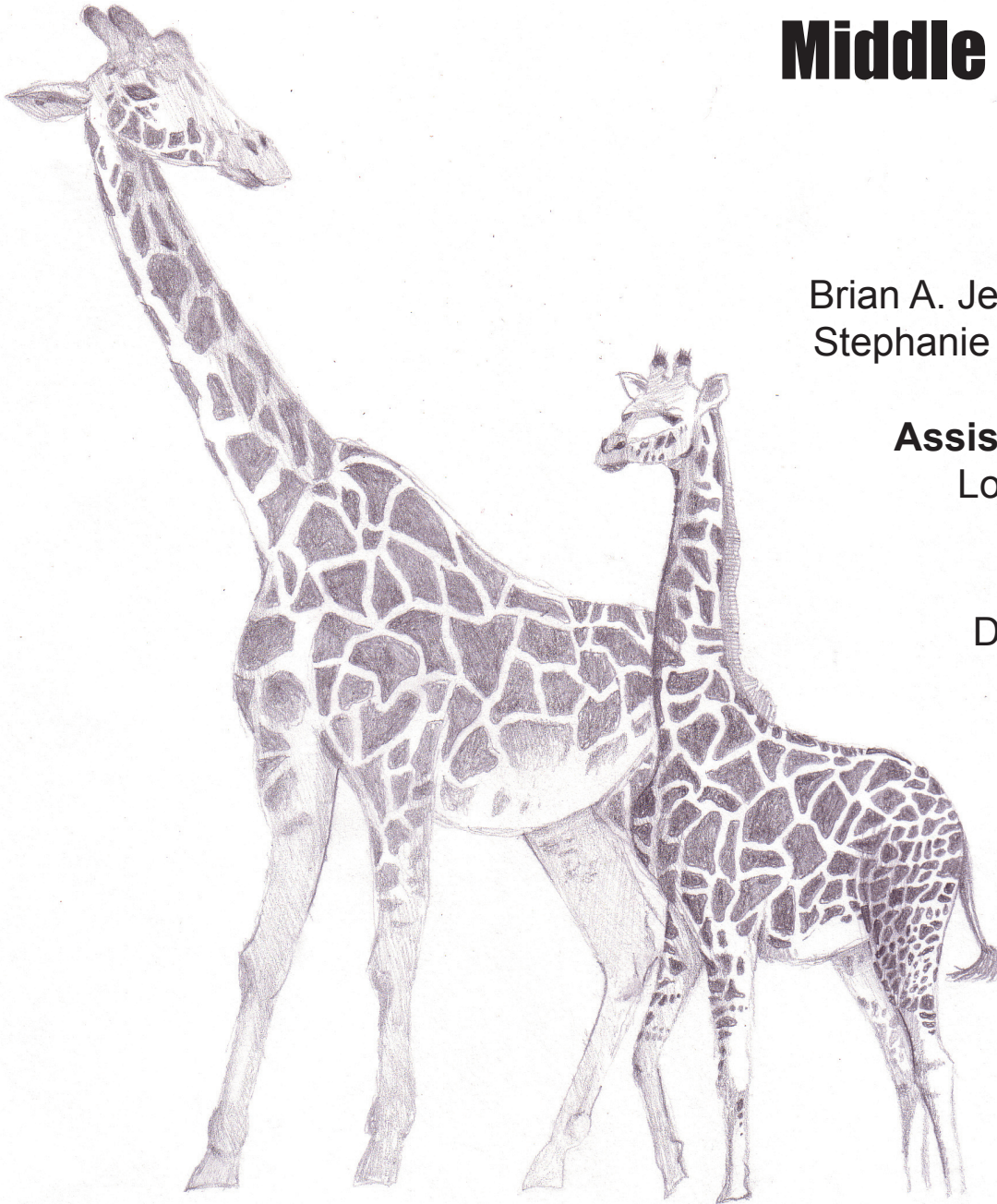


Heredity

Teacher's Guide Middle School



Editors:

Brian A. Jerome, Ph.D.
Stephanie Zak Jerome

Assistant Editor:

Louise Marrier

Graphics:

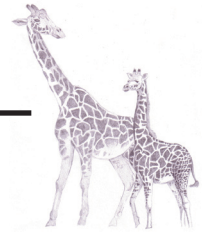
Dean Ladago
Fred Thodal

Visual Learning Company

www.visuallearningco.com

1-800-453-8481

25 Union Street
Brandon, Vermont



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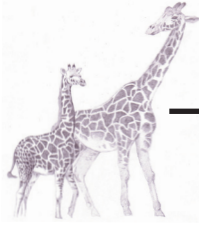


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Viewing Clearances

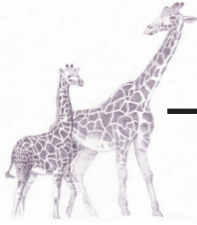
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A Message from our Company...

