Table of Contents

Welcome to the Adventure!

Step into the captivating world of forensic science with *The Science Fair Mystery*, a thrilling twelve-lesson course tailor-made for sixth and seventh-grade students. Unlock the secrets of crime scene investigation and ignite your students' scientific curiosity while embarking on a journey to crack the case surrounding the annual science fair at Einstein Academy.

The Science Fair Mystery allows students to delve into the riveting world of forensic science, where biology, chemistry, physics, and cutting-edge technology converge. This educational adventure is an opportunity to explore the practical applications of science within the confines of your classroom. Elevate your students' learning experience by embracing the multifaceted world of forensic science––the perfect addition to any science curriculum.

Our lessons and activities are meticulously crafted to fulfill the Next Generation Science Standards (NGSS). This course also satisfies the Common Core State Standards in Mathematics, English Language Arts, and Literacy, offering a holistic educational foundation for students. For an in-depth exploration of these standards, refer to the comprehensive standards matrix in the appendix.

Community Learning courses are a dynamic force, igniting the imagination of young minds and nurturing youthful curiosity across the country. Thematic integration coupled with prolonged, hands-on engagement is the cornerstone of every Community Learning experience.

Who and Where Can You Teach *The Science Fair Mystery*?

Our easy-to-manage materials and step-by-step plans support all instructors. No specialized knowledge is required to teach the course, making this entertaining forensic science mystery ideal for classrooms, after-school programs, intersession programs, museum groups, summer camps, youth groups, and clubs –– anywhere young people are gathered!

Hands-on Enrichment and Critical Thinking in Science

Across the nation, there's a resounding call for hands-on activities that cultivate vital skills for students like critical thinking, confidence, competence, and scientific literacy. Educators and leaders recognize the influential role of high quality, after-school programs, especially those with a sharp focus on science, mathematics, and literacy. *The Science Fair Mystery* isn't just a course; it's an exhilarating mystery that unlocks the doors to these essential skills and more–– allowing your students to immerse themselves in scenarios designed to inspire creative problem-solving, foster critical thinking, nurture teamwork, and get their hands dirty by collecting evidence. *The Science Fair Mystery* is a gateway to a world of discovery and empowerment!

Initiate Exploration

Immerse your students in an exciting, hands-on learning experience with *The Science Fair Mystery*. The course is centered around a crime that unfolds in Mr. Phillips's science classroom just weeks before the much-anticipated annual science fair at Einstein Academy. Every year, a 1st, 2nd, and 3rd place winner is named, and Mr. Philips gives a letter grade increase to the student who wins first place. The mystery begins when Mr. Phillips arrives at school one fateful morning and discovers a classroom infested with fruit flies. Sofia's science fair project has been sabotaged! Mysterious events keep happening throughout the week as more student projects are targeted, and the need to solve the mystery becomes more dire. Your students are about to become forensic

investigators as they meticulously analyze evidence, conduct interviews, sharpen their observational skills, and narrow the list of suspects using their newfound expertise.

We've got you covered with our course kit––stocked with everything your students need to unravel *The Science Fair Mystery* through a forensic lens. Get ready to spark your student's curiosity and deepen their problem-solving skills with this thrilling adventure into the world of science and investigation.

From Crime Scene to Classroom: Teaching the Science Fair Mystery

Instructors, get ready to dive into *The Science Fair Mystery*––a teaching experience that's accessible and fun! We've got all your teaching needs filled in our lightweight carryalls, making the setup a breeze. Each lesson teaches a different forensic technique, encouraging scientific reasoning and immersing your students in exciting scientific processes.

Once you've explored the lesson, vocabulary, and the desired outcomes, it's time to transform your classroom into a hub of group exploration. Our lessons provide clear instructions on how to set up each demonstration, utilizing the provided materials in our course kit.

Safety is our top priority, so we've covered you with specific precautions tailored to each lesson. The instructor should know where emergency assistance and supplies are located.

Each student activity in these lessons is a piece of the puzzle and could be the key to solving the mystery. The instructor should review the corresponding pages in the Student Book to guide their students through each lesson successfully. As the instructor, your enthusiasm is essential for keeping your students invested in the mystery!

Course Kit Components

Each Course Kit comes with a printed Instructor's Guide and Teacher Resources on a thumb drive (referred through this guide simply as "Resources"). The thumb drive contains a PDF version of the Instructor's Guide, Student Book, Handouts, Supply Lists, Safety Sheets, and Video Links. Our course kits also contain all the materials you need to successfully guide your students through each lesson.

The Science Fair Mystery: Teacher Resources and QR Code

Our online resources provide instructors with an in-depth guide to The Science Fair Mystery, ensuring that the instructor and the students can make the most out of this one-of-a-kind crime scene investigation. This resource page includes an introduction to the course, the Preparation Overview, Lesson by Lesson Training, Video Tutorials, and access to the Instructor's Guide, the Student Book, and the Student Handouts. To access these helpful resources, scan the QR code below or visit **https://blog.commlearning.com/** to get started!

Instructor's Guide

Our Instructor's Guide is easy to follow and provides clear instructions in each lesson. The Instructor's Guide features a list of lesson objectives, materials needed for each lesson, and directions on how to prep for each lesson. The Instructor's Guide also contains the following:

Notes for the Instructor

Brief instructor notes that introduce the subject matter and challenges presented in each lesson. They often contain real-life, age-appropriate examples from historical and contemporary crimes. This section may be shared with your students to help them better understand forensic investigation.

Notes for the Students

A brief overview of the activities, objectives, and vocabulary covered in the upcoming lesson is meant to excite your students about forensic science!

Vocabulary

Course terms are defined here. The terms and definitions can also be found at the end of the Instructor's Guides and Students Books.

Activities

Step-by-step procedures are provided for the instructor's demonstration and the student activity.

Wrap-up

Discussion-provoking questions summarize learning and help students take their inquiry further. These questions are also provided at the end of each lesson in the Student Books, where students will document their answers and observations related to each lesson.

Other Directions, Discussions, and Destinations

Relevant links to multimedia, web resources, and books are provided here to extend lessons and deepen understanding across disciplinary and cultural divides.

Student Books

Designed for students to record their discoveries class after class, the Student Books will keep your young Forensic Investigators engaged in their scientific investigation throughout the course. The books serve as companions to the Instructor's Guide and contain reports, charts, visual aids, areas to record observations, and a complete glossary of terms used in the course—the complete *Science Fair Mystery* Student Book is provided in Resources for your individual use.

Companion Resources

After purchasing *The Science Fair Mystery*, instructors will have access to several companion resources, including lesson extensions and other ideas for dynamic classroom activities. Links to forensic videos and other multimedia resources provide exciting lesson extensions. Immediate support is always available by phone, email, or webinar from our experts at Community Learning.

About Community Learning

At Community Learning, we believe learning should be a journey fueled by curiosity, so we create and curate hands-on learning kits and partner with organizations that share our vision for exploration-based education. Instead of traditional textbooks, our activities and resources get learners doing, thinking, and exploring—whether they're aspiring scientists, storytellers, or makers—while building critical thinking skills through engaging challenges and real-world problem-solving. Working alongside outstanding educators and experts, we carefully select and develop kits and products that inspire through engagement and fun, helping parents and educators nurture their learners' natural curiosity in ways that spark discoveries that could last a lifetime. Together, let's engage, expand, and inspire the next generation of lifelong learners.

If you have any questions, suggestions, or feedback, please visit our website or email us at **info@commlearning.com**.

Preparation Overview

	Lesson 1 **Time Will Tell: Creating Timelines and Sketching the Crime Scene**	**Lesson 2** **The Magic of Iodine: Unveiling Hidden Palm Prints**	**Lesson 3** **Impressions Unleashed: Examining the Language of Tool Marks**	**Lesson 4** **Hot Tips: The Chemistry of Flame Test Powders**
Print/Copy	Student Book pages 1 - 12	Student Book pages 13 - 17	Student Book pages 18 - 26	Student Book pages 27 - 31
Organize Kit Supplies	• Plastic Rulers • Student Books • Pencils	• Prilled Iodine • Plastic 16 oz Tub • Gloves • Spray Bottles • Cornstarch Tub • Index Cards • Fingerprint Ink Pad • Student Books • Pencils	• Modeling Clay • Screws • Plastic Ruler • Student Books • Pencils	• Baking Soda • Cream of Tartar • Table Salt • Borax • Epsom Salt • Tealight Candles • Black Paper • Popsicle Sticks • Aluminum Trays • Isopropyl Alcohol • Portion Cups • Student Books • Pencils
Prepare	• Read Instructor's Guide Introduction and Preface • Locate handout for Conclusive and Inconclusive evidence	• Put iodine crystals in plastic tubs with lids on • Fill plastic spray bottles containing cornstarch with water • Locate handout for the Arch – Loop – Whorl Examples	• Create balls of clay for each student • Give five different screws to each group	• Label powders and sticks • Fill portion cups with correct powders • Prepare trays for each group
Acquire Additional Supplies				Matches

Preparation Overview

	Lesson 5 **Witness Chronicles: Unlocking Clues through Observation**	**Lesson 6** **Skidding Away: Tracking Mysteries in Skid Marks**	**Lesson 7** **Glass Puzzles: Assembling Clues from Shattered Fragments**	**Lesson 8** **The Print Detective: Dusting for Fingerprints and Patterns**
Print/Copy	Student Book pages 32 - 36	Student Book pages 37 - 43	Student Book pages 44 - 47	Student Book pages 48 - 53
Organize Kit Supplies	• Student Books • Pencils	• Student Books • Pencils • Plastic Ruler • Scissors	• Aluminum Tray • Glycerin • Tweezers • Soda Lime Glass • Flint Glass • Borosilicate Glass • Fire Glass (crime scene glass) • Student Books • Pencils	• Glow Powder • Small UV Flashlights • Student Books • Pencils
Prepare	• Organize Students into groups of two	• Locate or print 15 copies of the Crime Scene Tracks photograph	• Place five portion cups on aluminum tray (one for liquid, four for glass samples) • Label one portion cup of Glycerin with a permanent marker. • Fill the portion cup about halfway with the Glycerin • Use the remaining four portion cups for the glass samples	• Lightly coat your finger in the glow powder • Gently press your finger with the glow powder onto surfaces around the classroom
Acquire Additional Supplies				

