

Held for Ransom

Forensic Handwriting Analysis

Heather Shaffery, Aubrey Cole, Erin Finley
Published by *K20 Center*

This work is licensed under a Creative Commons CC BY-SA 4.0 License

Grade Level	7th – 12th Grade	**Time Frame**	180 minutes
Subject	Science	**Duration**	3–4 periods
Course	Forensics		

Essential Question

How are characteristics of handwriting used in document analysis?

Summary

In this lesson, students will explore forensic document analysis with an emphasis on handwriting. They will learn about the 12 characteristics of handwriting analysis and use them to analyze samples of their own handwriting and a peer's. Students will apply the skills they practiced to identify the writer of a ransom note from a collection of known handwriting samples. In small groups, students will act as expert witnesses and present their evidence to a jury of their peers to convince them that the group has identified the ransom note writer.

Snapshot

Engage

Students explore the 12 handwriting characteristics used in forensic document analysis.

Explore

Students use the 12 characteristics to perform an analysis of their own handwriting and a peer's.

Explain

Students take notes on document analysis, the history of handwriting analysis, and the development of individualized handwriting.

Extend

Students apply what they've learned about handwriting analysis to identify the writer of a ransom note from a collection of handwriting samples.

Evaluate

Student groups act as expert witnesses and present to a jury of their peers the evidence supporting the identity of their ransom note writer.

Standards

Georgia Standards of Excellence: Forensic Science (Forensic Science)

SFS2.c: Use models for the evaluation of handwriting and document evidence.

Attachments

- Characteristics of Handwriting—Held for Ransom.pdf
- Expert Testimony—Held for Ransom.docx
- Expert Testimony—Held for Ransom.pdf
- Handwriting Analysis—Held for Ransom.docx
- Handwriting Analysis—Held for Ransom.pdf
- Lesson Slides—Held for Ransom.pptx
- Ransom Note Exemplar Analysis—Held for Ransom.docx
- Ransom Note Exemplar Analysis—Held for Ransom.pdf
- Window Notes—Held for Ransom.docx
- Window Notes—Held for Ransom.pdf

Materials

- Lesson Slides (attached)
- Ransom notes (written by students ahead of time)
- Lined paper
- Pencils
- Colored pencils and/or highlighters
- Rulers and/or calipers
- Magnifying glasses
- Characteristics of Handwriting handout (attached; one per student)
- Handwriting Analysis lab handout (attached; one per student)
- Window Notes handout (attached; one per student)
- Expert Testimony handout (attached; one per student)
- Ransom Note Exemplar Analysis handout (attached; 2–3 per group)
- Ransom Notes written by students (see prep note in Engage)

20 minutes

Engage

Teacher's Note: Forensic Science Standards

Note that there are no national or Oklahoma-specific standards outlined for Forensic Science courses. We have used the following Forensic Science standard from the state of Georgia as a high-quality point of reference for this lesson.

Teacher's Note: Set-Up

Prior to beginning this lesson, each student should write a ransom note aligned to the following scenario. Do not tell them ahead of time what the purpose of the note is.

> A child from a wealthy family has been abducted. His parents received a ransom note requesting a large amount of money in exchange for his safe return.

Either have students write their own notes that specify the amount of money, location of drop-off, timing, etc., requested from the parents, or create a script that all students will copy verbatim. Note that while the first option is more creative for the students, it also increases the likelihood that they will later identify these letters based on knowledge of their peers rather than based on handwriting evidence.

Collect the notes and set them aside for a later activity. Be sure you know which note belongs to which student, but leave the notes anonymous (e.g., number the notes and keep a private record of who is assigned to each number).

To begin this lesson, go to **slide 2** and ask students to copy down the Fourth Amendment on two sheets of lined paper. They should make two copies. *Do not tell students what the purpose of the activity is yet.*

Continue to **slides 3–5** to introduce the lesson's essential question and learning objectives. Go to **slide 6** to introduce document analysis. Let students know they will learn more about the field later. Now inform the students that they will be conducting their own document analysis beginning with handwriting analysis of their Fourth Amendment exemplars. Go to **slide 7** and ask them to do an informal Collective Brain Dump of ideas about what characteristics might be used to analyze handwriting. Discuss as a class before continuing.

