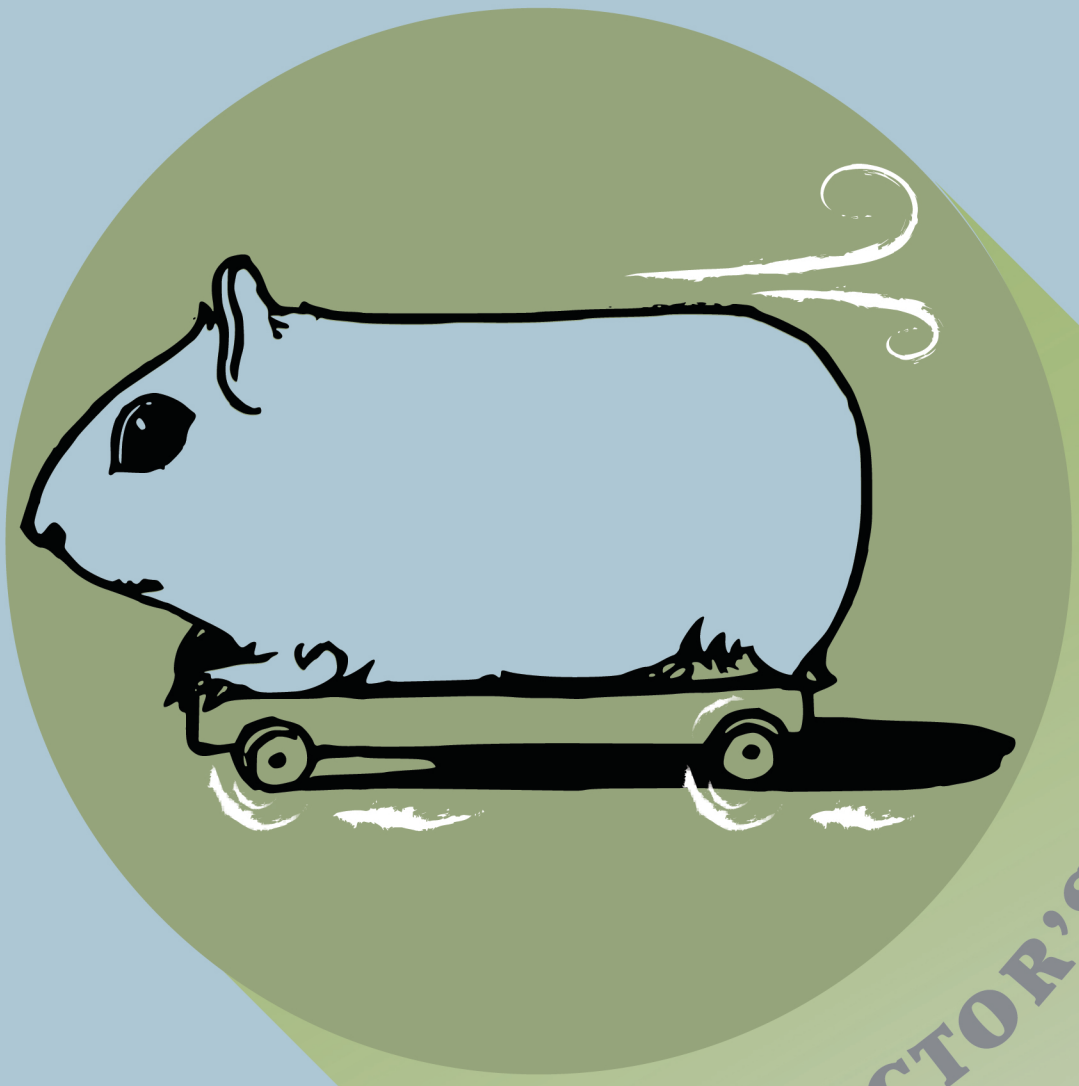
A Crime Scene Investigation

Rogue Rodent MYSTERY



INSTRUCTOR'S GUIDE

Community LEARNING

Rogue Rodent Mystery

A Crime Scene Investigation

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Preface

Welcome!

Rogue Rodent Mystery: A Crime Scene Investigation is a 10-lesson course for elementary students. It is designed to ignite curiosity and stimulate authentic learning by creating real life contexts ranging from lab analyses to print making to criminal investigation. Our courses have been used enthusiastically in more than 45 states, stimulating young minds and engaging young hands for many years. In fact, thematic integration—over an extended period of hands-on engagement—forms the driving concept behind all Community Learning's courses. The lessons and activities that comprise Rogue Rodent Mystery are aligned to the practices, cross-cutting concepts, and disciplinary core ideas that are the foundation of the Next Generation Science Standards (NGSS). In addition, the activities included in this unit align to the Common Core State Standards in Mathematics and English Language Arts and Literacy. For more information on the standards please see the Standards Matrix included in the appendix.

Who Can Teach *Rogue Rodent Mystery* and Where?

Instructors are supported by easy-to-manage materials and step-by-step plans. No specialized knowledge is required to launch 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 in Science and Critical Thinking

The call for hands-on activities that build critical thinking skills, confidence, competence, and science literacy can be heard on the national, state, and local levels. To be sure, educators and officials in both the public and private sectors point to the critical role ongoing, quality after-school programs play, especially programs with a focus on science, math, and reading—the same skills now tightly linked to the economic productivity of our society.

Rogue Rodent Mystery exposes students to this and more. The course sets up scenarios that invite students to solve problems creatively, think critically, work cooperatively in teams, and use evidence, models, tools, and scientific techniques effectively.

Bringing the Mystery to Life

Rogue Rodent Mystery is based on the premise that a crime occurred in Ms. Hawkins' science classroom at Cavia Elementary. Her classroom is filled with all sorts of neat things and also has a pet guinea pig named Alice. Alice is a very special part of the class. Mrs. Hawkins loves animals and knows that the best way for her students to learn about what an animal needs to survive is by observing, or watching, the animal up close. The entire class helps take care of the guinea pig - feeding her, giving her fresh water, cleaning her enclosure, providing things for Alice to chew on, and taking her home to care for her on the weekends. Yesterday, Mrs. Hawkins said goodbye to her students as they headed home. She put Alice safely back in her enclosure and then went to the cafeteria to grab an afternoon snack. When she came back 20 minutes later she noticed …Alice was gone! Inside this box are all the materials needed by your students to conduct the investigation, including photographs, scientific equipment and "evidence." Each lesson introduces new intriguing evidence, forensic techniques, and insight toward solving the *Rogue Rodent Mystery*. To limit the suspect possibilities, Ms. Hawkins has narrowed the suspects to four—all current students of hers. Together, your students work toward the most plausible scenarios and celebrate their findings in the concluding lesson with certificates honoring their work as forensic investigators.

