Clue to Clue

Created by Julie Gilstrap Miller

For Third or Fourth Grade AIG Students

August 2015

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I. Introduction

A. Rationale—The primary goal of this unit is to encourage academically or intellectually gifted (AIG) students to use higher order thinking skills to solve for the unknown in a variety of problems. In "Clue to Clue," the AIG students assume the role of international detectives who are problem-solving around the globe in search of an answer to a mystery: Who painted the White House green? To resolve this mystery, the students will follow geographic clues, solve math problems, and eliminate suspects to uncover the culprit. During the unit, students are required to analyze texts, photos, and information; look for details or evidence; and make connections. They must also draw conclusions, make deductions or inferences, and think logically. Higher order thinking skills are important when encouraging academic growth and progress in gifted students, but also are essential in keeping these students challenged and engaged. Two instructional models included in this unit are meant to foster the students' use of higher order thinking skills. For the Questioning Model, students progress from questions that allow for demonstration of basic knowledge and comprehension, to questions that allow for application and analysis, and finally to questions that call for synthesis and evaluation. This method guides students as they dig deeply into a topic and move beyond a basic understanding. For the Visual Thinking Model, students are asked open-ended questions as they analyze and draw conclusions based on a piece of art. In both models, students must refer to the text or original source for evidence to support the conclusions they've drawn.

The content for this unit is directly linked to the Common Core Standards in Math and English Language Arts, as well as the North Carolina Social Studies Essential Standards. The math content focuses on solving word problems, creating equations that allow students to identify and solve for an unknown, and assessing the reasonableness of an answer. The focus of the ELA goals are for students to do a close-reading of a text, make logical inferences, and cite specific evidence when answering questions or drawing conclusions. This unit also connects to the Social Studies curriculum for geography, in which students are to understand identifying characteristics (such as population, language, or culture) of geographic locations. .

The main concept of this unit, mystery, is important for AIG students to understand well as it is applicable to many academic domains and real-world situations. Mystery can be a puzzle, riddle, or enigma; it is something hard to understand or explain. It can be an unanswered question in science or a type of literature. Exploring a basic understanding of mystery blends well with the goal of problem-solving. Developing the students' understanding of how problem-solving skills (such as analysis, observation, or evaluation) can be applied to

resolve mysteries or answer questions will allow them to become better problem-solvers in a variety of situations. Whether answering a research question in history, drawing a conclusion as to why a character behaved a certain way in a novel, or solving a logic riddle, problem-solving for an unknown is something that AIG students will face often.

One further goal of this unit is to develop perseverance in gifted students. When working in a regular classroom setting, AIG students can be left unchallenged. This can lead to the student's belief that information or mastery comes quickly and with little struggle on his/her part. Providing the AIG student with challenging tasks will help to develop persistence and perseverance. Both of these traits are necessary when students are faced with difficult challenges in academic domains or in life. Learning to struggle, grapple, revisit, and ultimately work through a given problem is an important life skill.

B. Differentiation for Gifted Learners---Acknowledging that all students do not share the same learning styles, rates of knowledge acquisition, or interests results in a need for differentiation. When working with an AIG population, differentiation is even more important to keep the students challenged and engaged. Increasing the complexity of the material, offering challenging tasks or queries, allowing students to explore the depth of a topic or an idea, accelerating the pace of the lessons, and allowing for students to work or respond creatively are all methods of differentiating for gifted learners. There are multiple opportunities for differentiation contained in this unit.

Content: The complexity of the content in this unit makes it appropriate for an AIG population. To be successful with exploring and solving the mysteries in the unit, students must use higher-level processing and problem-solving skills. Students must analyze texts and photographs carefully, drawing conclusions based on information they can pull from the text directly or infer from the clues. Strong research and deductions skills are also necessary. Some of the math concepts required to solve the problems are for higher grades, but are appropriate in an AIG setting.

Process: The variety of challenges presented in this unit makes it appropriate for gifted students. Process is differentiated in this unit by allowing students to engage in discussions and tasks that require higher-level thinking skills. Students are required to analyze facts or details;

evaluate clues and information, as well as their own efforts; construct hypotheses; make inferences; and draw conclusions based on information gleaned from solving the problems correctly.

Product: Allowing for individual student creativity makes this appropriate for AIG students. Product is differentiated in this unit by allowing for student choice. Students will choose how to organize the information and clues that they gather along the way. Provided graphic organizers may be used or students may create their own method for storing information. Also, the final product may take a variety of forms. Students can choose to create the final product in a paper format (such as a poster or letter) or they may choose an electronic format (such as a Powerpoint, Prezi, or Animoto).

Learning Environment: Allowing for a student-designed and student-led learning environment makes this appropriate for gifted learners. The learning environment in this unit is differentiated by again allowing for student choice. Students may choose to work independently, in pairs, or in small groups. This choice is given as they solve the various daily mysteries and math problems, as well as for the final product. Collaboration is encouraged, but not forced. Groupings are very flexible and are student-created.

II. Goals and Outcomes

Content Goals and Outcomes:

Goal 1: To develop understanding of how close reading can yield deep comprehension of a text or source

Students will be able to:

A. Read or examine closely to determine what the text, word problem, or source says.
B. Make logical inferences from a text.
C. Cite specific textual evidence when writing or speaking to support conclusions drawn.
D. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

Process Goals and Outcomes:

Goal 2: To develop problem-solving and reasoning skills with application to math

Students will be able to:

A. Identify the unknown in a given problem.
B. Evaluate information and make judgments as to its importance.
C. Analyze information and draw conclusions.
D. Use tools to research information and apply it to solve a problem.
E. Solve word problems using the four operations.
F. Defend and self-evaluate their problem-solving abilities.

Concept Goals and Outcomes:

