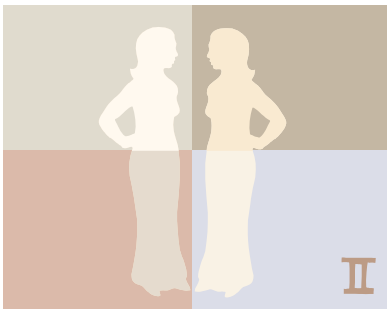
Summative Assessment
For
Twin Traits



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Summative Assessment Instructions

Duration: One class period
Standard (s) Assessed: LA.A.1.3.1, LA.A.1.3.4, SC.F.2.3.2.8.1, SC.F.2.3.2.8.3, SC.F.2.3.3.8.1, SC.H.1.3.2.8.2
Description of Assessment Activity: Students respond to a variety of short answer questions enabling the teacher to assess student mastery of the selected content. A review following the assessment will allow students time to reflect on their learning furthering student retention and transfer.
Teacher Directions:
Prior to the assessment:

1. Make one classroom set of the assessment. Students write on their own paper, but each student needs a copy of the assessment.

Day of the assessment:

1. Pass out the assessment.
2. Go over student instructions.
3. Allow students time to take the assessment.
4. Collect assessment and assess using the provided answer key. Questions that have a high number of students showing non-mastery may indicate gaps in teaching. It may be necessary to further instruct on this content in order for students to show mastery.

Student Directions:

1. Listen as I go over the assessment instructions.
2. Answer the questions to the best of your ability, reflecting on the learning that has taken place over the last 2 weeks. Take your time and write in complete sentences. By writing in complete sentences, I can better follow your responses.
3. Turn in your work once you have completed your answers.

Scoring Method and Criteria:

Use Answer key for suggested answers. Allow some flexibility in answers as student language will be different. Questions 1-7 should be graded on the following suggested grading scale. A suggested grading scale might be that each answer is worth 12.5 points. Full credit is 12.5 points per answer. Partial Credit could be worth 7 points. Teachers may choose to use another grading scale that is more in line with what has been used in their classroom.

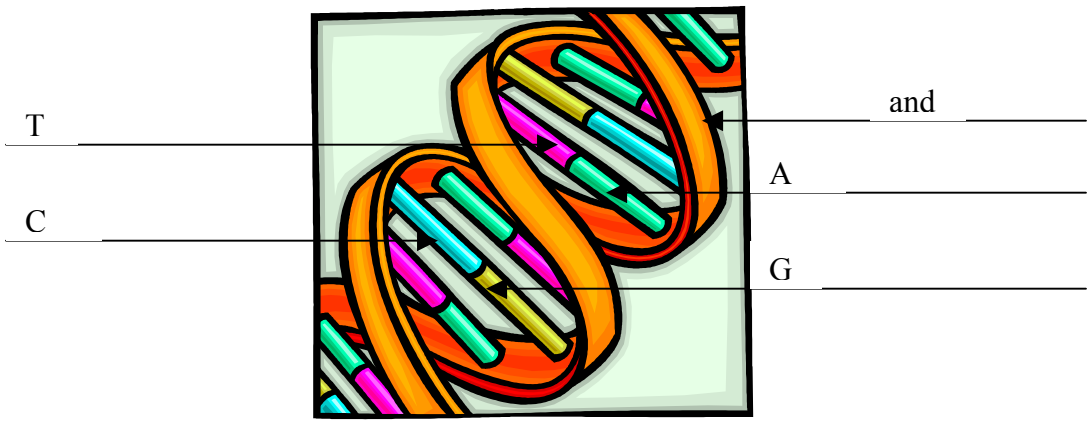
Twin Traits
Summative Assessment

Use your own paper.

1. List four traits that you have inherited from your parents. Label each trait as **dominant** or **recessive**.

2. Explain how your parents' genes (alleles) determined the specific traits you inherited. Be sure to address how dominant and recessive traits are determined in an offspring.

3. Label the following model of DNA structure.



4. Explain how this DNA replicates to pass traits from parents to offspring. Be sure to include how this process results in variations within a species.