Provide each student with a copy of the **Characteristics of Handwriting** handout (attached). Go to **slides 8–11** to review the twelve characteristics of handwriting with students. The lesson slide notes have a few additional details beyond what is included in the table description. Encourage students to make additional notes on their handout to further clarify the descriptions of each characteristic.

40 minutes

Explore

To prepare students to do two rounds of handwriting analysis, distribute the **Handwriting Analysis** handout (attached) to each student. Go to **slide 12** and review the instructions for how students should analyze one of their own Fourth Amendment writing samples. After students have completed their own handwriting analysis, they should trade their second copy of the Fourth Amendment with a neighbor and repeat the analysis on their partner's writing sample.

Teacher's Note: Materials for Handwriting Analysis

Provide students with highlighters and/or colored pencils to mark unusual handwriting features, rulers and/or calipers so students can measure spacing and letter size, and magnifying glasses for close examination.

Next, go to **slide 13** and ask students to compare the analysis of their handwriting to their partner's analysis of it. They should first look at the writing samples side-by-side to assess visual similarities and differences in their writing characteristics. Then they should compare their data tables to see how consistent their analyses were. Call on a few students to share their findings with the class.

Go to **slide 14** and have the class discuss the questions. It is important for students to understand how to visually eliminate samples without doing a close examination because they will use this skill in a later activity.

Teacher's Note: Discussion Question Facilitation

The following bolded text will help provide context and solicit more detailed student ideas.

- Could you easily tell that the two samples of handwriting were from different people just by looking at them? **Ask students to explain their answer.**
- Did any handwriting characteristics in your data table seem to be unique enough to use to identify another unknown handwriting sample? **If so, ask students to describe the trait(s).**
- **Unique letter combinations are another feature that could be added to this list of the 12 analysis characteristics. For example, many people may have very distinctive ways of writing double Ls, such as in the word hallway, or a unique way of writing the letters "th," such as in the word *the*.** Describe a different example of a characteristic that you would add to the list of characteristics.

Before moving on, make sure students write their name at the top of each of their two Fourth Amendment samples before they turn them in.

20 minutes

Explain

Now that students have had an opportunity to practice handwriting analysis, let them know that they're going to learn more about how handwriting is used in forensics. Distribute the **Window Notes** handout (attached), then move to **slide 15** and introduce the Window Notes instructional strategy. As you go over the content on the slides, they should note down facts, vocabulary, surprising things, and any questions they have. This is a good opportunity to encourage them to take notes without writing down everything on the slide. A summary of the information in their own words is enough. Consider pausing briefly after each slide to give students an opportunity to finish capturing their questions and thoughts.

Go to **slides 16–17** to introduce document analysis to students. Mention to students the forgery details that are in the slide notes: forgery can include things you wouldn't expect, like changing information on your driver's license to enter a bar illegally; forgers often work for organizations like the FBI, because they are experienced and therefore experts.

Go to **slide 18** and provide an overview of the professional field of handwriting analysis. Depending on how in-depth you want to go into the history of handwriting analysis in the case, you may also want to provide additional information about the Lindbergh baby kidnapping beyond the brief bullet point in the slides. Continue to **slide 19** to discuss handwriting. Handwriting, like fingerprints, is unique to individuals. Unlike fingerprints, which form in utero, handwriting develops over time and becomes more consistent as people reach adulthood. However, students should understand that handwriting can still vary due to a variety of factors.

Wrap up the lecture/notes by going to **slide 20** to discuss some of the shortcomings of handwriting analysis, and how investigators can get higher quality handwriting exemplars from potential suspects.

40 minutes

Extend

Students apply their understanding of handwriting analysis to act as document experts evaluating ransom notes.

Teacher's Note: Preparing for the Activity

Print extra double-sided copies of the **Ransom Note Exemplar Analysis** handout (attached); do not collate them. Pages 1–2 are copies of the 12 characteristics close examination table, and pages 3–4 are visual elimination justification tables.

Put students into small groups (3–4 is ideal). Provide each group with one ransom note and twice as many samples as there are students in the group (i.e., 6–8 samples). Be sure that one of the writing samples in each group belongs to the writer of their assigned ransom note.

If you only have one Forensics class, sort the Fourth Amendment writing samples so that no group has a copy of their members' own writing samples. If you have more than one Forensics class, use the samples from another class for this analysis instead (e.g., Class A uses Class B's samples and ransom notes).

