Handwriting Analysis

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Handwritng is unique to each individual. Although some peoples' handwriting may have similar styles and characteristics in common, acquired when these people learned to write by copying letters and words, they tend to take on individual styles with age. Also, as a person ages, their handwriting will show additional changes.

Generally, one cannot determine the age or sex of a suspect or whether they are left-handed or right-handed from a normal writing sample. Certain types of flourishes and embellishments in writing styles and detailed examination of an original document my give hints at some of some of these characteristics.

In handwriting analysis, one should look for similarities in the shapes, styles, alignment, and spacing of letters.

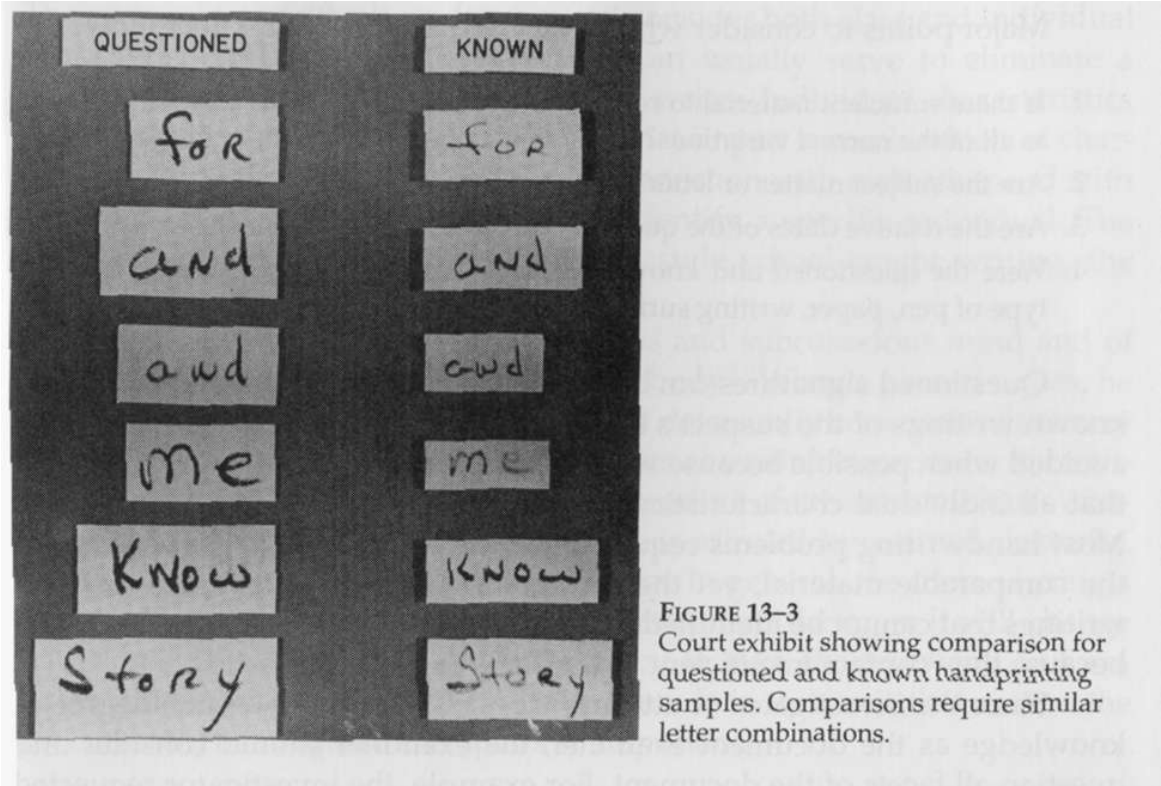


FIGURE 13–3
Court exhibit showing comparison for questioned and known handprinting samples. Comparisons require similar letter combinations.

Reference: Reproduced from Saferstein, **Criminalistics**. 5th Ed., Prentice Hall, 1995.

Materials:

Documents to be examined
Ruler
Protractor
Magnifying lenses

Safety Precautions

There are no safety hazards with this procedure.

Procedure

Never work with original documents. Always make copies to work with.

Original documents must be maintained for evidence. Handle original documents as little as possible. Keep them protected in archival sleeves or folders. Any testing for fingerprints must be done after the handwriting and document analysis.