Dear Educator:

Thank you for your interest in the educational videos produced by the Visual Learning Company. We are a Vermont-based, family owned and operated business specializing in the production of quality educational science videos and materials.

We have a long family tradition of education. Our grandmothers graduated from normal school in the 1920's to become teachers. Brian's mother was an elementary teacher and guidance counselor, and his father was a high school teacher and superintendent. This family tradition inspired Brian to become a science teacher, and to earn a Ph.D. in education, and led Stephanie to work on science educational programs at NASA.

In developing this video, accompanying teacher's guide, and student activities, our goal is to provide educators with the highest quality materials, thus enabling students to be successful. In this era of more demanding standards and assessment requirements, supplementary materials need to be curricular and standards based - this is what we do!

Our videos and accompanying materials focus on the key concepts and vocabulary required by national and state standards and goals. It is our mission to help students meet these goals and standards, while experiencing the joy and thrill of science.

Sincerely,

Brian and Stephanie Jerome



National Standards Correlations

National Science Education Standards

(Content standards: 5-8, National Academy of Sciences, c. 1996)

Life Science - Content Standard C: Reproduction and Heredity
as a result of their activities in grades 5-8, all students should develop an understanding that:

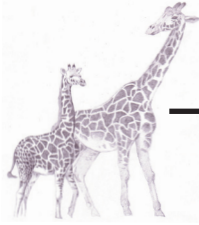
- Every organism requires a set of instructions for specifying its traits. Heredity is the passage of these instructions from one generation to another.
- The characteristics of an organism can be described in terms of a combination of traits. Some traits are inherited and others result from interactions with the environment.

Benchmarks for Science Literacy (Project 2061 – AAAS, c. 1993)

Heredity 5A

By the end of the 5th grade, students should know that:

- Some likenesses between children and parents, such as eye color in human beings, or fruit or flower color in plants, are inherited. Other likenesses, such as people's table manners or carpentry skills are learned.
- For offspring to resemble their parents, there must be a reliable way to transfer information from one generation to the next.



Student Learning Objectives

Upon viewing the video and completing the enclosed student activities, students will be able to do the following:

- Describe heredity as the process of passing traits from parents to offspring.
- Provide several examples of both inherited traits and acquired traits.
- Differentiate between inherited traits and acquired traits.
- Explain how traits commonly have two factors or genes.
- Understand the difference between a dominant and a recessive trait.
- Describe the Law of Dominance which states that in a living thing the dominant trait is expressed and the recessive trait is hidden.
- Using a trait such as pea plant height, symbolize dominant and recessive traits with capital letters and lower case letters.
- Provide examples of some common traits found in humans, and state whether they are dominant or recessive.



Assessment

Preliminary Assessment:

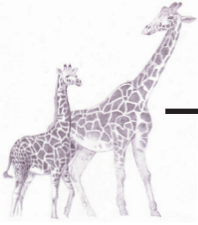
The Preliminary Assessment, provided in the Student Masters section, is an assessment tool designed to gain an understanding of students' pre-existing knowledge. It can also be used as a benchmark upon which to assess student progress based on the objectives stated on the previous pages.

Video Review:

The Video Review, provided in the Student Masters section, can be used as an assessment tool or as a student activity. There are two main parts. The first part contains questions that can be answered during the video. The second series of ten questions consists of a video quiz to be answered at the conclusion of the video.

Post Assessment:

The Post Assessment, provided in the Student Masters section, can be utilized as an assessment tool following completion of the video and student activities. The results of the Post Assessment can be compared against the results of the Preliminary Assessment to evaluate student progress.



Introducing the Video

Before showing the program write the term “trait” on the board. Ask students to describe the meaning of this word. Write their definitions on the board. Next, instruct students to write down some of their physical traits. Give them some hints such as height, hair color, eye color, etc.

Ask students to write down some things they are good at doing. Examples might include playing soccer, singing, painting, talking, writing, or listening to music. Next, ask students to compare these two different lists of traits. Have them describe the difference between these two different types of traits.

Write the words “Inherited Traits” and “Acquired Traits” on the board. Explain the difference between these different types of traits. Next, ask students to describe which examples of traits are acquired traits and which are inherited traits. Tell students to pay close attention to the program to learn more about traits and the fascinating topic of heredity.

Video Viewing Suggestions

The student Master “Video Review” is provided for distribution to students. You may choose to have your students complete this Master while viewing the program or to do so upon its conclusion.

The program is approximately twenty minutes in length and includes a ten question video quiz. Answers are not provided to the Video Quiz on the video, but are included in this teacher’s guide. You may choose to grade student quizzes as an assessment tool or to review the answers in class.

The video is content-rich with numerous vocabulary words. For this reason you may want to periodically stop the video to review and discuss new terminology and concepts.