Making the Most of Each Lesson

With all the necessary materials provided in convenient, lightweight carryalls, and the setups, processes, and procedures explained in detail, instructors will find *Rogue Rodent Mystery* easy and fun to teach. Each lesson provides an activity that teaches a new but related aspect of scientific reasoning and a particular scientific process. None of the labs require special handling or complicated setups.

After familiarizing themselves with the lesson, vocabulary, and intended outcome of the activity, instructors set up their classroom so that it is easy for students to work in groups. Clear guidance is provided in each lesson on how to set up the demonstration area with all the relevant materials at hand.

Any necessary safety precautions specific to individual lessons are also provided. The instructor should be sure to know where emergency help and supplies are located.

Each lesson activity that the students accomplish becomes part of their "crime scene portfolio" and contributes, ultimately, to solving the mystery. Because of this, instructors need to review the corresponding pages in the Student Activity Book in order to guide students in completing their part of the activity.

Course Kit Components

Each course kit contains an Instructor Guide, Resource CD and all of the materials and tools necessary to teach the course to a class of 30 students.

Course Kit Contents

Packed in easy-to-manage carryalls, every material or tool needed to solve the mystery is organized in a way that makes the course easy to teach again and again. Among some of these materials are:

- Rulers
- Foam balls
- Miniature figurines
- Eye masks
- Beakers
- Tempera paint
- Markers
- Pan balances
- Centimeter Cubes

Instructor's Guide

Every step is taken to provide an easy-to-follow format and fun-to-read instructions for each lesson. In addition to a brief listing of objectives, materials, and setup procedures, useful icons point the instructor to a number of key elements:

Notes for the Instructor

Brief instructor notes introduce the subject matter and challenges presented in the particular lesson. They often contain real-life, age-appropriate examples from crime in history or popular culture.

Notes for the Students

These notes "set the stage" for each lesson by presenting brief material to read, listen to, and discuss.

Vocabulary

New and relevant terms are defined here. Note, too, the comprehensive "Glossary" at the rear of the Instructor's Guide and Student Books.

Activity Description

Here, step-by-step procedures are provided for both the instructor's demonstration and the students' immersion in the activity.

Wrap-up

Discussion-provoking questions are designed to summarize learning and help students take their inquiry further.

Clean-up

Clear instruction on preserving and storing materials is provided to ensure kit longevity and cost effectiveness.

Other Directions, Discussions and Destinations

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

Student Books

Designed for students to record their discoveries class after class, the Student Books acquire a narrative quality that keeps the young "Crime Scene Investigators" engaged in scientific investigation over time. The books serve as companions to the Instructor's Guide and contain reports, charts, places to attach samples, and areas to record observations, as well as a full glossary of terms used in the course.

The complete *Rogue Rodent Mystery: A Crime Scene Investigation* student book is provided in PDF on your resource CD, with an unlimited license for reproduction for your school or organization's use.

Companion Resources

When you adopt *Rogue Rodent Mystery: A Crime Scene Investigation*, your instructors will have access to a number of companion resources. A Resource CD offers tips, lesson extensions, and other great ideas for the classroom. Word search and crossword puzzles help reinforce newly learned and used vocabulary. Links to forensic videos and other multi-media resources provide authentic lesson extensions. Immediate support is always available by phone, email, or webinar from the experts at Community Learning.

About Community Learning

Our mission is to provide interactive curriculum created around thematic topics that truly engage students through experiential learning projects. Developed by subject experts with decades of teaching experience, our courses provide full support for administrators desiring high-interest activities and projects that meet and exceed current learning standards.

Instructors - We need your input!

We consider you our treasured partners in making these classroom-tested activities even better. To this end, we invite you to complete a short evaluation about your experiences with *Rogue Rodent Mystery: A Crime Scene Investigation*.

Please go to http://www.commlearning.com/courseevaluation to fill out the course evaluation.

Preparation Overview

	Lesson 1 Observing the Clues: Investigating with Your Senses	Lesson 2 Recording Your Findings: Sketching the Scene	Lesson 3 Listening to a Witness: Creating a Composite Sketch	Lesson 4 Analyzing Alibis: Monitoring the Movement of Suspects	Lesson 5 Applying Physics: Studying Force and a Falling Skeleton
Print/Copy	Student Book pages 1-8	Student Book pages 9-15	Student Book pages 16-22	Student Book pages 23-38	Student Book pages 39-51
Organize Kit Supplies	• DVD of crime scene • Air freshener • Senses cards • Person of interest script • Scissors • Blindfolds • Earplugs • Small bandages • Plastic spoon • 250 mL beaker • Red tempera paint • Pencils	• Crime scene tape • Flip chart • Scaled dog photos • Scaled doghouse photos • Crime scene sketch • Mrs. Hawkins's 1st letter • Scissors • Manilla envelope • Marker	• Examples of composite sketches • "Artist" and "sketch" stickers • Centimeter cubes • Plastic cups • Pencils • Crayons	• Copy of suspect photos • Manilla envelope • Copy of Mrs. Hawkins's 2nd letter • Flip chart • Marker • Copies of alibi cards for each suspect • Scissors • Pencils	• Copy of Cavia Elementary School map • Sketch of Mrs. Hawkins's crime scene • Set of directional stickers • Stress balls • Model figurines • Rulers • Crayons • Pencils
Prepare	• Set up DVD player • Make red paint • Arrange for an adult (person of interest) to come into your room at a designated time • Cut out the required number of senses cards	• Cut out the dogs and doghouses • Address the manila envelope to your school and your class	• Count cubes into plastic cups	• Choose and label the appropriate suspects for your class • Arrange suspect photos near flip chart • Place Mrs. Hawkins's letter in the manila envelope	• Designate large flat areas for groups to work
Acquire Additional Supplies	• Water	• Cell phone, digital camera, or note paper • Clock with second hand			