When requesting writings by a subject, they should be given voluntarily. Dictate the text, never show the subject the original document. Make sure that the subject is comfortable and is using the same type of paper and writing instrument. If other samples of the suspect's handwriting are available use them for additional comparison.

Characteristics of Handwriting

Examine the spacing between letters and words. Use a ruler to measure typical spacing.

Examine the relative height, width, and size of letters. Use a ruler to measure these for comparison.

Examine pen lifts and separations. Some letters and combinations will be continuous while others may not be connected. Look at the beginning and ending strokes of words and letters and any connecting strokes.

Are there any unusual letter formations such as loops and curls or a mixture of cursive and printing of letters?

Is there any shading of letters due to uneven pressure applied in writing?

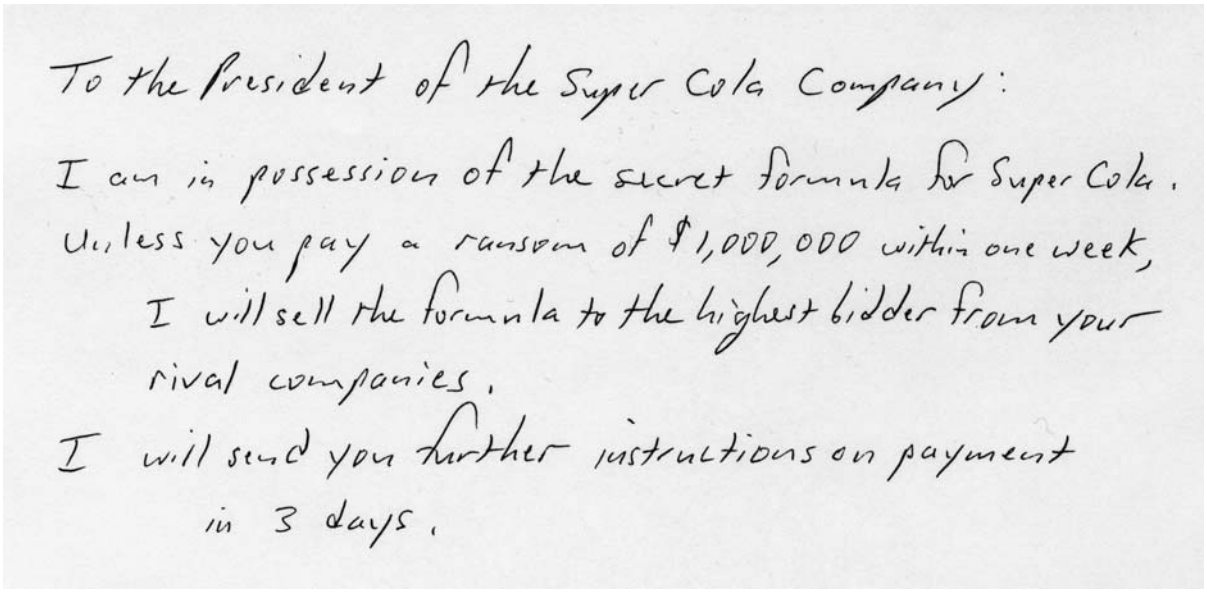
Examine the slant of the letters. Do they slant left, right, or not at all? Are the slants consistent throughout the writing sample? Measure the angles of slant using a protractor.

Examine the baseline habits. Are the words and letters on the baseline or are they above and below. A ruler will be helpful in determining this.

Look for flourishes and embellishments. Using small circles to dot i's or for periods, loops on capital letters or ending letters, etc. Are there any unusual letter formations?

Look at the placement of diacritics. Are the i's dotted and t's crossed? Individuals tend to dot i's and cross t's in unique fashions.

Study the ransom note in Figure H-1. Note some of the unique characteristics of the individual's handwriting.


To the President of the Super Cola Company:

I am in possession of the secret formula for Super Cola.
Unless you pay a ransom of $1,000,000 within one week,
I will sell the formula to the highest bidder from your
rival companies.

I will send you further instructions on payment
in 3 days.

Figure H-1. A ransom note.

Figure H-2 contains samples of handwriting from 5 suspects. Can you determine who wrote the ransom note shown in Figure H-1? Write your results on the data pages.

Handwriting sample from Suspect 1

I am in possession of the secret formula for Super Cola.

Handwriting sample from Suspect 2

I am in possession of the secret formula for Super Cola.

