

A collection of white index cards with the word "Dictionary" written on them, pinned together with colorful pushpins. The cards are arranged in a fan-like pattern, showing various numbers (1, 4, 6, 7, 8, 10, 11, 12, 13, 14, 22, 23) and symbols (sun, @, stars, checkmark, plus, minus) next to the word.

Figure 1 shows three panels (A, B, and C) of gelatinatin zymograms. Each panel displays two rows of five gels. The top row is labeled 'RT' and the bottom row 'LT'. The columns are labeled 'B1', 'B2', 'B3', 'B4', and 'B5'. Panel A shows a single band of activity in each gel. Panel B shows a single band of activity in each gel. Panel C shows a single band of activity in each gel.

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II. Introduction & Overview

A. Rationale

In this unit, students will know how to be successful detectives. They will develop skills they never knew they needed, and they will improve other skills they thought they already had mastered. The focus of the unit is perspective and how it influences truth. This is a jam-packed concept with a wide range of impact. Students will learn overall how and when it is appropriate to allow perspective to influence the truth. They will know how to recognize if/when perspective is positively or negatively impacting the truth of a situation. Students will be given sample situations where they will need to remain factual without allowing themselves to be influenced by personal perspectives. This is the most challenging component of the unit and students will need to continuously remind each other to remain impartial to evidence they come across.

Children have a general idea about investigation because they investigate every day. However, in order to be a successful detective, these students must learn the content behind the code of ethics. They must learn the meaning of being truthful, impartial, accurate, thorough, and overall ethical. Not only must they understand the meaning of these terms but also how to appropriately apply them to real life situations. The best detectives follow a code of ethics that allows them to solve crimes but also, they can apply the code to real life. Understanding this code will help with the overall concept of the unit: Perspective influences truth.

Code of Ethics, fingerprints, handwriting, reconstructing evidence, observations, and perspective. These are all key components in becoming a successful detective. Without even just one of these, a detective could easily miss something in a case or possibly be incorrect. They must study the content and master the skills in order to fully grasp the concept of how perspective influences truth. The content and skills are necessary to build

their background. If students do not take the time to invest in learning the art of being a detective, they will be wasting their time. It will take a shorter amount of time to learn the basics then to try and work backwards. Additionally, if and when students learning detective basics, they will then be able to explore further and enhance their basic skills. This will in turn create a successful detective and well-rounded individual.

B. Differentiation for Gifted Learners

This unit could be taught on a wide scale: quite basic to incredibly challenging. The age group of the children impacts differentiation as well. Some students are ready for the challenge of differing perspectives while others are still quite literal. Perspective is a potentially deep and complex concept, particularly when considering there may be multiple perspectives when viewing a scene. For example, when students were shown a picture without any background knowledge, they had to think creatively. Many students stayed in their safe zone and only shared initial thoughts while never changing their minds. The highly gifted (and some older) students listened to their peers and began thinking more about *what* caused the scene in the picture and *why*. They would use phrases like, “Well if what ‘Sarah’ said is true then maybe it wasn't a way for people to get into the building but instead a way to escape.” They were allowing themselves to be flexible.

The group that I taught was a group of ten students; eight girls, two boys. Two of the girls were fifth graders while the rest were fourth graders. I tried a variety of ways for students to work together: partners, groups, individually. The gifted students were not jarred but differing responses or opinions than their own when they were in a discussion setting. It also seemed to help the group's discussion when there was no right or wrong answer. However, when there was a right/wrong answer situations (multiple choice in fact) and students needed to defend answer choices, the environment became a bit

hostile. Students had very strong opinions. As the facilitator, I allowed the discussion while reminding students to remain factual. This was easier said than done.

The Performance task is where I believe lots of differentiation can take place. I gave the students a mini crime scene with only a few details. There were documents, fingerprints, handwriting samples, etc. They needed to use what they had learned (content and skills) and apply it to the crime scene while remembering the perspective can influence truth. I was limited with my time so I had to give a few more details to the case and add more evidence to speed the process up a bit. However, the perspectives on who committed the crime and why were still amazing!!! *Note to self, set quicker pace for skills in order to allow enough time for performance task!*

This unit allows students to challenge themselves to focus on more than simply one correct answer. Obviously being accurate is important, but gifted learners need to think more about the why. Why did this happen? Why would someone do this? What actually happened? How do I know that it did? How can I prove it? Could there be any other possible reason? Why could it be? Which seems more plausible? It also allows students to come up with ideas and ways to do things I did not originally plan for. Flexibility is key and this unit allows for that.

Lastly, I had students work together in pairs but when they asked if they could join forces, how could I say no? They were using each other as resources and saving on time. They were sharing facts, resources, and perspectives. This in turn led them to the truth. Since I was limited with my time, we shared overall ideas on who committed the crime and why. Next time I would allow students to create evidence boards to share what evidence they found, why it was important, and how it was relevant to the guilt or innocence of the suspect.

III. Goals and Outcomes

A. Content Goal: To develop understanding of key detective tools.

Students will know how to...

- a. Classify objects by observable physical properties (including size, color, shape, texture, weight, and flexibility).
- b. Analyze factual information and evidence provided.
- c. More accurately observe evidence based on deeper knowledge. (fingerprints, handwriting, "blood" spatter, etc.)
- d. Compare and contrast handwriting and fingerprints.
- e. Describe in detail observations of the crime scene from all perspectives.

B. Process Goal: To develop reasoning skills when referring to social sciences.

Students will know how to...

- a. Collaborate effectively with peers.
- b. Analyze a situation and share his/her perspective respectively while keeping an opened mind.
- c. Provide factual evidence that supports perspective.
- d. Develop questions and hypotheses for why the crime occurred.
- e. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context

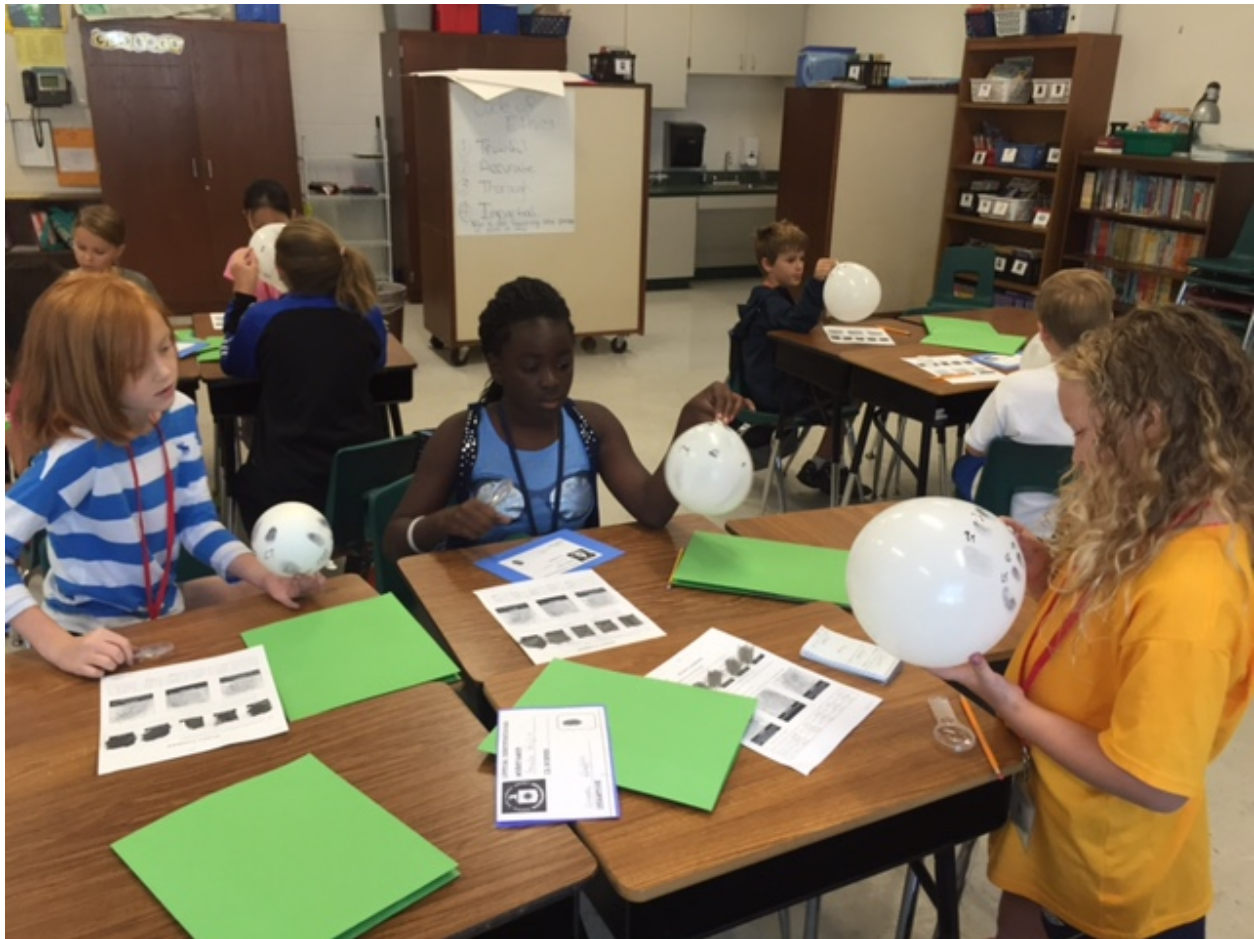
C. Concept Goal: To understand the concept of perspective and how it influences truth.

