

Name: _____

EPIGENETICS

Answer the questions below as you progress through the Epigenetics lesson and slideshow.

1. Describe DNA. What does it look like? What does it do? Where is it located?

2. What are some ways that your DNA changes?

3. Is the DNA in all of your cells the same? How do you know?

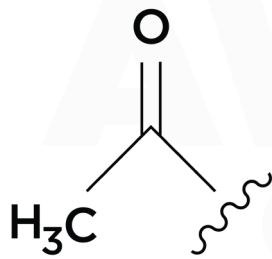
4. Label the parts of diagram below.



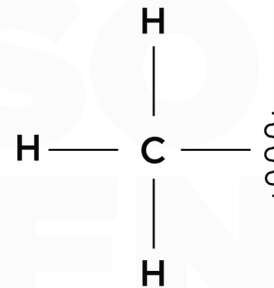
5. Fill out the table below with “yes” or “no” to record whether the change is genetic or epigenetic.

	Genetic Change	Epigenetic Change
Caused by nucleotide sequence change		
Caused by change in DNA packaging		
Irreversible		
Reversible		
Can cause disease		
Changes how DNA sequences are read		

6. Circle the correct answers under each figure.



Acetyl groups generally **(tighten/loosen)** DNA which **(increases/decreases)** expression.



Methyl groups generally **(tighten/loosen)** DNA which **(increases/decreases)** expression.

7. What are some things that can change epigenetic marks?

8. Should Adam be concerned for future cancers? Why or why not? What do you think a doctor would recommend to Patrick?

9. Describe what DNA is and how it is packaged in the cell.

10. What are epigenetic changes and what do they do?

11. What kinds of things change epigenetics?

12. Record the answers to the article you were assigned. Next, meet up with students who had the same article and compare your thoughts. Finally, come back to your group and tell them about your article. Fill in the answers for the other articles below.

Dutch Hunger Winter/Holocaust

A. Describe what an epigenetic mark is. What in these two situations caused the parents to have different epigenetic marks than usual?

B. What are some of the symptoms of children born during and directly after the Dutch Hunger Winter? The Holocaust?

C. Some say that hearing the stories of tragedies like above from parents cause PTSD like symptoms in children. How, if you had everything at your disposal, could you test this?

Epigenetics of Maternal Care & Stress Management

A. What was the outcome of rat pups who were nurtured more? How were they different than those that were neglected?

B. Do you think the behavior of the rat pups would switch if you swapped them a second time? Why or why not?

C. What evidence supports that these epigenetic marks can be passed on to offspring? What evidence goes against it?

Critiques & Questions About Inheritance

A. What might explain epigenetic similarities found between parent and offspring if epigenetic marks are not heritable? For example, why might a mom and daughter both have a higher risk for diabetes if it is not passed down in the epigenome?

B. How many people do you think should be surveyed in order to make a conclusion on epigenetic inheritance?

C. If all scientific equipment and money was available to you, how could you design a study to test this?