Handwriting sample from Suspect 3

I am IN possession of the Secret formula for Super Cola

Handwriting sample from Suspect 4

I AM IN POSSESSION OF THE SECRET FORMULA FOR SUPER COLA.

Handwriting sample from Suspect 5

I am in possession of the secret formula for Super Cola.

Figure H-2. Handwriting samples from five suspects.

Characteristics of Forged Documents

Writing in forged documents tends to be slowly written and will show a lack of individuality. Letters tend to have an unnatural appearance as if the forger was drawing the letters. This makes letters inconsistent in the document, shows unnatural starts and stops and a general lack of rhythm to the writing. Any mistakes will show a careful correction. Signatures will be identical.

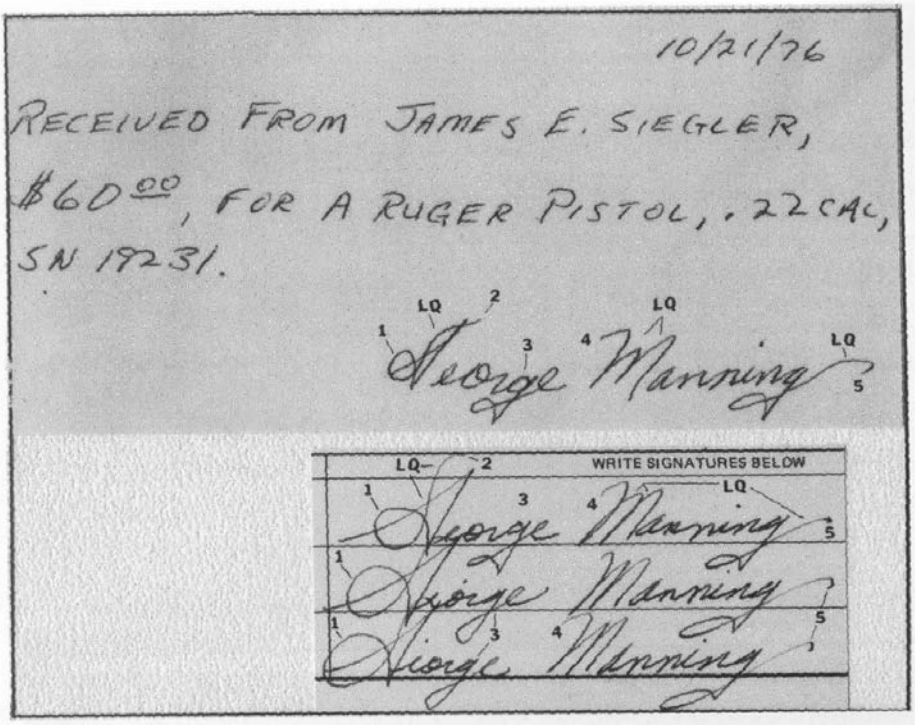


FIGURE 13–4 A case involving a simulated signature. The George Manning signature on the note was "drawn" by a person who had a good signature to use as a guide. As in most simulations the line quality (LQ) is very poor. (1) The loop of the *G* in the simulated signature is too small and confined, whereas the real writer is quite free with that loop. (2) The direction of approach is different. (3) The bowl of the small *g* is much larger in the simulated signature than in the known. (4) The approach stroke in the *M* in the simulated signature is blunted, whereas in the known writing that stroke feathers—a sign of movement. (5) The terminal stroke on the *g* in the questioned signature is tapered (showing movement), whereas the real writer comes to an abrupt halt at that stroke. These and many characteristics label the signature a simulated forgery.

Reference: Reproduced from Saferstein, **Criminalistics**. 5th Ed., Prentice Hall, 1995.

Try this:

Write your signature five times in the spaces below:

_____

_____

_____

_____

_____

Now, try to write your signature **exactly** as you did in the 5th sample, above.

_____

Ask your lab partner to write your signature **exactly** as you did in the 5th sample, above.

_____

Complete the information on the data pages.

Disguised Writing

If a suspect attempts to disguise their writing, they will generally exhibit inconsistent slant and letter formations with a major change in the size of their letters. Capital letters will be different and they often will use block lettering. As they write, there will be a lack of rhythm, irregular spacing, and unnatural starts and stops. Occasionally they will add excessive ornamentation. Some individuals will try to write with the wrong hand.