Students will know how to...

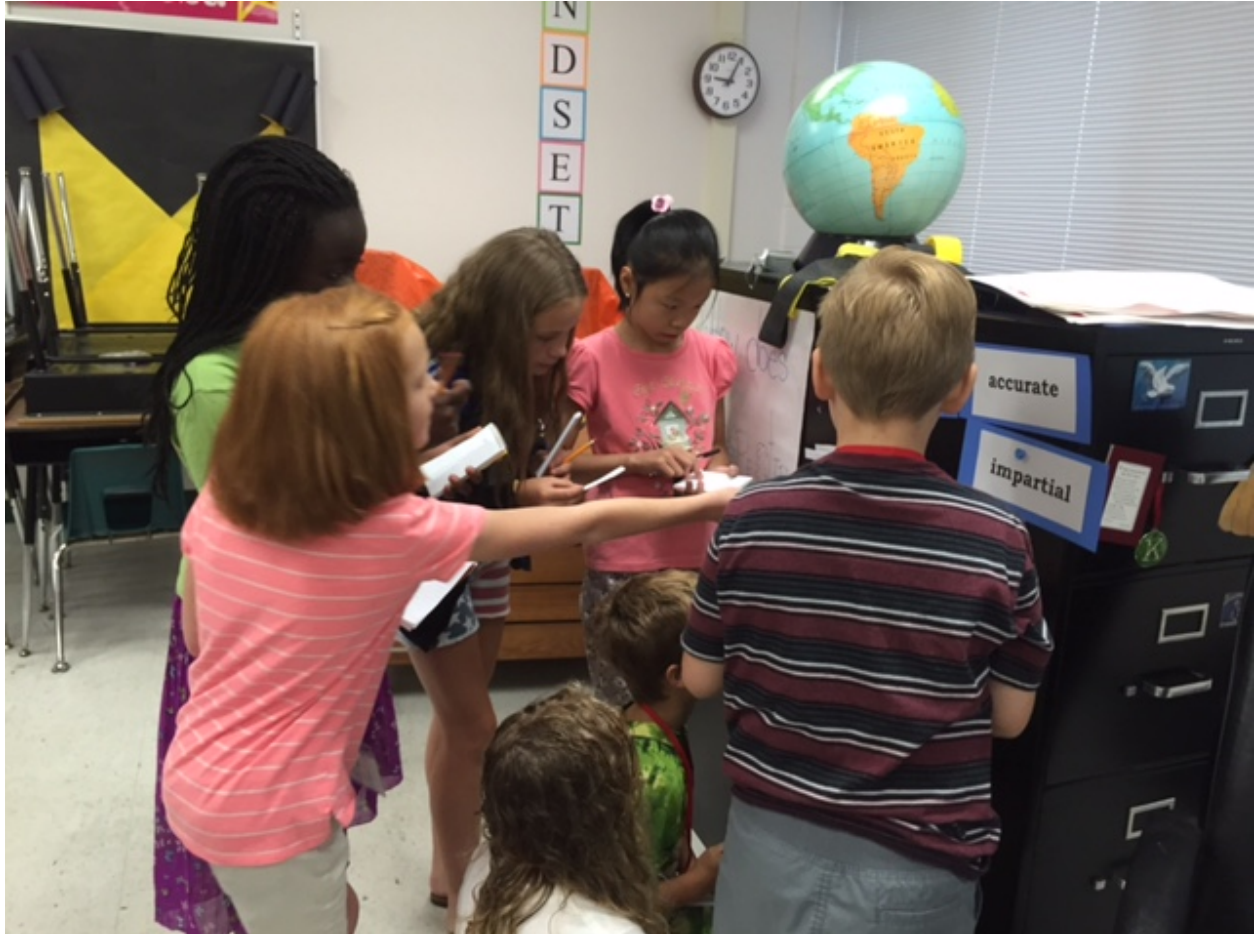
- a. Infer changes in speed or direction resulting from forces acting on an object.
- b. Distinguish fact from interpretation.
- c. Appropriately recognize the influence perspective has on viewing evidence.
- d. Predict possible outcomes and reasons for unsolved situations.
- e. Analyze multiple perspectives and recognize how that can positively/negatively impact the truth of a situation.