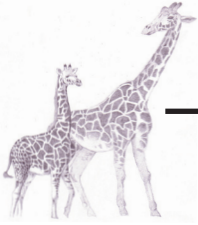


Video Script: Heredity

1. Have you ever heard the expression, “you have your mother’s eyes”?
2. Or, “you have your father’s walk”?
3. Or, perhaps you heard someone say, “he looks just like his father when he was a little boy”?
4. This phenomenon is not only true with people. . .
5. . . . but with animals as well. Why do these ducklings look so much like their mother?
6. Notice how this young buffalo looks so similar to its mother.
7. Plants too look like their parents. . .
8. . . . just look at these lupines which came from the seeds of this plant.
9. What causes these similarities between offspring and parents?
10. And what causes some features to be similar and others not?
11. During the next few minutes we are going to discuss these questions and others as we explore the fascinating topic of heredity.

12. Graphic Transition – Inherited Traits

13. Things like skin color, . . .
14. . . . eye color, . . .
15. . . . the configuration of markings on this giraffe. . .
16. . . . and the shape of a leaf are all characteristics.
17. Another word for characteristics is “traits”.
18. Where do traits come from? Many traits are inherited from our parents.
19. For example, if one of your parents has brown hair. . .
20. . . . and brown eyes, this may explain why you have the same traits.
21. A living thing is a collection of traits, and heredity is the passing on of traits from parent to offspring.
22. In a few minutes we will discuss how traits may be passed on from parents to offspring in the process of heredity.
23. But, first let us discuss the difference between traits that are inherited and those that are not.
24. Think about something you are good at, whether it is reading. . .
25. . . . music. . .
26. . . . talking with other people. . .
27. . . . or playing sports. These are all examples of traits that are acquired. They are not inherited.
28. Things that you have learned are acquired traits.
29. Even though your parents may be good at these things, you did not inherit these traits from your parents.



Script (cont.)

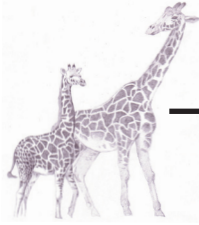
30. Inherited traits are characteristics you are born with such as hair color. . .
31. . . . the shape of your ears. . .
32. . . . or the shape of your eyes.
33. This holds true for other types of living things including animals. A dog, for example, inherits traits such as the color of his fur or the shape of his body.
34. **You Decide!** Is surfing an acquired or inherited trait?
35. This person had to learn how to surf.
36. It takes practice and many spills in order to become a good surfer. So even though it appears that this person was born with the ability to surf, he actually had to learn how to do it.
37. Let us now take a look at how our understanding of inherited traits began.
38. **Graphic Transition – The Father of Genetics**
39. During the 1860's an Austrian monk by the name of Gregor Mendel experimented with pea plants in his garden.
40. He was interested to see if he could find a pattern in the way certain characteristics are passed down from one generation to the next.
41. Mendel chose pea plants to work with for a variety of reasons. Pea plants are easy to grow and they grow quickly. Pea plants also exhibit many sharply contrasting traits that can be studied at the same time.
42. He could easily observe traits such as plant height,. . .
43. . . . seed color, as well as seed shape.
44. Mendel studied a total of seven distinct traits in pea plants. Another benefit was the fact that pea plants could be easily cross pollinated.
45. Pollination is the process of pollen transferring from the male part of the plant to the female part of the plant. In nature, pollen is often transported by birds, bees, or the wind.
46. Mendel himself was able to actually control the process of pollination by taking the pollen from one plant and using it to fertilize another plant. In this way, he was able to actually create desired crosses.
47. Little did Mendel know, his experiments would serve as the cornerstone for the science known as genetics.
48. Genetics is the study of the process of heredity, or the study of passing traits from one generation to the next.
49. For this reason, Gregor Mendel is often referred to as the "Father of Genetics".
50. Let us now take a closer look at some of the discoveries Mendel made in his garden.



Script (cont.)

