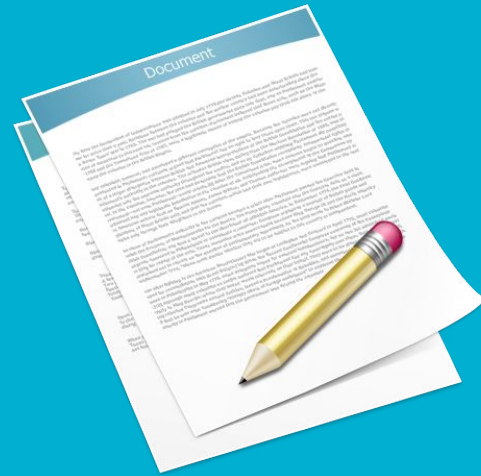


Questioned Documents



Questioned Documents

Any document about which some issue has been raised or that is the subject of an investigation



Document Examiners

- ❑ Mostly examine handwriting to originate its source or its authenticity
- ❑ Will also examine typed writings, computer printings, photocopies, inks, papers, and forgeries, and decode altered and charred documents

Document Examiners

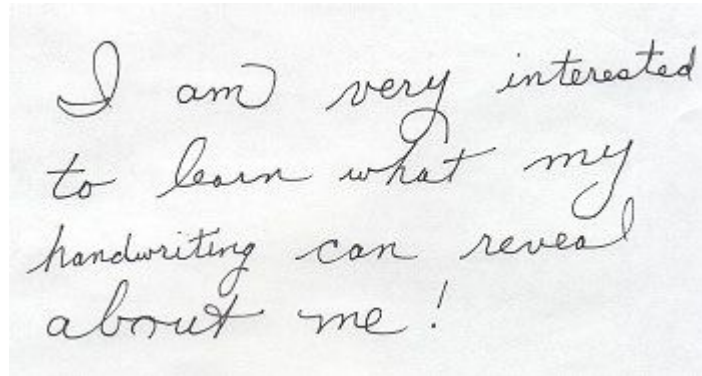
- ❑ May need to use microscopes, photographs, chromatography, and other lab examinations on the questioned documents
- ❑ Many work in federal, local, and state crime labs, but they may also work in private practices

Handwriting- General Info

- ❑ Two different individuals' handwriting cannot be identical
- ❑ Since handwriting is associated with mechanical, physical, and mental functions, it is almost impossible to reproduce exactly

Handwriting- General Info

- ❑ Handwriting can be almost as individual as a person's fingerprint



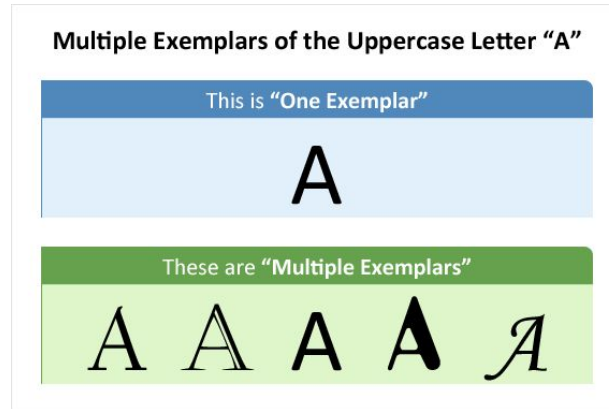
I am very interested
to learn what my
handwriting can reveal
about me!

Handwriting- Examining and Comparing

- ❑ A positive comparison must be based on an ample number of common characteristics between known and questioned writings
- ❑ collecting a lot of exemplars (known writings) is critical in order to make a comparison

Handwriting- Examining and Comparing

- ❑ Exemplars should contain some of the same words or combinations of letters that are present in the questioned document



Handwriting- Examining and Comparing

- ❑ Forensic Information System of Handwriting (FISH) database
 - ❑ If the document is a part of a high profile case or is suspected to be written by a repeat offender, the document may be scanned into the FISH database

Handwriting- Examining and Comparing

- ❑ FISH
 - ❑ This database is maintained by the U.S. Secret Service
 - ❑ It can provide a list of “hits” based on mathematical values calculated from the scanned images, but a document examiner makes the final confirmation or elimination

Handwriting- 12 Factors

- ❑ To determine whether the handwriting on the document is authentic, the examiner will generally examine the following twelve factors:

Handwriting- 12 Factors

1. Average amount of space between words and letters
2. Relative height, width, and size of letters
 - a. height of the letters, including a comparison of the height of uppercase to lowercase letters