IV. Assessment Plan

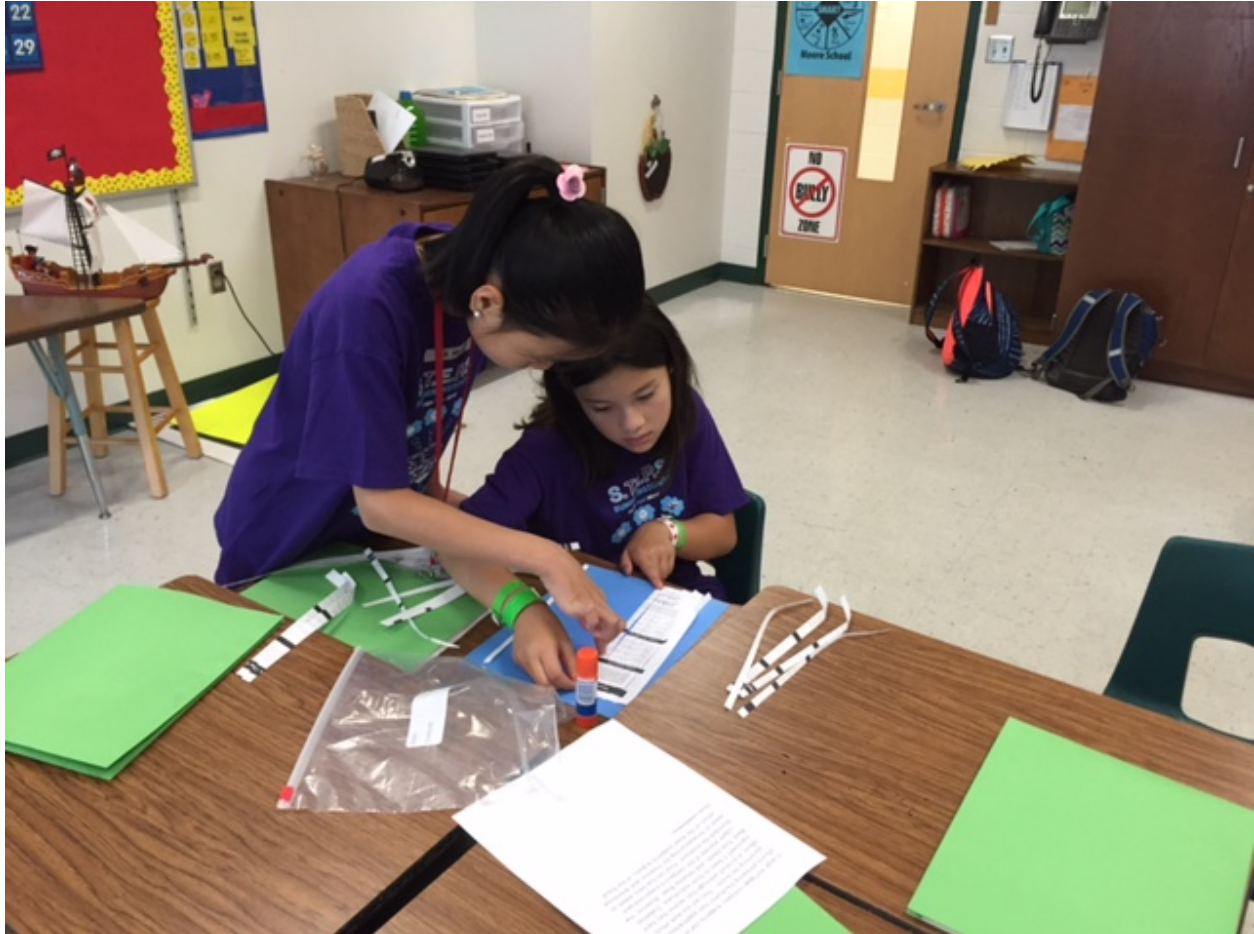
Students will show that they have understood the content, process, and concept multiple ways. They will develop their skills and show what they have learned by solving minor cases. The first case they will solve is based on fingerprinting. They will learn how to correctly analyze fingerprints and this will allow them to match fingerprints to a suspect. They will then need to use their critical analysis in addition to perspective to accurately identify the suspect while giving reasonable proof as to why this suspect is guilty or innocent.

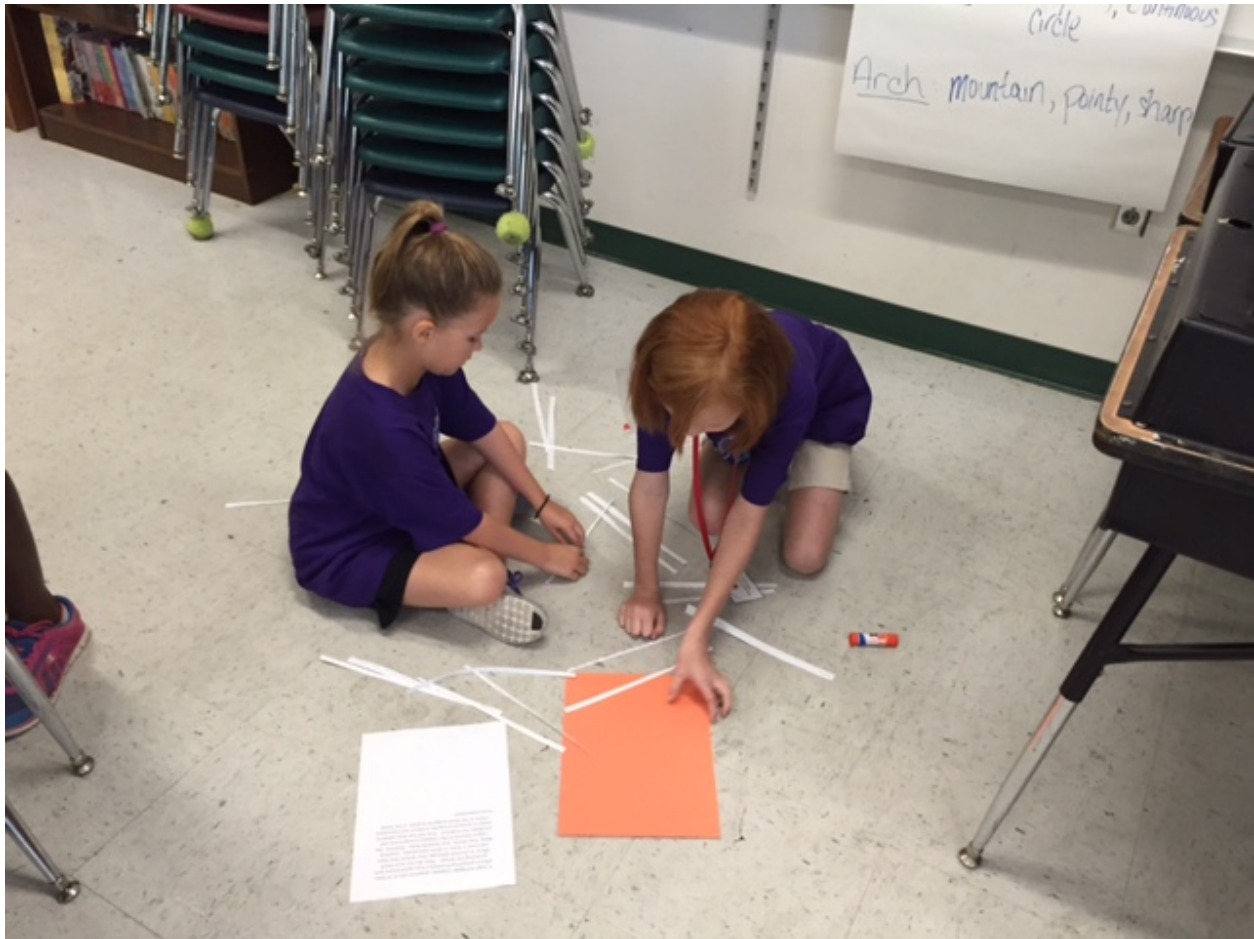


Next, students will show a master level of understanding in regards to handwriting by matching documents together. They will then apply this skill to the performance task. In the performance task, they will need to recognize that there are multiple sets of handwriting taken from the crime scene. Can they match it to the suspects? Who is guilty? Is there more than one guilty party? Could there be someone guilty by association?