Preparation Overview

	Lesson 9 **Student Stories: Following Hunches in Their Biographies**	**Lesson 10** **Fingerprint Frenzy: The Art of Dusting for Prints**	**Lesson11** **Interrogation Investigation: Role-Playing as Student Investigators**	**Lesson 12** **Identifying the Culprit: The Thrilling Conclusion of the Science Fair Mystery**
Print/Copy	Student Book pages 54 - 56	Student Book pages 57 - 61	Student Book pages 62 - 69	Student Book pages 70 - 76
Organize Kit Supplies	• Student Books • Pencils	• Blank Index Cards • Dusting Powder • Powder Brush • Fingerprint Tape • Magnifying Lenses • Student Books • Pencils • Wipes • Scissors	• Student Books • Pencils	• Student Books • Pencils
Prepare	• Locate and print Suspect Statements	• Hand out magnifying glasses and wipes to students	• Organize Students into groups of 6	• Have students fill out the Final Forensic Summary worksheet, discuss answers as a class
Acquire Additional Supplies				

The Science Fair Mystery

There is a growing sense of excitement at Einstein Academy as the annual science fair is only a few weeks away. Every year, a 1st, 2nd, and 3rd place winner is named. In addition, Mr. Philips gives a letter grade increase to the student who wins first place. The students are experimenting with their best ideas with high hopes of winning first place, but much work still needs to be done.

Tuesday at 9:00 AM, Mr. Phillips greeted his first-period science class in the hall outside his classroom door. They were all there on time and eager to work on their projects. Mr. Phillips unlocked the door, and students filed in quickly and hurried to their seats. Mr. Phillips followed them into the classroom and noticed several students swatting at the air. He looked around the room and realized there was a big problem.

“There are flies loose in the classroom––this is a huge problem!” announced Mr. Phillips.

“Oh no! Those are my fruit flies for my science fair project!” exclaimed Sofia.

“Did you secure your fruit flies, Sofia?” inquired Mr. Phillips.

“Yes! I remember putting them on the shelf yesterday at 2:00 PM,” Sofia responded.

“Well, it appears they are all free…I wonder how they got out of their containers?” Mr. Phillips asked. The students squealed as they swatted the flies away.

“Let’s settle down, class! The first thing we need to do is clear the classroom of these fruit flies. It’s 9:05 AM, and we have plenty of time to work on our projects today. Let’s calmly line up and walk over to Ms. Turner’s classroom. I will lock the classroom and call the office to see what we need to do next,” instructed Mr. Phillips.

While the students walked over to Ms. Turner’s classroom, Mr. Phillips called the front office and explained the situation to the administrative assistant, Mrs. Garcia. Principal Hebert was busy, so Mrs. Garcia headed to his classroom to help.

“Can someone tell me what happened here?” Mrs. Garcia asked the students.

“There is a swarm of loose fruit flies in our science class!” reported Robert.

“Someone set my fruit flies free, and now my project is ruined! I know I put them away yesterday,” cried Sofia.

“I’m really glad that’s not my project,” added Robert.

Mrs. Garcia, trying to get to the bottom of the mystery, asked, “Do we know if anyone messed with anyone else’s projects?”

“I hope my project is ok,” said Destiny with concern.

“Your electricity project won’t win anyway. It doesn’t work,” Robert teased.

The Science Fair Mystery Continued

"That's because it's not finished yet!" Destiny retorted.

Mrs. Garcia tried to reassure the students. "Now, class, let's not get frazzled. I need to find out what's going on."

Curious, Ava asked, "How will you do that?"

"I just started a master's program in Forensic Science," Mrs. Garcia explained. "I'm learning how to preserve evidence at a crime scene so it can be analyzed, and helping investigators find who committed a crime," pausing to think for a moment, Mrs. Garcia continued, "It appears this may have been done on purpose..."

"Does that mean you are going to investigate who did this?" inquired Robert.

"Not quite. I'm going to look for clues that might be evidence," clarified Mrs. Garcia. "I'm going to message my professor to see if he can help with the investigation. We use Slack, a messaging systems. It works well for projects. I'll start a channel and include my professor and classmates. It's a bright group, I'm sure they'll be able to help. Then, I can gather evidence and send it to my team of Forensic Investigators. They will look at the evidence closely and determine what happened to Sophia's project."

"How will you know if something is evidence?" Destiny asked Mrs. Garcia.

"Evidence can be anything related to the crime that helps find the person or people involved. For example, the container the fruit flies were in is considered evidence," Mrs. Garcia explained.

"Wait, so you mean there could be more than one person who did this?" cried Destiny.

"We won't know anything for sure until Mrs. Garcia has her Forensic Investigators look at the clues," Mr. Phillips said.

Taking charge of the situation, Mrs. Garcia turned her attention to Mr. Phillips. "Mr. Phillips, when did you lock your classroom yesterday, and who has the keys?"

"I lock my classroom during lunch from 12:00 PM – 12:30 PM and after school at 3:30 PM every day," Mr. Phillips explained. "9:00 AM today was the first time I opened my door since yesterday. No one else has keys to my room except the janitors. Why do you ask?"

"If this was done on purpose, I need to think about who had access to your classroom and their 'Means, Motive, and Opportunity,'" Mrs. Garcia explained her thought process.

"What does that mean?" Ava asked.

The Science Fair Mystery Continued

"Means is how a crime was committed. The person who committed the crime has to be someone with access to this room. Motive is the reason why someone commits a crime. Opportunity is when the person can commit a crime," Mrs. Garcia explained. "Hmm...Is your Science Fair competitive? Is there a prize for first place?"

"Yes, there is first, second, and third place," Mr. Phillips confirmed.

"Remember, the letter grade increase on our report cards is for the first-place winner!" Ava added.

"That prize could get me a C in this class! I really need to bring my grade up..." Robert mumbled.

"Well, I can't win because my project is ruined! I need at least two weeks to reset my flies. I'm not finished collecting my data yet," Sofia said sadly.

"Don't expect to get extra time on your project Sofia. I asked for extra time because my supplies hadn't arrived yet, and Mr. Phillips said no," Ava chimed in.

"Okay, that's enough," Mr. Phillips said firmly. "I understand we have some problems we need to work through, but I can't postpone the science fair another week. We also need to let Mrs. Garcia gather her evidence."

Mrs. Garcia addressed Mr. Phillips once more. "Mr. Phillips, I need a list of your students and their report card grades to send to my investigators. Maybe that will give them a place to start."

To be continued...

Observations

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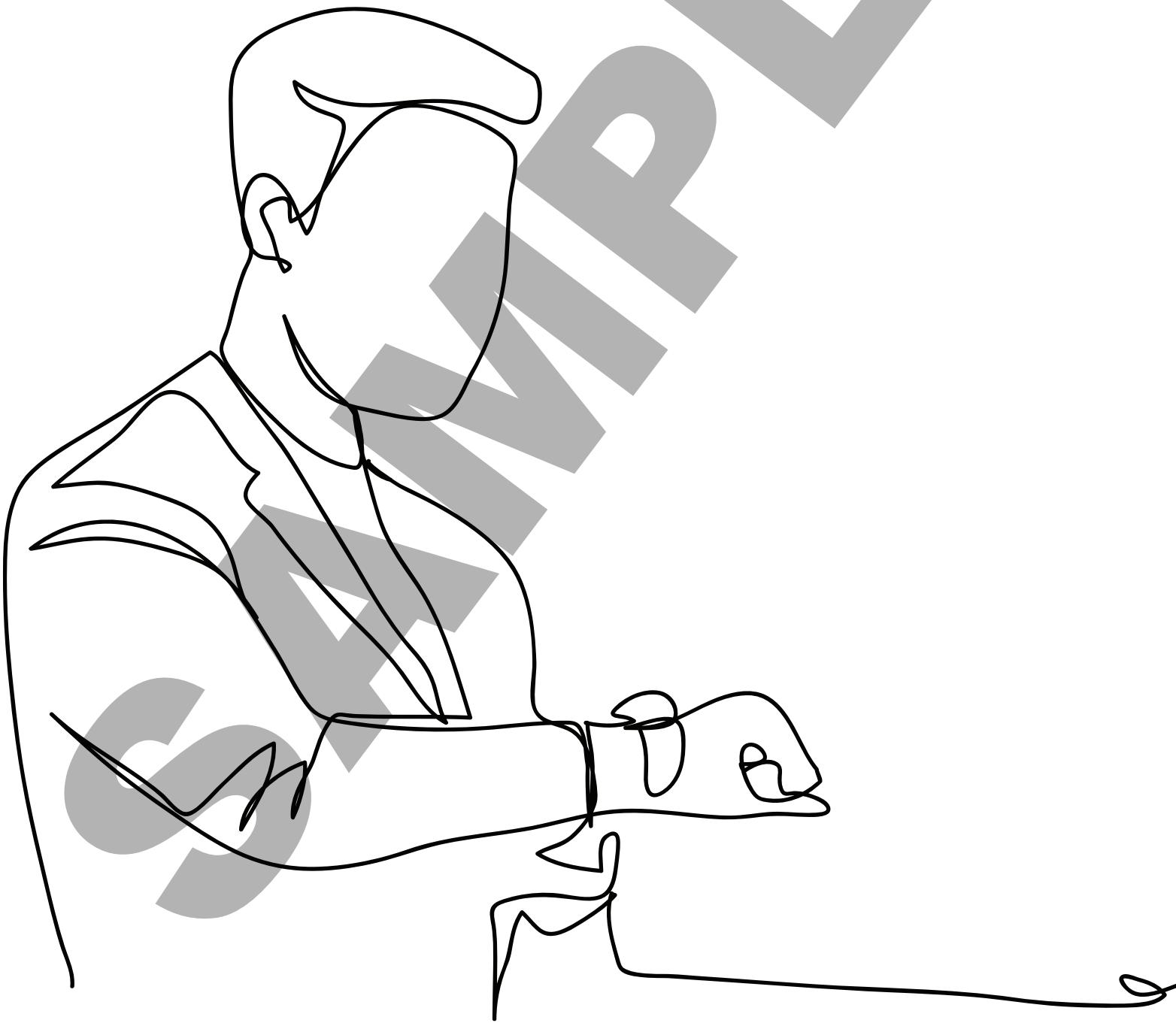
Observations