Preparation Overview

	Lesson 6 Inspecting Pattern Evidence: Comparing Shoe Prints	Lesson 7 Researching Rodents: Discovering a Guinea Pig's Survival Needs	Lesson 8 Following Colorful Clues: Making Orange Paint	Lesson 9 Weighing the Evidence: Testing the Scales of Justice	Lesson 10 Considering the Confession: Understanding Misunderstandings!
Print/Copy	Student Book pages 52-63	Student Book pages 64-74	Student Book pages 75-82	Student Book pages 83-88	Student Book pages 89-96
Organize Kit Supplies	• Scissors • Plastic cups • Card stock paper • Spray bottles • Rulers • Centimeter cubes • Crayons • Pencils	• Copies of Alice's photo • Copy of Mrs. Hawkins's 3rd letter • Manilla envelope • Markers • Crayons • Poster board sheets • Pencils	• Red, blue, and yellow temper paint powders • 1,000 mL beaker • 250 mL beakers • Coffee scoop • Mixing spoon • Flip Chart • Marker • Copy of Mrs. Hawkins's 4th letter • Manilla envelope • Foam plates • Suspect stickers • Wooden stir sticks • Pencils	• DVD of the crime scene • Copy of suspect photos • Copies of Lady Justice • Plastic cups • Centimeter cubes • Pan balances • Index cards • Markers • Pencils	• Manilla envelope • Copy of Mrs. Hawkins's final letter • Guinea pig stickers • Poster board sheets • Crayons • Markers • Pencils
Prepare	• Cut sheets of card stock in half • Count out centimeter cubes into plastic cups • Fill spray bottles with water • Try the shoe print experiment to get a good idea of how it works best	• Gather print resources about guinea pigs from a local or school library • Optional: set up classroom for online access to resources about guinea pigs • Place Mrs. Hawkins's letter in the manila envelope	• Mix paints and pour into beakers for each group • Arrange beakers of paint on foam plates • Place Mrs. Hawkins's letter in the manila envelope	• Count out centimeter cubes into cups • Display suspect photos	• Place Mrs. Hawkins's letter in the manila envelope
Acquire Additional Supplies	• Water • Paper towels	• Books about guinea pigs • Optional: computers with internet access	• Paper towels	• One monetary bill of any denomination	• Optional: celebration supplies

Notes

Introduction

Instructor's note: To build intrigue and set the scene, read this introduction to students prior to beginning the first lesson.

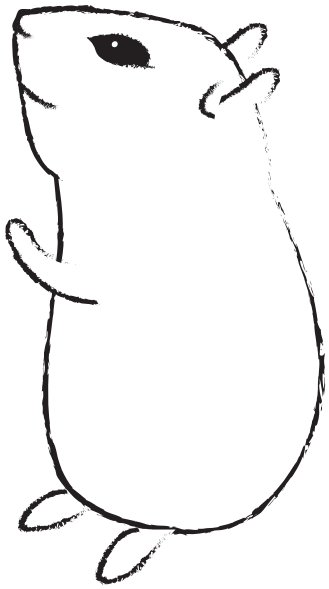
Rogue Rodent Mystery

Mrs. Hawkins is the science specialist at Cavia Elementary school. Her classroom is filled with all sorts of neat things like rainbow-producing prisms, a human skeleton model, microscopes, and an insect collection. Her classroom also has a pet guinea pig named Alice.

Alice is a very special part of the class. Mrs. Hawkins loves animals and knows that the best way for her students to learn about what an animal needs to survive is by observing, or watching, the animal upclose. The entire class helps take care of the guinea pig — feeding her, giving her fresh water, cleaning her enclosure, providing things for Alice to chew on, and taking her home to care for her on the weekends. Alice is such a gentle and curious creature, and the students at Cavia Elementary take their responsibilities very seriously.

Yesterday, Mrs. Hawkins said goodbye to her students as they headed home. She put Alice safely back in her enclosure and then went to the cafeteria to grab an afternoon snack. When she came back 20 minutes later she noticed:

- The front door ajar
- The skeleton in the middle of the classroom had been knocked over
- The window on the side of the classroom was open
- The outlines of a few muddy shoeprints were all around
- Orange paint scattered around the classroom and on Alice's enclosure
- The classroom smelled like lemon juice
- Alice was gone!



