

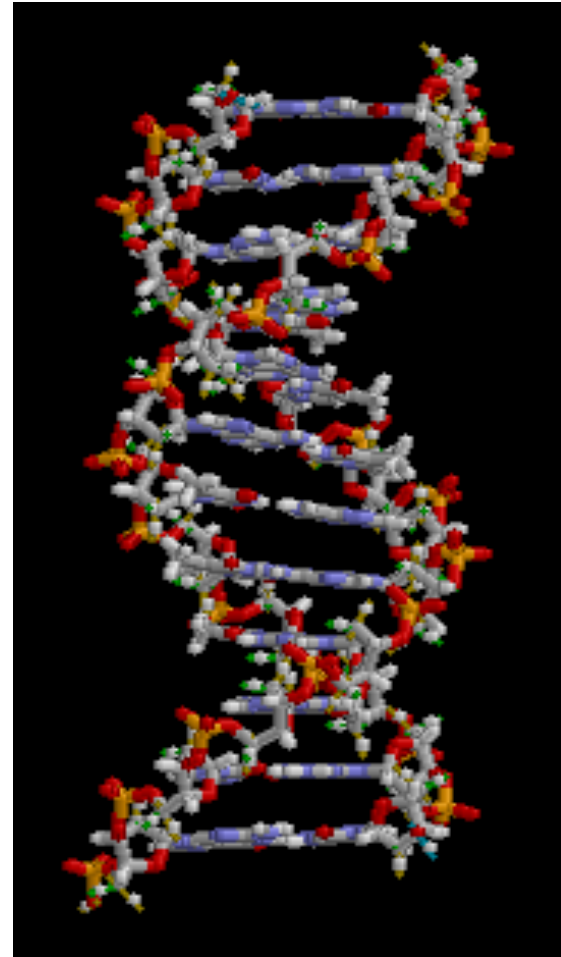
let's talk  **science**  
partnership program

**Forensic Detective**

# Agenda

let's talk   
science

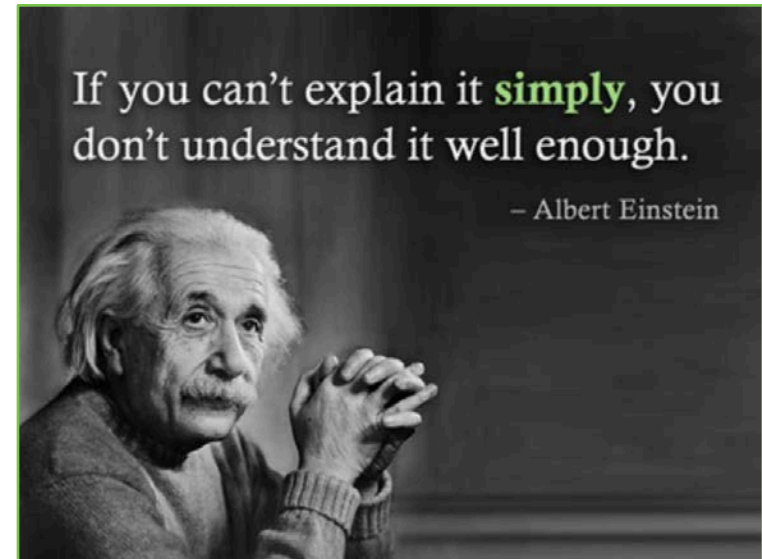
- Introduction
- What is DNA?
- How can we extract DNA?
- DNA extraction activity
- Gel Electrophoresis
- How is DNA used in Forensic Investigations?
- DNA Fingerprint Activity
- Conclusion



# Introduction

let's talk   
science

- What do scientists do?
- Where are they?
- What types of scientists are we?
- How does this type of science affect you?



## What is DNA?

- DeoxyriboNucleic Acid
- What is DNA made of?
- Where is DNA found?
- What is the function of DNA?
- Why is it important?



## Extracting DNA

- Time to extract your own DNA!
- Materials:
  - Bottled water
  - Clear dish soap
  - Food dye
  - Table salt
  - Isopropyl Alcohol