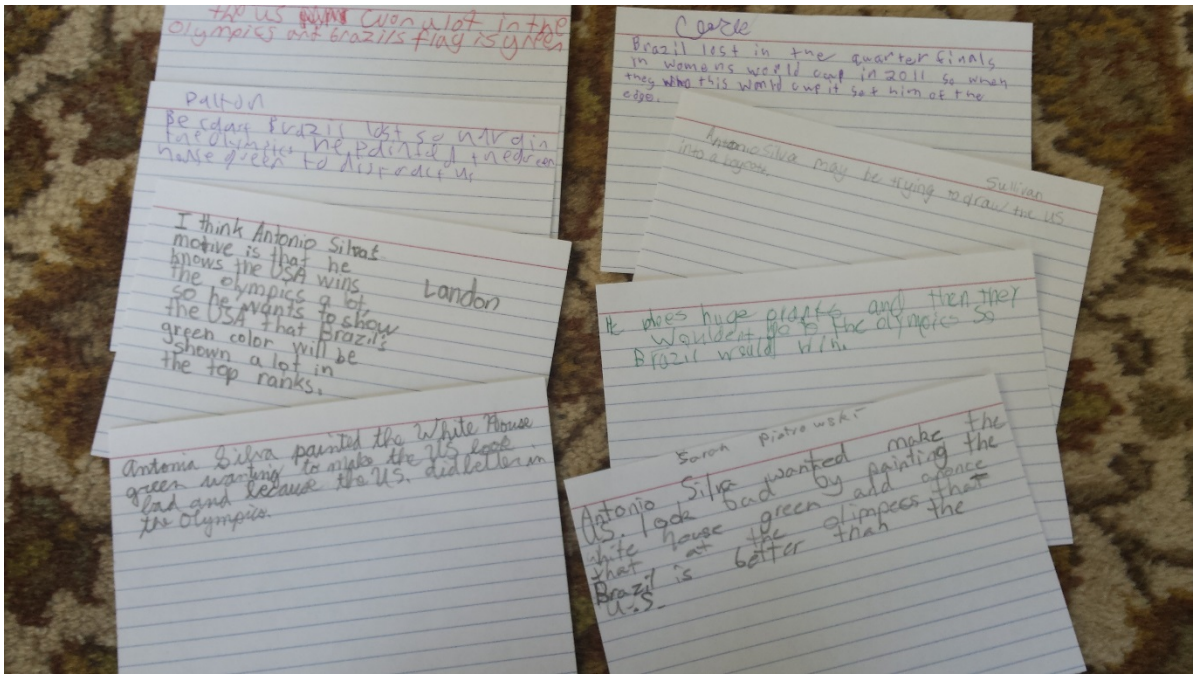
Goal 3: To understand the concept of mystery

Students will be able to:

A. Use appropriate language (Detective's Vocabulary) when discussing aspects of mystery.
B. Have working definitions of what mysteries are.
C. Analyze evidence or details to draw a conclusion.
D. Apply higher-order thinking skills and logic to resolve mysteries.

III. Assessment Plan

Formative Assessments: Formative assessments are formal or informal "check-ups" conducted by the teacher during the learning process to drive further instruction. For this unit, there are multiple opportunities for this type of assessment. One example of an informal assessment would be in the graphic organizers found in the Detective's Case File. Students will be recording information, making judgements, forming hypotheses, defending suspect choices based on evidence, and self-evaluating their skills. Reading this can provide the teacher with a quick glimpse of the student's progress and engagement, as well as how successful he/she is with solving the daily math or geographical mysteries. This example is informal as there are no set guidelines or expectations; each student will be assessed based on his/her experience with or interpretation of the material. Another example of an informal assessment would be the index cards or sticky notes that students use to give their definition of a mystery. Reading these will give the teacher an idea if students are understanding the overall concept of mystery and are applying the problems-solving skills to the lessons. A final example of an informal formative assessment would be in the students' responses to oral questioning. The teacher carefully selects the questions and matches them to students. By listening to the responses, the teacher is able to gauge student understanding and is then able to move forward in the lesson or line of questioning.



Summative Assessments: Summative assessments are used at the end of the learning process and are used to evaluate student learning of the given topic or lesson. For this unit, the following performance task would be the summative assessment:

Someone has painted the White House green! The United Nations is assembling an international team of detectives who will travel the world and apply analytical and problem-solving skills to solve the mystery of who could have painted the White House green… and YOU have been recruited to be a member of this investigative team.

If you accept this mission, you will follow geographical clues, solve math word problems, eliminate suspects, and uncover the culprit. Once you have identified the true suspect, you will need to present your findings to the United Nations panel so that they may apprehend the suspect before he (or she!) strikes again. You may choose to present your findings in an electronic or paper format. Make sure that your presentation includes any information that will convince the members of the UN panel that you have identified the right criminal. Remember to use your Detective's Vocabulary and Facts of the Case when convincing the panel members. You may want to include the countries you visited during the investigation, the information that helped you eliminate other suspects, or the final clues that led you to the culprit. Make sure to include a

graphic representation of the suspect so that an all-points bulletin can be issued for his/her apprehension.

Act quickly, Detective! Time is running out before this culprit strikes somewhere else in the world….

A performance task is a complex activity that asks students to perform or demonstrate their knowledge, understanding, or proficiency with regard to a given area of study or concept. Students should demonstrate that they can use what they have learned through a real-world situation.

Completion of the performance task at the end of this unit will provide the teacher with much information about the student(s):

- The teacher will be able to observe if the students followed the guidelines and completed all aspects of the assignment.
- The goal of this assignment was to encourage higher order thinking skills as students solved for the unknown in a variety of word problems. The teacher will be able to see how students attempted to solve problems and if they were successful.
- The role of the student in this assignment was to assume the part of an international detective who solved mathematical and geographical mysteries to travel the world and catch the culprit. The teacher will be able to observe if the student took on this role and engaged in the various travels and problem-solving activities.
- The audience for this task was the United Nations Panel who had requested the help of the international detectives. The teacher will be able to see if the students addressed the audience in the final product.
- The situation, or context, for this assignment was to solve various problems to uncover where the detectives needed to travel in the world, as well as which suspects could be eliminated. The teacher will be able to see how the students applied their problem-solving skills to the different tasks.
- The product for this task was the presentation of gained information (the culprit) to the UN panel. The presentation could take a variety of forms. The teacher will be able to observe whether the student showed creativity and originality as

he/she presented his/her findings. The teacher can also see if the student demonstrated understanding of the concept of mystery.

- The standards and criteria for this product are explained and shared with students through the actual performance task contained in the Power Point. These could be further clarified for the students by providing a rubric. The rubric could be as simple as using each of the six bulleted points from above or it could be made more detailed, based on the teacher's needs.


ALPHABET
MYSTERY
CLUE TO CLUE
What's Abnormal?
-nobody knows
somthing happened

IV. Lesson Plans

TEACHER NAME	Lesson #
Julie K. G. Miller	1

MODEL	CONTENT AREA	GRADE LEVEL
Questioning	Language Arts/Math/ Social Studies	Third/Fourth

CONCEPTUAL LENS	LESSON TOPIC
Mystery	Using evidence (clues) from a text to solve mysteries and mathematical word problems

LEARNING OBJECTIVES *(from State/Local Curriculum)*

Language Arts:

· R.CCR.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

· RL.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

Math:

· 3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Social Studies:

· 3.G.1 Understand the earth's patterns by using the 5 themes of geography: location, place, human-environment interaction, movement, and regions.

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Problem-solving resolves mysteries	How are mysteries resolved through problem-solving?