Lesson 1

Time Will Tell:

Creating Timelines and Sketching the Crime Scene



Lesson 1
Time Will Tell: Creating Timelines and Sketching the Crime Scene

OBJECTIVES

Students will:

- Learn how to develop a timeline including all relevant events
- Use descriptive positional and comparative words to communicate the relationship between objects verbally
- Create a rough sketch that represents the physical relationships of objects in a crime scene
- Identify suspects by considering one's "motive" for ruining the science fair
- Define, identify, and explain conclusive and inconclusive evidence
- Understand how conclusive and inconclusive evidence is used during an investigation

MATERIALS

Instructor:

- 15 Plastic Rulers
- 30 Pencils (one for each student)

Students (per groups of two):

- 1 Plastic Ruler
- 2 Pencils
- Student Books (one for each student)

PREPARATION

1. This activity will introduce ten suspects to the mystery. Students should NOT be told the number of suspects. This information is for the instructor's knowledge only.
2. Read the Science Fair Mystery Introduction, the Slack Messages, Notes for the Students, and each activity's directions before your class begins.

Notes for the Instructor

The *Science Fair Mystery* is a project-based learning experience that asks students to complete activities to determine who is sabotaging the science fair. Throughout the mystery, students collect and analyze forensic evidence, learn about investigation techniques, and utilize fundamental tools crime scene investigators use. Each lesson uncovers another puzzle piece for the students to help them solve the mystery.

This lesson introduces the mystery to students through a narrative story, challenging them to develop their observations based on evidence. Observations and investigations go hand in hand. Everything an investigator sees, hears, smells, feels, and sometimes tastes helps solve a mystery. **Observations** help student investigators develop a timeline, document events chronologically, and create a crime scene sketch. Timelines have been used throughout history as an investigative tool because they corroborate each witness's story and establish connections between people, evidence, events, and places. Attorneys often refer to timelines during a trial to prove that a person was or was not involved in an event.

A **crime scene sketch** accurately records the scene as first discovered so investigators can examine it later. A crime scene sketch does not require artistic talent. It just needs to be accurate enough to convey facts about the crime scene.

Crime scene sketches continue to be used by investigators today for many reasons, including questioning a suspect about the scene. Sketches are also used during a trial to help the court better understand the physical crime scene. Crime scene sketches are typically drawn by hand at the scene, displaying the relationship between objects and evidence. After measuring the distance between objects and evidence, the crime scene sketch will

be **drawn to scale**, meaning all objects in the sketch will look proportionate to one another in size as they would in real life.

After students create a crime scene sketch of their classroom, they review the sketch and crime scene photos in their student book. The student books serve as a 'crime scene portfolio' where students document evidence during each lesson. The Class Roster, for example, is used throughout the mystery as students check off suspects based on new evidence and clues. Students will even be able to identify suspects during this lesson! It is important to note that many real-life investigations do not present a suspect until later in a case.

Notes for the Students

Investigators, it's time to begin solving the mystery! We will start by collecting **forensic evidence** that will help you figure out who is sabotaging the science fair. Remember forensic evidence is anything that can be used to prove that a person did or did not have something to do with a crime. When solving crimes, investigators rely on evidence to establish the truth. Evidence can be classified as either conclusive or inconclusive, depending on its strength and its ability to prove or disprove a claim.

Conclusive evidence is information that leads to a definite conclusion or establishes a fact beyond a reasonable doubt. In other words, conclusive evidence eliminates all other possibilities and suspects. The evidence supports or proves a claim, and it leaves no room for doubt. DNA found at the scene of a crime and video footage of a crime are usually considered conclusive evidence.

Inconclusive evidence is information that does not definitely prove or disprove a claim. The evidence could be incomplete, or it could point to several suspects. Inconclusive evidence leaves doubt in the eyes of the investigator. Circumstantial evidence, evidence that you can draw a conclusion from, is considered inconclusive. Circumstantial evidence suggests a conclusion without providing a definite answer. For example, finding a suspect's fingerprint at a crime scene is inconclusive evidence because it does not prove guilt. It merely proves that the suspect was present. Having an alibi is also considered inconclusive evidence. An **alibi** is a statement that a person uses to prove that they could not have committed the crime because they were somewhere else at the time. For example, a suspect is accused of robbing a bank at 6:00 PM. But the suspect says that he couldn't have done it because he was seeing a doctor at the same time. The suspect's alibi is the doctor. What makes the alibi inconclusive evidence is two-fold. First, the doctor could be lying about the fact that he saw the suspect at 6:00 PM for a doctor's appointment. Second, the doctor was telling the truth, but he saw the suspect at 6:30 because his appointments were running behind. If he saw the suspect at 6:30, it would have provided enough time for the suspect to rob the bank and still get to the doctor's office.

While inconclusive evidence may not clearly identify a suspect, it is still useful in the investigation. It may help to uncover new leads or eliminate a suspect. When several pieces of inconclusive evidence are put together, they can contribute to making a strong case against the suspect. In this way, several pieces of inconclusive evidence can become conclusive.

Luckily, you already have the most essential tool you need—your ability to make **observations**. Observations are information gathered about a crime scene using your senses. For example, imagine being in a bakery. You can use your senses to make observations. You can use your eyes to see the bread and cookies displayed in the case. You can use your nose to smell the bread baking in the oven. You can use your sense of touch to feel the bread on the counter. *We make many observations about the world around us every day!*

Another tool you will need to begin your investigation is a **timeline**. A timeline is a list of important events written down in the same order they happened in (from first to last). A good forensic investigator will take notes to help them remember all the information they gather before creating a timeline. Timelines also help investigators determine suspects by finding the relationships between people, evidence, events, and places. A **suspect** is a person that you believe might be involved in committing the crime. Suspects usually have **means**, **motive**, and **opportunity** when they commit a crime. Means is **how** a person commits a crime. Motive is **why** someone commits a crime. Opportunity is **when** someone commits a crime.

After creating your timeline, you will use your observation skills to create a crime scene sketch. A **crime scene sketch** is a drawing of a crime scene that includes the location and size of each piece of evidence. Crime scene sketches are **drawn-to-scale**, meaning all objects are made to look proportionate to each other like they do in real life. Crime scene sketches are essential because they show where evidence is located in a room.

In the 1990s and early 2000s, a series of art thefts occurred in various museums and galleries in Europe. One notable case in 2002 involved the theft of a valuable painting by Vincent van Gogh, "View of the Sea at Scheveningen," from the Van Gogh Museum in Amsterdam, the Netherlands. The investigation into the theft of the van Gogh painting relied on various pieces of evidence, including a crime scene sketch of the museum's layout. The sketch depicted the location of the painting, its security measures, and the point of entry used by the thieves. This information was crucial in understanding how the theft was carried out and determining how to recover the artwork. Ultimately, the stolen van Gogh painting was recovered in 2016 in Italy. The crime scene sketch, along with other investigative techniques, played a significant role in solving the case and returning the stolen artwork to the museum.

Read through the "Read the Science Fair Mystery Introduction" to begin your investigation. Good luck!

Vocabulary

Alibi: A statement by a person under suspicion in a crime, expressing that they were in a different place when the offense was committed.

Crime Scene Sketch: A rough drawing of the crime scene that includes the location and size of each piece of evidence.

Drawn-To-Scale: When all objects in a drawing are increased or decreased in size by the same amount to look proportional to one another.

Forensic Evidence: Any physical thing that may be used to prove a person did or did not commit the crime.

Means: Determining **how** a person committed a crime, including a person's physical and mental abilities.

Motive: Determining **why** someone committed a crime, including what thoughts motivated them to do it.

Observation: Information gathered about the crime scene by using the five senses.

Opportunity: The determination of **when** someone committed a crime.

Suspect: A person that investigators believe may have been involved in the crime.

Timeline: A list of noteworthy events that took place from oldest to most recent.

Activity 1: Timeline Development

10 minutes

1. Record the most important events that took place At Einstein Academy by completing the "Developing a Timeline" datasheet.
2. Write down the most important events that took place in numbers 1 – 4 on your "Timeline" datasheet in your student books, capturing the event, day, and approximate time.

Activity 2: Sketch the Scene

20 Minutes

1. Begin your sketch by drawing the general shape of <u>your</u> classroom room on the Lesson 1 graph paper in your Student Book. What fixed objects can we draw from the scene (walls, windows, doors, and furniture)? Keep in mind the scale of each object in the room, so it is best to start with the largest item first.
2. Next, add 4-5 small objects in the classroom for detail. Ask students to add them to their sketches. Draw them in your scene on the graph paper. Remind students that this is a rough sketch. If this were a real crime scene, the next step would be to make a final sketch by measuring the distance between objects and drawing them to scale.

3. After you finish your sketch, recall the evidence below from the story and draw in where you believe these items are located in Mr. Phillip's classroom (display photos of "The Classroom" and "The Classroom Cabinets" from your resources thumb drive)."

   - *Fruit flies loose in the classroom.*
   - *Opened containers on the table.*
   - *The chemical cabinet opened.*
   - *Palm Print on the table.*

Activity 3: Identifying Suspects

10 minutes

1. Locate and distribute the conclusive and inconclusive handout to students. Next, have students complete Activity 3: Conclusive and Inconclusive.