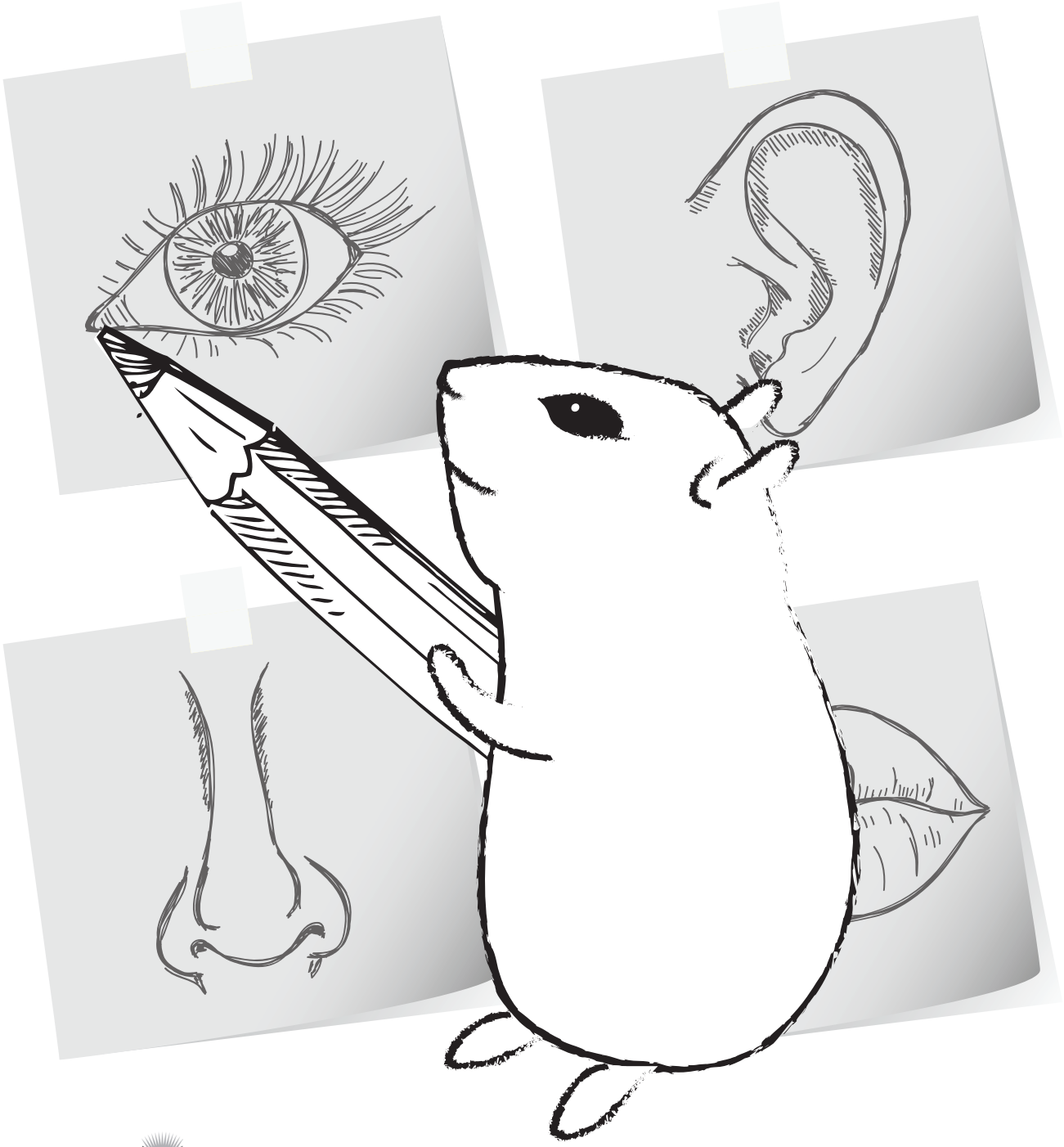
Mrs. Hawkins is desperate to get Alice back safely. The whole school is worried and heartbroken that they will never see their beloved guinea pig again.

Mrs. Hawkins has written to me asking if our class can help bring Alice home! Since we do not know anyone in the class, Mrs. Hawkins believes we will be able to keep an open mind about who the thief might be. We must observe the crime scene and make a list of suspects. We must ask questions and try to figure out the answers. Making observations and running tests to answer questions is science. Doing science experiments in order to solve a mystery is called forensic science. Are you ready to be a forensic scientist? Mrs. Hawkins and the kids at Cavia Elementary school are counting on you!

Lesson 1

Observing the Clues:

Investigating With Your Senses



Lesson 1

Observing the Clues: Investigation with Your Senses

OBJECTIVES

Students will:

- Understand that senses allow our bodies to take in information about the environment
- Practice using their senses in a mystery-based setting
- Record their information and use the record to communicate their findings to peers
- Organize and display data on a graph

MATERIALS

Instructor:

- 1 DVD of the crime scene
- 1 air freshener
- 1 set of Senses Cards
- 1 copy of person of interest (POI) script
- 1 pair of scissors
- 2 blindfolds
- 2 sets of earplugs
- 2 small ⅜" x 1 ½" bandages
- 1 plastic spoon
- 1 250 mL beaker
- Red tempera paint
- Water

Students (per each):

- Student book
- Pencil

PREPARATION

1. Have your students practice using their five senses before this activity.
2. Setup a DVD player in the classroom.
3. Using the beaker and the plastic spoon, make a small amount of red paint: mix 2 heaping spoonfuls of red tempera paint powder with 1 Tbsp. of water. Stir until smooth.
4. Arrange for a non-class member, preferably an adult, to visit your class as the person of interest (POI) at a designated time. Provide the POI with a loose script (see activity) and instructions.
5. Prepare the Senses Cards deck by cutting out the cards. Use two no-eye cards, two no-nose cards, two no-ear cards and enough full-face cards so that each person in the class may draw one card from the deck.

Notes for the Instructor

This mystery is a project-based learning experience that asks your students to complete a series of activities in order to bring home Alice, the missing guinea pig. The more realistic the mystery seems to your students, the more engaged and invested they will be in learning the information and conducting the science experiments. As the instructor, your enthusiasm and investment is key!

Throughout this mystery, students will use the scientific method to solve problems. They will:

- Make **observations** about the world around them and use these observations to ask questions.
- Form an idea, or **hypothesis**, about what they think happened.
- Conduct tests, or **experiments**, that help them answer their questions.
- Look at the results, or **data**, of their experiment and figure out what the data show.
- Make a **conclusion**, or answer their initial question.
- **Communicate** their findings with others.

This initial activity introduces your students to the mystery of the missing guinea pig through a video taken immediately after realizing that Alice was missing. Students will also be introduced to the job of a **forensic scientist** and prepare to take on the role by practicing their skill of observation.

Observation, the process of using your senses to gather information, is one of the most essential skills in science. Scientists are constantly taking in information through their senses of sight, sound, smell, taste and touch. These observations often lead to questions that are then answered through experimentation.

In particular, forensic scientists must be very in tune to their senses as they investigate crime scenes. Everything that they see, hear, smell and feel can help them to solve the mystery. Conversely, if the forensic scientists miss something important, the mystery may go unsolved.

Data collection and record keeping is also extremely important in forensic science. Investigators take detailed photographs, create sketches, make notes and label physical evidence. Recording allows scientists to revisit the scene throughout the investigation.

After watching the video, your students will practice making observations and recording those findings about a person of interest that will visit the classroom. With these skills in place, they will be well on their way to bringing Alice home!

Notes for the Students

Our bodies are constantly taking in information about the world around us. Our eyes help us see; our ears help us hear; our nose helps us smell; our skin and hands help us feel; and our mouths help us taste. Using all of our senses to gather information is called **observation**.

Forensic scientists rely heavily on their **senses** (except for their sense of taste) when looking at a crime scene and talking with **persons of interest**. Forensic scientists never know what might be an important piece of information to solve the mystery, so they try to take in as much information as possible using each sense.