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
· Students will know vocabulary associated with solving mysteries: alibi, clue, crime, deduction, detective, evidence,	· Students will analyze a text and identify important evidence (clues). · Students will construct lists, make

hunch, motive, mystery, red herring, sleuth, suspect, victim, witness · Students will know identifying characteristics (population, language, culture) of geographic locations. · Students will know how a conclusion can be drawn based on evidence in a text. · Students will know how a graphic organizer can categorize information. · Students will know vocabulary associated with problem-solving mathematical problems. · Students will know strategies for solving multiple-step word problems.	connections between, and give support for identifying evidence in a given text. · Students will analyze information and draw conclusions. · Students will make judgments as to the importance of information. · Students will use research tools to locate information and apply it to solve problems. · Students will identify the unknown in a given math problem and solve problems using the four operations. · Students will defend and self-evaluate their problem-solving abilities.

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:
· What is a mystery? · How can mysteries be solved? (Can all mysteries be solved?) · What tools or materials might be useful in solving mysteries? · What methods or actions must a good detective use?	· What vocabulary might you need when discussing mysteries? · How can you learn about the population, language, or culture of a certain area? What tools might you use? · How can you identify a clue in the given text/case? · How can you construct a list of possible clues that might be used to solve the current mystery? · How can you make connections between clues? · How can you analyze the clues and construct a hypothesis as to who committed the crime? · How can you explain the clues that helped you deduce this possible solution? · How can you organize your detective's notes so that you can add to them as you progress from mystery to mystery?	· How was this part of the mystery resolved through problem-solving? · How can you justify which suspect you have eliminated from the suspect pool? · How could you discriminate, or determine, a red herring from an actual clue? · How would you self-evaluate your ability to solve this part of the mystery? · How did you decide which clues were valuable? · How did you construct your hypothesis for solving this part of the mystery? · How would you evaluate your problem-solving technique for the math problem? How can you defend why you chose this strategy?

	· How can you apply a variety of problem-solving strategies to tackle a given math problem? What might you ask yourself first? · How can you find the unknown in a math problem? What parts of the problem help you decide how to proceed? · How can you debate or defend your choice of strategies?	

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
	Students will engage in higher-level discussions as they analyze, evaluate, and defend clues, their hypotheses, or problem-solving strategies they selected.	Students will choose how to organize the information/clues that they gather along the way. Provided graphic organizers may be used or students may create their own method for storing information. The final product may take a variety of forms.	Students may choose to work independently, in pairs, or in small groups as they solve the mysteries or the math problems.

PLANNED LEARNING EXPERIENCES

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

***See page 39-41 of this document for the Link to the PowerPoint, Facts of the Case organizers, and Detective's Vocabulary.

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.*

The teacher (playing the role of Chief of Detectives, "COD") will present the students with the following (which is an excerpt from the final performance task) while the theme music from Mission Impossible plays in the background and the PowerPoint ("PPT," which has graphics, questions, and dialogue to be used as students solve the mysteries) is displayed

on the Promethean Board:

CoD: "Someone has painted the White House green! The United Nations is assembling an international team of detectives who will travel the world and apply analytical and problem-solving skills to solve the mystery of who could have painted the White House green… and YOU have been recruited to be a member of this investigative team. If you accept this mission, you will follow geographical clues, solve math problems, eliminate suspects, and uncover the culprit. Once you have identified the true suspect, you will need to present your findings to the United Nations panel so that they may apprehend the suspect before he (or she!) strikes again! Are you in? Are you ready to put your problem-solving skills to the test to solve this mystery?"

Each student will then be given a Detective's Kit, consisting of an ID badge, detective's notebook, magnifying glass, highlighter, pencil, pen, and Facts of the Case. Students will be given time to explore the kits and, once they are ready to accept the challenge, the teacher (Chief of Detectives) presents the group with the Case File for Day 1. (Estimated time: 10 mins)

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.*

The CoD will direct the students to the Facts of the Case, which begins with a copy of the bios of the 5 international suspects who could have committed this mysterious crime. Students are given an opportunity to read (independently or in groups) the bios. The chief then explains that this group of detectives is to follow the clues, using specific details in texts and pictures and using data gained from math problem-solving, as they must eliminate the suspects one-by-one to identify the mastermind behind the mystery. They are then tasked with analyzing the clues/basic facts of the first case to see if they can create a hypothesis to determine where in the world the team must travel first to determine the first suspect to be cleared. Students work together to analyze the case file and compile lists of clues in their notebooks. (Teacher will listen, circulate among the groups, and ask leading questions if students become stuck.) (Estimated time: 15 mins)

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.*

The students share their lists of clues and give the reasons behind their thoughts. (A master list of clues is written on the board.) The chief then introduces a list of vocabulary words that the students will need as they investigate the mystery. (These will be printed on a bookmark and given to each student for use/reference throughout the mystery unit.) The teacher then introduces the Facts of the Case, which is the graphic organizing tool that the detectives will use to help organize their findings about each part of the mystery.

After discussing the clues found, the teacher models how to continue the search by making connections between the clues using tools such as the computer, the world map, the globe, and the atlas. For this particular lesson, the chief will model an internet search using World Book Online and the clues "lemur fur and ariary." With the chief monitoring the search carefully, the students will "land" in the country of Madagascar. (Estimated time: 15 mins)

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*

Upon "arrival" in Madagascar, the students will be told that they are hot on the trail of the suspect and will need to do research to solve the first mathematical component of the mystery:

CoD: You are indeed hot on the trail of the suspect! Solve this mathematical mystery to receive the next set of clues:

What is the difference between the land area of your current country and the land area of the country where your mystery began? Your answer should be in square kilometers.

Match the answer of this problem to the identification number of one of the suspects to eliminate him/her.

Students will need to consult an atlas in the classroom or use worldbookonline (my preference for this lesson) to locate the information and then apply it to find the unknown in the word problem to eliminate the first suspect. Students may work independently or in groups to solve this part of the mystery.

Answer: 9,371,180 – 587,041= 8,784,139 *(This allows Adeniyi Azikiwe to be eliminated from the pool of suspects.)* (Estimated time: 10-15 mins)

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

Once the detectives have identified the first suspect to be eliminated and highlighted the evidence in the text of the bio that allowed identification, the chief will request that each detective write (in their detective's notebook or graphic organizer) a brief summary of how this part of the mystery was resolved through problem-solving, as well as give a brief self-evaluation of how they performed as detectives. Detectives should include at least 4-5 mystery-related vocabulary words in their response. (Estimated time: 10-15 mins)

***Upon completion of this summary/evaluation, the chief will present the idea of the final product that was mentioned in the Performance Task (PPT slide #3).