let's talk  **SCIENCE**

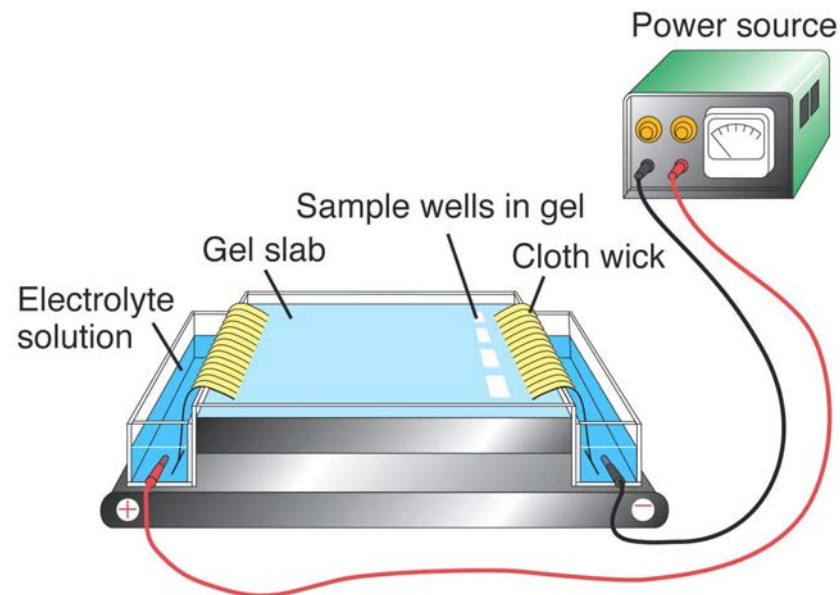
# Biological Separation

1. Mix 500 mL drinking water with 1 tbsp of salt.
2. Take 3 tbsp of mixture to another cup.
3. Gargle the 3 tbsp salt water. Time for 1 minute.
4. Spit back into cup.
5. Stir with 1 drop of soap.
6. Mix 100mL isopropyl alcohol and 3 drops of food dye.
7. Tilt salt cup and gently pour a 2cm layer on top.
8. Wait 2.5 mins!

# Gel Electrophoresis

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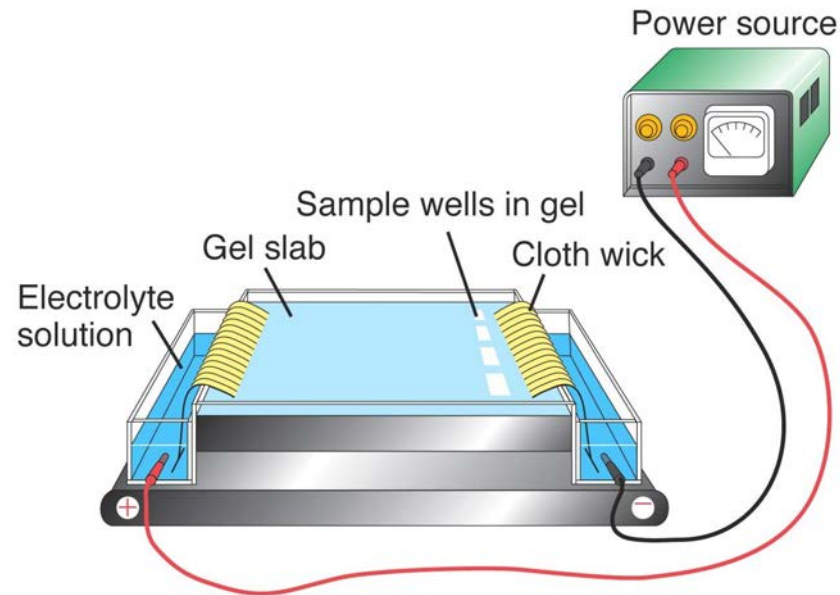
- What is Gel Electrophoresis?
  - method used to separate and analyze different molecules like DNA, RNA, and proteins into fragments
  - Fragments separate in terms of their **size** and **charge**



# Gel Electrophoresis

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SCIENCE

- Let's do our own
- Instead of using actual DNA, we'll use food colors and we'll see how they separate
- Materials are shown on set-up:

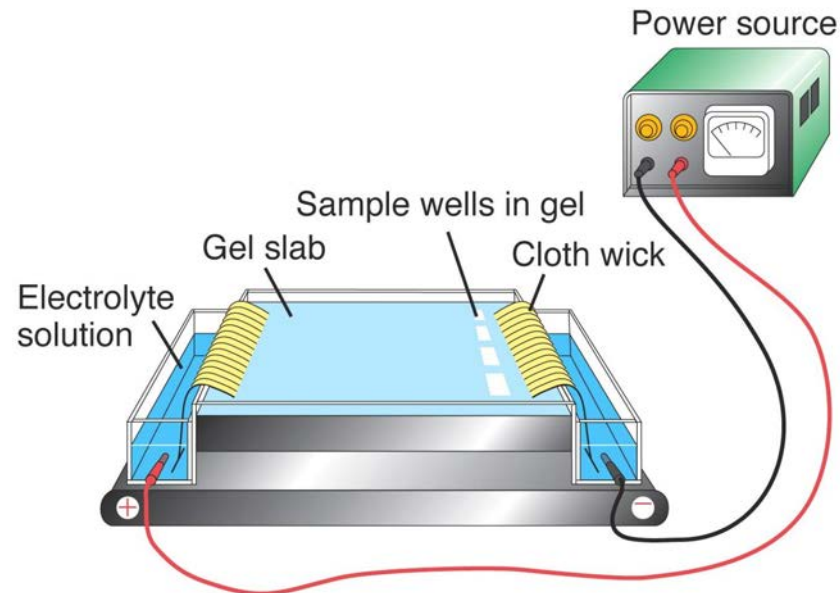




# Gel Electrophoresis

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- After loading, let it run for 45 mins.



