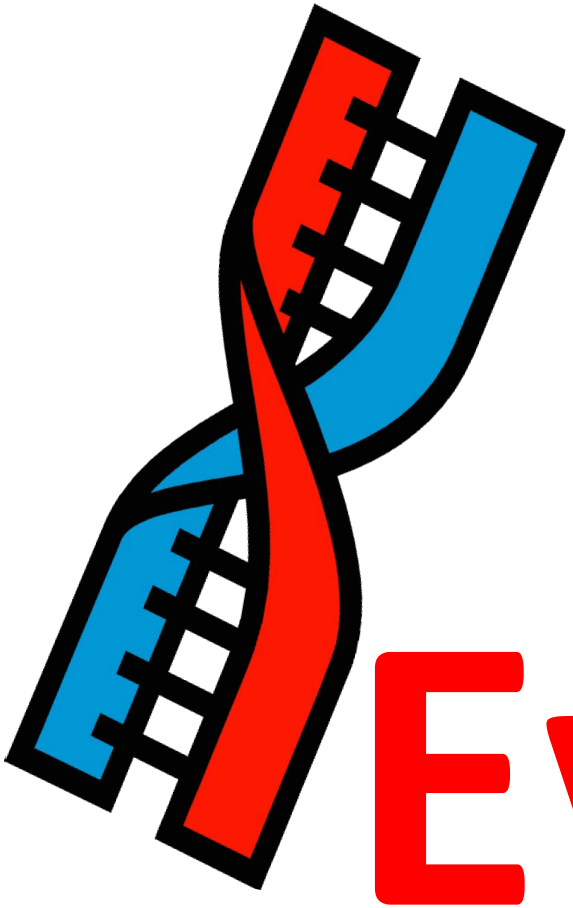


DNA Evidence

How is DNA be used to solve crimes?

What is DNA?

DNA stands for **deoxyribonucleic acid** and contains **genetic information.** It is found on **chromosomes** located in the nucleus of our cells.

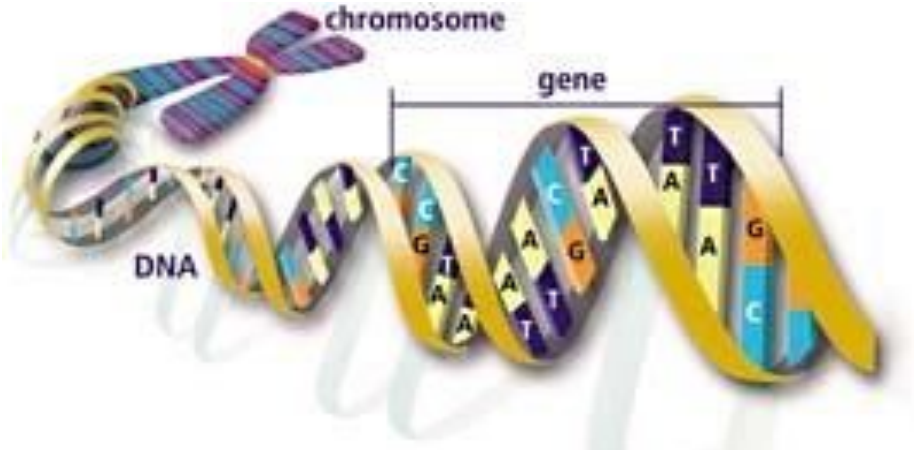
What makes up DNA?

• The sides or **backbone** of the DNA molecule are made up of **sugar (deoxyribose)** and **phosphate molecules**.

• The rungs that form the middle of the molecule are made up of pairs of **nucleotides** or **nitrogen bases**. **Adenine** (A) pairs with **thymine** (T), while **guanine** (G) always pairs with **cytosine** (C).

• The order of the bases determines the **genetic code**.