5. Scientists use the inquiry process to study events and make important discoveries. You have designed an experiment with a group to test the nature versus nurture theory using identical twins as your subjects. Use your experimental design to explain each step in the inquiry process.

Question	
Hypothesis	
Variable	
Control	
Procedures	

6. In light of what you have learned about how the environment affects a species, what do you think the results of your experiment would be?

7. Read the following passage about the concerns of nature versus nurture in cloning a species. As you read note in the margins the strategies that you use before, during and after reading to ensure that you understand the meaning correctly. When you finish complete the strategy log for one strategy used in each phase of the reading process.

NATURE versus NURTURE

Cloning produces an exact genetic copy of the donor's DNA. This does not assure that the cloned individual will have the same physical or behavioral traits as the donor. This does not assure that the new individual will be the same as the donor physically or behaviorally. This does not assure that the new individual will be the same as the donor. These individual may vary in physical or behavioral traits.

For example, identical twins share identical DNA just as clones do. Yet it is clear that identical twins are neither physically nor behaviorally identical to one another. If they do not have identical diets and nutrition, then they will not be the same height or weight. They may suffer from different injuries, or wear their hair different lengths. Identical twins do not always share the exact same values or beliefs. They often do not like the same sports or choose the same jobs. Likewise, they do not always choose similar friends or mates.

If genetically identical twins, (or clones) were raised in different environments then their physical and behavioral traits would differ accordingly. Imagine identical twins that are separated at birth. A middle class French family living in Marseilles raises one. A Kickapoo Indian family living on a Reservation in Oklahoma raises the other. How identical will these genetically identical people end up looking and acting? Will they think alike? Will they feel they same way about the same kinds of things? Will they have the same beliefs? Will they dream alike? Will they have the same needs and desires? Will they like the same kinds of people, foods, drinks, and clothes? Obviously the answer is no. One will dress, speak and be French. The other will dress, speak, and be a Kickapoo Indian.

Their differences will be obvious. But will they have any major similarities? If so, can these similarities be the result of having identical DNA?

The environments in which DNA identical individuals grow up help shape them. The DNA is the biological make-up, but, it does not determine all physical and behavioral traits. The environment works with DNA to determine the final traits of the individual.

This is the core of the "nature-nurture" debate: What is the relation of DNA and the environment in the development of individuals?

Strategy Log

Before Reading			
Paragraph	Problem I Had	Strategy I Used	How It Worked

During Reading			
Paragraph	Problem I Had	Strategy I Used	How It Worked

After Reading			
Paragraph	Problem I Had	Strategy I Used	How It Worked

8. You have been learning about the debate among many scientists concerning the importance of nature and nurture in human development. Write a paragraph explaining which one you believe is more important – nature or nurture. Be sure to defend your position with factual information that you have learned throughout the course of this unit.

Twin Traits
Summative Assessment
Answer Key

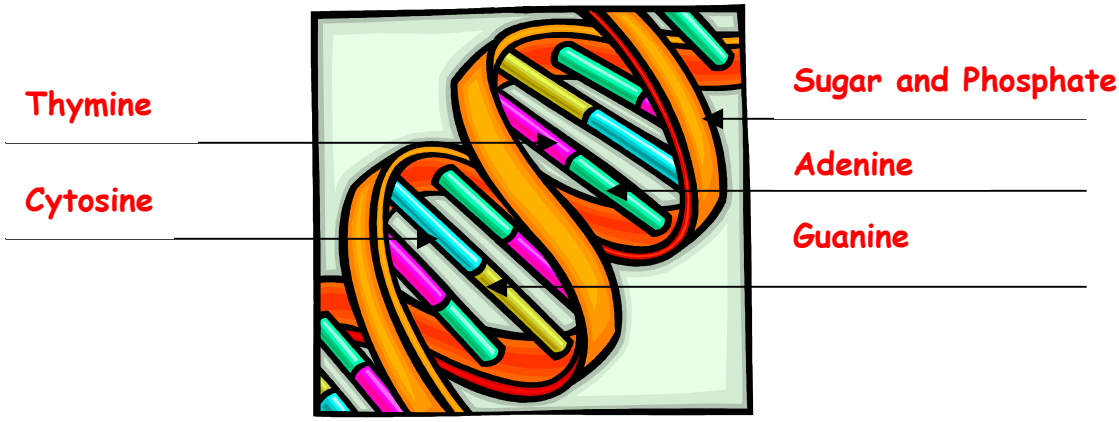
Note: For full credit, students should be able explain the processes using the scientific terminology. Partial credit may be given if the teacher feels that the student has correctly explained the process using laymen terms and can decipher what has been written.