# let's talk Science

## Forensic Investigations

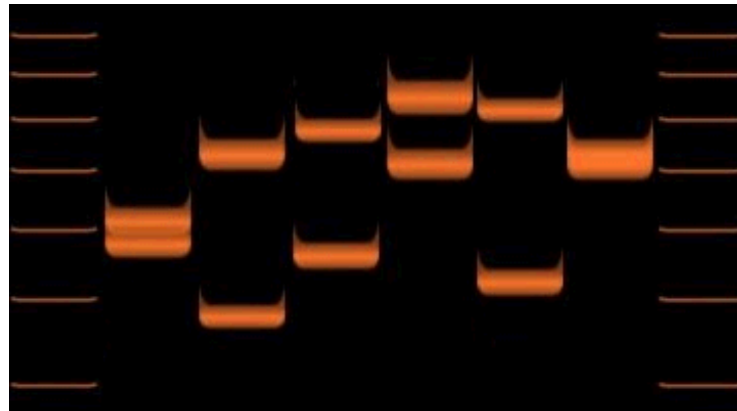
- What does “Forensic” mean?
- How does one become a Forensic Investigator?
- Why is DNA important in Forensic Investigations?
- What type of ‘clues’ or ‘traces’ do Forensic Investigators usually look for in a crime scene?



# let's talk Science

## Forensic Investigations

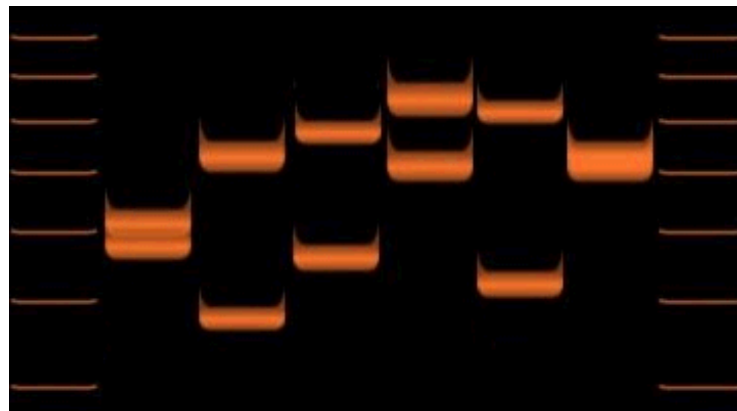
- Fingerprints, bloodstains, hair, finger nails, saliva
- What do we get from the traces above?
- What is DNA Fingerprinting?
  - Technology used by forensic scientists to identify a person by their DNA profiles or Genetic Fingerprint



# let's talk Science

## Forensic Investigations

- Fingerprints, bloodstains, hair, finger nails, saliva
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  - Technology used by forensic scientists to identify a person by their DNA profiles or Genetic Fingerprint



## DNA Fingerprinting

Find out who ate the lollipop?

- Materials:
  - Restriction Enzymes
  - DNA
  - Agarose Gel on tray
  - Nylon membrane
  - Probes
  - X-ray film
  - Developer





## DNA Fingerprinting

Find out who ate the lollipop?