Performance Task: **Someone has painted the White House green! The United Nations is assembling an international team of detectives who will travel the world and apply analytical and problem-solving skills to solve the mystery of who could have painted the White House green… and YOU have been recruited to be a member of this investigative team.**

If you accept this mission, you will follow geographical clues, solve math word problems, eliminate suspects, and uncover the culprit. Once you have identified the true suspect, you will need to present your findings to the United Nations panel so that they may apprehend the suspect before he (or she!) strikes again. You may choose to present your findings in an electronic or paper format. Make sure that your presentation includes any information that will convince the members of the UN panel that you have identified the right criminal. Remember to use your Detective's Vocabulary and Facts of the Case when convincing the panel members. You may want to include the countries you visited during the investigation, the information that helped you eliminate other suspects, or the final clues that led you to the culprit. Make sure to include a graphic representation of the suspect so that an all-points bulletin can be issued for his/her apprehension.

Act quickly, Detective! Time is running out before this culprit strikes somewhere else in the world….

***If there is extra time today, students may continue to explore the atlases, maps, globes, and websites provided.

TEACHER NAME	Lesson #
Julie K G Miller	2

MODEL	CONTENT AREA	GRADE LEVEL
Visual Thinking Strategy	Language Arts/Math/ Social Studies/Visual Arts	Third/Fourth

CONCEPTUAL LENS	LESSON TOPIC
Mystery	Using evidence (clues) from photos to solve mysteries and subsequent mathematical word problems

LEARNING OBJECTIVES *(from State/Local Curriculum)*

Language Arts:

· R.CCR.1 Read closely to determine what the text* says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. [*In this case, the text is a photograph.]

· RL.3.1 Ask and answer questions to demonstrate understanding of a text*, referring explicitly to the text as the basis for the answers. [*In this case, the text is a photograph.]

Visual Arts:

· 3.V.1 Use the language of visual arts to communicate effectively.

· 3.V.2 Apply creative and critical thinking skills to artistic expression.

Math:

· 3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Social Studies:

· 3.G.1 Understand the earth's patterns by using the 5 themes of geography: location, place, human-environment interaction, movement, and regions.

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Problem-solving resolves mysteries	How are mysteries resolved through problem-solving?

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)

· Students will know and use the provided vocabulary associated with solving mysteries: alibi, clue, crime, deduction, evidence, hunch, inquiry, investigation, motive, mystery, observation, red herring, scene of the crime, sleuth, suspect, witness. (*See the attachment of the Detective's Vocabulary List for complete definitions.) · Students will know that details in a photo can be used to draw conclusions. These conclusions may be the basis for clues or evidence used to solve a mystery. · Students will know identifying characteristics (language, culture) of geographic locations, such as the country of Russia. · Students will know how an atlas or online tool can be used to locate information about a certain place. · Students will know strategies for solving multiple-step word problems in math.	· Students will build their understanding of the concept of mystery through investigation and analysis. · Students will analyze a text (photograph) and identify important evidence or details. · Students will view a picture or photograph and evaluate it creatively and critically. · Students will organize details or evidence and give reasons for their classification. · Students will analyze information and draw conclusions. · Students will make judgments as to the importance of information. · Students will use research tools to locate information and apply it to solve problems. · Students will problem-solve and generate a hypothesis. · Students will defend and self-evaluate their problem-solving abilities.

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:
· What skills helped you solve the previous mysteries? · What did you learn about problem-solving as it relates to a mystery? · What words from our vocabulary list have been helpful when trying to solve mysteries? Are there other words that we need to add to our list? · How can you learn about the population, language, or culture of a certain area? What tools might you use to research this?	· What is mystery? · What mysteries, details, clues, or evidence can you discover by studying these photos? · How can you apply the clues derived from these photos to help determine their country of origin? · What details do you notice first when studying the photograph(s)? · How would you describe the people or objects in this photo? · What do you notice about the clothing worn by the people in the photo? What global or cultural clues can you deduce from this	· How was this mystery resolved through problem-solving? · What vocabulary or skills did you need as you problem-solved? · How would you self-evaluate your ability to solve this mystery? · How did you decide which clues in the photograph were valuable? · How did you construct your hypothesis for solving this part of the mystery? · How would you evaluate your problem-solving technique for the math problem? How can you defend why you chose this strategy?

	information? · What do you notice about the weather occurring in the photo? What global or cultural clues can you deduce from this information? · What buildings/background do you see? What do these buildings make you think of? What clues can you deduce from these buildings? · What else can you find/observe in these photographs that might be helpful information? · How can you analyze and make connections between the clues to construct a hypothesis as to where the suspect has traveled? · How can you apply a variety of problem-solving strategies to tackle a given math problem? How can you break apart the problem to identify the important information necessary for solving this problem?	· How can you justify which suspect you have eliminated from the suspect pool?

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
	Students will engage in higher-level discussions as they analyze photos and evaluate and defend possible clues, their hypotheses, or problem-solving	Students will choose how to organize the information/clues that they gather. Provided graphic organizers may be followed or students may create their own method for storing information. The final product may	Students may choose to work independently, in pairs, or in small groups as they solve the mysteries or the math problems.

	strategies they selected.	take a variety of forms.	

PLANNED LEARNING EXPERIENCES

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

***This is the second lesson in the series and starts on PPT slide#8.** In this mystery unit, students will be working as an international team of detectives that are out to solve a major mystery that just occurred: Who painted the White House green? At this point in the unit, the detectives will have traveled from Washington DC to Madagascar, where they solved the first mysteries. The Chief of Detectives (teacher), CoD, acts as facilitator. (See the previously-explained companion documents, Detective's Vocabulary and Facts of the Case, which students will be using during this lesson.)

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.*

As the students enter the classroom, there will be a collage of the following four images from Chris Van Allsberg's The Mysteries of Harris Burdick on the Promethean Board.

Students will be asked to observe the images and each student will be tasked with selecting one image that he/she feels presents the viewer with a mystery. Students may take an index card or sticky note and attempt to draw a conclusion and explain the mystery behind the picture. After a few minutes, the teacher will ask students to share their thoughts and writings, but first will pose the question, "**What is mystery?**" As each child shares his/her thoughts, the teacher will continue to return to the question of the concept of mystery: something that is hard to explain, that baffles or perplexes, that begs to be discussed, analyzed, explored, and (sometimes) solved. A working definition will be created, to be revisited and referenced often throughout the rest of the lessons. (Index cards or sticky notes may be added to the poster where the working definition is being crafted.)

At this point, the teacher will tell students that it is time to revisit the current mystery of "Who Painted the White House Green?" and will put on the costume and resume the persona of the Chief of Detectives from lesson one.

CoD: Detectives, you solved the math problem in Madagascar and your findings were sent to the local police. The police were hot on the trail of the suspect, but when they arrived at the suspect's hideaway, the only items found in the abandoned hideaway were two photographs.