2. Review the report card grades on the Evidence Update chart in the Student Books. Next, identify suspects with a possible motive by putting an **X** next to their name in the "Evidence #1" column (low grades may indicate a motive).

Wrap-up Discussion

5 Minutes

1. Read the following statements and decide if they are Means, Motive, or Opportunity. Why?

   Karen had her lunch break from 12:30-1:00.
   Tony lost his job and needed money for rent.
   Gabby has a lock-picking kit.

2. What can forensic investigators learn from a timeline?

3. How are crime scene sketches similar and/or different from other drawings?

4. Think about Means and Opportunity. According to the timeline, when might someone have the opportunity to enter Mr. Phillips's classroom, and how?

Other Directions, Discussions, and Destinations

Observation Skills Memory Game:
Have students look around your classroom for twenty seconds and become familiar with where objects are in the room. Then, have them close their eyes. Instructors should change five things about the scene (turn or move objects, add something, take something away). This should be a mix of easy and challenging changes. Have students open their eyes and spot the changes by describing where the object is (or was) located in the room by using descriptive comparative words (bigger or smaller than, closer to, farther from, lower than, higher than) and positional words (above, below, beside, in front of, next to, near, far).

Observation Skills Memory Game:
Find a few 'spot the difference' images online if you can access a projector or printer. Have students look at the first image for twenty seconds and become familiar with the scene. Then, take the image away for a few seconds. Finally, present the second image where they can spot the difference. Have students describe where the changes are in the image by using descriptive comparative words (bigger or smaller than, closer to, farther from, lower than, higher than) and positional words (above, below, beside, in front of, next to, near, far).

Spot The Difference Game (free online puzzle):
Each of these fun online puzzle games will challenge the player to use the observational and critical thinking skills they previously learned in Lesson 1. Each puzzle will show two versions of the same picture. However, the player must spot all the differences between the two. **https://www.hidden247.com/Spot-The-Difference.html**

These additional references offer more in-depth information and real-world examples for students to explore while enhancing their understanding of forensic science, crime scene investigation, and suspect identification:

- The National Institute of Justice (NIJ) has a comprehensive guide on crime scene investigation and sketching on its website.
- The American Academy of Forensic Sciences (AAFS) website provides case studies and timelines from actual forensic investigations.

Lesson 1: Slack Messages

Forensics Masters Program

Channels
#einstein-academy-science-fair-investigation

Direct Messages

 Prof Harold Warren

 Vicki Samuels

 John Cashman

 Steven Smith

 Joyce Katz

 Juan Alverez

 Tony Romano

 Carol Cooper

Welcome to the einstein-academy-science-fair-investigation channel

This channel is for everything #einstein-academy-science-fair-investigation.

Hold meetings, share docs, and make decisions together with your team.

 Valeria Garcia
joined #einstein-academy-science-fair-investigation

 Prof Harold Warren
joined #einstein-academy-science-fair-investigation

 Juan Alverez
joined #einstein-academy-science-fair-investigation

 John Cashman
joined #einstein-academy-science-fair-investigation

 Steven Smith
joined #einstein-academy-science-fair-investigation

 Vicki Samuels
joined #einstein-academy-science-fair-investigation

 Joyce Katz
joined #einstein-academy-science-fair-investigation

 Tony Romano
joined #einstein-academy-science-fair-investigation

 Carol Cooper
joined #einstein-academy-science-fair-investigation

Lesson 1: Slack Messages Continued

Valeria Garcia

Hey, Professor Warren and classmates! I invited you to this channel because, as you know, I'm a school administrator during the day, and a suspicious incident happened today. I believe a forensics investigation would be helpful.

Replies

Vicki Carol Tony John Valeria

Prof Harold Warren

As we previewed in my syllabus, your forensic investigators should create a timeline showing all events from first to last.

Valeria Garcia

Makes sense, we have to talk to a few people, but sure, we can do that.

Prof Harold Warren

Then if the crime scene is intact, they can create a crime scene sketch, which is a rough drawing of a crime scene that will help them see where evidence is located in a room. And how close or far apart evidence is from other objects.

John Cashman

Once the crime scene sketch is complete, post it here. That way, we can all look at it.

Valeria Garcia

Sure!

Prof Harold Warren

The next step in the investigation will be to use a class roster to identify the first round of suspects. They can start making observations, what they notice, and gather about the crime scene by using their senses and carefully watching, listening, and thinking.

Valeria Garcia

Will do! This is excellent information, we're off to a good start thanks, everyone!

Prof Harold Warren

After these steps are complete, you will need to preserve the forensic evidence to help them figure out what happened. Remember, forensic evidence is anything that can be used to prove that a person did or did not have something to do with this "incident."

Vicki Samuels

Yes!

Carol Cooper

Sure, fill us in.

Tony Romano

Happy to help!

John Cashman

Sure, I'm intrigued, is anyone hurt?

Valeria Garcia

No, but the kids are very upset.

Lesson 1

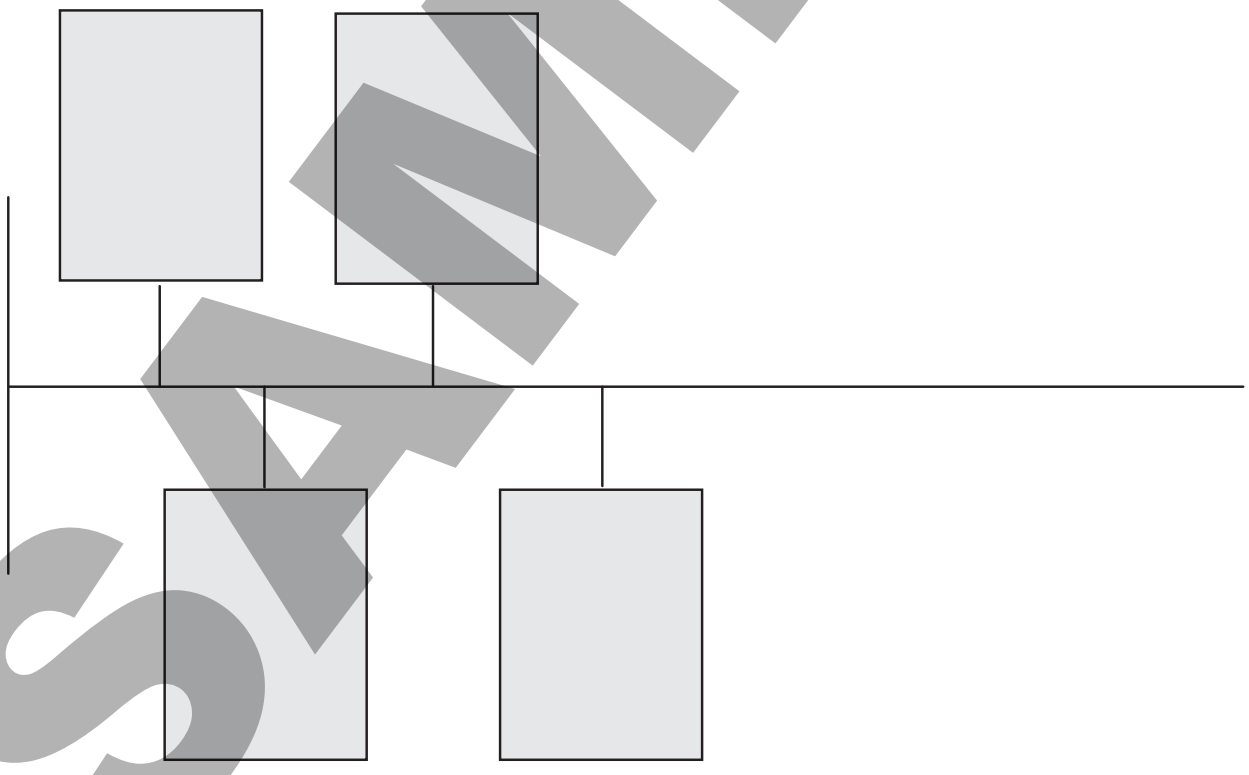
Activity 1: Developing a Timeline

Directions:

1. After reading or listening to the story, write down the most events you recall below:

Event	Day of Week	Time	(Date)

2. Create boxes on your timeline above and below the line to represent events captured in the table above. You can pick any date to start.