Go to **slide 21** to introduce the scenario. Put students into groups of 3-4. Have students go to page 3 of the **Handwriting Analysis** handout (previously distributed) and pass out copies of the **Ransom Note Exemplar Analysis** handouts to each group. Provide each group with a previously written Ransom Note (see Prep note in Engage), make sure the author of the note is not in the group. Go to **slide 22** to review the activity instructions with the students. They should conduct the first two steps together: doing a close examination of the ransom note using the 12 characteristics (Handwriting Analysis handout), and visually eliminating any samples that obviously do not match the note. They should record on the Ransom Note Exemplar handout(s) their reasoning (i.e., which characteristics they noted) for each elimination.

Next, ask students to divide up any remaining handwriting samples among themselves and conduct close examinations of those. As a group, they should then compare their close examinations of the samples and ransom note and come to a conclusion about which sample matches their note. Tell students it is okay if they feel uncertain in their conclusion. The important part is that they can justify their decisions based on the evidence available to them. It is also okay for them to return to the samples they eliminated visually and do close examinations on those if they feel it's necessary.

60 minutes

Evaluate

To wrap-up the lesson, students will work in their groups to create an expert witness presentation to convince a jury of their peers that they have identified the ransom note writer from their handwriting samples. Go to **slides 23–24** to introduce students to the activity scenario and content expectations. Pass out a copy of the **Expert Testimony** handout (attached) to each student. Go to **slides 25–26** to review with students what should be included in the introduction and conclusion of their presentation. Students should work as a group to create these two portions, and it is up to them who will present each. It is fine for only one student in the group to record the information for the introduction and conclusion on the handout.

Proceed to **slide 27** to discuss the argument portion of the presentation. (Note that the student handout has more details than the slides, so be sure to draw their attention to those.) Students should divide up the evidence presentation work evenly so that everyone is creating at least one of the arguments on their own. Tell students they will each be presenting their part of the argument and turning in the written version at the end of the activity. Each student should have a written explanation in at least one of the argument boxes in the handout (*Eliminated Visually*, *Eliminated or Confirmed with Close Examination*).

Teacher's Note: Example of Work Division (Group of 4)

- Introduction: Entire group
- Arguments:
  - 1 student develops the explanation for visual eliminations
  - 2 students divide up the close examination eliminations and each develops explanations for their samples
  - 1 student develops the explanation for close examination of the sample matching the ransom note
- Conclusion: Entire group

Once students have completed their written arguments, have each group present their testimony to the class. At the end of their presentation, the jury members should each record the names of the students in the group, circle *yes* or *no* whether they were convinced by the testimony, and provide a summary of the reason behind their decision.

Teacher's Note: Student Presentations

Consider having students use slide presentations with images or a document camera to provide better visual documentation of their evidence for the jury, particularly the matching sample and ransom note. While not necessary, it will make their explanations clearer for the audience.

After all groups have presented, collect the Expert Testimony handouts from students for individual evaluation of their work. Go to **slide 28** and, as a class, discuss the following questions to provide a final reflection on the lesson:

- What was it about the expert testimonies that you found convincing (or unconvincing)?
- Do you think handwriting/document analysis can provide enough evidence to convict someone of a crime? Why or why not?

Optional Activity: Solving a Forensic Case

Consider having students apply their handwriting and document analysis skills within a forensic case context. By stepping into the role of a forensic scientist, students can examine evidence, make comparisons, and draw conclusions using authentic investigative techniques. The Flinn Forensics™—6-kit Bundle includes an ink inspection case that supports this type of analysis, along with additional activities that reinforce a range of core skills essential to forensic science.

Follow-Up Activities

Choose another lesson from the Forensics Collection.

Research Rationale

See Career Exploration Through Experiential Learning - Forensics Evidence in Action Plan

Resources

- *Flinn Forensic Files-6-Kit Bundle*. Flinn Forensic Files™ 6-Kit Bundle. (n.d.). https://www.flinnsci.com/flinn-forensic-files---6-kit-bundle/ap7917/
- Georgia Department of Education. (July 2019). Science Georgia standards of excellence, SCIENCE - forensic science. Georgia Department of Education. https://www.georgiastandards.org/Georgia-Standards/Documents/Science-Forensic-Science-Georgia-Standards.pdf
- K20 Center. (n.d.). Collective brain dump. Strategies. https://learn.k20center.ou.edu/strategy/111
- K20 Center. (n.d.). Window notes. Strategies. https://learn.k20center.ou.edu/strategy/189