Figure 1

Figure 2

The chief instructs the students to independently observe the photos. Students are given time to observe and then record their initial thoughts and ideas in their notebook or Facts of the Case organizer from their detective's kit. (Duration 5-10 mins)

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.*

The chief then explains that this group of detectives will now analyze the two photos for any clues, details, or information that might unravel the mystery of the next global destination. Students will be given time to study the photographs. (The magnifying glasses from their Detective's Kit might come in handy here!) The chief will begin the discussion by posing the following questions:

CoD:
What details, clues, or evidence can you find in these photos?
How can you apply the clues derived from these photos to help determine their country of origin?

The students will then work, independently or in groups, to analyze the photos and compile lists of clues in their notebooks. (See the list below for leading questions that the teacher might ask to get students started or to encourage a path of exploration.) Students should consult atlases and online resources to explore their thoughts and ideas.

During this exploration, the teacher will circulate among the groups and assist students' analyses by asking the following questions:

Starting with Photo 1:

What details do you notice first when studying the photograph?
What do you think is going on in the photo? What makes you think this?
Who are the people in this photo? How would you describe them?
What do you notice about the clothing worn by the people in the photo? What global or cultural clues can you deduce from this information?
What do you notice about the weather occurring in the photo? What global or cultural clues can you deduce from this information?
What buildings/background do you see? What do these buildings make you think of?
What clues can you deduce from these buildings?
What else can you find/observe in these photographs that might be helpful information when determining where you need to travel to next?

Continuing with Photo 2:

What do you observe in this photo?
How can you describe the objects in the photo?
What details do you see that make you say that?
What might the purpose be of the objects in the photo?
What colors or themes do you notice on the objects? What global or cultural clues can you deduce from this information?

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.*

The students will communicate their ideas regarding clues and findings and must give the reasons behind their thoughts. A master list of clues and findings is written on the board. (The teacher will make sure that key details in the photos (buildings, for example, have been identified during the independent practice. If the students have indeed used the atlases and online resources, the country of Russia will be given as a possible destination.)

After compiling and discussing the possible clues found, the teacher confirms that the clues indeed point to Russia.

CoD: Yes! You have problem-solved your next destination: the country of Russia! While you "travel" to your next destination, learn about Russian nesting dolls by watching this video. (Hyperlink found in PPT.)

This will allow the students to dig deeper in their exploration and understanding of Russian culture. Students add the notes to their Facts of the Case organizer for this case.

https://www.youtube.com/watch?v=z7LjWTxHPNA

Students will then "travel" to Russia for the next part of the case.

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*

Upon "arrival" in Russia, the students will be presented with the next math mystery to solve.

CoD: You are sharp problem solvers, detectives! Solve this mathematical mystery to receive the next set of clues:

Vladlena has a set of 8 nesting dolls. The largest doll has a volume of 300 cubic centimeters when empty. If the volume of each doll decreases by 1/2, what would the volume be of the smallest doll? The correct answer will be the identification number of the next suspect to be eliminated.

Students may use paper (Facts of the Case organizer), pencils, calculators, or the computers to find the unknown in the word problem to eliminate the second suspect. Students may work independently or in groups to solve this part of the mystery. (The teacher will again listen, circulate among the groups, and ask leading questions if students become stuck.)

Answer: 300 / 2= 150 / 2= 75 /2= 37.5 / 2= 18.75 / 2= 9.375 / 2= 4.6875 / 2= 2.34375 *(This allows Hans Malik Peterson to be eliminated from the pool of suspects.)*

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

Once the detectives have identified the second suspect to be eliminated and highlighted the evidence in the text of the bio that allowed identification, the chief will request that each detective write a brief summary and self-evaluation (in their Detective's Notebook) of how this portion of the case was solved, making sure to note the importance of the two photos used. The teacher might pose the following questions and allow for students to respond through writing: "How did these photos lead you to the next destination?" "How were you able to problem-solve to resolve this mystery? What skills did you use to uncover the mystery?" Detectives should include at least 4-5 mystery-related vocabulary words in their response.

***Upon completion of this summary/evaluation, the chief will give students the opportunity to start planning their performance task projects. The goal for today would be for students to choose their working groups and to select the format (paper, electronic) that their project

will take. Students will provide a list of requested supplies. If there is extra time today, students may continue to explore the atlases, maps, globes, and websites provided.

TEACHER NAME			Lesson #
Julie K G Miller			3
MODEL	**CONTENT AREA**	**GRADE LEVEL**	
Questioning	Language Arts/Math/ Social Studies	Third	
CONCEPTUAL LENS	**LESSON TOPIC**		
Mystery	Using evidence (clues) from a text to solve mysteries and mathematical word problems		

LEARNING OBJECTIVES *(from State/Local Curriculum)*

Language Arts:

· R.CCR.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

· RL.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

Math:

· 3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Social Studies:

· 3.G.1 Understand the earth's patterns by using the 5 themes of geography: location, place, human-environment interaction, movement, and regions.

THE ESSENTIAL UNDERSTANDING ***(What is the overarching idea students will understand as a result of this lesson?***	**THE ESSENTIAL QUESTION** ***(What question will be asked to lead students to "uncover" the Essential Understanding)***
Problem-solving resolves mysteries	How are mysteries resolved through problem-solving?
CONTENT KNOWLEDGE **(What factual information will students learn in this lesson?)**	**PROCESS SKILLS** **(What will students be able to do as a result of this lesson?)**
· Students will know vocabulary associated with solving mysteries: alibi, clue, crime, deduction, detective, evidence,	· Students will apply data to make logical inferences. · Students will construct lists, make

hunch, motive, mystery, red herring, sleuth, suspect, victim, witness (For complete definitions, see Detective's Vocabulary bookmark accompanying this lesson.) · Students will know identifying characteristics (population, language, culture) of geographic locations. · Students will know how a conclusion can be drawn based on evidence in a text. · Students will know how a graphic organizer can categorize information. · Students will know vocabulary associated with problem-solving mathematical problems. · Students will know strategies for solving logic problems.	connections between, and give support for identifying evidence in a given text. · Students will analyze information and draw conclusions. · Students will make judgments as to the importance of information. · Students will use research tools to locate information and apply it to solve problems. · Students will identify the unknown in a given math or logic problem. · Students will defend and self-evaluate their problem-solving abilities.