Lesson 1

Activity 1: Developing a Timeline

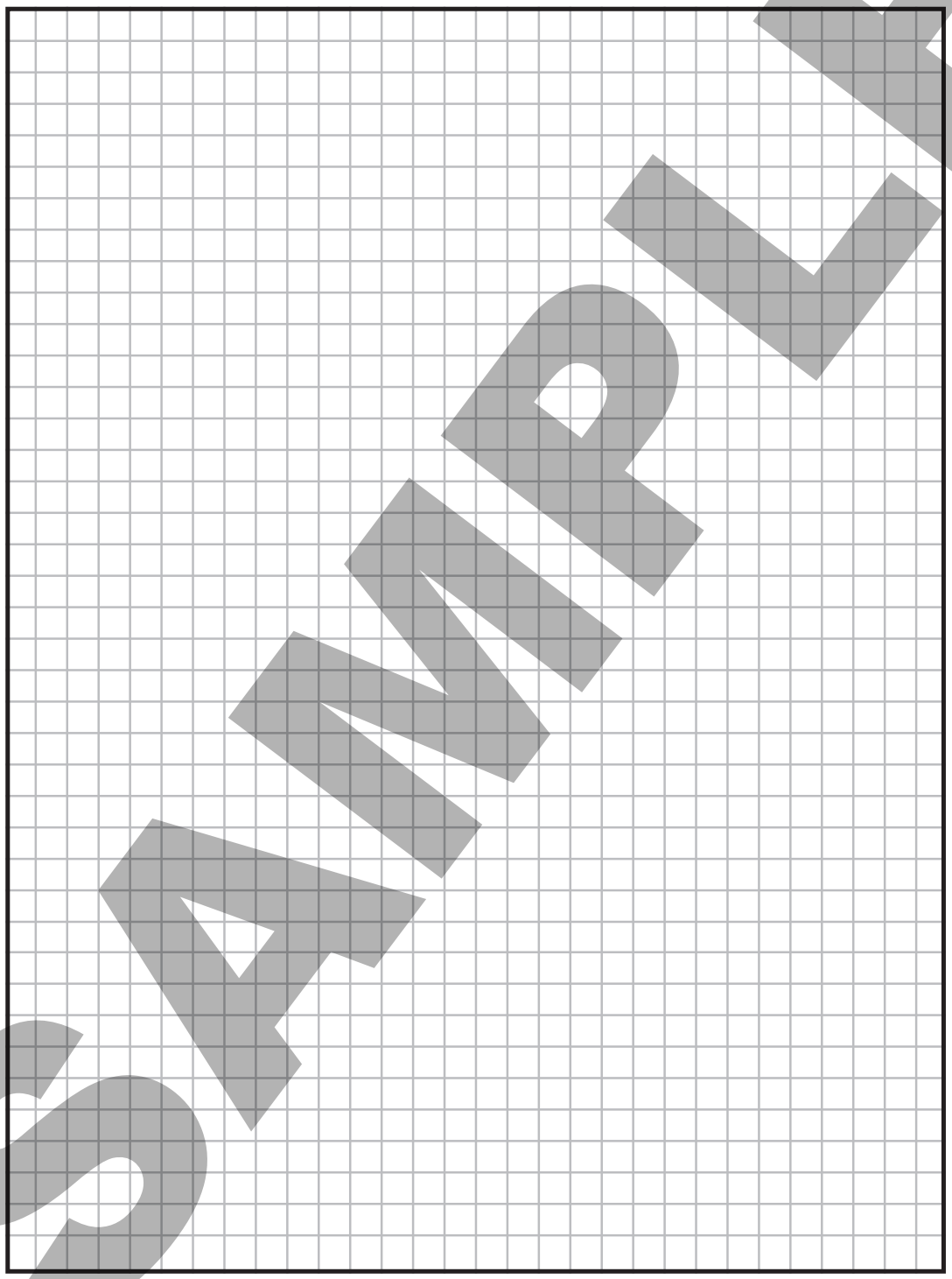
Student Book Page 6

Lesson 1

Activity 1: Developing a Timeline

Lesson 1

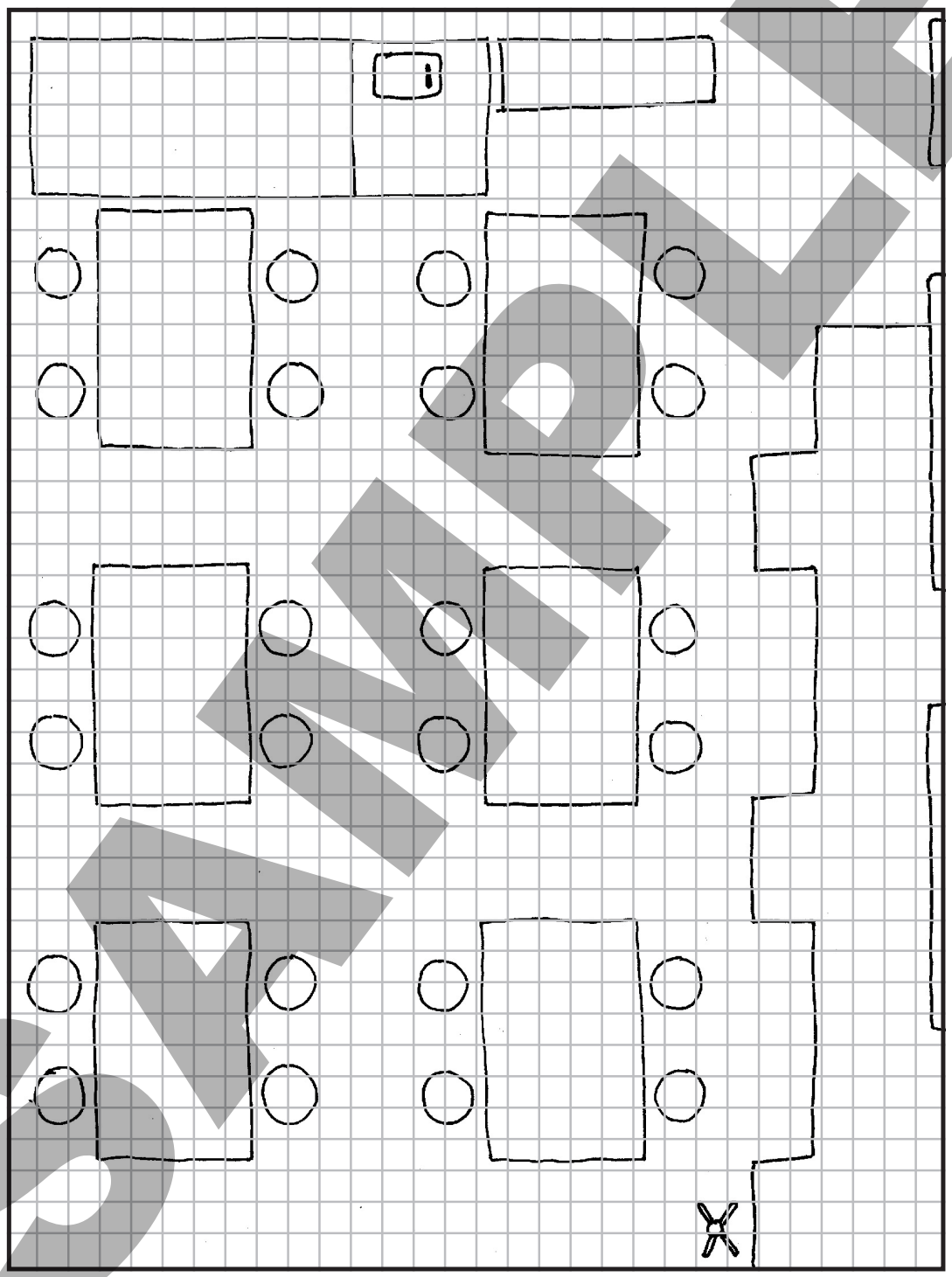
Activity 2: Sketch Your Classroom



Student Book Page 8

Lesson 1

Activity 2: Mr. Phillips's Classroom Sketch



Lesson 1

Activity 3: Conclusive and Inconclusive

After completing the classroom sketch, read through the passage below. Use the information about conclusive and inconclusive evidence to help you.

On Thursday, Jaden changed into his basketball uniform. He put his school uniform, backpack, and iPad into this locker. Then he shut his locker door. He put his combination lock on the locker and tugged twice on the lock to make sure it was locked. Then, headed onto the basketball court to participate in a basketball game against Westside Junior High. He left the locker room at 3:15. After the game ended at 4:30, Jaden returned to find his locker open. The lock had been cut, and his iPod was gone. Jaden quickly reported the theft to the principal.

The principal quickly began collecting evidence. He recorded each piece of evidence on a separate piece of paper. The principal isn't sure which evidence is conclusive and which evidence is inconclusive. He needs some help!

Cut out the pieces of evidence. Sort them into two categories: conclusive and inconclusive. Then, fill out the worksheet.

After completing the conclusive and inconclusive activity, take some time to list 3 reasons why you think someone would want to ruin Sofia's project.

1 _____

_____

2 _____

_____

3 _____

_____

Lesson 1

Evidence Update

Consult the current class roster and current grade averages below, with Mr. Phillips awarding one letter grade boost for winning first prize. Place an **X** in the Evidence #1 column where you think students may have a possible motive.

Student Name	Grade	Evidence #1	Evidence #2	Evidence #3	Evidence #4	Evidence #5	Evidence #6	Evidence #7
Allen, Jayden	D	X						
Burns, Tiffany	B-							
Bush, Daniella	B+							
Day, Nicholas	F	X						
Haston, Rachel	D	X						
Holt, Savannah	F	X						
Holt, Zachary	D	X						
Homes, Sofia	A+							
Jones, Anthony	D-	X						
Kinsley, Abby	B							
Knot, Benjamin	D+	X						
Meyers, Ava	D+	X						
Murphy, Natalia	A							
Nelson, Charlie	F	X						
Norris, Martin	B							
Philson, Rita	C							
Pines, Robert	F							
Sanchez, David	D-	X						
Simmons, Brie	C-							
Smith, Tommy	D-	X						
Steelmon, Jen	C+							
Stone, Kim	D-	X						
Turano, Enzo	A-							
Walker, Destiny	D+	X						
Wells, Lizzy	B							

Lesson 1

Time Will Tell:

Creating Timelines and Sketching the Crime Scenes

Background

Investigators, it's time to begin solving the mystery! We will start by collecting forensic evidence that will help you figure out who is sabotaging the science fair. Remember, forensic evidence is anything that can be used to prove that a person did or did not have something to do with a crime. Evidence can be classified as either conclusive or inconclusive, depending on its strength and its ability to prove or disprove a claim.

Conclusive evidence is information that leads to a definite conclusion or establishes a fact beyond a reasonable doubt. In other words, conclusive evidence eliminates all other possibilities and suspects. The evidence supports or proves a claim, and it leaves no room for doubt. DNA found at the scene of a crime and video footage of a crime are usually considered conclusive evidence.

Inconclusive evidence is information that does not definitely prove or disprove a claim. The evidence could be incomplete, or it could point to several suspects. Inconclusive evidence leaves doubt in the eyes of the investigator. Circumstantial evidence, evidence that you can draw a conclusion from, is considered inconclusive. Circumstantial evidence suggests a conclusion without providing a definite answer. For example, finding a suspect's fingerprint at a crime scene is inconclusive evidence because it does not prove guilt. It merely proves that the suspect was present. Having an alibi is also considered inconclusive evidence.