Double Helix

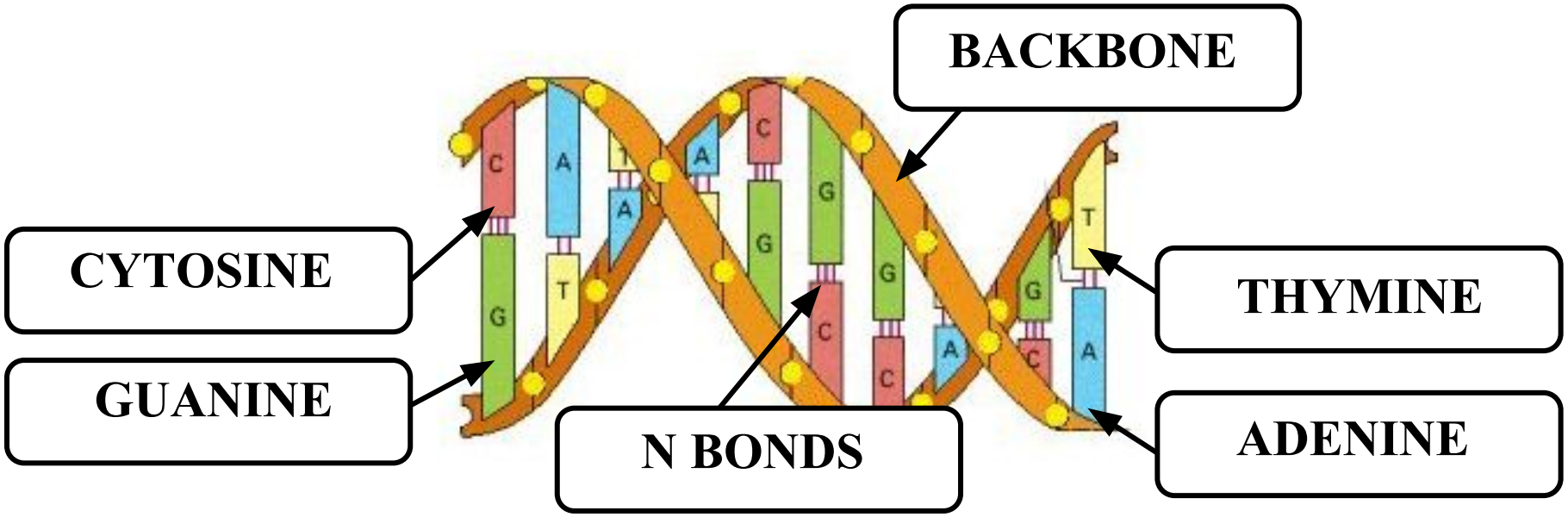


DNA Image: http://science.howstuffworks.com/genetic-science/dna-evidence.htm

Label the DNA molecule shown below.

Word List:

Cytosine Adenine Thymine Guanine Backbone Nitrogen (N) Bonds



How is DNA used as evidence?

- Each person's DNA is **different** from other people (except identical twins).

- DNA collected from a crime scene can either link a **suspect to the evidence** or **eliminate a suspect**, similar to the use of fingerprints.

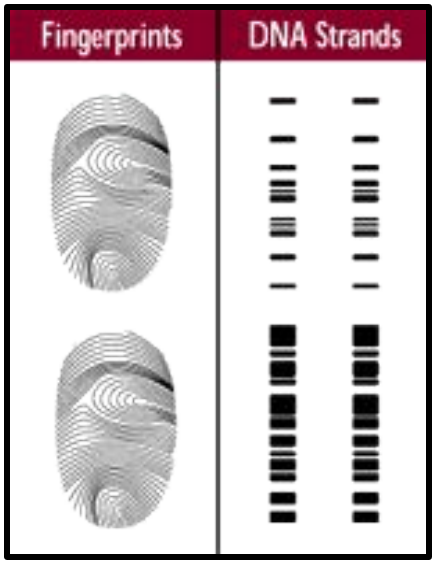
- DNA **can identify a victim** through DNA from relatives, even when no body can be found.

- DNA can **link crime scenes** together by linking the same perpetrator to different scenes locally, statewide, and across the nation.