51. **Graphic Transition – Mendel’s Garden**

52. In his garden, Gregor Mendel experimented with a variety of traits in pea plants including flower position, pod color, pod shape, seed color and shape, plant height, as well as seed coat color.
53. Over a period of seven years he kept careful records on the 20,000 plants he grew.
54. Mendel studied traits separately. He started with plants that displayed a desired trait, and always produced offspring with that desired trait. He called these types of plants “true breeders” because they always produced offspring like their parents.
55. For example, when a tall pea plant is bred with another tall pea plant, they produce tall pea plants.
56. **You Predict!** What type of offspring would be created from crossing a tall pea plant with a short pea plant?
57. Mendel too, was interested in this question.
58. When he crossed a tall pea plant with one of a short height, the offspring produced were all tall.
59. He called the offspring the first generation. Why were the first generation plants all tall? What caused the trait for short height to disappear?
60. Mendel then let these tall offspring pollinate amongst themselves, a process known as self pollination.
61. An interesting thing arose in the next generation of plants. About 3/4 of the plants were tall, but about 1/4 were short.
62. The trait for shortness, which seemingly disappeared in the first generation of pea plants, reappeared in the second generation. Why?
63. **Graphic Transition – Mendel’s Explanation**
64. Gregor Mendel was quite perplexed by the fact that the first set of offspring had no short plants, but the second generation had about 1/4 short plants.
65. Mendel drew upon his background in mathematics to develop a possible explanation. He hypothesized that each pea plant must have two factors for a particular trait.
66. He reasoned that each parent contributed a factor to an offspring.
67. In other words, the male parent contributed one factor and the female parent contributed the other factor. Each trait that an offspring exhibits is actually made up of two factors.
68. He reasoned that in some cases one factor could mask another factor.
69. For example, in the case of pea plant height, the trait of tall height masks, or dominates, the factor for short plant height.
70. The factors are what we call “genes” today.



Script (cont.)

71. **Graphic Transition – Dominant and Recessive Traits**

72. One of Mendel's most important discoveries dealt with the principle of dominance and recessiveness.
73. The stronger trait which masks the weaker trait is called the dominant trait.
74. And the weaker trait that seemed to disappear is called the recessive trait.
75. This principle is summarized in the Law of Dominance, which states that in a living thing the dominant trait is expressed and the recessive trait is hidden.
76. To make it easier to understand dominant and recessive traits, we can symbolize them with letters.
77. A dominant form is represented by a capital letter.
78. And a recessive form is represented by a lower case letter.
79. Remember that traits are made up of two characters.
80. So the symbol for a true breeding tall pea plant would be capital T, capital T, and the symbol for a true breeding short pea plant would be lower case t, lower case t.
81. Another trait that Mendel studied was pea pod color.
82. True breeding green pea pods can be symbolized by capital P, capital P. This trait is dominant.
83. Yellow pea pods are symbolized by lower case p, lower case p, and are recessive.
84. When a true breeding green podded pea plant is crossed with a yellow podded pea plant. . .
85. . . . offspring in the first generation are symbolized by capital P and lower case p.
86. **You Decide!** What will the pods of these offspring, from these parents look like?
87. These plants have green pea pods because the dominant allele masks the recessive allele.
88. If these plants are then cross-pollinated amongst themselves they would produce offspring that exist in one of four different ways.
89. One type of offspring would have capital P, capital P. Two out of four offspring would have the combination of capital P and lower case p. And the fourth type of offspring would have lower case p, lower case p.
90. So, what would these offspring look like?
91. That is right, 3 out of the 4 would have green peapods and 1 out of 4 would have yellow peapods.

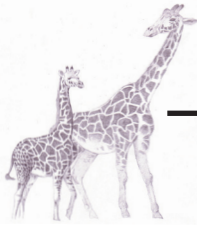
92. **Graphic Transition – Traits in People**

93. There are hundreds of readily observable traits in the human body that are genetically determined.
94. As you are well aware, there are a wide range of physical differences between people ranging from. . .



Script (cont.)

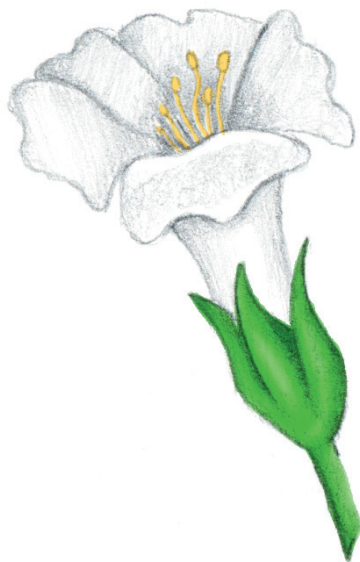
95. . . . differences in height, weight. . .
96. . . . body build, . . .
97. . . . facial features, . . .
98. . . . and athletic ability, to name just a few.
99. These genetic differences can be attributed to many reasons.
100. One factor that may account for these differences is related to dominance and recessiveness of certain traits.
101. For example, have you ever noticed that some peoples' hairlines go straight across their forehead?
- 102. You Observe!** Describe this hairline formation.
103. This formation creates a downward V coming to a distinct point.
104. This hairline formation, known as a widow's peak, is the result of a dominant gene.
105. Those with a straight hairline have a recessive trait represented by lower case w, lower case w.
106. Look closely at the earlobe of the person next to you.
107. If their earlobe is free hanging this is the result of a dominant trait, capital L.
108. But, if their earlobe is attached directly to the side of their head, they have the recessive combination lower case l lower case l.
109. There are many other traits related to dominant and recessive genes including the ability to roll your tongue. . .
110. . . . and the presence of dimples, to name just a few.
- 111. Graphic Transition – Summing Up**
112. During the past few minutes we have explored some of the fascinating aspects of heredity.
113. We discussed the difference between traits that are inherited such as hair color, . . .
114. . . . and traits that are acquired, such as the ability to play a musical instrument.
115. We took a look back in time at some of the fascinating work which Gregor Mendel did in his garden.
116. We specifically discussed how his experiments with pea plants led to his hypothesis that each trait is made up of two characters - one contributed by the male parent and the other by the female parent.
117. The principle of dominant and recessive traits was also explained, . . .
118. . . . and we discussed how these are often symbolized by capital and lower case letters.
119. Finally, we discussed some of the ways dominant and recessive traits reveal themselves in humans.
120. So, the next time you look at yourself in the mirror. . .