An alibi is a statement that a person uses to prove that they could not have committed the crime because they were somewhere else at the time. For example, a suspect is accused of robbing a bank at 6:00 PM. But the suspect says that he couldn't have done it because he was seeing a doctor at the same time. The suspect's alibi is the doctor. What makes the alibi inconclusive evidence is two-fold. First, the doctor could be lying about the fact that he saw the suspect at 6:00 PM for a doctor's appointment. Second, the doctor was telling the truth, but he saw the suspect at 6:30 because his appointments were running behind. If he saw the suspect at 6:30, it would have provided enough time for the suspect to rob the bank and still get to the doctor's office.

While inconclusive evidence may not clearly identify a suspect, it is still useful in the investigation. It may help to uncover new leads or eliminate a suspect. When several pieces of inconclusive evidence are put together, they can contribute to making a strong case against the suspect. In this way, several pieces of inconclusive evidence can become conclusive.

As you collect evidence during each session of the Science Fair Mystery, you will need to decide if the evidence is conclusive or inconclusive.

Lesson 1

Time Will Tell:

Creating Timelines and Sketching the Crime Scenes

Background

Luckily, you already have the most important tool you need. Your ability to make observations. Observations are pieces of information gathered about a crime scene by using your senses. For example, you may observe the smell of bread in a bakery using your sense of smell. You may observe a person knocking on a door using your sense of sight. We make many observations about the world around us every day!

Another tool you will need to begin your investigation is a timeline. A timeline is a list of important events written down in the same order they happened in (from first to last). A good forensic investigator will take notes to help them remember all of the information they gather before creating a timeline. Timelines also help investigators determine suspects by finding the relationships between people, evidence, events, and places. A suspect is a person that you believe might be involved in committing the crime. Suspects usually have means, motive, and opportunity when they commit a crime. Means is how a person commits a crime. Motive is why someone commits a crime. Opportunity is when someone commits a crime.

After creating your timeline, you will use your observation skills to create a crime scene sketch. A crime scene sketch is a drawing of a crime scene that includes the location and size of each piece of evidence. Crime scene sketches are drawn-to-scale, meaning all objects are made to look proportionate to each other like they do in real life. Crime scene sketches are essential because they show where evidence is located in a room.

In the 1990s and early 2000s, a series of art thefts occurred in various museums and galleries in Europe. One notable case in 2002 involved the theft of a valuable painting by Vincent van Gogh, "View of the Sea at Scheveningen," from the Van Gogh Museum in Amsterdam, the Netherlands. The investigation into the theft of the van Gogh painting relied on various pieces of evidence, including a crime scene sketch of the museum's layout. The sketch depicted the location of the painting, its security measures, and the point of entry used by the thieves. This information was crucial in understanding how the theft was carried out and determining how to recover the artwork. Ultimately, the stolen van Gogh painting was recovered in 2016 in Italy. The crime scene sketch and other investigative techniques played a significant role in solving the case and returning the stolen artwork to the museum.

Read through the "Introduction" to begin your investigation. Then, refer to the text message exchange from Ms. Garcia to begin your investigation. Good luck!

My Notes:

Lesson 1: Slack Messages

Forensics Masters Program

Channels
#einstein-academy-science-fair-investigation

Direct Messages

 Prof Harold Warren

 Vicki Samuels

 John Cashman

 Steven Smith

 Joyce Katz

 Juan Alverez

 Tony Romano

 Carol Cooper

Welcome to the einstein-academy-science-fair-investigation channel

This channel is for everything #einstein-academy-science-fair-investigation.

Hold meetings, share docs, and make decisions together with your team.

 Valeria Garcia
joined #einstein-academy-science-fair-investigation

 Prof Harold Warren
joined #einstein-academy-science-fair-investigation

 Juan Alverez
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 John Cashman
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 Tony Romano
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 Carol Cooper
joined #einstein-academy-science-fair-investigation

Lesson 1: Slack Messages Continued

Valeria Garcia

Hey, Professor Warren and classmates! I invited you to this channel because, as you know, I'm a school administrator during the day, and a suspicious incident happened today. I believe a forensics investigation would be helpful.

Replies

Vicki Carol Tony John Valeria

Prof Harold Warren

As we previewed in my syllabus, your forensic investigators should create a timeline showing all events from first to last.

Valeria Garcia

Makes sense, we have to talk to a few people, but sure, we can do that.

Prof Harold Warren

Then if the crime scene is intact, they can create a crime scene sketch, which is a rough drawing of a crime scene that will help them see where evidence is located in a room. And how close or far apart evidence is from other objects.

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Once the crime scene sketch is complete, post it here. That way, we can all look at it.

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No, but the kids are very upset.

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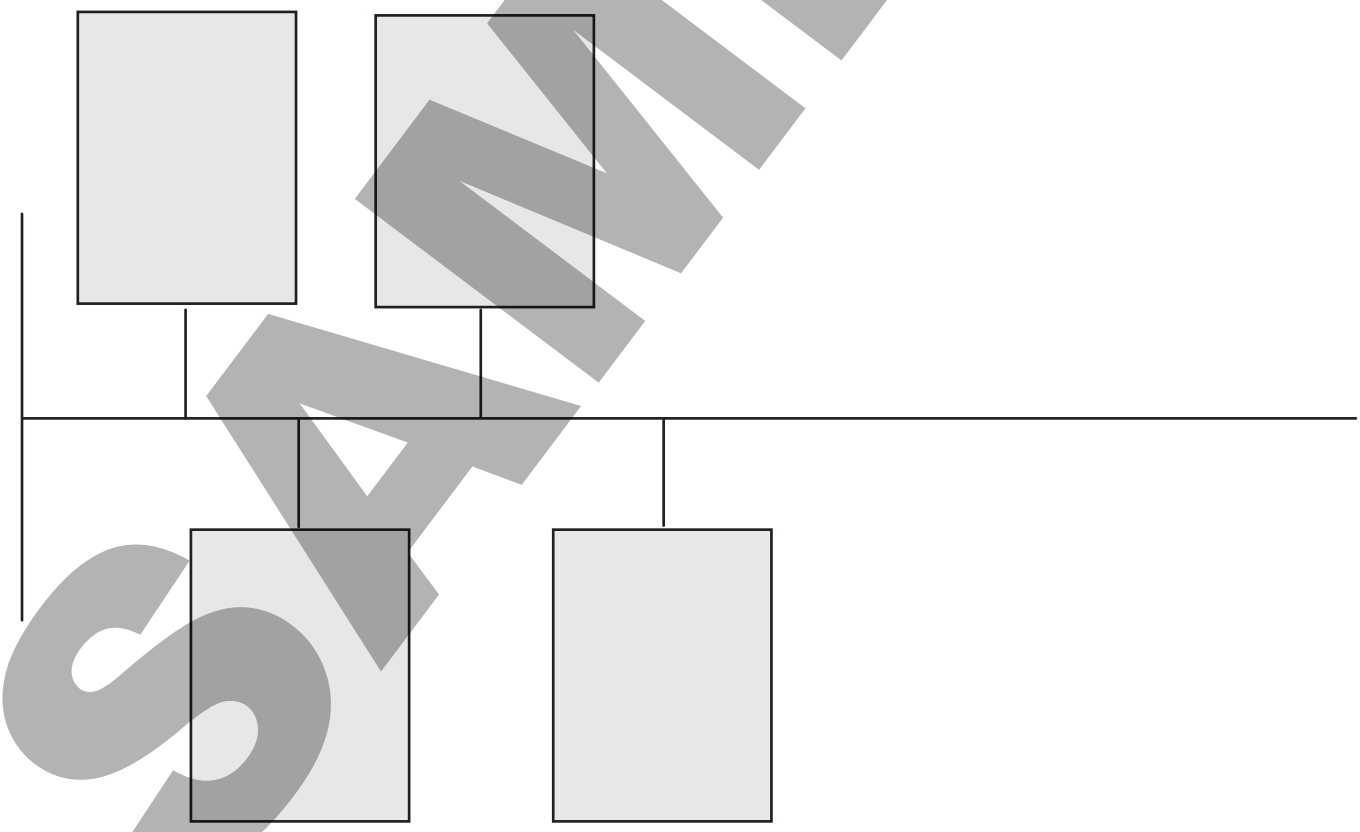