Handwriting- 12 Factors

b. Width of the letters and the space

between the letters and the words

c. Size of the letters relative to the available space

the lazy

the lazy

the lazy

Handwriting- 12 Factors

3. Line quality- observing if the lines are smooth, free-flowing, or shaky and wavering
4. Connecting strokes- comparing the strokes between upper and lower case letters, and the strokes between the letters and the words

Handwriting- 12 Factors

5. Beginning and ending strokes-
observing how the writer begins and
ends words, numbers, and letters



Handwriting- 12 Factors

6. Pen lifts and separations

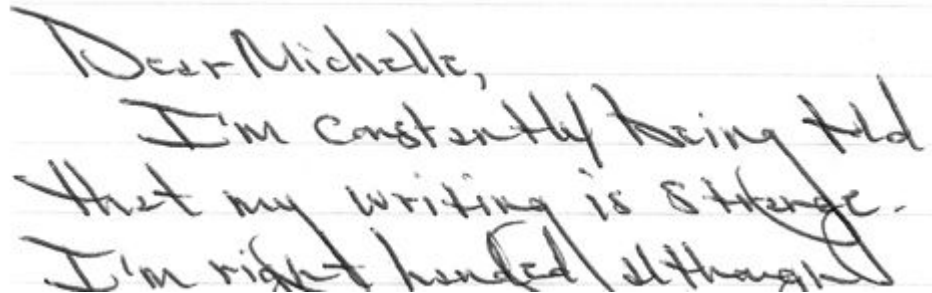
- a. How the writer stops to begin new letters and words
- b. Forgeries may have lifts or separations in unusual places, such as within a letter

Handwriting- 12 Factors

7. Shading and pen pressure- differing amounts of pressure used by the writer, that make lines light, dark, narrow, or wide
8. Baseline habits- analyzing if the writer's letters stay straight or move up and down compared to the baseline

Handwriting- 12 Factors

9. Slant- analyzing the writing slant: left, right or straight
10. Unusual letter formation- such as letters with tails or letters written backwards



Dear Michelle,
I'm constantly being told
that my writing is strange.
I'm right handed although

Handwriting- 12 Factors

11. Flourishes or embellishments- any fancy letters, curls, loops, circles, etc.
12. Letter characteristics
 - a. completeness of closed characters such as o, e, and a
 - b. dotting of i and j, and crossing of t

Factors that can affect handwriting samples

1. Types of writing instrument (pens, pencils, crayons, etc.)
2. Types of writing surface (paper, wall, napkin, etc.)
3. Underlying surface (smooth or rough)
4. Mood of the writer (happy, depressed, angry, etc.)

Factors that can affect handwriting samples

5. Age of the writer (undeveloped or shaky handwriting)
6. Writing speed (slow or quick)
7. Position of the writer (sitting or standing)
8. Position of the document (flat, vertical, or horizontal surface)

Factors that can affect handwriting samples

9. Environmental exposure (temperature, humidity, etc.)
10. Other factors
 - a. consumption of alcohol or drugs
 - b. injury and/or illness

Typescript Comparisons

- ❑ Typescript is the result of machine-created documents, such as those created by computer printers, photocopiers, fax machines, and typewriters

Typescript Comparisons

- ❑ Defects, missing pieces, or scratches may help to identify the machine where the document originated
 1. Computer printers- identifying the kind of ink and toner can reduce the number of suspected printers used

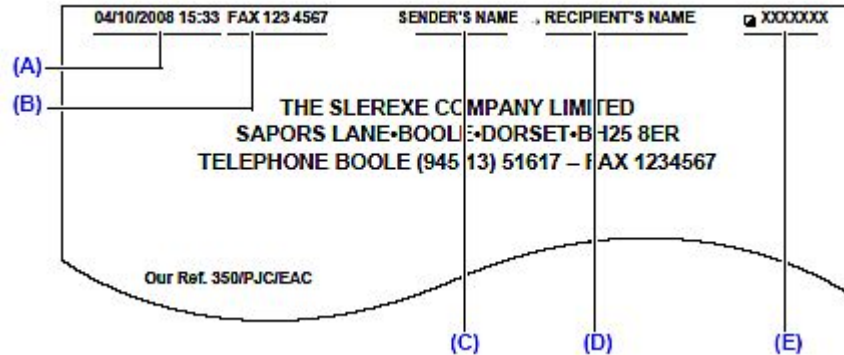
Typescript Comparisons

2. Photocopiers

- a. The debris on the glass or the mechanical portions can form distinctive patterns
- b. These marks can change over time and may help date the document

Typescript Comparisons

3. Fax machines have a header on each page known as the TTI (transmitting terminal identifier) that helps identify the origin of the fax



Typescript Comparisons

4. Typewriters

a. Wear and defects in the typeface, misalignments or characters, and the ribbon can narrow down the search to the original typewriter

Typescript Comparisons

b. The Haas Atlas is a catalog that is organized by typewriter name and includes font, manufacturer information, serial numbers, etc.