You'll often see a good forensic scientist taking notes. The notes help them to remember all of the information they gather.

In order to bring Alice home safely, we need to be good forensic scientists. Today you will sharpen your senses by helping me learn more about a person of interest (POI). You may take notes in your student books — write things down or draw pictures — to help you remember. Then we will share and record our observations as a class. These skills will come in handy later!

Our POI will be a visitor to the classroom. He hasn't done anything wrong, but I want to learn more about him…just in case. You can help me by using your senses of sight, sound, smell and touch (not taste) to write down as much as you can about the POI.

There is one catch. During the visit, some of you will have one of your senses taken away. Two of you will be wearing blindfolds, removing your sense of sight. Another two of you will use earplugs, removing your sense of hearing. Another two of you will use small bandages to block your sense of smell. Those of you with these impairments will have to work hard to collect information using your remaining senses. After our visitor leaves, we will record the information that we gathered on a **graph**.

Vocabulary

Forensic scientist: a person who uses science to solve a mystery or crime

Graph: an illustration that records data

Observation: the process of using your senses to gather information

Person of interest (POI): a person who may be involved in a crime

Sense: a way that your body takes in information about the world around you, including sight, hearing, smell, taste and touch

Activity 1: Looking at the Crime Scene

15 minutes

1. Read the *Introduction* out loud to the class, if you have not already done so.
2. Tell the students that as soon as Mrs. Hawkins realized that something was wrong in her room, she used her cell phone to make a video of the scene. She made sure to film and mention everything that she thought we might need to know about to help find Alice.
3. Watch the video sent in from Mrs. Hawkins's class.
4. Give students time to share their reactions and excitement about Alice's disappearance.
5. Ask students to complete *Looking at the Crime Scene* in their Student Books.
6. Discuss what differences the students found in the classroom after the crime.

Activity 2: Observing a Person of Interest

30 minutes

1. Before class, ask another adult to come into your classroom at a designated time. Before entering he should open the air freshener, smear red paint on his palms, and then hold the air freshener in his hand. Provide this person with a loose script:

> "Hello guys! I'm Mr. Percellus." (May change name accordingly.) Scuffle your feet as if wiping them on a doormat and wave your hands around a bit. Next, discuss the weather with the teacher, tapping your foot and waving your hands while talking. Finally, proclaim, "My hands are filthy!" Hold them up to reveal red paint before noisily washing in the classroom sink. Instead of drying your hands, shake them dry, spraying as many students as possible in the process. Say, "Goodbye everyone!" and then leave noisily.

2. Explain that before moving forward with the case you think we might need to sharpen our skills of observation and collecting data. Read *Notes for the Students* section to the class.
3. Show students the four types of cards in the Senses Cards deck. Explain that students with a full-face card will observe the POI with all of their senses. Students who draw a card with a sense crossed out will observe the POI without that sense.
4. Shuffle the deck. Give each student a card from the Senses Cards deck to determine which students will wear blindfolds, earplugs or a bandage covering their nostrils. Help students to put on sense blocking materials before the POI arrives.
5. Introduce the POI to the class. Remind students to record any observations in *Observing a Person of Interest (POI)* in their Student Books. The two students who are blindfolded will have to remember their observations and record them after the blindfolds have been removed.
6. After the encounter, students will consider the observations they made using each sense. The data will be recorded on a graph. Review *Parts of a Graph* in the Student Books. Talk about how to record information on a graph.
   - Title a graph to describe what you are graphing: "Observations of a Person of Interest."
   - Y-axis or vertical (up and down) lists the actions of the POI.
   - X-axis or horizontal (side to side) lists the sense(s) that may used to observe an action.
7. Discuss what actions the students observed the POI doing.
8. Turn to the populated graph *Observations from a Person of Interest* in the Student Books.
9. Read the list of things observed to the students and add anything additional.

10. Ask the students to complete the graph by placing an "X" in the sense(s) used to observe each change.

Activity 3: Revisiting the Video

15 minutes

1. Congratulate students on sharpening their senses. Remind them that forensic scientists must always have their eyes, ears, noses, and hands on high alert during a case so that they don't miss any important clues.
2. Re-watch the video, this time focusing on what each sense is taking in from the crime scene.
3. Turn to *Revisiting the Video* in the Student Book and read the list of "classroom changes" to the students from the "Observations from the Crime Scene" graph. Ask students to add any additional changes they noted.
4. Have students complete the graph by placing an "X" in the sense(s) used to observe the classroom changes that occurred after the crime was committed.
5. The video can be watched again at any point during this mystery. Use it as a reference for the crime scene or to reinvigorate the investigation.

Wrap-up

10 minutes

1. Discuss what happened.
   - Count the observations for each sense on the "Observations from a Person of Interest" graph. Which sense(s) did we use the most? Why do you think that is?
   - Why did some people have different answers than others? What does this tell us about how people take in information? How is this game like being a witness in a crime?
2. Have the students wearing blindfolds or earplugs compare their observations to the others. What do you notice? What are some situations where a person's senses might be impaired? Do you think this person would still be a good witness?
3. If possible, have the POI revisit the classroom as a regular person. Reiterate the idea that this person did not do anything wrong; we were simply observing him to practice our skills.
4. Give students time to record any additional thoughts on the blank *My Observations* page.

Clean-up

5 minutes

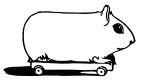
1. Clean and dry beaker.
2. Collect Student Books.
3. Return DVD and all remaining supplies to the kit.

Other Directions, Discussions and Destinations

The following activities and websites enrich what has been learned in this lesson about observation and senses.