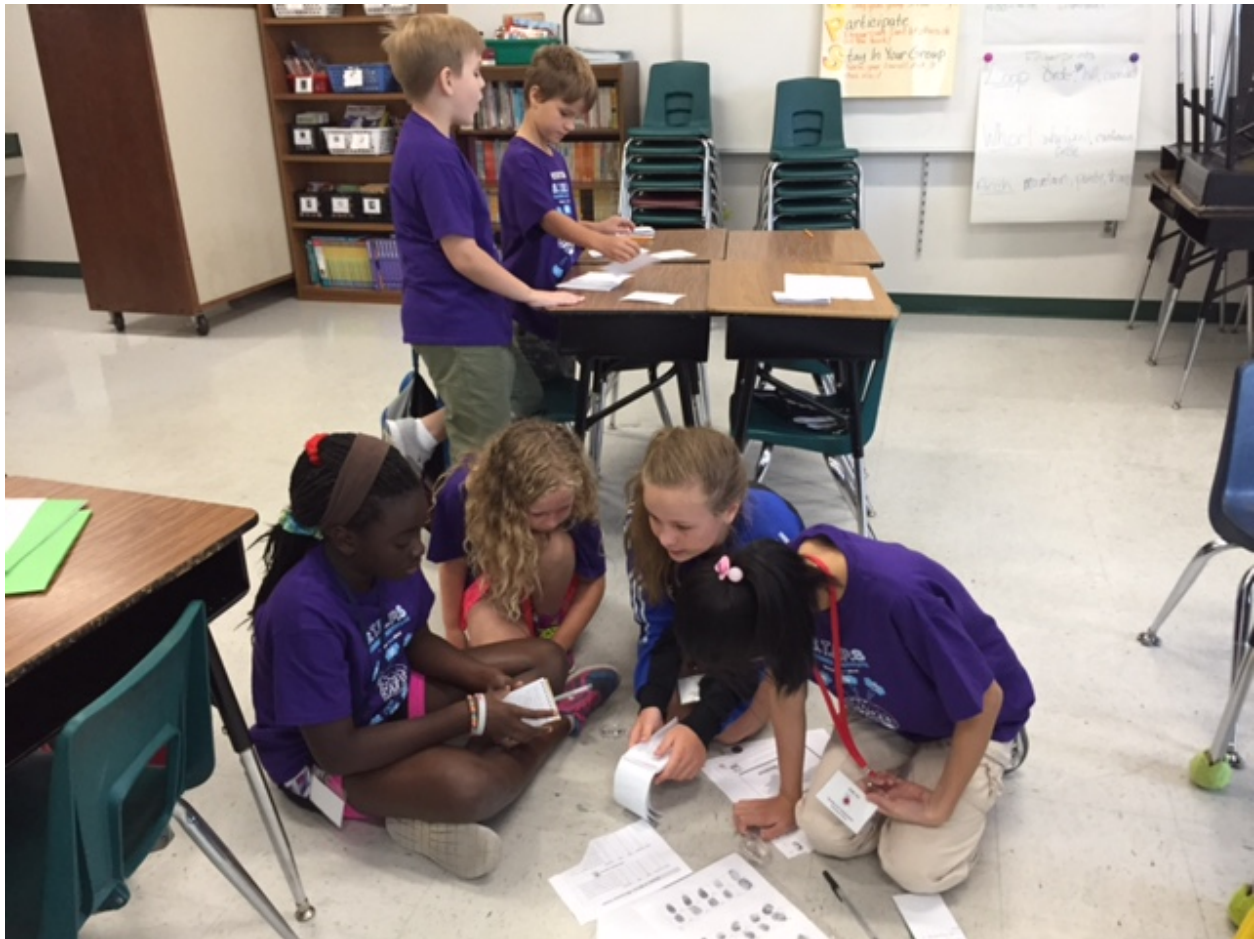
Reconstructing evidence. Students will be given a task of putting together documents and then accurately determining, who committed the crime of fraud, why did he/she do it, and to prove it with facts. They will apply this content and skill to the overall concept of perspective in order to solve the crime in the performance task.



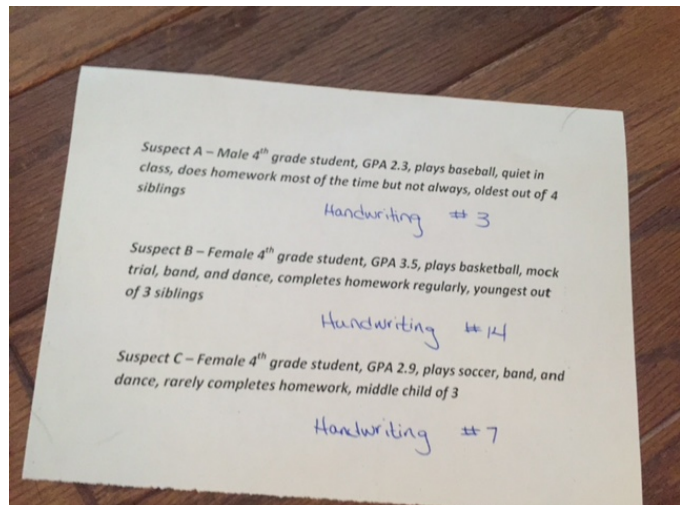
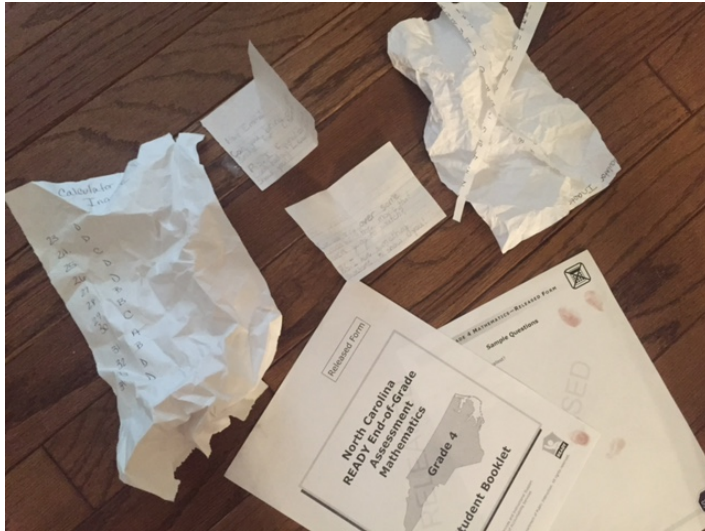


Overall the students will show their understanding through discussion and observations. Watching students discover facts and develop theories based on facts and perspective is the true way to see their understanding. Gifted learners will thrive throughout this unit. It is both complicated and challenging. Observing their reactions to multiple reasonable possibilities creates an engaging environment. I found that while it encouraged some competitiveness, it fostered more teamwork than anything else. Students learned to share facts, ideas, and perspectives while allowing themselves to listen and be open to other perspectives too. In the end, many of the students were able to convey to the group that a person's perspective can help lead to

the truth, however perspective can also hinder the truth if one does not remain impartial and careful.



Documents found at the crime scene & suspect information.



V. Lesson Plans

TEACHER NAME		Lesson #
Lindsay Voss		1
MODEL	CONTENT AREA	GRADE LEVEL
	Science/Writing	4
CONCEPTUAL LENS		LESSON TOPIC
Perspective		Handwriting Analysis (Including intro to ethics)
LEARNING OBJECTIVES <i>(from State/Local Curriculum)</i>		
CCSS.ELA-LITERACY.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. CCSS.ELA-LITERACY.RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context  K.P.2.1 Classify objects by observable physical properties (including size, color, shape, texture, weight and flexibility).		
THE ESSENTIAL UNDERSTANDING <i>(What is the overarching idea students will understand as a result of this lesson?)</i>		THE ESSENTIAL QUESTION <i>(What question will be asked to lead students to “uncover” the Essential Understanding)</i>
<i>Perspective influences truth</i>		<i>How does perspective influence truth?</i>
CONTENT KNOWLEDGE <i>(What factual information will students learn in this lesson?)</i>		PROCESS SKILLS <i>(What will students be able to do as a result of this lesson?)</i>
Handwriting observations: Slanting, “i” dot, “t” crossing, symmetry, letter height, alignment to baseline, movement of letters Oblique lighting (seeing small indentations in the surface of the paper because they produce shadows with greater contrast than the indentations themselves)		SWBAT identify similarities between handwriting SWBAT generalize ways in which to decipher handwriting SWBAT identify less obvious clues when observing evidence SWBAT understand how to be ethical
GUIDING QUESTIONS <i>What questions will be asked to support instruction?</i> <i>Include both “lesson plan level” questions as well as questions designed to guide students to the essential understanding</i>		
Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
What evidence can be investigated without much equipment? How can handwriting be used as evidence? How can handwriting be investigated?	What similarities/differences do you notice? Why are some movements or characteristics easier to analyze than others? How can people “change” their handwriting? Why is this a difficult task? Is all evidence obvious to see/find? Why/why not?	Did you notice differences or similarities that others did not? Why do you think that is? Can handwriting sample prove guilt or innocence or guilt? Why or why not? How do we know when we have truly found <i>all</i> of the evidence? How does perspective influence truth? Should perspective be applied in a situation like this?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
Samples of handwriting Samples of personal letters The way that the handwriting is presented will be more challenging. Instead of individual cards, words will be placed on one entire document for students to view.	Individual investigation versus teacher leading the class with specific questions to answer and trials to investigate.		