Script (cont.)

121. . . . pick some flowers. . .
122. . . . or see people walking down the street, think about some of the ways living things inherit traits.
123. You might just look at the process of heredity a little differently.
- 124. Graphic Transition – Video Assessment**
125. Fill in the correct word to complete the sentence. Good luck and let's get started.
 1. Skin color is an _____ trait.
 2. Playing music is an _____ trait.
 3. _____ is the process of passing on traits.
 4. _____ is the study of heredity.
 5. Gregor _____ is called the "Father of Genetics".
 6. Eye color is an example of a _____.
 7. A _____ trait is usually expressed, and a recessive trait is not.
 8. According to the Law of Dominance, the dominant trait is expressed and the _____ trait is "hidden."
 9. A recessive trait is symbolized by a _____ case letter.
 10. _____ are the basic units of heredity.

Answers can be found on page 17.





Student Assessments and Activities

Assessment Masters:

- Preliminary Assessment
- Video Review
- Post Assessment

Student Activity Masters:

- Where did that Trait Come From?
- Human Genetic Traits
- Vocabulary of *Heredity*



Answers to Student Assessments

Preliminary Assessment (pgs. 20-21)

1. traits
2. heredity
3. acquired
4. inherited
5. genetics
6. Mendel
7. dominant
8. genes
9. recessive
10. expressed
11. true
12. false
13. true
14. false
15. false
16. true
17. true
18. false
19. true
20. true

Video Review (pg. 22)

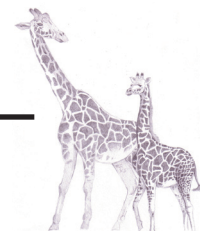
1. Surfing is an acquired trait. A person has to learn how to surf.
2. The offspring produced were all tall.
3. The pods of these offspring are green because the dominant allele masks the recessive allele.
4. The hairline formation, known as a widow's peak, creates a downward V coming to distinct point.

Video Quiz (p. 22)

1. inherited
2. acquired
3. heredity
4. genetics
5. Mendel
6. trait
7. dominant
8. recessive
9. lower
10. genes

Post Assessment (pgs. 23-24)

1. dominant
2. expressed
3. Mendel
4. genes
5. recessive
6. inherited
7. heredity
8. genetics
9. acquired
10. traits
11. false
12. true
13. true
14. true
15. false
16. false
17. true
18. true
19. true
20. false



Answers to Student Activities

Where did that Trait Come From? (pg. 25)

1. inherited trait
2. inherited trait
3. acquired trait
4. inherited trait
5. acquired trait
6. acquired trait
7. inherited trait
8. acquired trait
9. acquired trait
10. inherited trait

Examples of acquired traits:

1. I can play basketball, hit a baseball, or play soccer.
2. I like rap, country, or rock music.
3. I like to eat french fries, I am a vegetarian, I like Mexican, Chinese or Italian food.
4. I am very good at spelling.
5. I like school.

Examples of inherited traits:

1. blue, brown, green eyes
2. brown, blonde, black, red hair
3. short or tall
4. round, oval, heart-shaped face
5. size eight shoes

Human Genetic Traits (pgs. 26-28)

Trait	Describe Phenotype of Trait	Describe the Possible Genotypes of the Trait
Ear Lobes	Unattached or Attached	if unattached - L if attached - ll
Hairline	Widow's peak or Smooth	widow's peak - W smooth - ww
Tongue Rolling	Yes (can) or No (can't)	if yes - R if no - rr
Bent Little Finger	Bent or Straight	if bent - F if straight - ff