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 can "mystery" be defined? How can some mysteries be like others? How can some mysteries be different from others? · How can mysteries be solved? (Review) · How have we solved the different parts of our mystery? What strategies have been used? What has worked well? What hasn't worked well? · What tools or materials have been useful in solving mysteries? · What methods or actions must a good detective use?	· What vocabulary have you needed when discussing mysteries? · How can you describe the symbols in the artwork? How could you describe any patterns or the order of the symbols? How could you identify what type of symbols or communication this is? · How can you learn about the population, language, or culture of a certain area? What tools might you use? · How can you construct a list of possible clues that might be used to solve the current mystery? · How can you analyze the clues and construct a hypothesis as to who committed the crime? · How can you explain the clues that helped you	· How was this part of the mystery resolved through problem-solving? · How do inferences help when solving a logic problem? · How can you justify which suspect you have eliminated from the suspect pool? · How would you self-evaluate your ability to solve this part of the mystery? · How would you evaluate your problem-solving technique for the math or logic problem? How can you defend why you chose this strategy?

	deduce this possible solution? · How can you apply a variety of problem-solving strategies to tackle a given math or logic problem? What might you ask yourself first? · How can you find the unknown in a math or logic problem? What parts of the problem help you decide how to proceed? · How can you debate or defend your choice of strategies?	

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
	Students will engage in higher-level discussions as they analyze, evaluate, and defend clues, their hypotheses, or problem-solving strategies they selected.	Students will choose how to organize the information/clues that they gather along the way. Provided graphic organizers may be used or students may create their own method for storing information. The final product may take a variety of forms.	Students may choose to work independently, in pairs, or in small groups as they solve the mysteries or the math problems.

PLANNED LEARNING EXPERIENCES

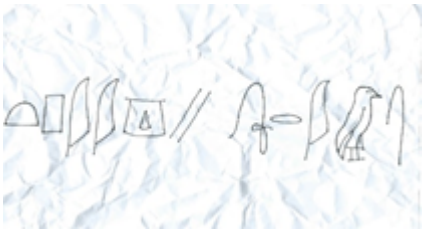
(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

******This is the third lesson in the series and starts on PPT slide#15.*** In this mystery unit, students will be working as an international team of detectives that are out to solve a major mystery that just occurred: Who painted the White House green? At this point in the unit, the detectives will have traveled from Washington DC to Madagascar to Russia, where they have solved several mysteries. The Chief (teacher) acts as facilitator. (See the previously-explained companion documents, Detective's Vocabulary and Facts of the Case, which students will be using during this lesson.)

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.*

Having solved their math problem in Russia in the previous lesson, the teacher will begin today's lesson in character as the Chief. When students arrive, the figure below will be on the Promethean Board.

CoD: Detectives, you solved the mysteries in Russia! Your findings were sent to the local police, but the suspect had once again fled the scene just as he (or she) was about to be captured! When the police entered the suspect's last known address, the hideout was empty, except for some artwork hanging on the wall. What observations or deductions can you make about this artwork?



The chief instructs the students to observe the artwork (which is hieroglyphics). Students are given time to observe and then record their thoughts and ideas in their Detective's Notebook or Facts of the Case organizer from their detective's kit. (Duration 10 mins)

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 are given an opportunity to share what they notice or what they already know about the artwork; they may also ask questions. The teacher might ask several questions to get the discussion moving: How can you describe the symbols in the artwork? How could you describe any patterns you see or the order of the symbols? How could you identify what type of symbols or communication this is? Does anyone know what type of symbols or communication this is? Students will have the opportunity to explore the artwork, possibly researching it on the computer if someone is able to identify it as hieroglyphics. (Estimated time: 15 mins)

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.*

The students share what they have noted and explain their thinking. At this point, If no one has been able to identify the symbols as Egyptian hieroglyphics, the teacher will provide this bit of information.

CoD: The police believe that the suspect may have hidden the next destination in the artwork! To learn more about this type of communication and uncover the mystery in the artwork, watch this video. Pay close attention to the details concerning how to read hieroglyphics.

The students will watch a short video clip to deepen their understanding of hieroglyphics:

https://www.youtube.com/watch?v=Xvw6Kn3kwlQ
(Hyperlink found in PPT.)

After watching the video and answering any questions that arise from it, the chief will provide students with the key for cracking the hieroglyphic code. (See the Hieroglyphic Alphabet below.)

Students will work independently, with a partner, or in small groups to solve the message hidden within the hieroglyphic artwork. Answer: Students will decipher the code and read the message backwards to reveal "Cairo Egypt." (Estimated time: 20 mins)

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*

Upon "arrival" in Egypt, the students will be told:

CoD: You are closer to nabbing the suspect, who is trying to make a get-away on one of the ships in the city's port! How logical are you, Detectives? There are 5 ships in the port in Egypt. Our suspect has escaped by hiding on the ship carrying his/her favorite food… almonds! Can you use logic to solve this mystery and figure out where the suspect is headed next?

The students will use the organizing grid below to record what they know or learn as they problem-solve. If this is the students' first experience with logic grids, the teacher may

assist the group in recording the first pieces of information.

Ships Puzzle

There are 5 ships in the port:

1. The Greek ship leaves at six and carries coffee.
2. The ship in the middle has a black chimney.
3. The English ship leaves at nine.
4. The Chinese ship with blue chimney is to the left of a ship that carries coffee.
5. To the right of the ship carrying cocoa is a ship going to Marseille.
6. The French ship is heading for Manila.
7. Next to the ship carrying rice is a ship with a green chimney.
8. A ship going to Perth leaves at five.
9. The Japanese ship leaves at seven and is to the right of the ship going to Marseille.
10. The ship with a red chimney goes to Hamburg.
11. Next to the ship leaving at seven is a ship with a white chimney.
12. The ship on the border carries corn.
13. The ship with a black chimney leaves at eight.
14. The ship carrying corn is anchored next to the ship carrying rice.
15. The ship to Hamburg leaves at six.

CoD: Having used the logic clues, which ship is our suspect is hiding on? Once you have identified the ship, we will send the authorities quickly so that they can make the arrest before the suspect sails out of the port! Also, by carefully analyzing the details of what you have learned in this puzzle and in the bios, you are able to eliminate one more suspect from the suspect pool.

The students work independently, in small groups, or in pairs to solve the logic problem. Upon completing this logic puzzle, the students will apply their solution to eliminate the third suspect. They will need to apply their solutions to the remaining bios in the case study. (Estimated time: 20-30 mins)

Ship's Origin					
Departure Time		**6:00**			
Cargo					
Chimney Color					
Destination					

City					
					

Answer: Identifying the ship carrying almonds allows you to eliminate Ciara O'Brien due to her nut allergy. It also allows students to discover that the suspect is headed to Perth.

Ship's Origin	Chinese	Greek	French	English	Japanese
Departure Time	5:00	**6:00**	8:00	9:00	7:00
Cargo	**Nuts**	Coffee	Cocoa	Rice	Corn
Chimney Color	Blue	Red	Black	White	Green
Destination City	Perth	Hamburg	Manila	Marseille	?