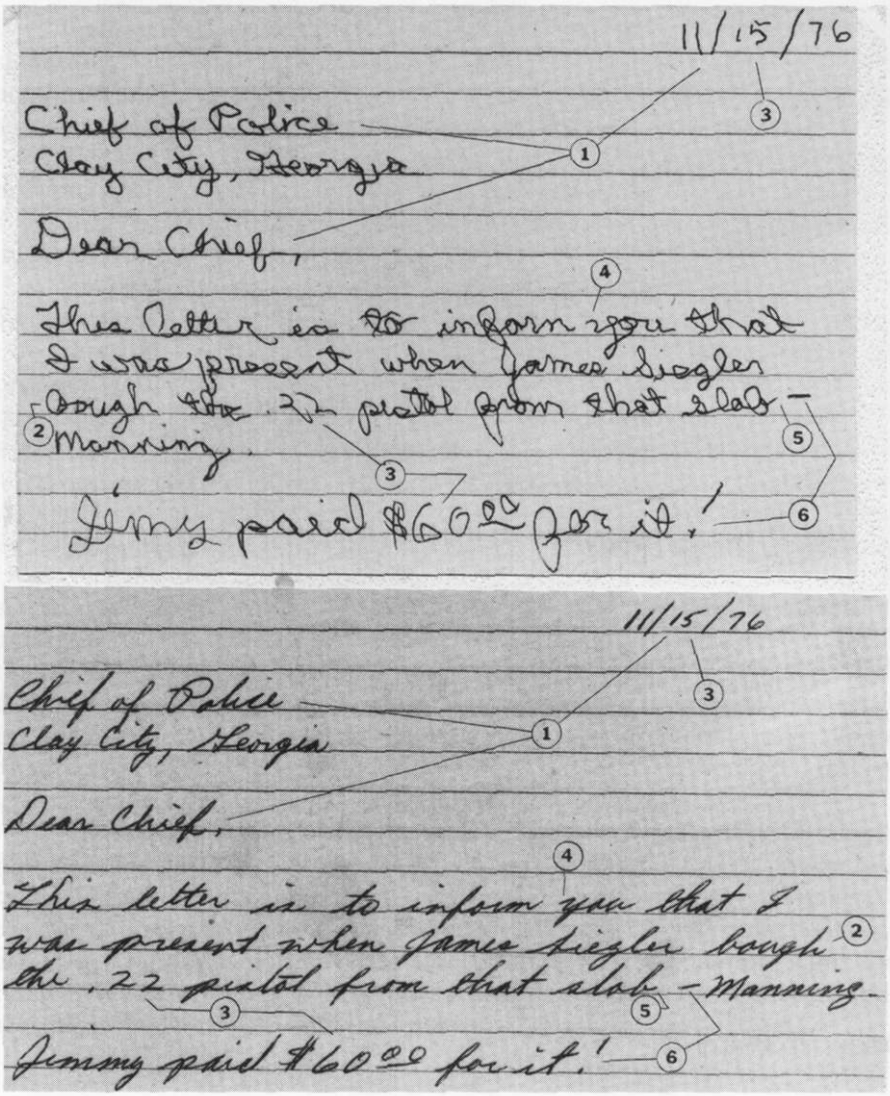


FIGURE 13–5 In a case of disguise it is up to the questioned document examiner to penetrate the writing and identify sufficient habitual characteristics that have remained. In this case, the questioned note was, in all likelihood, written with the unaccustomed hand, while the writing below was written with the accustomed hand. Some of the characteristics that remained in the questioned note are the (1) placement of the words on the paper, (2) spelling errors, (3) consistent abbreviations in both questioned and known, (4) initial strokes, and (5) punctuation, and, of course, the combinations of these characteristics.

Reference: Reproduced from Saferstein, **Criminalistics**. 5th Ed., Prentice Hall, 1995.

If an independent writing sample is available, it should be used for comparison.

Try this:

Look at Figure H-2. Write the sentence in the space below. Use your normal writing.

_____

Write the sentence again. This time try to make it look different from your normal writing, but try to write at a reasonable rate of speed.