- DNA can **place an individual at a crime scene**, in a **home**, or in a **room** where the suspect claimed not to have been.

- DNA can **refute a claim of self-defense** and put a weapon in the suspect's hand.

- It can change a story from an **alibi** to one of **consent**.



DNA Strand Image & information : http://www.dna.gov/audiences/investigators/know/

What factors affect DNA evidence?

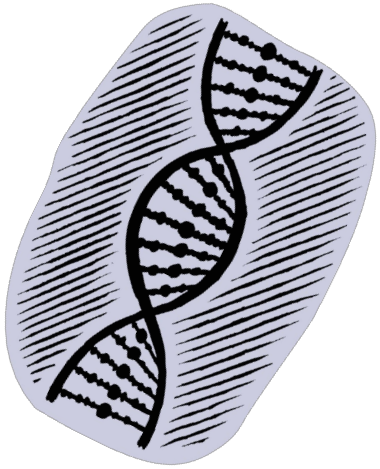
Several factors can affect the DNA left at a crime scene, such as **environmental factors** (e.g., heat, sunlight, moisture, bacteria, and mold). Therefore, not all DNA evidence will result in a usable DNA profile. Further, DNA testing cannot identify when the suspect was at the crime scene or for how long.

What is CODIS?

CODIS stands for **COmbined DNA Index System**, which is an electronic database of DNA profiles that can identify suspects. DNA profiles from individuals convicted of certain crimes, such as rape, murder, and child abuse, are entered into CODIS and help officers identify possible suspects when no prior suspect existed.

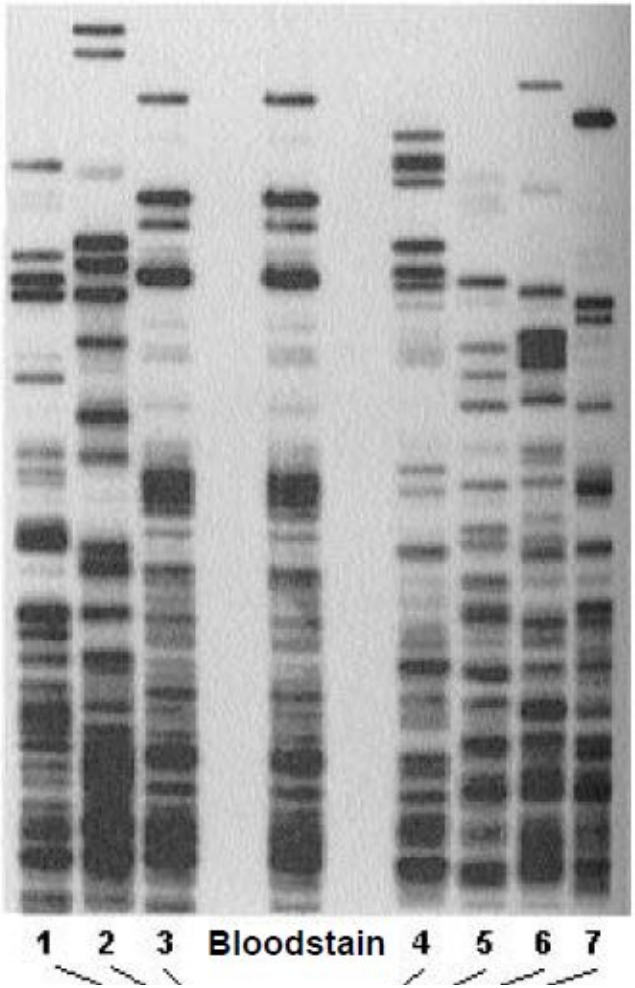
Did you know?

Each human cell contains three billion DNA base pairs. Our unique DNA amounts to 0.1% or 3 million base pairs.