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.

Hook: Law and Order music playing...Upon entering students will complete a google doc including 5 things they think detectives should have. Take responses and place them in a Wordle. Share the wordle with the class. Next, introduction into being a detective and the overall investigation (Performance task) Create badges with fingerprint. Jump into ethics from CSI Website. (See Intro CSI Keynote) Also, have letters in ziplock bags hanging from a clothes line. Evidence of handwriting samples. Have a sign up naming the documents as handwriting samples. Document A-1, A-2, A-3, A-4, etc. Wait to discuss these after intro to ethics.

Ask Pre-lesson questions once all students are settled and have had an opportunity to view the documents.

Students will complete the Handwriting Analysis at <http://forensics.rice.edu/en/For-Educators/Online-Activities.html> matching activity with a partner. They will need a computer for this to complete the activity. The purpose is to complete this activity prior to instruction and then try again at the end and have a conversation about what was done differently.

Explore - In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.

There will be two activities done today for the lesson. 1: Students will be using writing samples that have been previously created.

Ex. 1. dictionary

1. dictionary

2. *dictionary*

2. *Dictionary (see picture of handwriting example below)*

The teacher will cut apart the second column and rearrange the order. Hopefully there will be around 10-15 samples. Students will be in partners or small groups (not more than 3 people) and discuss and write down observations they see. They should be talking about the characteristics of the letters, they way that they're formed, etc. Allow 2-3 minutes for groups to discuss.

After 2-3 minutes, have groups share 1 idea they discussed. The teacher should be looking/listening for slant of letters, "I" dots, "t" crossings, movement, connection with letters, symmetry, height of letters, etc. This should mostly be student driven, however if students are not including these characteristics, the teacher should mention these.

At this point students should have a better understanding of what to look for. Allow students time to match corresponding words with each other. Once students think they are correct then they should bring the final list to the teacher. If they are missing any, either a) circle incorrect matches or b) let them know how many correct they have.

2: Teacher distributes evidence from the crime scene. The evidence will include an answer key from the EOG that has imprints on the document. The guilty suspect copied down the answers onto a separate document but left evidence on top of the answer key. Students will view the evidence and need to come to this conclusion. In addition, the teacher will share with the students previously written documents that the suspects were requested to provide for this case. Can students recognize imprints on evidence and then apply perspective why there are imprints? Can they use evidence to find the guilty party?

Explain - Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.

Ask students during lesson questions. What observations have you made? Hopefully students will discuss impressions left on the ransom note which will in turn lead to deeper discussion about why it's important to look for subtle clues. How can these subtle clues help interpret evidence?

Elaborate —Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways

Students will create samples (criminal or some other note) to exchange with other individuals. Analyze and share observations with each other. Students will find new aspects to investigate like how many papers can one stack together and still be able to create an imprint. Does the paper matter? Can it be done with a marker, pen, pencil? Etc. Allow the students to investigate independently and/or with the group. Remind students to be thinking about if/when it is appropriate to include personal perspective when reviewing handwriting samples.

Evaluate: This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.

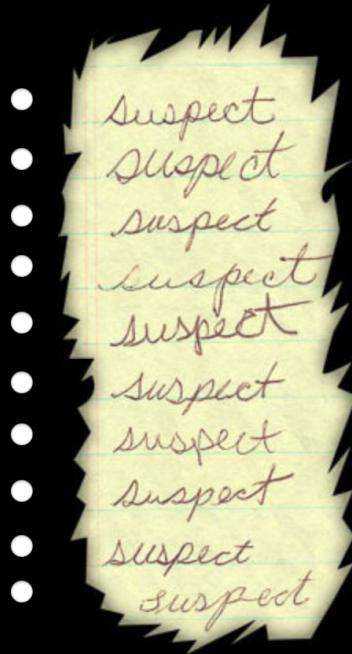
Students will be evaluated based on matching handwriting as well as their discussion on why and how handwriting is an important piece of evidence.

Here, students will be evaluated on their investigations as well as matching the handwriting samples together. Post lesson questions. How will this impact the way in which you view handwriting? How or why do people use handwriting as a reference? Lastly, students will complete <http://forensics.rice.edu/en/For-Educators/Online-Activities.html> which is another handwriting matching activity. This will allow students to practice their skills and what they have learned about handwriting. The websites informs students if they are incorrect about any matches. How quickly can they complete the task?! Does perspective help or hurt matching correct answers?

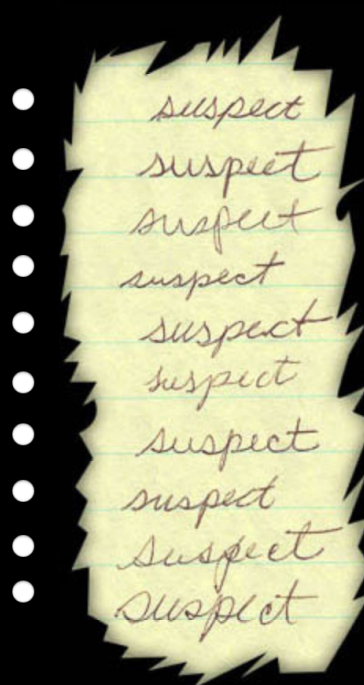
Handwriting Analysis computer activity

Choose one sample from Column A and one sample from Column B,
then 'Check' to see if you're right.

COLUMN A



COLUMN B



CHECK

CLOSE X

1. Dictionary Dictionary

2. Dictionary Dictionary

3. Dictionary Dictionary

4. Dictionary Dictionary

5. Dictionary Dictionary

6. Dictionary Dictionary

7. Dictionary Dictionary

8. Dictionary Dictionary

9. Dictionary Dictionary

10. Dictionary Dictionary

11. Dictionary Dictionary

12. Dictionary Dictionary

13. Dictionary Dictionary

14. Dictionary	Dictionary
15. DICTIONARY	DICTIONARY
16. Dictionary	Dictionary
17. Dictionary	Dictionary
18. Dictionary	Dictionary
19. Dictionary	Dictionary
20. Dictionary	Dictionary