Lesson 1

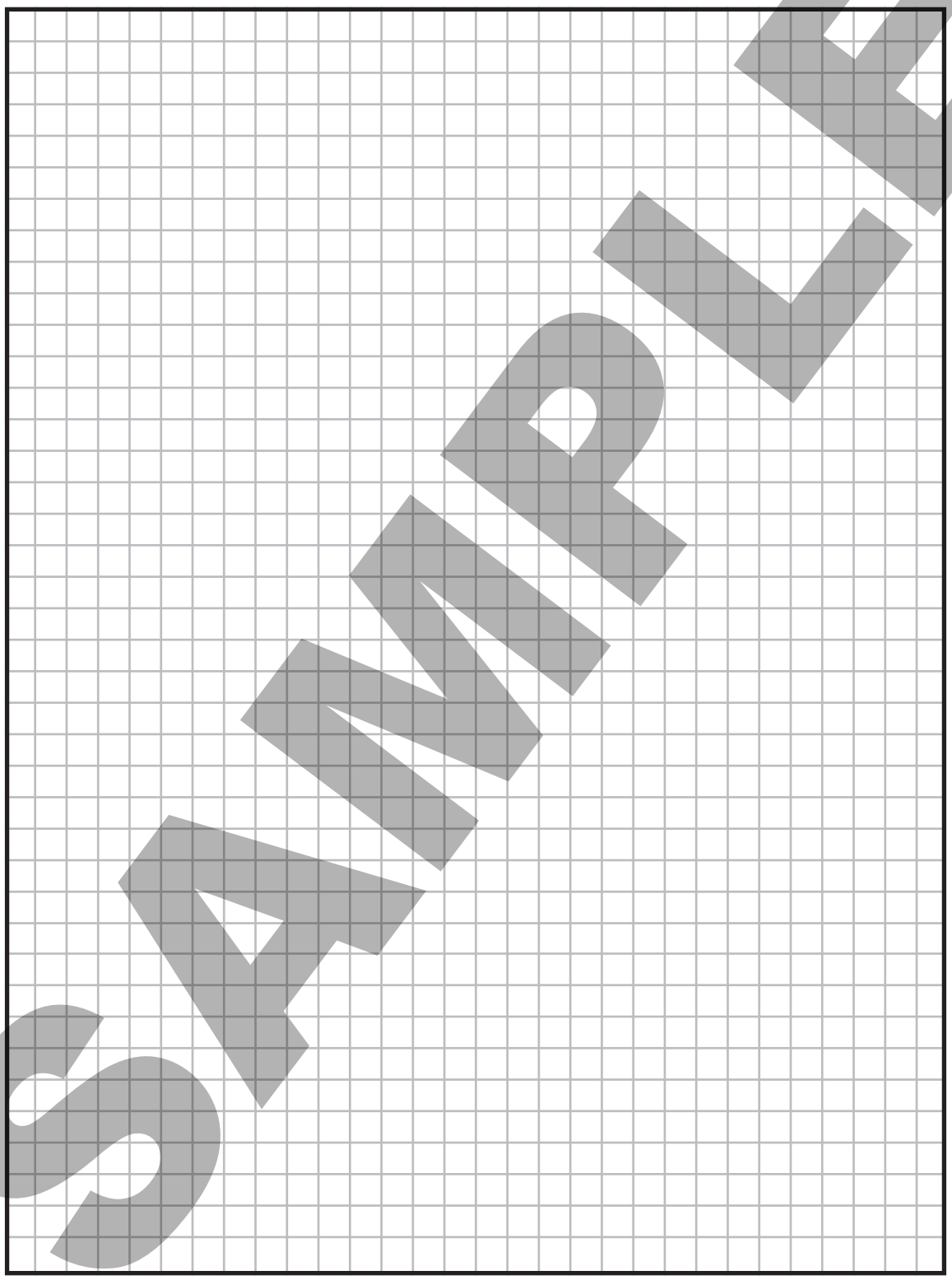
Activity 1: Developing a Timeline

Lesson 1

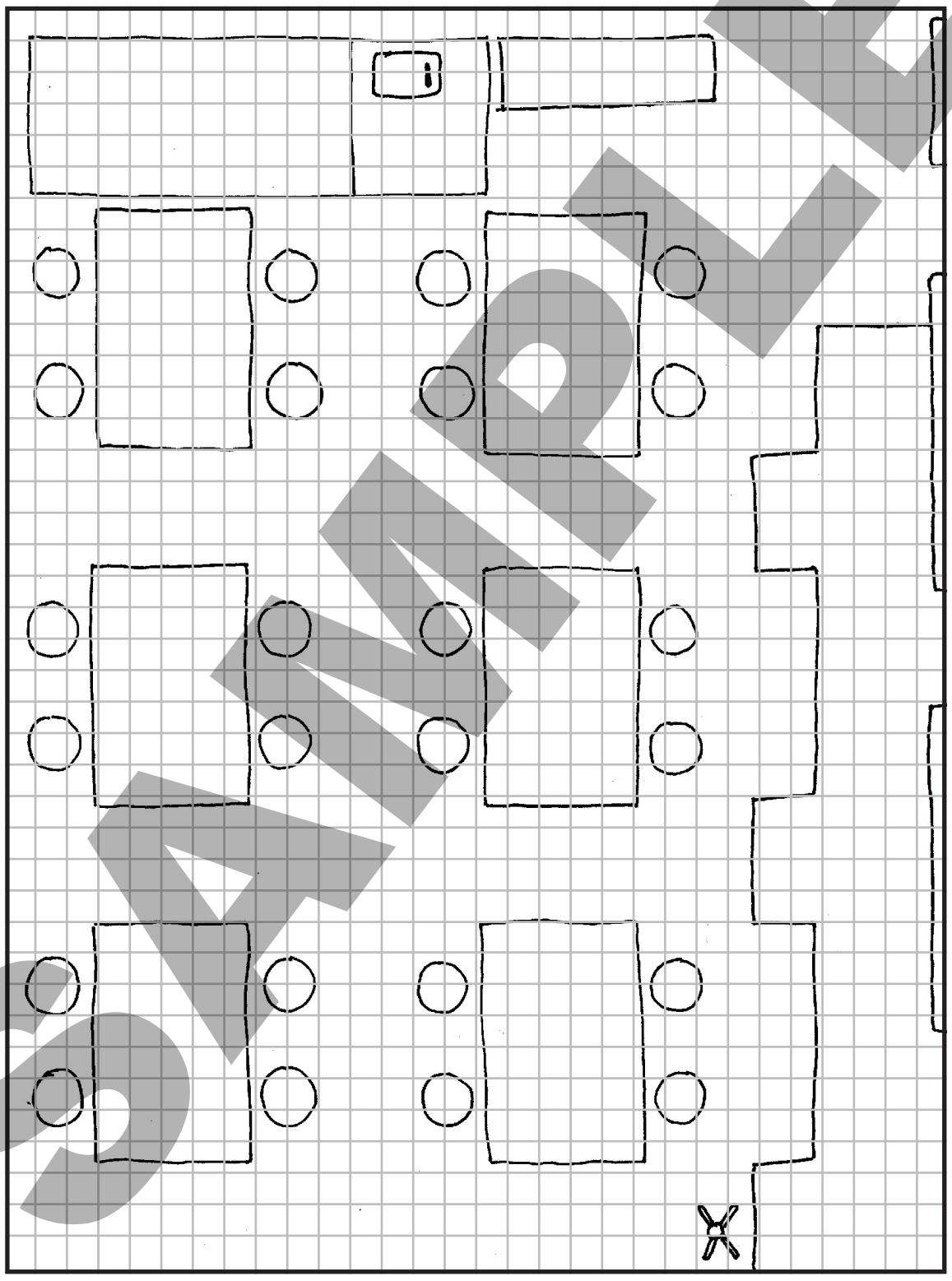
Activity 1: Developing a Timeline

Activity 2: Sketch Your Classroom

Use the graph paper to sketch the scene.



Activity 2: Mr.Phillips Classroom



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Cut out the pieces of evidence. Sort them into two categories: conclusive and inconclusive. Then, fill out the worksheet.

After completing the conclusive and inconclusive activity, take some time to list 3 reasons why you think someone would want to ruin Sofia's project.

1 _____

_____

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_____

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Evidence Update

Consult the current class roster and current grade averages below, with Mr. Phillips awarding one letter grade boost for winning first prize. Place an **X** in the Evidence #1 column where you think students may have a possible motive..

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Burns, Tiffany	B-							
Bush, Daniella	B+							
Day, Nicholas	F							
Haston, Rachel	D							
Holt, Savannah	F							
Holt, Zachary	D							
Homes, Sofia	A+							
Jones, Anthony	D-							
Kinsley, Abby	B							
Knot, Benjamin	D+							
Meyers, Ava	D+							
Murphy, Natalia	A							
Nelson, Charlie	F							
Norris, Martin	B							
Philson, Rita	C							
Pines, Robert	F							
Sanchez, David	D-							
Simmons, Brie	C-							
Smith, Tommy	D-							
Steelmon, Jen	C+							
Stone, Kim	D-							
Turano, Enzo	A-							
Walker, Destiny	D+							
Wells, Lizzy	B							

Wrap-Up Discussion Notes

Read the following statements and decide if they are Means, Motive, or Opportunity.

Karen had her lunch break from 12:30-1:00.

Tony lost his job and needed money for rent.

Gabby has a lock-picking kit.

Explain your answers

_____

_____

What can forensic investigators learn from a timeline?

_____

_____

How are crime scene sketches similar and/or different from other drawings?

_____

_____

Think about means and opportunity. According to the timeline, when might someone have the opportunity to enter Mr. Phillips's classroom, and how?

_____

_____

Other Observations:

_____

_____

_____

_____

Glossary

Alibi: A statement by a person under suspicion in a crime, expressing that they were in a different place when the offense was committed.

Arch Pattern: The ridges of the fingerprint that enter from one side make a rise in the center, and exit on the opposite side of the print. They are shaped like an arch.

Arsenic: A toxic metallic element.

Body Language: Non-verbal indicators that communicate a person's feelings.

Cast: Filling an impression with a flexible material to accurately retain the impression shape for analysis.

Closed-Ended Questions: Questions that can be answered with a "yes" or "no".

Crime Scene Sketch: A rough drawing of the crime scene that includes the location and size of each piece of evidence.

Cross-Contamination: When one substance unintentionally comes into contact with another, creating a potentially different test result.

Drawn-To-Scale: When all objects in a drawing are increased or decreased in size by the same amount to look proportional to one another.

Electrons: One of three subatomic particles that make up atoms

Eyewitness: A person who has directly seen an event happen that relates to an investigation.

Fingerprint: The impression of lines and patterns made by a person's fingers.

Forensic Evidence: Any physical thing that may be used to prove a person did or did not commit the crime.

Glass Refraction: The bending of light as it passes through glass or liquids of different densities.

Heists: A heist is a planned and coordinated criminal act, typically involving theft or robbery of valuable items such as money, jewelry, or other high-value goods.

Impression: The result of two objects coming into contact with enough force to leave a mark.

Indicators: A hint that can be a trend or pattern in a person's body language connected to an emotion they are experiencing.

Interrogation: A formal questioning session where an investigator provides evidence to the suspect, allowing them to confess to the crime if they are responsible or involved.

Investigative Interview: An informal questioning session to gather unknown information and/or confirm events and details of a crime.

Latent Print: Prints that are left behind by natural oils and sweat on the skin. They are not visible to the naked eye.

Loop Pattern: Ridges of the fingerprint that enter from the left or right re-curve and pass out of the same side they entered. They look like a rounded knob.

Means: Determining how a person committed a crime, including a person's physical and mental Abilities.