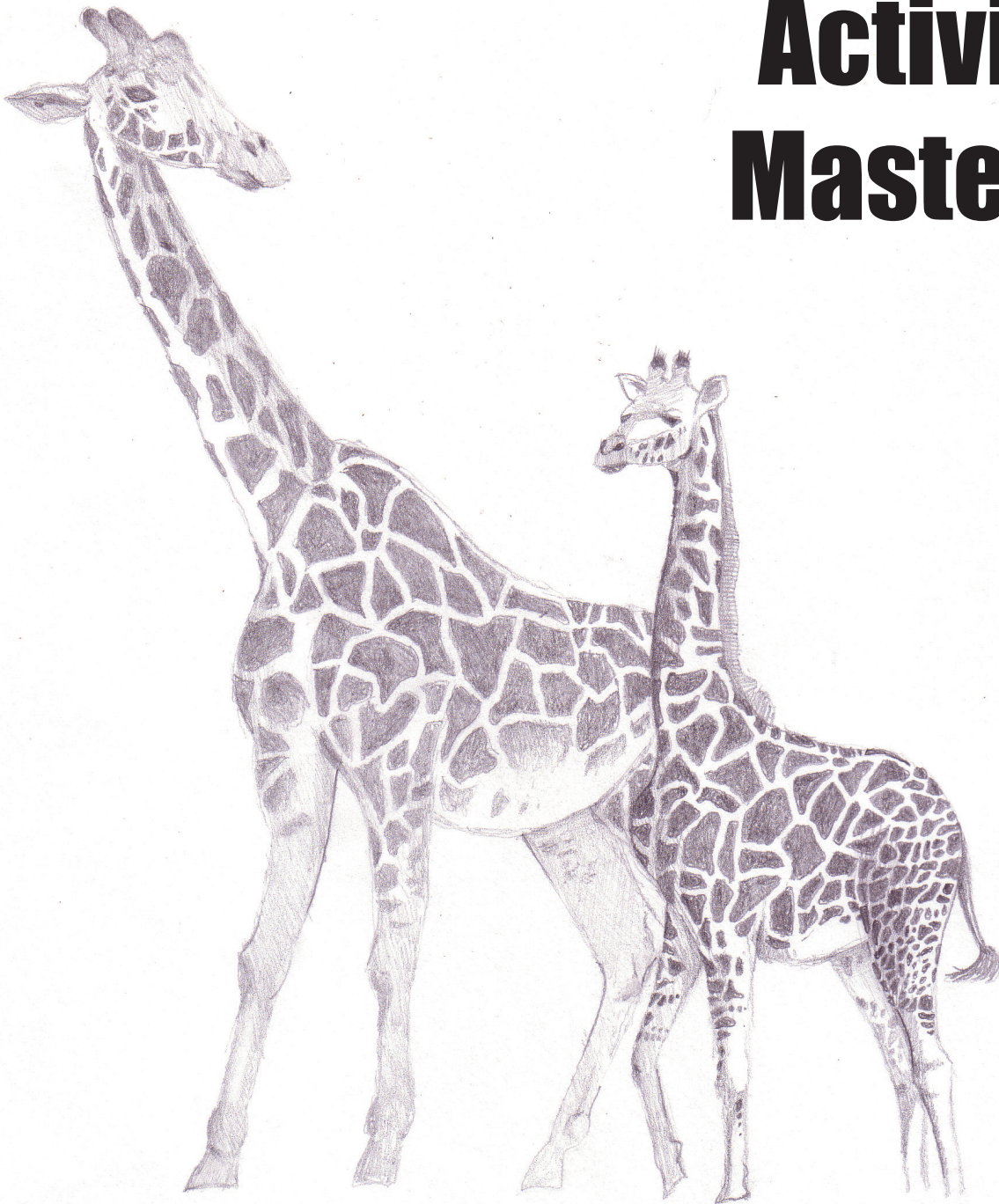
1. Phenotype is the outward appearance of a trait (the physical appearance). Genotype refers to the genetic makeup of the trait.
2. These answers will vary by class.
3. The answer will vary depending on the makeup of the class.

Vocabulary of *Heredity* (p. 30)

1. e - trait
2. h - heredity
3. a - acquired trait
4. i - genetics
5. d - inherited trait
6. b - Gregor Mendel
7. c - dominant
8. f - recessive
9. j - gene
10. g - law of dominance



Assessment and Student Activity Masters



Preliminary Assessment

Directions: Fill in the blank with the correct word. A list of possible answers is provided at the bottom of the page.

1. Another term for characteristics are _____.
2. _____ is the process of passing traits from parents to offspring.
3. Things you have learned are _____ traits.
4. Hair color and skin color are examples of _____ traits.
5. _____ is the study of the process of heredity.
6. Gregor _____ is often referred to as the father of genetics.
7. A _____ trait tends to mask a recessive trait.
8. _____ are the basic units of heredity.
9. _____ traits are usually symbolized by a lower case letter.
10. The Law of Dominance states the dominant trait is _____ and the recessive trait is hidden.

Mendel
inherited
genes
genetics
acquired

traits
recessive
heredity
dominant
expressed

Preliminary Assessment

Directions: Decide whether the statement is true (T) or false (F).