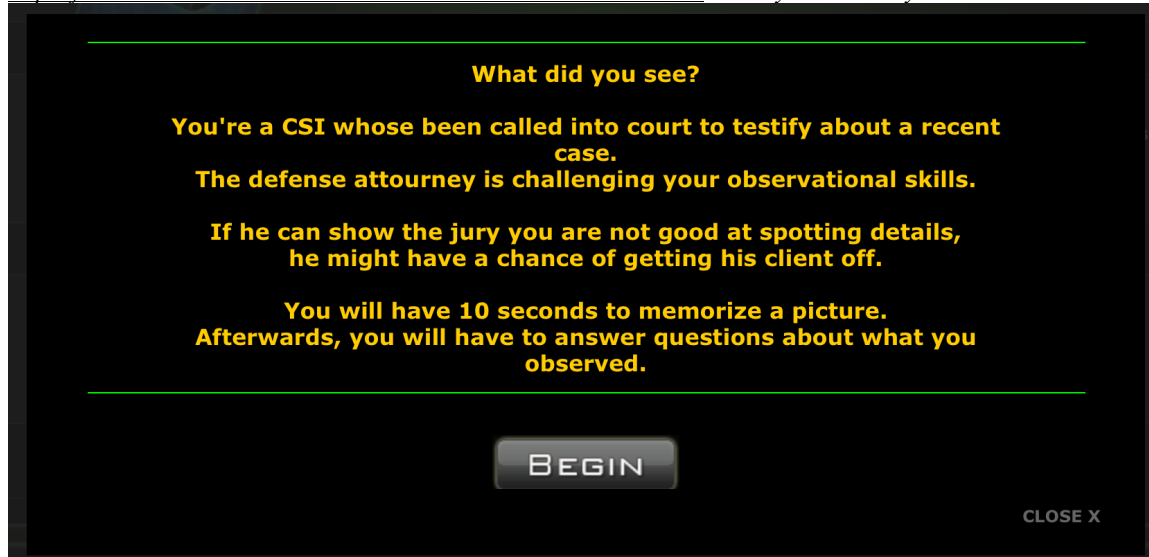
TEACHER NAME			Lesson #
Lindsay Voss			2
MODEL	CONTENT AREA	GRADE LEVEL	
VTS	Science	4	
CONCEPTUAL LENS		LESSON TOPIC	
Perspective		Addressing perspective while assessing a crime scene	
LEARNING OBJECTIVES <i>(from State/Local Curriculum)</i>			
NC Standard Course of Study Science – Evidence, models, and explanation Science as inquiry Science in social and personal perspectives			
THE ESSENTIAL UNDERSTANDING <i>(What is the overarching idea students will understand as a result of this lesson?)</i>		THE ESSENTIAL QUESTION <i>(What question will be asked to lead students to “uncover” the Essential Understanding?)</i>	
Perspective influences truth		How does perspective influence truth?	
CONTENT KNOWLEDGE <i>(What factual information will students learn in this lesson?)</i>		PROCESS SKILLS <i>(What will students be able to do as a result of this lesson?)</i>	
-There are multiple perspectives -An effective detective views a situation through multiple perspectives -Truth can look differently through each suspect/victim's eyes		-SWBAT analyze a situation and share his/her perspective -SWBAT communicate effectively in a group discussion sharing and listening to multiple perspectives -SWBAT create questions and hypotheses for why the crime occurred	
GUIDING QUESTIONS <i>What questions will be asked to support instruction?</i> <i>Include both “lesson plan level” questions as well as questions designed to guide students to the essential understanding</i>			
Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:	
Why do people commit crimes? When might there be an appropriate or reasonable time to commit a crime? If so, when? If not, why not?	What do you see in the picture? What happened here? What evidence can you support this with? Why do you think this occurred? Who was impacted by this crime? How did these people feel? What is your evidence to support this?	Who was/were the victim/victims? Who could've been the criminal? Are the different perspectives reasonable? Which perspective is the most logical? How does perspective influence truth?	
DIFFERENTIATION <i>(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.</i>			
Content	Process	Product	Learning Environment
Pictures of a vandalized classroom (I want to create a crime scene and take a picture while having another scene set up in the classroom)	Students use observations and perspective to create possibilities and reasons for the crime.		Applying knowledge, observations, and perspective to solving the crime while investigating.

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.

<http://forensics.rice.edu/en/For-Educators/Online-Activities.html> - Test your memory



Be prepared to talk about what you see? Was this an easy task or not? Why simple? Why difficult? What could you do to be better? How would another person's perspective assist you if you were viewing the scene together?

While discussing observations as a whole class, there will be an interruption in class. A person will come in and take a stapler but do so undetectably. The person will walk around and touch many items. The purpose being to then ask students what they observed after the person left. Did they even notice someone in the room? Did they notice what was taken? Why are there different perspectives? How does perspective influence truth?

Explore - In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.

After discussing pre-lesson questions, students will work together to answer:

What do you see in the picture?

What happened here?

What evidence can you support this with?

Why do you think this occurred?

Who was impacted by this crime?

How did these people feel?

What is your evidence to support this?

Explain - Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.

Students will then be instructed to discuss what they learned from individual groups. What did you observe? Were there any shared perspectives within the group? What were some, if any, varying perspectives? Was anyone's single perspective right/wrong? If there was a disagreement, could you understand another person's perspective? Were there any arguments? What did you learn from discussing and possibly debating perspectives within the small group? What needs to be considered when collaborating with a few people or a large group? Which would be easier – to work with a few or many? Why?

Elaborate —Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways. Full class – Who did it? Who was impacted by the action? What are reasonable motives for the crime? What evidence can be used to back up these perspectives? Why was the act done? The teacher will be the facilitator while the entire class shares and discusses openly their own perspectives. They will be reminded to remain factual and respectful. Also to be tactful in their explanations.

Focus on evidence: While there's a partially vandalized classroom in front of the students, they need to learn detective skills. They will be reminded that what they are witnessing is a crime scene where an EOG was compromised that will remain untouched. Remain factual. Decide if/when it's appropriate to apply perspective. Without talking, they will jot down factual observations for 5 minutes in their detective notepads.

After 5 minutes, the teacher will pose pre-lesson questions for the groups to discuss.

Why did someone commit this crime?

What may have caused someone to risk suffering the consequences of tampering with an EOG?

Is there ever an appropriate or reasonable time to commit a crime? If so, when? If not, why not?

Talk with two other people and share your thoughts. Also discuss if you think this crime was appropriate to commit?

Why not? Why?

Are you surprised by others' responses?

Evaluate: *This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.*

Summary of the lesson – shared by students (teacher will include any necessary details left out)

Post Lesson Questions will be included in the assessment. Students will have to provide the following:

Logical suspect and reasonable motive

They will need to provide factual evidence and be able to defend their choices factually.

They should consider the following:

Who was/were the victim/victims?

Who could've been the criminal?

What makes the different perspectives reasonable?

Which evidence supports your logic?

How does perspective influence truth?

TEACHER NAME		Lesson #
Lindsay Voss		3
MODEL	CONTENT AREA	GRADE LEVEL
PBL	Science & Math	4th
CONCEPTUAL LENS		LESSON TOPIC
Perspective		Finding evidence and discovering how it relates to a crime
LEARNING OBJECTIVES <i>(from State/Local Curriculum)</i>		
CCSS.MATH.CONTENT.4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. Percentages NC Standard Course of Study Science – Evidence, models, and explanation Science as inquiry Science in social and personal perspectives		
THE ESSENTIAL UNDERSTANDING <i>(What is the overarching idea students will understand as a result of this lesson?)</i>		THE ESSENTIAL QUESTION <i>(What question will be asked to lead students to “uncover” the Essential Understanding)</i>
<i>Perspective influences truth</i>		<i>How does perspective influence truth?</i>
CONTENT KNOWLEDGE <i>(What factual information will students learn in this lesson?)</i>		PROCESS SKILLS <i>(What will students be able to do as a result of this lesson?)</i>
• Code of Ethics • Fingerprints • Graphing statistics • Percentages		• SWBAT understand how/when to maintain code of ethics • SWBAT recognize fingerprint characteristics • SWBAT graph national statistics (fingerprints) • SWBAT determine percentages based on fractions • SWBAT make generalizations about the percentages

GUIDING QUESTIONS

What questions will be asked to support instruction?

Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
How do we find the "bad guy(s)"? When, if ever, is it important to be honest/lie? Why is it important to be able to "read" fingerprints?	How can you identify a person's fingerprints? Are some fingerprints more common than others? What are some similarities? What are some differences? What ways can you tell the difference between the types of fingerprints?	What generalizations can you make about fingerprints? How do fingerprints help us when finding evidence in cases? How does perspective influence truth?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
The problem proposed is higher level thinking once students put all components together.	How the students reach a decision will vary.		

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.

CSI Theme Song – “Who Are You?” by The Who
<http://forensics.rice.edu> will be up on the screen (CSI TV show characters)

Pre-Lesson questions will be asked and briefly discussed.

Students will walk through Case One: Rookie Training together as a whole class. We will view (briefly) DNA and Medical Examiner and more specifically, CSI Ethics. They will then have an opportunity to talk about the importance of ethics when finding and evaluating evidence. They will then be asked, “What is an important form of evidence that all detectives and police officers use often? (Fingerprints) What do you know about fingerprints?”

Explore - In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.

Students will be given samples of Loops, Whorls, and Arches. They will discuss in small groups, observations about the different types of fingerprints. What do you notice? What is similar? What is different? What stands out the most about each?

Students will then independently complete the attached activity I. They will be able to discuss their findings with one another once they have created samples of their fingerprints on the balloon.

What are the percentages of students with loops? Whorls? Arches? They will then graph the results of the class and compare the results to the national results. This will be done on Activities II, III, and IV.

Explain - Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.

Why are these percentages relevant? What do they mean? They should be developing generalizations about types of fingerprints; what is most common/least common. How can we use this data when solving crimes? How does that impact evidence? How does that influence perspective?

Elaborate—Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways

Case #4589241-B

Problem: “Three weeks ago a local bakery was robbed at gunpoint. The thief wore a mask, so even when the police found a suspect the bakery owner couldn't make a positive ID. However, as the CSI processing the scene, you collected several fingerprints from various parts of the bakery. The police have identified a suspect, but he says he's never been to that bakery. It's your job to see if the suspect's fingerprints match any of those recovered at the scene of the crime. “

Students will need to use what they have learned and apply it to this case. Is the suspect guilty or not? What is your evidence?

Evaluate: This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.

Collect percentage and graphing data

Observation

Recognizing each type of fingerprint by the end of class

Outcome results from the case

TEACHER NAME		Lesson #
Lindsay Voss		4
MODEL	CONTENT AREA	GRADE LEVEL
	Science	4
CONCEPTUAL LENS		LESSON TOPIC
Perception		Reconstructing evidence
LEARNING OBJECTIVES <i>(from State/Local Curriculum)</i>		
3.P.1 Understand motion and factors that affect motion. 3.P.1.1 Infer changes in speed or direction resulting from forces acting on an object. 3.P.1.3 Explain the effects of earth's gravity on the motion of any object on or near the earth.		
THE ESSENTIAL UNDERSTANDING <i>(What is the overarching idea students will understand as a result of this lesson?)</i>		THE ESSENTIAL QUESTION <i>(What question will be asked to lead students to "uncover" the Essential Understanding)</i>
Perspective influences truth		How does perspective influence truth?
CONTENT KNOWLEDGE <i>(What factual information will students learn in this lesson?)</i>		PROCESS SKILLS <i>(What will students be able to do as a result of this lesson?)</i>
How to correctly and carefully reconstruct evidence Point of Origin - The point in space where the blood spatter came from- three dimensional Drop Patterns - Characteristic patterns present when blood drips into standing wet blood Projected Blood - Blood under pressure that strikes an object Blood Spatter Analysis - Uses the size and shape of blood drops to reconstruct the crime scene Angle of Impact - The angle at which a blood drop strikes a surface Fact Perspective Evidence Physical evidence		SWBAT collaborate effectively with peers SWBAT distinguish fact from interpretation SWBAT more accurately view evidence SWBAT acknowledge the influence perspective has on viewing evidence that they may not know the entire story behind
GUIDING QUESTIONS <i>What questions will be asked to support instruction?</i> <i>Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding</i>		
Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:

Whose perspective is truth? When can there be more than one truth? How do we know what is fact? Can we truly know when we've found the truth? How can we remain focused on facts and evidence? What are some basic guidelines to remember when handling evidence?	What evidence is important and why? Is there any incriminating evidence? If so, how? What types of documents are in our possession? How do we separate fact and evidence? When does perspective come into play? When is it appropriate?	How did working with your partner help/hurt your progress? What about with the whole class? How has perspective or interpretation influenced the truth? How can you remain truthful, honest, and factual while considering personal perspective?
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DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
	Gifted students will be challenged on a deeper level; not only physical evidence but intangible perspectives will be considered.		-Teacher facilitated -Student driven -Students in pairs, but also whole class if necessary -Flexible environment to fit all needs

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.

"Blood" spattered evidence hanging in the classroom. Blood Spatter Analysis - Ask students as they arrive, how could we recreate these samples? What do we need to consider when looking at the evidence? As a detective, why is it important, or not important, to think about why these spatters were made? How might reenactments or recreations help detectives solve crimes? Walk around with your partner for 4 minutes and then discuss these questions. Be prepared to share what you discussed.

After 4 minutes, have students discuss, How might reenactments or recreations help detectives solve crimes? Briefly discuss possible ways to recreate "blood" spatters. Students will be given an opportunity with his/her partner to recreate the sample. They will need to have an opportunity to do this outside on the grass. Then, give each pair a "blood" spatter sample and one blank paper. Students will have 10-15 minutes to recreate the sample. This is practicing and not actual evidence so no worries about any mistakes. Inaccuracies are how we learn for future evidence samples.

After students have had time to attempt to recreate their sample, each pair will show and share their successes or frustrations while attempting to recreate the original sample. Discussion should include direction of blood, impact, distance, gravity, etc.

Focus needs to remain on facts and observations without bringing perspective in yet.

Revisit the importance of reenactment.

Introduce Reconstructing Shredded Documents (A House Divided) – Students will be given a shredded document that, with a partner they will reconstruct.

Explore - In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.

Students will be working together with a partner on an individual document. They will then be allowed and encouraged to work collaboratively, as a detective team would. They will reconstruct physical evidence and then pay close attention to what the physical evidence shows.

What evidence is important and why?

Is there any incriminating evidence?

If so, how?

What types of documents are in our possession?

How do we separate fact and evidence?

When does perspective come into play? When is it appropriate?

Explain - Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.

Which document(s) seem particularly suspicious or incriminating?

Do any names appear on more than one document?

Who do you think is the culprit and why?

Based on the evidence, how was the suspect stealing from the mortgage company?

Students should discuss their findings and discuss any debates they may have. How did they come to the conclusions they did? Was perspective involved? Did personal perspective help or hurt solving the case? Why or why not?

Elaborate —Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways

What strategies would you use in a similar case in the future? What would you do differently? What did you do that was successful?

How does perspective influence truth? Were you able to definitively solve the case? How can you prove truth? When can there be times that you can't prove the truth? How can your truth be different from another's? What happens when you're not factual? How does this impact a case?

Students will then be given shredded documents potentially relevant to their current case. They will reconstruct the documents and work on deciding who has committed the crime of tampering with the 4th grade math EOG.

Evaluate: This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.

Debrief and write a summary of the case that would accompany this case file. Remember to be factual and precise.

Include a separate explanation of how perspective, in this case or the blood spatter activity, influenced your findings. If you believe that it did not influence your findings, how did you remain purely factual? Address whether or not you believe you can solve a case without perspective.

