Introduction

- At crime scenes, investigators often find unknown materials that need to be identified.
- If the unknown material is a mixture, an investigator may want to know one of two things about it:
  1. **What are the ingredients of the mixture?**
  2. **Is the mixture found at the scene the same as a known mixture?**
ok...so what’s a mixture?

- A mixture is a collection of two or more substances that are physically close together.
- **For Example**
  - Soda or Pop (Potatoes or Tomatoes) is a mixture of sugar, artificial colors, caffeine, and flavors.
- Other mixtures include:
  - Drugs
  - Cosmetics
  - Fuels
  - Dyes
  - ...Moving on...
Chromatography

- **Chromatography** is an ancient method of separating parts of a mixture.
- The word Chromatography really means, “**Color Writing**”.
- The inks in modern pens are made of a mixture of dyes.
- These inks show a variety of colors when a solvent, such as water passes through them.
Colors in Chromatograms

- Different types of water-soluble ink pens vary in their composition.
- Two different brands of pens will give two dissimilar chromatograms.
- Therefore if ink samples are taken from separate locations on a document that was written with one pen, all samples should produce the same chromatograph.
What does this have to do with Forensics?

- By using chromatograph, **Forensic Scientists** can determine whether a document contains two or more different inks.
- One drawback of using ink chromatography in Forensic Science is that it destroys the evidence.
- The document under investigation must have areas cut from it so the ink can be analyzed.
In Summary

If an entire document has been written with the same ink pen, then test applied to different portions of the document should produce the same results.

If the chromatogram produced are the same, the **Forensic Scientist** can assume the inks are the same.

Diverse solvents can be used in **ink chromatography**. For inks that are water soluble, water is the solvent of choice. For inks that are not soluble in water, methanol, ammonium hydroxide, ethanol, acetone or hydrochloric acid can all be used as solvents.
Thanks😊

Remember we are in the lab for Wednesday and Thursday!

Please refer to the plan of the week for upcoming assignments.