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

Once the detectives have identified (and agreed upon) the next suspect to be eliminated, the chief will request that each detective write (in their detective's notebook) a brief summary of how this part of the mystery was resolved through problem-solving, as well as give a brief self-evaluation of how they performed as detectives. Detectives should include at least 4-5 mystery-related vocabulary words in their response. (Estimated time: 10-15 mins)

***Upon completion of this summary/evaluation, students will be given the opportunity to start their performance task projects. (Not knowing who the suspect is, they can work with basic formatting and organization.)

TEACHER NAME	Lesson #
Julie K G Miller	4

MODEL	CONTENT AREA	GRADE LEVEL
Questioning	Language Arts/Math/ Social Studies	Third/Fourth

CONCEPTUAL LENS	LESSON TOPIC
Mystery	Using evidence (clues) from a text to solve mysteries and mathematical problems

LEARNING OBJECTIVES *(from State/Local Curriculum)*

Language Arts:

· R.CCR.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

· RL.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

Math:

· 3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Social Studies:

· 3.G.1 Understand the earth's patterns by using the 5 themes of geography: location, place, human-environment interaction, movement, and regions.

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
Problem-solving resolves mysteries	How are mysteries resolved through problem-solving?

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
· Students will know vocabulary associated with solving mysteries: alibi, clue, crime, deduction, detective, evidence, hunch, motive, mystery, red herring, sleuth, suspect, victim, witness (For complete definitions, see Detective's Vocabulary bookmark	· Students will apply reasoning and logic to discover something unknown. · Students will construct lists, make connections between, and give support for identifying evidence in a given text through the use of their graphic organizers.

accompanying this lesson.) · Students will know identifying characteristics (population, language, culture) of geographic locations. · Students will know how a conclusion can be drawn based on evidence in a text. · Students will know how a graphic organizer can categorize information. · Students will know vocabulary associated with problem-solving mathematical problems. · Students will know strategies for solving logic problems.	· Students will analyze information and draw conclusions. · Students will make judgments as to the importance of information. · Students will use research tools to locate information and apply it to solve problems. · Students will identify the unknown in a given math or logic problem. · Students will defend and self-evaluate their problem-solving abilities.

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 can mysteries be solved? (Review) · How have we solved the different parts of our mystery? What strategies have been used? What has worked well? What hasn't worked well? · What tools or materials have been useful in solving mysteries? · How will knowing our suspect's name solve the mystery? What still remains unanswered? How do you know when a mystery is solved?	· How have you unraveled or solved the various mysteries? What skills, strategies, or vocabulary have you needed? · How did solving this last mystery differ from solving those from Day 1, 2, or 3? · Revisiting the concept of mystery, how can we add to our original definition? · How can you apply a variety of problem-solving strategies to tackle a given math or logic problem? What might you ask yourself first? · How can you find the unknown in a math or logic problem? What parts of the problem help you decide how to proceed? · How can you debate or defend your choice of strategies? · How can you construct a list of possible clues that might be used to solve the current mystery?	· How was this mystery resolved through problem-solving? · How can you justify which suspect you have identified as the culprit? How can you explain the clues, evidence, or steps that led you to this culprit? · How can you formulate a hypothesis as to the culprit's motive? · How would you self-evaluate your ability to solve this mystery? · How would you evaluate your problem-solving technique for the math or logic problem(s)? How can you defend why you chose the strategies you used? · How has our understanding of "mystery" changed throughout this investigation?

	· How can you analyze the clues and construct a hypothesis as to who committed the crime? · How can you use found objects/manipulatives/shapes to create a flag? How can you research information on certain countries and/or their cultures?	

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
	Students will engage in higher-level discussions as they analyze, evaluate, and defend clues, their hypotheses, or problem-solving strategies they selected.	Students will choose how to organize the information/clues that they gather along the way. Provided graphic organizers may be used or students may create their own method for storing information. The final product may take a variety of forms.	Students may choose to work independently, in pairs, or in small groups as they solve the mysteries or the math problems.

PLANNED LEARNING EXPERIENCES

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

******This is the fourth and final lesson in the series and starts on PPT slide#22.*** In this mystery unit, students will be working as an international team of detectives that are out to solve a major mystery that just occurred: Who painted the White House green? At this point in the unit, the detectives will have traveled from Washington DC to Madagascar to Russia to Egypt to Australia, where they have solved several mysteries. The Chief of Detectives (teacher) acts as facilitator. (See the previously-explained companion documents, Detective's Vocabulary and Facts of the Case, which students will be using during this lesson.)

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.*

Having solved their math problem in Cairo in the previous lesson, the teacher will again begin today's lesson in character as the Chief. When students arrive, there is a mysterious box sitting on a desk at the front of the room. The box resembles a safe and has space on the front for an 8-digit code.

CoD: You made it! Your problem-solving skills have brought you from Washington, DC to the island of Madagascar to Moscow, Russia to Cairo, Egypt, and finally, to Perth, Australia! You have resolved both geographical and mathematical mysteries by analyzing clues and using strategies to reveal the unknown. You are so close to discovering who painted the white house green! But will knowing the suspect's identity truly solve the mystery? Will your desire to uncover the unknown be satisfied by just revealing the name? Are there other mysteries still to be resolved?

Chief will allow for discussion of what other mysteries still need to be uncovered. If no one is curious as to the motive (the WHY behind the mystery) the teacher will ask leading questions to arrive at this question.
(Duration 10 mins)

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.*

The chief unveils the final math mystery to be resolved.
CoD: The code required to open the safe is unknown. To solve this mystery and open the safe, use logic as a problem-solving strategy. Record your work and thoughts in your Facts of the Case graphic organizer.

Students work independently or in groups to solve the problem.

--Other than the fifth and the seventh digits, no digits repeat.
--The first digit is the sum of the duplicate digits.
--The second digit is one more than the digit to its left.
--The fourth digit is one-third of the second digit.
--The eighth digit is the product of the third and fourth digit.
--The sixth digit is the quotient if you divide the seventh digit by the fifth digit.

Answer: 8 9 2 3 4 1 4 6

The chief affirms the correct combination and "opens" the safe. (PPT slide #13???)
(Estimated time: 15 mins)

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.

Before divulging the contents of the safe, the teacher has students revisit the concept of mystery. The students should look back in their graphic organizer and notebooks as they discuss the following questions:

-- How did you use problem-solving to resolve mysteries? How did you unravel this last mystery? What skills, strategies, or language did you need to solve the problem?
--How did solving this last mystery differ from solving those from Day 1, 2, or 3?
--Revisiting the definition of mystery that we explored on Day 2: Do we need to add to or change our original definition of mystery? (Estimated time: 10-15 mins)

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*

When the safe is opened, the contents are revealed: a letter and a large envelope. **CoD reads the letter aloud:**

Well done! Bem feito, Detectives! You have pursued me around the globe and finally you are close to exposing the culprit! But the mystery is not yet resolved.
Ask yourself,
"Who am I? And why did I paint the White House green?" Use the shapes contained in this safe to assemble two flags. One will reveal my identity and the other will give a clue as to my motive. You are so very close to having solved the mystery!