1. Brainstorm a list of detective/spy tools. What sense does each tool heighten? Challenge students to invent their own detective/spy tool. Students should come up with a name for the tool, describe what it does and draw a picture of the tool.
2. Spend time looking at different objects using the naked eye, a magnifying glass and a microscope. Draw images to record what you see. How does each tool change the appearance of the object? Think of a time when each level of sight would be most useful.
3. Test how well you distinguish colors using this online test. **http://www.xrite.com/online-color-test-challenge**

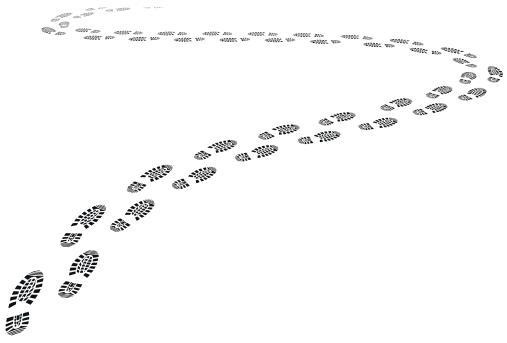
Looking at the Crime Scene



What changed? Match the objects seen in Mrs. Hawkins's classroom to before or after the crime.

before crime

after crime



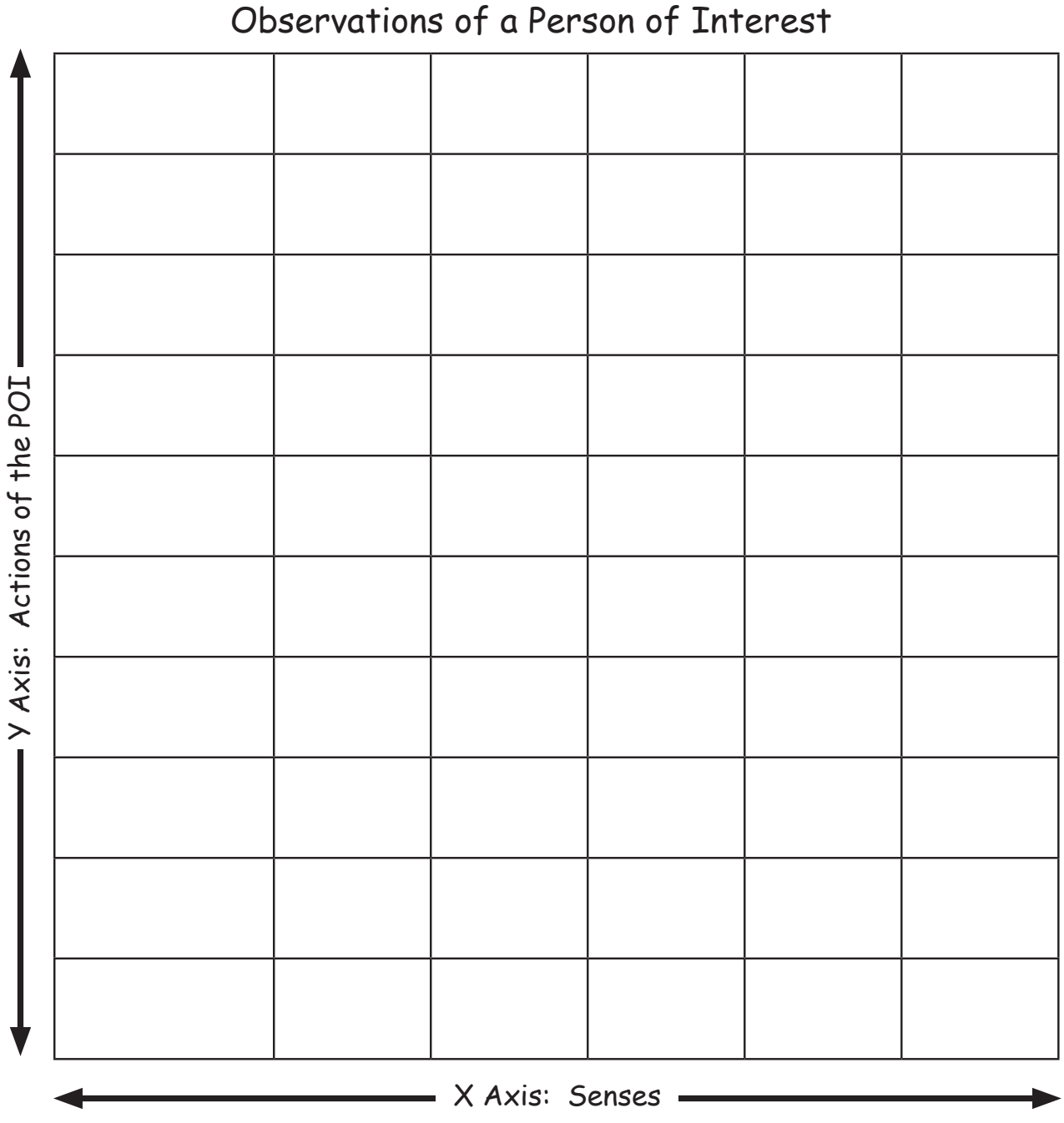
Lesson 1

Observing a Person of Interest

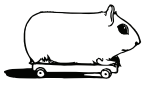
Draw and label what you observed about the POI.

Lesson 1

Parts of a Graph



Observations of a Person of Interest



Place an X in the box for the sense used to observe each action.

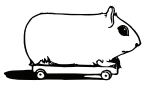
Observations of a Person of Interest

Actions of a Person of Interest

feet shuffling					
talking					
foot tapping					
waving hands					
hand washing					
hand shaking					
water spraying					
	see 	hear 	smell 	feel 	taste 

Senses Used

Revisiting the Video



Place an X in the box for the senses used to observe each change.