9. List four traits that you have inherited from your parents. Label each trait as **dominant** or **recessive**. (Background knowledge of SCF23281) **Answers will vary.**

My Traits	Dominant or Recessive
Blue Eyes	**Recessive**
Height- Tall	**Dominant**
Fair Skin	**Recessive**
Free ear lobe	**Dominant**

10. Explain how your parents' genes (alleles) determined the specific traits you inherited. Be sure to address how dominant and recessive traits are determined in an offspring. (SCF23281)
The genes inherited from one's parents provide the potential for many traits. Every organism has a set of genes that determines its traits. These genes occur in pairs. Each gene in a pair is known as an allele. If one of the alleles masks the effect of the other allele, it is called a dominant allele. The allele that is masked is called a recessive allele.

11. Label the following model of DNA structure. (Background knowledge of SCF23283)



12. Explain how this DNA replicates to pass traits from parents to offspring. Be sure to include how this process results in variations within a species. (SCF23283)

Students should suggest, in their own writing that the A, G, C and T bases on each chain attract loose bases floating around within the nucleus. The A Base pairs with the T base. The G base pairs with the C base. Two new identical DNA molecules are formed. The replication of DNA is key to hereditary or the passing of traits from parent to offspring.

13. Scientists use the inquiry process to study events and make important discoveries. You have designed an experiment with a group to test the nature versus nurture theory using identical twins as your subjects. Use your experimental design to explain each step in the inquiry process. (SCH13282)

Explanations will vary based on experiments.

Question	**eg- Is musical ability determined by nature or nurture? (The testable question that spurs the scientific investigation.)**
Hypothesis	**eg- Musical ability is determined by nature. (An idea that can be tested by an experiment.)**
Variable	**eg- In a twin study, the environment can affect the results. (A factor that can affect the results of an experiment.)**
Control	**eg- In a twin study, the control would be a child not raised by musically talented parents, if the other twin is raised by musically gifted parents. (The factor that remains constant or fixed in an experiment.)**
Procedures	**The steps to complete an experiment. Students should list the steps in their experiments.**

14. In light of what you have learned about how the environment affects a species, what do you think the results of your experiment would be? (SCF23381)

Answers will vary. Students should declare that the trait they designed an experiment for is determined by nature or nurture and explain why they believe this to be so.

15. Read the following passage about the concerns of nature versus nurture in cloning a species. As you read note in the margins the strategies that you use before, during and after reading to ensure you understand the meaning correctly. When you finish complete the strategy log for one strategy used in each phase of the reading process.

NATURE versus NURTURE

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This is the core of the "nature-nurture" debate: What is the relation of DNA and the environment in the development of individuals?

Strategy Log
(LAA131, LAA134)
Answers will vary in some possibilities.

Before Reading			
Paragraph	Problem I Had	Strategy I Used	How It Worked
1	**No background knowledge**	**Prediction**	**Helped me think about what I would read.**

During Reading			
Paragraph	Problem I Had	Strategy I Used	How It Worked
4	**Understanding differences in culture.**	**Compare and Contrast**	**Helped me visualize differences.**

After Reading			
Paragraph	Problem I Had	Strategy I Used	How It Worked
7	**Knowing what the important ideas are.**	**Summarizing**	**Helped me focus on the main ideas.**

16. You have been learning about the debate among many scientists concerning the importance of nature and nurture in human development. Write a paragraph explaining which one you believe is more important – nature or nurture. Be sure to defend your position with factual information that you have learned throughout the course of this unit. (Essential Question)

Regardless of student opinion, students' answers should reflect knowledge that nature means hereditary genetic makeup and nurture means things that happen to a person after birth, including treatment by parents, peers, community, and society.