- | | | |
|---|---|---|
| 11. Skin color and eye color are examples of inherited traits. | T | F |
| 12. Heredity is rarely responsible for physical traits. | T | F |
| 13. Hitting a baseball is an example of an acquired trait. | T | F |
| 14. Genetics is the study of microorganisms. | T | F |
| 15. Gregor Mendel conducted most of his research using butterflies. | T | F |
| 16. Each parent tends to contribute a gene for a trait to offspring. | T | F |
| 17. A dominant trait tends to be represented by a capital letter. | T | F |
| 18. Recessive traits tend to mask dominant traits. | T | F |
| 19. A dominant trait is the trait which tends to be outwardly visible. | T | F |
| 20. The Law of Dominance states that in a living thing the dominant trait is expressed and the recessive trait is hidden. | T | F |

Video Review

Directions: During the course of the program, answer the questions as they are presented in the video. At the end of the video, answer the Video Quiz questions.

You Decide!

1. Is surfing an acquired or inherited trait?

You Predict!

2. What type of offspring would be created from crossing a tall pea plant with a short pea plant?

You Decide!

3. What will the pods of these offspring, from these parents look like?

You Observe!

4. Describe this hairline formation.

Video Quiz:

1. Skin color is an _____ trait.
2. Playing music is an _____ trait.
3. _____ is the process of passing on traits.
4. _____ is the study of heredity.
5. Gregor _____ is called the "Father of Genetics".
6. Eye color is an example of a _____.
7. A _____ trait is usually expressed, and a recessive trait is not.
8. According to the Law of Dominance, the dominant trait is expressed and the _____ trait is "hidden".
9. A recessive trait is symbolized by a _____ case letter.
10. _____ are the basic units of heredity.

Post Assessment

Directions: Fill in the blank with the correct word. A list of possible answers is provided at the bottom of the page.

1. A _____ trait tends to mask a recessive trait.
2. The Law of Dominance states that the dominant trait is _____ and the recessive trait is hidden.
3. Gregor _____ is often referred to as the father of genetics.
4. _____ are the basic units of heredity.
5. _____ traits are usually symbolized by a lower case letter.
6. Hair color and skin color are examples of _____ traits.
7. _____ is the process of passing traits from parents to offspring.
8. _____ is the study of the process of heredity.
9. Things you have learned are _____ traits.

expressed
genetics
recessive
heredity
Mendel

traits
genes
inherited
acquired
dominant

Post Assessment

Directions: Decide whether the statement is true (T) or false (F).

- | | | |
|---|---|---|
| 11. Gregor Mendel conducted most of his research using butterflies. | T | F |
| 12. A dominant trait is the trait which tends to be outwardly visible. | T | F |
| 13. Skin color and eye color are examples of inherited traits. | T | F |
| 14. The Law of Dominance states that in a living thing the dominant trait is expressed and the recessive trait is hidden. | T | F |
| 15. Heredity is rarely responsible for physical traits. | T | F |
| 16. Recessive traits tend to mask dominant traits. | T | F |
| 17. Hitting a baseball is an example of an acquired trait. | T | F |
| 18. Each parent tends to contribute a gene for a trait to offspring. | T | F |
| 19. A dominant trait tends to be represented by a capital letter. | T | F |
| 20. Genetics is the study of microorganisms. | T | F |

Where did that Trait Come From?

Background: You’ve probably heard people say things like, “she looks just like her mother.” Or, maybe a mother would say to her son, “You throw a ball like your father.” And, maybe you’ve heard someone say, “That baby has eyes just like her mother’s.” What do these statements really mean, and are they true?

To answer this question we need to know the difference between inherited traits and acquired traits. As you probably already know, a trait is a characteristic of a living thing. Some traits are inherited or passed on genetically from parents to offspring. Traits which are inherited include: hair color, blood type and skin color. Some traits, on the other hand, are acquired throughout the course of a person’s life time. Learned behaviors are an example of acquired traits. The ability to write is an example of an acquired trait.

Directions: Decide whether the trait described is an acquired trait or an inherited trait.

Trait	Inherited or Acquired Trait
1. The shape of your nose.	_____
2. The tonal quality of your voice.	_____
3. Ability to hit a baseball.	_____
4. Strength of your eyes.	_____
5. The extent of your vocabulary.	_____
6. The type of music you enjoy.	_____
7. Your shoe size.	_____
8. The way you pronounce certain words.	_____
9. The types of foods you like to eat.	_____
10. Eye color.	_____

List five acquired traits you possess.

- 1.
- 2.
- 3.
- 4.
- 5.

List five inherited traits you possess.

- 1.
- 2.
- 3.
- 4.
- 5.

Human Genetic Traits

Background: Our bodies are made up of thousands if not millions of traits inherited from our parents. We refer to these traits as genetic traits. Many of these traits are easily observable including the color of our eyes, height, and basic skin color.