Motive: Determining why someone committed a crime, including what thoughts motivated them to do it.

Observation: Information gathered about the crime scene by using the five senses.

Open-Ended Questions: Questions that require a long and detailed response. "Who, What, When, Where, Why, and How"

Opportunity: The determination of when someone committed a crime.

Palm Print: The impression of lines and patterns made by a person's palm.

Partial Print: A part of a fingerprint or distorted fingerprint that sometimes does not provide enough information to lead to a match.

Patent Print: Prints that are left behind by excess dirt, paint, ink, etc. Visible to the naked eye.

Physical characteristics: These are observations; they are features that can be described using your senses.

Preliminary tests: Tests that suggest, but do not confirm, the presence of certain materials or other findings.

Refractive Index: The measure of a bending ray of light. A higher refractive index means a glass or liquid is also denser.

Ridge Pattern: The wavy pattern produced by the cells growing on your fingertips.

Ridges: Fine lines in the skin that contain sweat pores.

Sabotage: The destruction of an employer's property (such as tools or materials) or the hindering of manufacturing by discontented workers.

Scandal: an event or action that causes public outrage or disgrace.

Skid Marks: Sliding marks left behind on the ground from tires "skidding" against the surface. These usually don't have a prominent tread pattern.

Statement: A person's telling their story in their own words.

Suspect: A person that investigators believe may have been involved in the crime.

Two-dimensional (2D) impression: Flat impressions only use length and width measurements; there is no depth. A shoe print is generally flat but can have depth depending on the flooring or ground underneath.

Three-dimensional (3D) impression: Impressions are discovered with length, width, and depth measurements, like a nail mark left on a piece of wood.

Timeline: A list of noteworthy events that took place from oldest to most recent.

Tire Tread: A specific design of tire grooves created to grip pavement better while the tires are in motion.

Tread Pattern: The pattern left behind by a tire.

UV (ultraviolet) Light: UV light is a kind of electromagnetic radiation with shorter wavelengths than visible light. Most UV light is not visible to the naked eye. In forensic science, an investigative blacklight is a tool that uses UV light to reveal various types of evidence that cannot be seen with the naked eye.

Whorl Pattern: Ridges of the fingerprint that are circular and look like a bull's eye target.

Written Statement: A voluntary written report made by a witness, victim, or suspect that tells the story of what happened in their own words.

Appendix

Science Fair Mystery Standards Matrix

The Science Fair Mystery is a 12-lesson program that helps learners meet the Next Generation Science Standards (NGSS) and the Common Core Learning Standards (CCLS).

Ideally suited for learners in grades 6-7, *The Science Fair Mystery* meets many of the practices, cross-cutting concepts, and disciplinary core ideas that comprise the Next Generation Science Standards. The practices, concepts, and disciplinary ideas specifically covered in this unit include:

PRACTICES:

Asking Questions and Defining Problems

- Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources, and, when appropriate, frame a hypothesis based on observations and scientific principles.

Planning and Carrying Out Investigations

- Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.
- Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how much data is needed to support a claim.
- Conduct an investigation to produce data to serve as the basis for evidence that can meet the goals of the investigation.

Analyzing and Interpreting Data

- Analyze and interpret data to determine similarities and differences in findings.

Engaging in Argument from Evidence

- Support an argument with evidence, data, or a model.

Obtaining, Evaluating, and Communicating Information

- Collect, analyze, discuss, and document evidence and clues.

Scientific Knowledge is Based on Empirical Evidence

- Science knowledge is based upon logical and conceptual connections between evidence and explanations.
- Science disciplines share common rules of obtaining and evaluating empirical evidence.

CROSS-CUTTING CONCEPTS:

Patterns

- Graphs, charts, and images can be used to identify patterns in data.

DISCIPLINARY CORE IDEAS:

PS1.A: Structure and Properties of Matter

- Measurements of a variety of properties can be used to identify materials.

PS1.B: Chemical Reactions

- Chemical Reactions observed where some reactions release energy and others absorb energy.

PS2.A: Force and Motion

- Damage observed at the crime scene displays the effects of an object's relationship with force and motion.

PS2.B: Types of Interactions

- Damage observed at the crime scene displays the type of reaction between an object and a surface.

PS3.C: Relation Between Energy and Forces

- Damage observed at the crime scene displays the relation between energy and forces with a reactionary result.

COMMON CORE LEARNING STANDARDS

In addition to meeting the National Science Education Standards (NSES) and Next Generation Science Standards (NGSS), this unit meets Common Core Learning Standards (CCLS) in English Language Arts and Literacy. Specific CCLS addressed include:

CCSS.ELA-Literacy.RI.6.1 : Read the text and analyze the dialogue between characters to uncover clues. Use these clues to make inferences about what might have happened, supporting observations with textual evidence.

CCSS.ELA-Literacy.RI.6.2 : After reading the text, discuss the central ideas and dilemmas that arise within each lesson related to the mystery. This should be based on supporting evidence.

CCSS.ELA-Literacy.RI.6.3 : Discuss how the SFM characters interact with one another, and change as the mystery develops and new clues are discovered.

CCSS.ELA-Literacy.RI.6.7 : Review graphs, photos, text message conversations, and interview conversations to better understand the SFM.

CCSS.ELA-Literacy.RI.6.8 : Evaluate and analyze the evidence presented along with the accusations made by characters in the story during the second half of the SFM.

CCSS.ELA-Literacy.RL.6.3 : Observe how the characters change and identify who is considered a suspect as new evidence is uncovered.

CCSS.ELA-Literacy.RL.6.4 : Review the text and evaluate the possible meanings behind suspect statements, taking into consideration 'means, motive, and opportunity'.

CCSS.ELA-Literacy.RST.6-8.3 : Follow the structured steps listed in the lab directions to complete the lab successfully.

CCSS.ELA-Literacy.SL.6.1 : Participate in discussions during the 'wrap up' section in each lesson, including discussions with students and as a class with the instructor. Take into consideration other's opinions based on evidence.

CCSS.ELA-Literacy.SL.6.4 : Discuss your observations during the wrap up section at the end of each lesson, using evidence to support your findings and suspicions.

CCSS.ELA-Literacy.SL.6.6 : Demonstrate an understanding of appropriate voice command while questioning suspects and witnesses.

CCSS.ELA-Literacy.W.6.1 : Document your observations based on scientific reasoning and lab analysis after the lesson.

CCSS.ELA-Literacy.W.6.9 : Document your evidence on the 'Class Roster' worksheet based on your analysis from the text and lab exercises.

CCSS.MATH.Content.6.RP.A.3 : Complete graphs and tables by measuring and evaluating evidence.

CCSS.MATH.Content.6.SP.B.5A : Document the number of observations by identifying suspects connected to each piece of evidence at the end of the lesson.

CCSS.MATH.Content.6.SP.B.5B : Measure your evidence and document your numerical findings in the proper unit of measurement.

STANDARDS MATRIX

Standard	Lesson											
	1	2	3	4	5	6	7	8	9	10	11	12
Next Generation Science Standards												
Practice: Asking Questions and Defining Problems		*	*	*	*	*	*	*	*	*	*	
Practice: Planning and Carrying Out Investigations	*		*		*	*		*	*	*	*	*
Practice: Analyzing and Interpreting Data	*	*	*	*	*	*	*	*	*	*	*	
Practice: Engaging in Argument from Evidence	*		*		*	*		*	*	*	*	
Practice: Obtaining, Evaluating, and Communicating Information	*					*						*
Cross-Cutting Concept: Patterns	*					*						
Disciplinary Core Idea: PS1-A: Structure and Properties of Matter				*			*					
Disciplinary Core Idea: PS1-B: Chemical Reaction		*		*			*		*			
Disciplinary Core Idea: PS2-A: Force and Motion			*			*	*					
Disciplinary Core Idea: PS2-B: Types of Interactions			*			*	*					
Disciplinary Core Idea: PS3-C: Relation Between Energy and Forces			*			*	*					
Common Core State Standards												
CCSS.ELA-Literacy.RI.6.1 : Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	*		*		*	*		*	*	*	*	*
CCSS.ELA-Literacy.RI.6.2 : Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.	*		*		*	*		*	*	*	*	*
CCSS.ELA-Literacy.RI.6.3 : Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).	*		*		*	*		*	*	*	*	*
CCSS.ELA-Literacy.RI.6.7 : Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.	*	*	*			*	*	*	*		*	
CCSS.ELA-Literacy.RI.6.8 : Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.								*	*		*	
CCSS.ELA-Literacy.RL.6.3 : Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.	*				*			*			*	*

CCSS.ELA-Literacy.RL.6.4 : Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.	*		*		*	*		*	*	*	*	*
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.SL.6.1 : Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade appropriate topics, texts, and issues, building on others' ideas and expressing their own clearly.	*	*	*	*	*	*	*	*	*	*	*	*
CCSS.ELA-Literacy.SL.6.4 : Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.	*	*	*	*	*	*	*	*	*	*	*	*
CCSS.ELA-Literacy.SL.6.6 :Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.					*						*	
CCSS.ELA-Literacy.W.6.1 : Write arguments to support claims with clear reasons and relevant evidence.					*	*	*	*	*	*	*	*
CCSS.ELA-Literacy.W.6.9 : Draw evidence from literary or informational texts to support analysis, reflection, and research.	*		*		*	*	*	*	*			
CCSS.MATH.Content.6.RP.A.3 : Use ratio and rate reasoning to solve real-world and mathematical problems. For example, make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	*					*						
CCSS.MATH.Content.6.SP.B.5A : Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations.	*		*		*	*	*	*	*			
CCSS.MATH.Content.6.SP.B.5B : Summarize numerical data sets in relation to their context, such as by: Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.		*				*						

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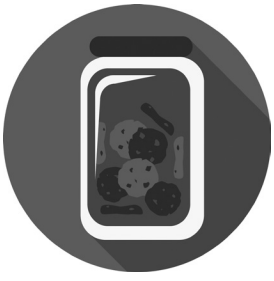

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