The students are then given the contents of the envelope (various shapes in various colors) and allowed to work as a group to construct the flag(s). Research tools may be consulted. Students may note the flags of the two remaining suspects as they attempt to problem-solve and construct with the shapes. Students are then given the task of working together to use the pieces to construct a flag of one of the remaining suspects. The suspect whose flag can be constructed from the pieces given is the true culprit!

Answer: Brazilian flag can be created. (This allows students to identify Antonio Silva as the culprit!) The remaining pieces/shapes can be assembled to create the Olympic flag.
(Estimated time: 15-20 mins)

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

Once the detectives have identified (and agreed upon) the true culprit, the chief will bring into question what the possible motive may have be. *(Most likely deduction: His motive behind turning the White House green was as a promotional stunt/prank to promote Brazil hosting the 2016 Olympic Games.)* Students can use the remaining clues in the bio, plus the Olympic flag that was created with the remaining shape pieces. (Teacher will allow for much discussion and speculation here. Students may conduct extra research if desired, where they may learn the connection that Rio will be hosting the 2016 Olympics. If the students have difficulty making the connections between the culprit's history with pranks and connection with Olympics, the teacher may ask questions that assist students. Alternatively, the students may be allowed to formulate their own hypotheses based on other deductions supported by evidence in the text or gathered during the investigation.) Students will construct their hypothesis as to the suspect's motive and include it in their final performance task assessment.

Each detective write a brief summary of the final mystery in the Case Summary section in their Facts of the Case. Students should describe how this overall mystery of who painted the White House green was resolved through problem-solving, as well as give a brief self-evaluation of how they performed overall as detectives. Detectives should include mystery-related vocabulary words in their response. (Estimated time: 15-20 mins)

***Upon completion of this summary/evaluation, students will complete their performance task projects. The final product is due at the end of class today.

PowerPoint Presentation to accompany this unit:

This PowerPoint essentially “drives” the unit. It offers a script, as well as organizes and recaps the global journey. The performance task is revisited at the end of each lesson.

https://docs.google.com/presentation/d/1iB44v5pN4ItU6exi9UL1XKOIeEnAiZOSxGP7CIQAxnY/edit?usp=sharing

Facts of the Case (Found in the Detective’s Kit):

Suspect Bios:

Suspect Bios

*As mysteries are solved, you should cross off each suspect as he/she is eliminated. Highlight the information in the text that allowed you to eliminate the suspect.

Jade Zhang

Id #5293378

Lives in Beijing, China. Studied International Law and Economics at Tsinghua University. Currently teaching classes on American propaganda at the same university. Member of the Communist party. Is also a celebrated artist with several brush paintings found in Beijing galleries.

Adeniyi Azikiwe

Id #8784139

Lives in the Ekiti State of Nigeria. Member of the Yoruba ethnic group. Currently serving in the state government as Head of Security and also leads the Anti-Corruption Task Force. Serves as head of the Yoruba Culture Center that aims to promote traditional ways of native heritage and life. Name means “a respected king.”

Antonio Silva

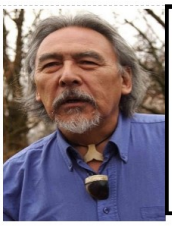
Id #79151866

Lives in Rio de Janeiro, Brazil. Was a standout football (soccer) star who played for Brazil in the World Cup multiple times. Became a TV star as a sports announcer and the host of the popular show, “Brazil’s Best Pranks.” Currently works for the 2016 Rio Olympics committee.

Ciara O’Brien

Id #493710

Lives in Dublin, Ireland. Member of the Catholic faith. Currently works as a Cabinet Minister of International Trade, appointed by the prime minister. Author of several best-selling cook-books aimed at living life with nut allergies. Was once invited to prepare dishes in the White House kitchen.



Hans Malik Peterson

Id #234375

Lives in Nuuk, Greenland. Member of the Inuit (Eskimo) ethnic group. Currently works as a hunter and sells seal, walrus, and caribou meat. Founder of an environmental group that aims to protect his beloved country and the way of life that his ancestors loved. Has been arrested for protesting commercial fishing and hunting corporations.

Graphic Organizers for Students:

Clues

Hunches, Deductions, or Bright Ideas

Possible Suspect(s) and their Motives

Other Information Worth Noting

Case Summary for Part 1 of the Mystery

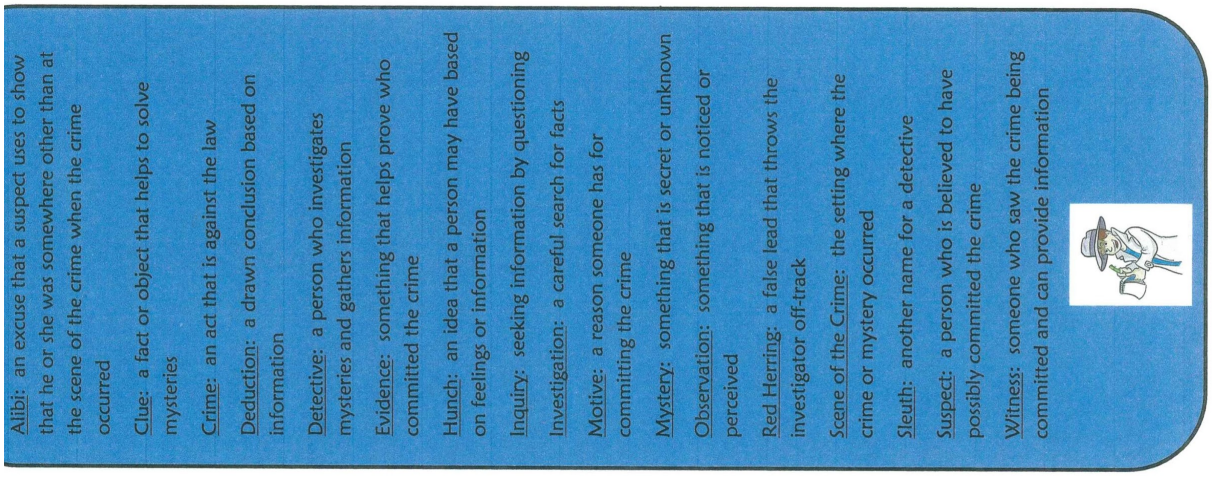
Country visited:

Suspect Eliminated:

Work Space

Work Space

Detective's Vocabulary Bookmarks:



VI. Unit Resources

Below is a list of resources that were used to create this unit. These resources would also prove helpful for anyone who is interested in learning more about teaching AIG students.

Allsburg, C. (1984). *The mysteries of Harris Burdick*. Boston: Houghton Mifflin.

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