Observations from a Crime Scene

Classroom Changes

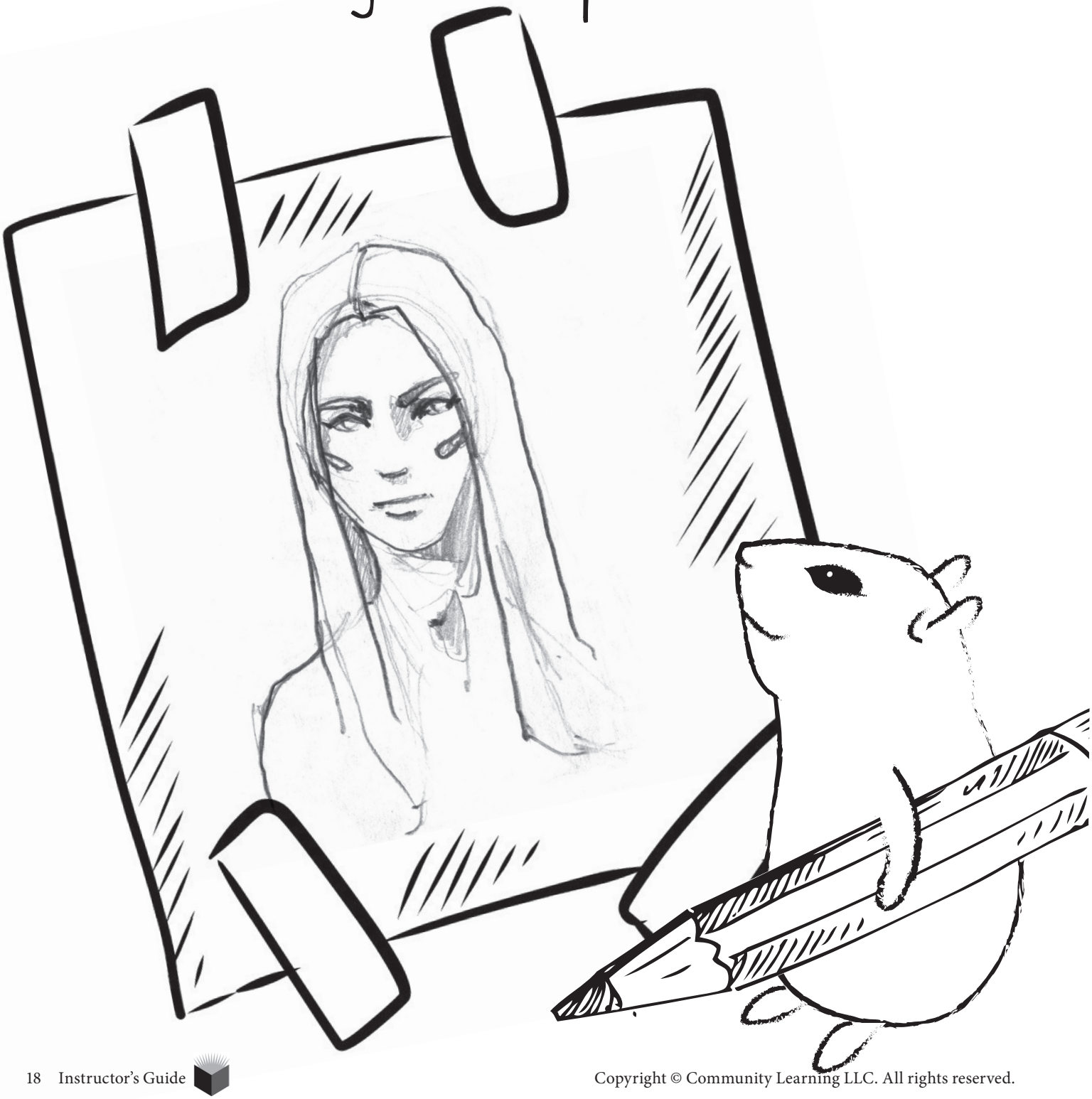
open door					
Alice missing					
time 2:45					
skeleton down					
foot prints					
orange paint					
window open					
lemon smell					
	see 	hear 	smell 	feel 	taste 

Senses

Lesson 3

Listening to a Witness:

Creating a Composite Sketch



Lesson 3

Listening to a Witness: Creating a Composite Sketch

OBJECTIVES

Students will:

- Use descriptive and positional words to convey the physical properties of objects
- Practice giving a description of an object to a peer
- Practice listening to a description of an object made by a peer
- Gain an understanding of mirror images

MATERIALS

Instructor:

- Examples of composite sketches
- 1 "artist" sticker
- 1 "sketch" sticker

Students (per pair):

- 4 centimeter cubes in assorted colors
- 1 plastic cup
- 2 pencils
- 1 pack of crayons
- Student Books

PREPARATION

1. Divide the class into pairs.
2. Count out 4 cubes per group into a plastic cup.

Notes for the Instructor

A composite sketch is a drawing of a person associated with the crime. This person could be a possible suspect or a missing person.

To create a **composite sketch**, a forensic artist must listen closely to a witness's description of a person of interest. From the description given, the forensic artist turns the witness's words into a picture of the person of interest that the entire investigative team can reference.

Lois Gibson, a forensic sketch artist from Texas, has received a Guinness World Record. She achieved the record for "having the most criminals positively identified due to the composites of one artist." Her drawings have helped law enforcement find hundreds of criminals. As a victim of a violent crime herself, she is excellent at spending hours helping victims, who think they remember little, come up with descriptions that are very accurate.

At this stage, young scientists are continuing to use descriptive and positional words to explain objects to their peers. Examples of descriptive words include words describing color, shape, size, hardness, texture, transparency, etc. Examples of positional words include near/far, beside, behind, in front of, on top of, below, diagonal to, etc.

Students will discover that a picture can replace a long verbal description and help others better understand. In science it is very common to use pictures — photographs, diagrams and graphs — to convey your process and findings.

Notes for the Students

Sometimes a forensic artist must draw something that she has never seen. This happens when a **witness**, or person who saw what happened, has information about the crime that the investigators are not able to look at. Sometimes this information is about an object that is no longer on the scene — such as a getaway car or something that was taken. Sometimes this information is about a person — such as a possible suspect or missing person.

When a witness sees something you did not, he can help you imagine what he saw by describing it. A witness might describe an object's: (try to find an object in the classroom matching each descriptive word)

- Size – large, medium, small, gigantic, tiny…
- Color - red, orange, yellow…

- Shape – round, square, oval, flat…
- Texture – smooth, rough, bumpy, spiky…

These words will help you to "see" the object in your mind.

The witness might also use words to describe the position of a person of interest or what happened. For example, he might say:

- She wore a hat on her head.
- He came out from behind the counter.
- They drove around the corner and out of sight.

Other positional words might include near/far, beside, in front of, below and diagonal to.

Drawing a **composite sketch** from a description can be tricky, especially if you are drawing a person or an animal, due to the concept of a **mirror image**. A mirror image is when something looks correct in appearance but is reversed, like your image in a mirror.