Performance Task

You are a detective for the WSFCS (Winston-Salem Forsyth County Squad) and currently have the task of investigating a crime scene. The crime: A 4th grade EOG appears to have been tampered with. There are 3 suspects currently being questioned. This is a terrible act, and the punishment will result in expulsion as well as either summer school or retention. Your team has the responsibility of collecting all of the evidence. Be careful not to contaminate the scene and remember to make sure all collected evidence is related to the crime. Miscellaneous materials could cause distractions to the case. All evidence must be presented to the defense, prosecution, and the school board. Did we fail to mention this case is going to school court? All of the evidence that you find and log into the system is visible principals, parents, and the superintendent. If you prepare your evidence well, justify the evidence's impact, and do not contaminate evidence you will do just fine. No pressure, but your role could in fact, decide the fate of the criminal. Guilty or Innocent? Only the evidence provides the truth...or does it?

Students will be given information that pertains to the case each day. After students have had practice with fingerprinting on day one, they will be given an envelop with fingerprints from the investigation. They will use what they have learned and apply it to the case that must be solved by the end of the week.

Day 1 – Handwriting

Day 2 – Observations of the crime scene (and others)

Day 3 – Finger Prints

Day 4 – Reconstruction of evidence

VI. Unit Resources

CSI: THE EXPERIENCE — Web Adventures. (2015). Retrieved July 1, 2015, from <http://forensics.rice.edu/en/For-Educators/Educators-Guide.html>

This link was so helpful to me. It gave me some ideas to modify, games to play, and resources to use. My audience was a group of 4th and 5th graders so some of the material on here is inappropriate for them. Under For Educators is a list of online activities. I used *Handwriting Analysis* for the students to match online handwriting samples. Let's just say easier said than done. I also used *Spot The Difference* which shows side by side pictures that are nearly identical. However, there are 5 differences that need to be found. This was another difficult task that the students all enjoyed even if they couldn't find each one. *Test Your Memory* is an activity that I even tried multiple times and was not always successful. The person watching the screen has 10 seconds. After 10 seconds, he/she is asked 10 questions all based on observations and memory. Lastly, is the *Power of Observation* activity. This is a YouTube video (slightly dated) where the viewer(s) are asked to pay attention to the number of times a basketball is being passed among a group of people. However, while this is happening, more is going on in the video than you might originally see. Completely appropriate but definitely watch a couple of times before sharing with the students.

In addition to the individual game activities, I used the case in the *Sticky Fingers* lesson. This was awesome because there was already a "criminal" and prints taken. I was able to use the scenario while coming up with my own questions for the students. We then in turn used what we learned with content and skills and applied that to the performance task.

Similarly, I used the documents from the case in *House Divided*. Again, the documents were created but I was able to create discussions and ask higher-level questions while using the scenario. Best of both worlds! This website has some great resources for teachers and families. I like that I was able to pull and tweak resources appropriately. I give complete credit to the teams and doctors that put this together. I will definitely be using it in the future!

(n.d.). Retrieved July 1, 2015, from <http://www.dpi.state.nc.us/docs/accountability/testing/releasedforms/g4mathnokey.pdf>

I used parts of the 4th grade Math EOG released test that DPI had on their website. This created a more serious crime rather than simply a test the "teacher" created. I did make sure students knew it was a released exam because some were concerned. I am sure any exam document could work.

The Great Brockville Trust Bank Robbery (1958) - Infamous Crime Scenes on Waymarking.com. (n.d.). Retrieved July 1, 2015.

This is the other picture that I used during my VTS lesson. Great discussion and awesome insight!

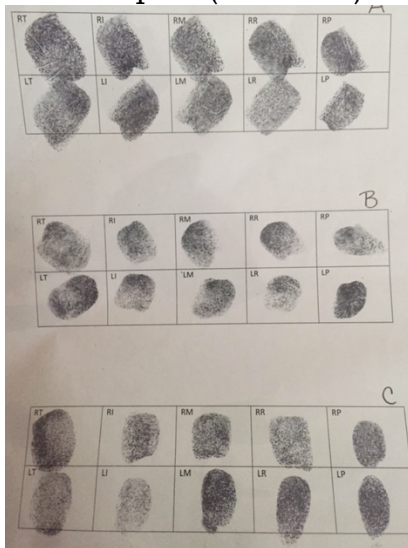
Spy class. (n.d.). Retrieved July 1, 2015, from <https://www.pinterest.com/pin/450219293972867706/>

This is where I found agent badges for the kids. They very much enjoyed them. Love Pinterest!

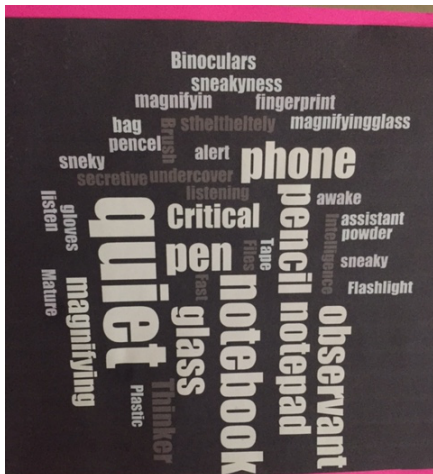
Villarica, H. (2012, May 2). Study of the Day: Social Inequality May Foster Distrust, Cheating in School. Retrieved July 1, 2015, from <http://www.theatlantic.com/health/archive/2012/05/study-of-the-day-social-inequality-may-foster-distrust-cheating-in-school/256444/>

This is one of the pictures that I used in a VTS lesson. I never told the kids what was happening nor did I tell them if they were correct or incorrect. That had much to say about this picture. Where it was taken place, ages of the men, and what it was they were actually doing. Great conversations and I would highly recommend using this picture in this unit.

Hard Copies (I created)

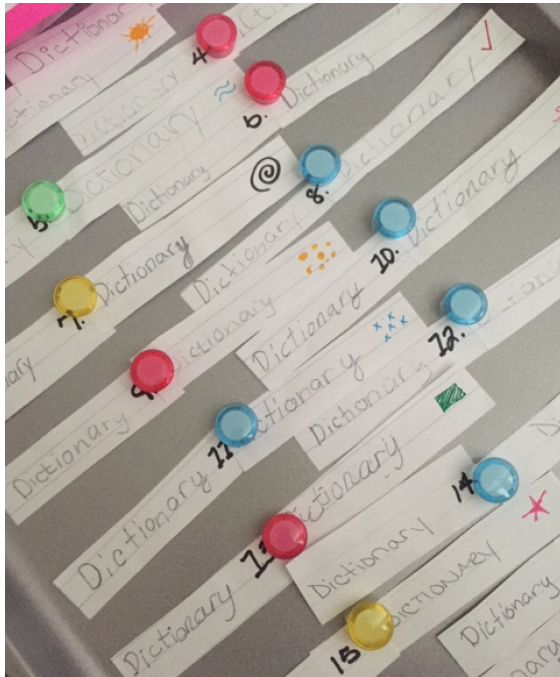


These are prints that I put together thanks to another colleague and student. I used these as the three suspects in the performance task case. I tried to have a variety for the students to examine as well as go with each suspect. I used this on day 3.



One of the first assignments I had the students do was to fill out a google document by listing 5 words they thought a good detective would need. I then took the document and copied the words and placed them in ABCya.com. This

site is similar to wordle, but I found it easier to use and print out. The students made good observations on this too: words that were similar, words that stood out, words they hadn't thought about.



On day 1 of the unit we discuss handwriting. I had my previous year students write the same word dictionary) twice. I also wrote the word. I then made a copy and cut the original. I labeled one side with numbers and the other side with symbols. The students then had to match a numbered word to the correct symbol. We used magnets on a filing cabinet so they were able to put together matches and manipulate matches accordingly. At the end of the day, I put the correct matches on the cookie sheet because some of the samples match the suspects in the performance task crime. This helps create relevance between the basic skills and the performance task while keeping in mind the concept too.