_____

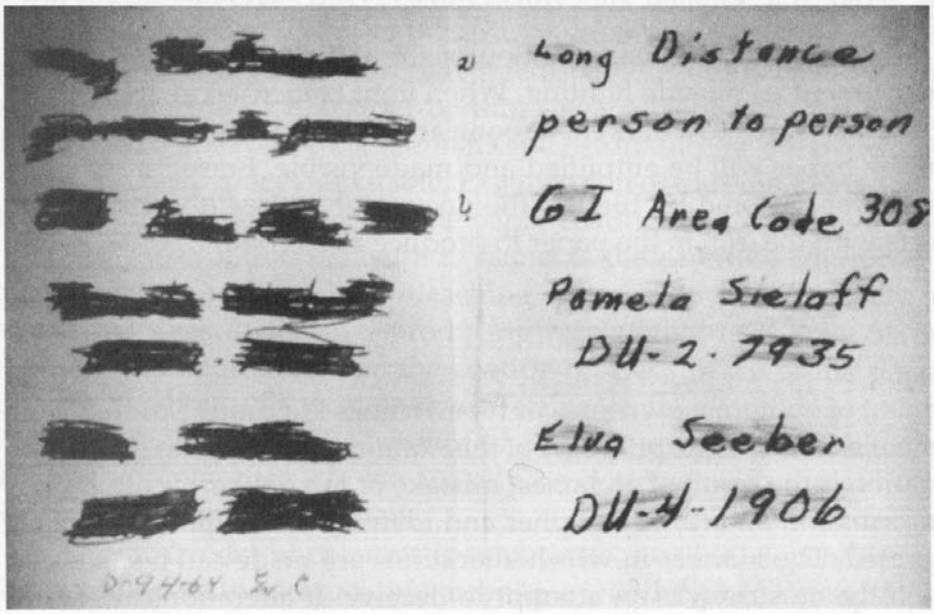
Can you write with your other hand? If so, write the sentence again.

_____

Complete the information on the data pages.

In addition to normal handwriting analysis, as discussed previously, methods can be used to detect handwriting, even when the writing has been obliterated. For example, using infrared film or infrared microscopy, some obliterated writing can be deciphered.

FIGURE 13–8 Deciphering obliterated writing using infrared-sensitive film or infrared image conversion microscopy.



Reference: Reproduced from Saferstein, **Criminalistics**. 5th Ed., Prentice Hall, 1995.

Bleaching ink on a document is a method that can be used to alter it, as in the bank check shown below. Ultraviolet light can be used to detect this if the paper, ink, or bleach has any fluorescent properties.