Discussion Demonstration:

- Choose two students to help you with this demonstration. Give one student the role of a forensic artist. The other student plays the object of the artist's sketch. Ask them to wear the appropriate sticker so it is visible to classmates.
- As a class, help the Artist and the Sketch to identify their left hand. Use a washable marker to write "L" on this hand. Repeat with the right hand. You can also show students that their left hand can make a letter "L" with the pointer finger and thumb. The right hand makes a backwards "L."
- Have the Artist and the Sketch stand facing classmates. Ask the Artist to point to the Sketch's left hand. Then ask the Sketch to raise his left hand. Do they agree?
- Next have the Artist and Sketch stand facing one another. Ask the Artist to point to the Sketch's left hand. Then ask the Sketch to raise his left hand. What happened?
- Ask, "Why is the Sketch's left hand on the Artist's right side?" Guide students to the idea of a mirror image. When two people face the same way, their left and right side line up. However, when two people face one another, their left and right side do not line up. They are a mirror image of one another.
- Explain that a forensic artist must remember that the left side of a person in a sketch is drawn on the right side of the paper and vice versa.

You have already practiced using your senses to gather information in front of you. Now you will practice sharing information about an object with a partner when only one of you is able to see it. Good forensic scientists are able to describe and listen to descriptions of objects. Both of these skills are important to this case and will help us bring Alice home!

Vocabulary

Composite sketch: a drawing of a face used in forensic science to help identify a person of interest

Cube: a box-shaped object with six equal square sides

Mirror Image: an image of an object that is correct in appearance but reversed

Square: a four-sided flat shape with straight sides of equal length

Witness: a person who saw what happened

Activity 1: Tell Me What You See

25 minutes

1. Divide the class into pairs. Have pairs sit back to back.
2. Give each pair a cup of four cubes. One person, the builder, uses the four cubes to make a small structure. The building must use all of the cubes, and all the cubes must touch.

3. The forensic artist's job is to draw the building that the builder will describe to him. Students may use a two dimensional square to represent the cube for this activity.
4. The builder uses positional and descriptive words to explain the building to his partner. The partner listens to the description and attempts to draw what the building looks like.
5. Switch roles and repeat the activity.
6. If time allows, review the definition of a square and a cube. Talk students through the steps to draw a cube in their student books. Perfection is not to be stressed, just the basic concept.
    1. Draw a square.
    2. Draw an overlapping square.
    3. Connect the squares at their right angels using four dotted, diagonal lines.
7. Collect cubes and cups. Be sure to keep cups as they will be needed for future lessons.

Activity 2: Drawing Alice

30 minutes

1. Have students find the blank guinea pig template in their Student Books. Point out the words "Alice's left side" and "Alice's right side" on the sketch. Remind them that when two people are facing one another their left and right side do not line up.
2. Explain that you will read a description of Alice to them several times. As you read, encourage them to imagine what Alice looks like on their sketch. One could describe Alice as striped and she has crazy hair that goes every which way!
    - Alice has black eyes.
    - She has a black nose.
    - Alice has a furry black patch between her eyes.
    - She has bushy orange eyebrows.
    - Alice's right ear is white.
    - Alice's left ear is brown.
    - Both sides of Alice's face are mixed brown and orange.
    - Alice has a wide orange ring around her neck.
    - The middle of Alice's body is the same mix of orange and brown as her face.
    - Alice has a wide orange ring around her body near her hips.
    - The back of Alice's body is the same color as her face and middle body.
3. Next give students access to crayons. This time, as you read the description, students should try to create a composite sketch of Alice in their books. Remind them that because Alice's hair is crazy and has a mix of colors that a mistake can easily be covered.
4. Read through the description as many times as students would like. Allow them to ask questions about the description. Encourage them to change their drawing as necessary.
5. Afterwards, have students compare their sketches. What do you notice?
6. Reveal the pictures of Alice. Have students share their reactions.

Wrap-up

10 minutes

1. Encourage discussion about the lesson. Ask:
    - What was it like to describe your building to your partner?
    - How is drawing what you are told different from drawing something that you can see for yourself?
    - How similar were the drawings and the actual buildings? Why do you think that is?
    - Which role did you prefer — the describer or the listener? Why?
    - What was it like to draw Alice from a description?

How similar was your drawing to your friends' drawings? To the actual picture of Alice?

Clean-up

5 minutes

Put away photos, cubes, cups and crayons.

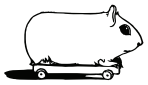
Other Directions, Discussions and Destinations

1. Have students use their drawings of Alice to make "MISSING" posters. Encourage them to use descriptive words and art to help others identify Alice.
2. Play your own version of Guess Who? in the classroom. Have everyone stand up. The teacher will choose one student to be "the suspect." Do not reveal who the suspect is. Have students ask yes or no questions about the suspect (ex. Does this person have on glasses? Is this person wearing pink?). As questions are answered, students who do not match the given description should sit down until "the suspect" is the only one standing. Keep track of how many questions it takes to find the suspect. Challenge students to try to get this number as low as possible.
3. Have students spend time drawing self portraits using mirrors. Encourage them to use descriptive words about themselves.

Notes

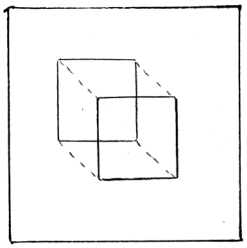
Lesson 3

Drawing a Cube



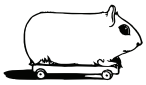
Use the space below to practice drawing a cube.

1. Draw a square.
2. Draw an overlapping square.
3. Connect the squares using four dotted, diagonal lines.



Lesson 3

Drawing Alice



Make a colorful composite sketch of Alice the guinea pig from the description below. Check off each number as you finish it.

- ☐ 1. black nose and eyes
- ☐ 2. furry black patch between eyes
- ☐ 3. bushy orange eyebrows
- ☐ 4. white right ear
- ☐ 5. black left ear
- ☐ 6. both sides of face: mixed brown and orange
- ☐ 7. wide orange ring around neck
- ☐ 8. middle of body: orange and brown like her face
- ☐ 9. wide orange ring around her body near her hips
- ☐ 10. back end same color as her face and middle body

Lesson 3

Drawing Alice

Alice's right

Alice's left