As you already know, the basic unit of heredity is the gene. A single human cell has 23 pairs of chromosomes, which contain thousands of genes. An allele is a form of a gene for a given trait.

In many traits such as height or eye color, several genes come together to create a trait. Whereas other traits, such as whether your earlobes are attached or unattached, are determined by a single gene. Genotype refers to the genetic makeup of a trait. Whereas phenotype refers to the outward appearance of a trait. And as you know, a trait may be dominant or recessive. In this activity we will look at several easily distinguished human traits, and attempt to figure out their genotype.

“Traits in You” Data Table

Trait	Describe the Phenotype of Trait	Describe the Possible Genotype of the Trait
Ear Lobes		
Hairline		
Tongue Rolling		
Bent Little Finger		

Human Genetic Traits Cont.

Directions:

1. The first trait you will examine focuses on your earlobe. Have a classmate closely examine whether your earlobe is attached directly to the side of your head, or whether it dangles freely. The diagram below illustrates an earlobe that is attached and an earlobe which is unattached.

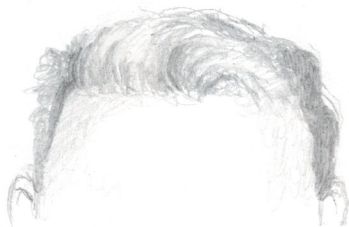


Attached earlobe



Unattached earlobe

2. Unattached earlobes are dominant and can be symbolized by a capital L. Earlobes attached directly to the head are the result of a homozygous recessive genotype, ll. In the data table record whether your own earlobes are attached or unattached, and your possible genotype.
3. Next, pull back the hair on your forehead so your classmate can see your hairline. Does your hairline form a smooth hairline that goes straight across? Or does your hairline come to a point in the middle of your forehead? Look at the illustration to see what kind of hairline you have.



Smooth hairline

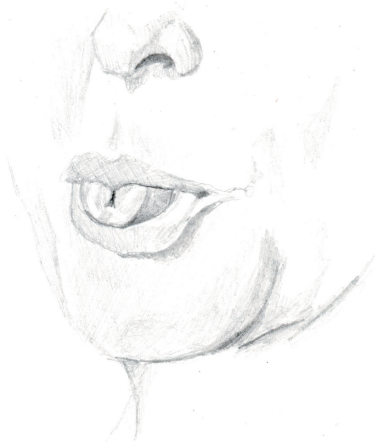


Widow's peak

4. A smooth hairline is caused by the recessive genotype, ww. When the hairline comes to a distinct point, this is referred to as a "widow's peak". This is caused by a dominant gene, W. Record your phenotype and possible genotype in the data table.

Human Genetic Traits Cont.

5. The next trait we will examine is your ability to curl or roll your tongue into a U-shape when extended. Some people can easily roll their tongue and others cannot. The diagram below illustrates a curled tongue and an uncurled tongue.



Curled tongue



Uncurled tongue

6. A dominant gene, R, gives people the ability to curl their tongue. People with the recessive genes rr do not have the ability to roll their tongue. Record your phenotype and genotype for this trait in the data table.
7. The last trait we will explore requires the close examination of your little finger. Place both hands on a table palms down and relax the muscles in your hands. Look closely to see if from the last joint on your finger the tip of your finger bends slightly inward. Does the tip of the littlest finger bend toward your fourth finger or is it straight?
8. A dominant gene, which we can symbolize by capital F causes the little finger to bend inward. Straight little fingers are the result of the homozygous recessive genotype, ff. Record your phenotype and possible genotype in the data table.

Human Genetic Traits Cont.

Questions:

1. Describe the difference between phenotype and genotype.

2. What percentage of the class had attached earlobes, and what percentage had unattached earlobes? Are more people dominant or recessive for the trait?

3. The human body has thousands of traits. Do any people in the class have all the same traits?

Vocabulary of Heredity

Directions: Unscramble the vocabulary words in the first column. Match the words to the definitions in the second column.

____ 1. atirt _____

____ 2. rthdeyie _____

____ 3. daqriceu ttira _____

____ 4. cgeetsni _____

____ 5. hnrдитеie titar _____

____ 6. eoggr nedlem _____

____ 7. admtonin _____

____ 8. esevsrcei _____

____ 9. egne _____

____ 10. alw fo adncmeoni _____

a. a characteristic of a living thing which is learned.

b. considered the father of modern genetics for his early experiments on heredity.

c. a “stronger” trait which masks a recessive trait.

d. a characteristic of a living thing which is passed on from parents.

e. a characteristic of a living thing.

f. a trait which tends to be masked by a dominant trait.

g. states that in a living thing the dominant trait is expressed and the recessive trait is hidden.

h. the process of traits passed on from parents to offspring.

i. the study of heredity.

j. the basic unit of heredity.