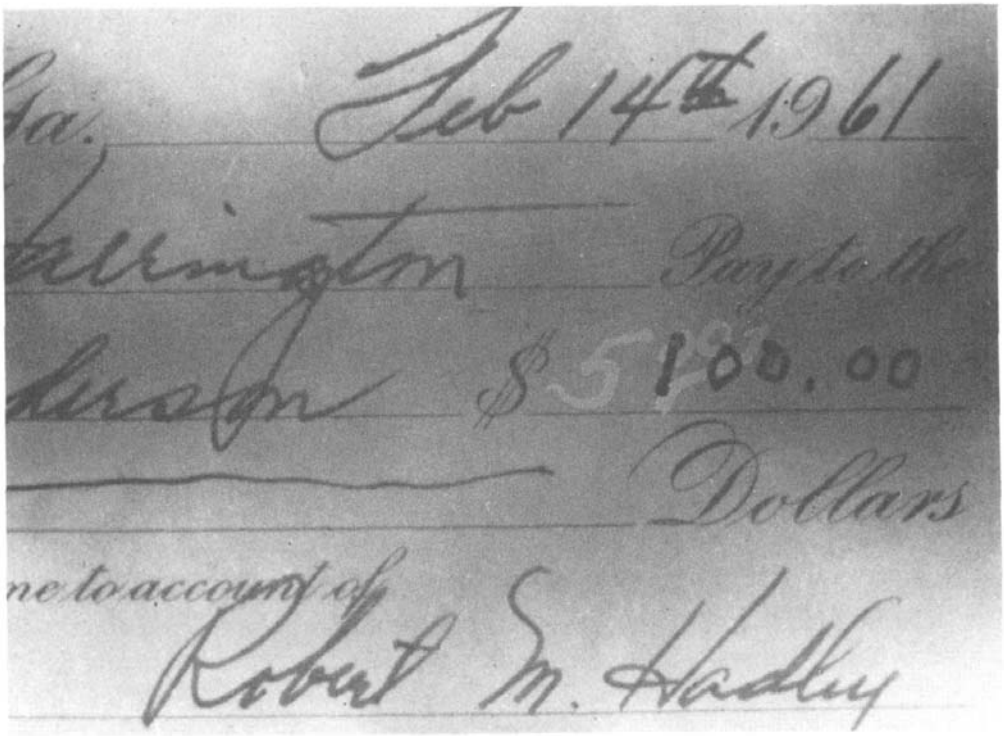


FIGURE 13–7 Ultraviolet examination showing altered entry on a check. The original entry, which was chemically erased, retained the fluorescent properties of the ink.

Reference: Reproduced from Saferstein, **Criminalistics**. 5th Ed., Prentice Hall, 1995.

Analysis of papers can also be used to compare documents, such as a ransom note. Papers can be compared to those in a home or business to ascertain the source and, in some cases, the manufacturer. The following chart shows the elemental analysis of different colored papers.

TABLE 13–1 Elemental Occurrence in Paper[a]

ELEMENT	CONCN RANGE,[b] ppm	PERCENT OCCURRENCE[c]				
		White	*Yellow*	*Green*	*Blue*	*Pink*
Tantalum	0.1–200	9.6	ND	ND	ND	ND
Copper	0.1–110	72.4	100	95.5	100	95.3
Arsenic	1.0–9.0	3.5	10.9	ND	ND	ND
Manganese	0.2–510	100	100	100	96.5	100
Samarium	0.01–150	75.0	68.5	91.0	46.5	57.2
Sodium	50.0–1840	100	100	100	100	100
Lanthanum	0.3–570	73.2	54.8	63.7	32.2	28.6
Gold	0.01–90	82.3	100	100	100	100
Chromium	1.0–330	76.8	100	100	100	100
Antimony	0.2–245	66.7	17.8	31.9	11.1	49.3
Bromine	0.01–160	24.7	15.1	14.3	46.4	51.2
Mercury	0.1–90	14.3	8.4	9.0	7.1	28.6
Rubidium	9.0–60	ND	9.5	ND	ND	ND
Iron	100.0–620	0.5	ND	18.2	14.3	ND
Barium	37.0–10,200	13.6	9.5	16.4	9.1	32.1
Zinc	22.0–90.0	9.4	10.0	9.1	50.4	38.3
Titanium	ND	39.2	26.1	59.1	46.4	52.3
Scandium	0.1–18.0	90.5	62.3	63.1	39.0	43.2
Molybdenum	8.0–330	1.5	ND	ND	7.1	ND
Tungsten	134[d]	ND	ND	ND	ND	4.9
Cobalt	1.0–4.1	ND	2.4	18.1	9.0	ND
Chlorine	470–2400	ND	1.8	ND	ND	ND
Cesium	5.6[d]	0.2	ND	ND	ND	ND

[a]456 white, 73 yellow, 22 green, 28 blue, and 21 pink papers were analyzed. The colors include various shades.
[b]Includes values obtained for all colors.
[c]ND = not detected.
[d]One sample only.

Source: R. Brunelle, W. Washington, C. Hoffman and M. Pro, "Use of Neutron Activation Analysis for the Characterization of Paper," *J. Assoc. Off. Anal. Chem.*, 54 (1971), 920–24. (Courtesy of the Association of Official Analytical Chemistry.)

Reference: Reproduced from Saferstein, **Criminalistics**. 5th Ed., Prentice Hall, 1995.

HANDWRITING ANALYSIS

Data and Results

Name _____ Course and Section _____

Partner(s) _____ Date _____

List your observations and measurements of the handwriting sample:

Spacing of words and letters

Relative height, width, and size of letters

Are there any pen lifts and separations?

Are there any unusual letter formations?

Is there any shading of letters?

Describe the slant of the writing.

Describe the baseline habit of the writer.

Are there any flourishes or embellishments?

Describe placements of diacritics.

Who wrote the ransom note? Explain.

Characteristics of Forged Documents

Are your five signatures the same? Explain.

Is your 6th signature identical to the signature you tried to copy? Explain.

Was your lab partner able to copy your signature? Explain similarities and differences.

If you examined any forged documents, describe your findings.

Disguised Writing

How good are you at disguising your writing?

If you examined any disguised writing, describe your findings.