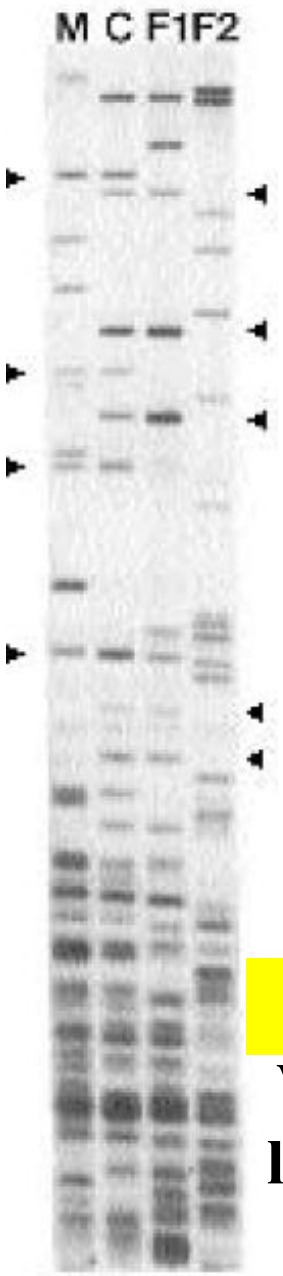


DNA information : http://www.dna.gov/audiences/investigators/know/

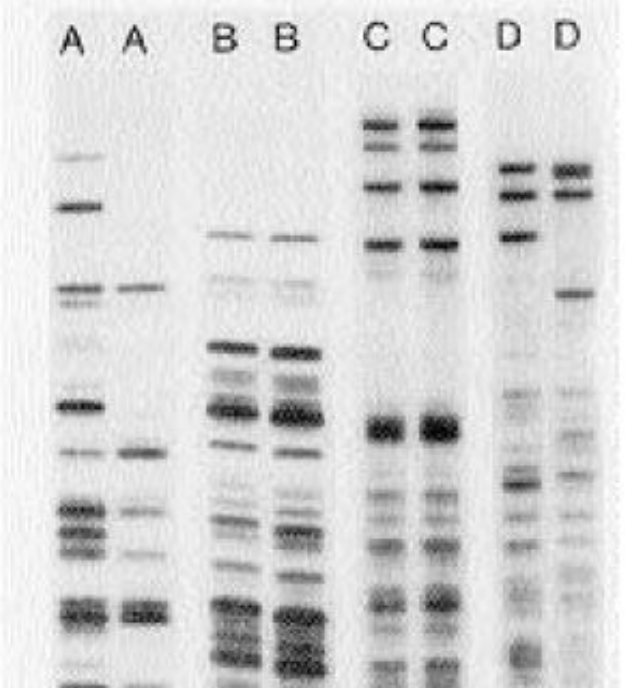
A. Who done it?



Which suspect matches the bloodstain?



C. Identical or not?



Which sets of twins are identical twins?

B. Whose your daddy?

Which sample is most likely to be the father? F1 or F2

Information & image from http://www.teachersdomain.org/resource/tdc02.sci.life.gen.lp_dnamysteries/

True or False?

Which three statements below are true?

1. The DNA in a man's blood is the same as the DNA in his skin cells and saliva.

2. Each person's DNA is different from every other individual's.

3. DNA can be found in all the cells in our bodies except the blood cells.

4. DNA can have forensic value even if it is decades old.

5. DNA evidence was first used to get a conviction in a trial in 1987.

Watch the video segment from *NOVA:* "The Killer's Trail" and be ready to answer the questions on the next slide.

Video available at
http://www.teachersdomain.org/resource/tdc02.sci.life.gen.sheppard/
More information available at http://www.pbs.org/wgbh/nova/sheppard/

Video Quiz

Choose the best answer for each.

1. Who was the victim?

A. Marilyn Sheppard B. Sam Sheppard C. Sam Sheppard, Jr.

2. What are the keys to DNA fingerprinting?

A. Chromosomes B. Alleles C. Nitrogen bases

3. Where did the scientist get the sample of DNA for Marilyn Sheppard?

A. Hair B. Skin C. Fingernail

4. Whose blood was found in the blood trail?

A. Marilyn Sheppard B. Sam Sheppard C. Neither