

Inherited Diseases and Forensics

Your team of experts will gather in-depth information on how sequences are used to detect inherited genetic diseases and to identify a suspect. The information you gather on these topics will be vital for the group discussion that will take place toward the end of your visit to the Museum, which will focus on:

"How can the knowledge of DNA sequencing be applied in the future?"

Answers to this worksheet can be found in the *Can You Use DNA to Prevent Disease?* and *How DNA Determines Guilt or Innocence* stations.

Can You Use DNA to Prevent Disease?

1. What is a mutation?

2. Match each mutation to the change in the message:

Original Sentence

TIME TO DREAM

TMET OD REAM

EMIT TO DREAM

TIIM ET ODREAM

TAME TO DREAM

Single letter change

Insertion

Deletion

Reverse

3. Why do you need to look at two copies of a gene to tell if a person has inherited a disease?

4. What is meant by the term "carrier"?

5. What single letter change is responsible for producing the genetic defect that causes sickle cell anemia?

_____ to _____

6. Hemochromatosis is an inherited genetic disease. Explore how we diagnose and treat this genetic disease using the interactive activity on the other side of the mutation exhibit.

a. What happens to a person with hemochromatosis?

b. What procedure do doctors use to treat hemochromatosis?

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How DNA Determines Guilt or Innocence

7. List three pieces of evidence that could be used by the FBI to get a DNA sample.

1. _____ 2. _____ 3. _____

8. Watch the forensics video. How could a death row inmate benefit from DNA sequencing technology that might not have been available at the time of the original trial?

9. How many sites in the DNA sequence are used by the FBI's Combined DNA Index System (CODIS)?

10. What are the chances of a suspect perfectly matching a sample at all CODIS sites?

11. Use the interactive to compare DNA samples from 3 suspects to a DNA sample left behind at the scene of a crime.

a. Which suspect matches the sample? _____

b. Which suspect is probably a sibling? _____

c. Which suspect is most likely unrelated to the other two? _____

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