- Procedure

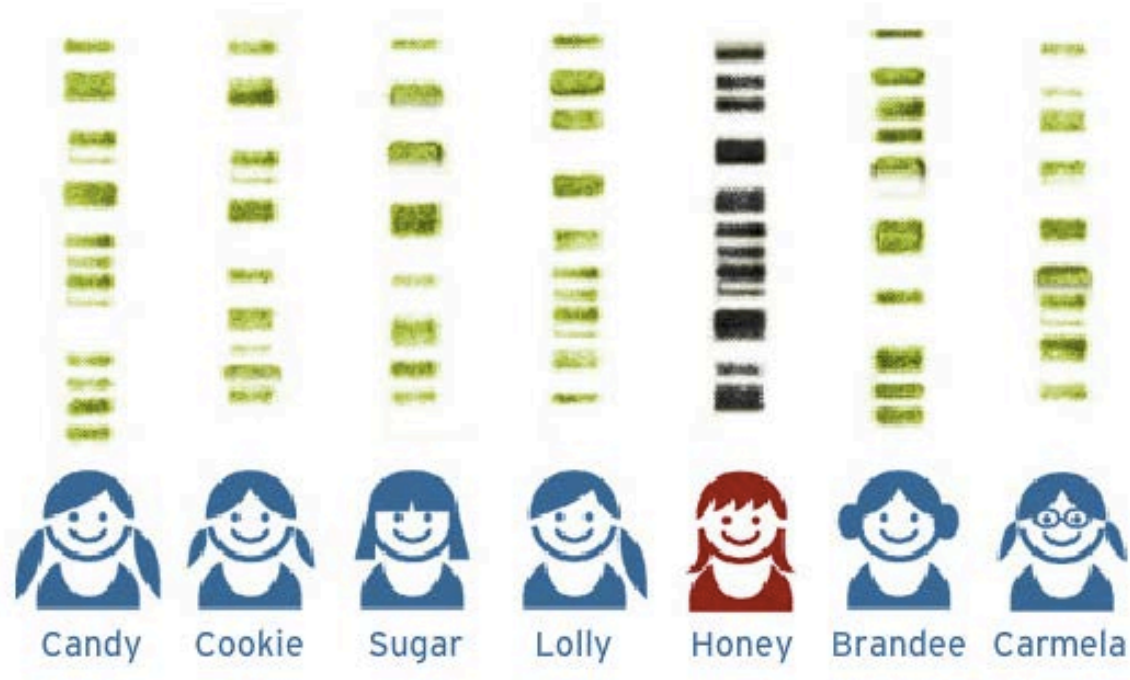
1. Pour restriction enzymes into DNA
2. Pour agarose gel into tray
3. Put DNA into tray
4. Turn tray POWER button ON
5. Place nylon membrane on gel
6. Pour probes on the nylon membrane
7. Place X-ray film on the membrane
8. Insert film into the developer
9. Developer exposes DNA Fingerprints



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# Who ate the lollipop?

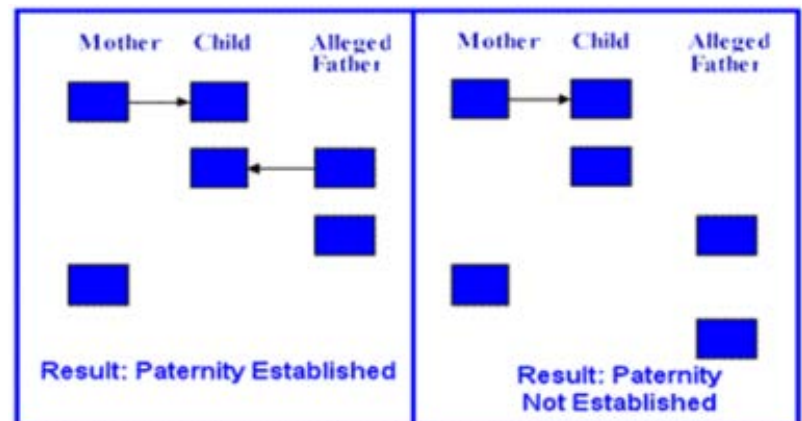
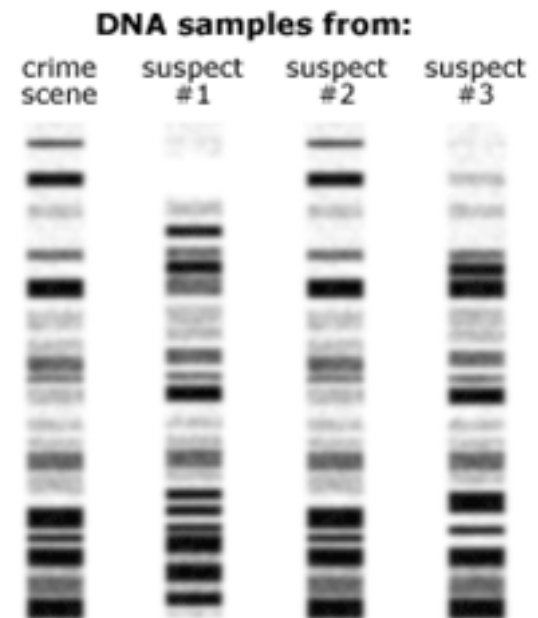
Honey is the lollipop culprit!!!



**SHE'S THE ONE!**

## Conclusion

- What is DNA?
- Why is DNA important in Forensic Science?
- How do we get a sample of DNA?
- How do we separate DNA to find someone's DNA Fingerprint?
- Can you think other ways where DNA Fingerprinting may be useful?



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**Thanks for having us!**