Altered Documents

- ❑ Documents are often altered after they have been prepared. This is sometimes done to hide their original content or create a forgery.

Altered Entry

IOU \$20,000.00

Normal View



Infrared Reflectance



Infrared Luminescence

Altered Documents- Additions

- ❑ Adding content to an already prepared document
- ❑ Infrared luminescence
 - ❑ emits infrared light when exposed to blue-green light
 - ❑ can be used to get results if a different ink is used

Altered Documents- Erasures

- ❑ One of the most common alterations of documents
- ❑ A rubber eraser, sandpaper, razor blade, or knife may be scratched against the paper's surface in an attempt to remove writing or type

Altered Documents- Erasures

- ❑ This irritates the top fibers of the paper which are visible under a microscope



Altered Documents- Obliterations

- ❑ A document may have parts that are blotted or smeared, making the original unreadable
- ❑ This is usually done with strong oxidizing agents to make the ink become colorless

Altered Documents- Obliterations

- ❑ This is not visible to the naked eye, but can be seen with microscopes, or ultraviolet or infrared lighting

Altered Documents- Charred Documents

- ❑ Sometimes documents are accidentally or purposely charred in a fire
- ❑ Infrared photography or reflecting light at different angles can sometimes reveal the document's contents

Other Document Challenges-Indentations

- ❑ Most of the time an indented impression is left on a paper below the primary writing

Other Document Challenges-Indentations

- ❑ The best way to read the impression is by using an ESDA (electrostatic detection apparatus)
 - ❑ this charges the paper
 - ❑ pouring toner powder over the charged paper develops the images on the indented paper

Other Document Challenges-Paper

- ❑ To identify paper, scientists may use the following characteristics
 - ❑ color
 - ❑ density
 - ❑ watermarks
 - ❑ dyes or bleaches
 - ❑ fluorescence under UV light



Other Document Challenges-Paper

- ❑ Raw material the paper is made from
- ❑ thickness

Other Document Challenges- Ink

- ❑ Considered a mixture, so it can be broken down into the different chemical components using the following lab tests
 - ❑ Thin Layer Chromatography (TLC)
 - ❑ A visible microspectrophotometer

Other Document Challenges- Ink

- ❑ Studying the chemical composition can sometimes determine
 - ❑ if a certain pen was used on a questioned document
 - ❑ how long the ink has been on the paper

Other Document Challenges

- ❑ Physical/ Fracture Match of separated documents- usually these documents are cut or torn and can be linked to the original source



Examples of Questioned Documents

- ❑ Checks
- ❑ Licenses and Certificates
- ❑ Passports
- ❑ (Counterfeit) Money



Forgery

- ❑ An item prepared with the intent to deceive



Forgery- Types

- ❑ Blind Forgery- made without a model of the signature or writing being forged
- ❑ Stimulated forgery- one made by copying a genuine signature
- ❑ Traced forgery- one made by tracing a genuine signature

Counterfeit

- ❑ Made in exact imitation of something important or valuable with the intention of deceit
- ❑ Columbia
 - ❑ the leading manufacturer of counterfeit U.S. currency
 - ❑ this counterfeit production supports their growing drug cartel

Anti-counterfeiting Security

- ❑ Watermarks- distinct images or designs put into paper during the papermaking process
- ❑ Color-shifting inks- ink that looks like different colors depending on the angle at which they are viewed (the number 50 on a \$50 bill looks copper from one angle and green from another)

Anti-counterfeiting Security

- ❑ Fine-line printing and microprinting- makes it difficult to achieve a high quality reproduction with copying or scanning
- ❑ Enlarged, off-center portraits- provide room for the watermark and reduce wear on the portrait caused by folding

Anti-counterfeiting Security

- ❑ Poor vision feature- the larger number on the back of bills is to help aid people with poor vision



Anti-counterfeiting Security

- ❑ Denomination-specific security thread
 - ❑ UV fluorescent ribbon running through the bill
 - ❑ guards against reprinting and bleaching



Counterfeit Detection Pen

- ❑ A security feature that businesses use to help eliminate receiving counterfeit bills



Counterfeit Detection Pen

- ❑ The pen contains iodine and when it is used on a counterfeit bill it produces a blue-black color
- ❑ When used on an authentic bill, it produces a pale yellow color that fades over time