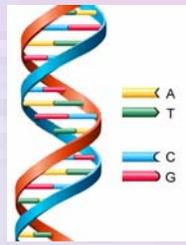


# DNA Fingerprinting

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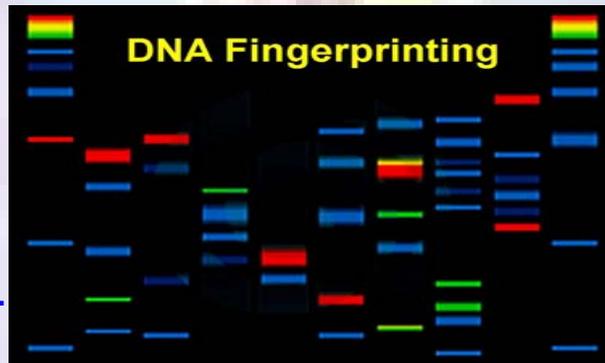
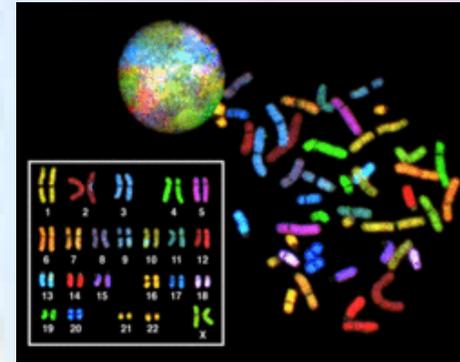


## What is a DNA Fingerprint?

Just like a "finger" print it distinguishes one individual or an organism from another by the sequence of the base pairs.

**The Human Genome** – this is the complete set of genetic instructions. All of this is found in every nucleus of every cell.

On average, individual people are 99.9% genetically identical to one another. But with 3 billion sets of base pairs there are still 3 million pairs that make us different!



## How a DNA profile is created...

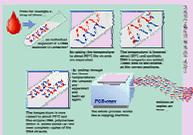
1. Evidence is collected from a crime scene. DNA is found in the nucleus of the cell. Samples can be obtained from teeth, sperm, blood, bones & hair.



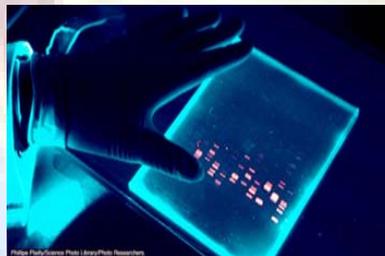
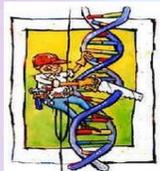
2. DNA is extracted from the source by breaking down the cells, removing the lipids and precipitating out the DNA.



3. PCR (polymerase chain reaction) performed. PCR amplifies a single or few copies of a piece of DNA making thousands of new copies of one particular part.



4. DNA is cut & run thru an electrophoresis machine which will separate the bands.



## Gel Electrophoresis

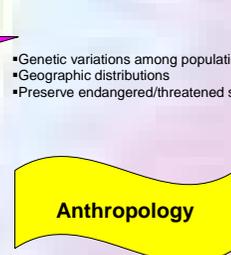
DNA fragments are separated on the basis of size...longer fragments will move thru the gel more slowly than the shorter fragments. These bands are then compared to the sample.

## What is DNA fingerprinting used for?



**CRIME SCENE DO NOT CROSS**

DNA from samples of hair, bodily fluids or skin at a crime scene are compared with those obtained from suspected perpetrators. DNA typing was first used in Great Britain for law enforcement purposes in the mid-1980s and was first employed in the United States in 1987.



- Relatedness of human fossils
- Romanovs



Using restriction analysis, DNA fingerprints of the mother, child and alleged father are compared.



- Disease resistance crops
- Longer shelf life of fresh food