

## Chapter Overview

The skill of observation is critical to the field of forensic science. Many factors affect our observational skills, such as our mood and whether we are alone or in a group. At times, how our brains perceive what goes on around us may not reflect reality. To be good observers, we must be systematic about how we examine our surroundings and not jump to conclusions. Sometimes a person is wrongly convicted of a crime because of faulty eyewitness testimony. People often remember things differently than how the events actually occurred. The purpose of the Innocence Project is to use DNA evidence to reexamine some of these cases.

## The Big Ideas

Observation is how you perceive your surroundings. Your brain affects your observations by filtering the information you take in from your environment. Many factors affect eyewitness accounts of a crime. Investigators must understand these factors when determining the accuracy of a witness's testimony. With practice and patience, you can train yourself to be a good observer. Forensic science attempts to uncover factual evidence from a victim, suspect, and crime scene. Forensic scientists do not try to prove whether someone is innocent or guilty. They are only interested in collecting and examining evidence.

### WAS SOMEONE STEALING THE TREES?

An officer with the Department of Natural Resources was called to a farm where a landowner had discovered missing trees. The trees were black walnut, a valuable wood used to make expensive furniture. The officer found six stumps where once there were living trees. The limbs and branches were left behind. Scattered around the woods were 20 empty beer cans.

The officer examined the area and found tracks left by a truck leading across a neighbor's field; the perpetrator of the theft had then cut through the boundary fence. By following the tracks, the officer found where the truck had slid sideways and scraped against a tree, leaving a small smear of paint. These pieces of evidence were photographed and sampled.

The landowner remembered having seen similar tire marks leading into another wooded area two miles up the road. The officer investigated these marks and found several more black walnut stumps and more empty beer cans. The officer documented numerous forms of evidence—a paint sample from the truck, tire tread impressions, and one fingerprint lifted from a beer can. The thefts stopped, and the case was considered unsolved.

Two years later, a man was caught stealing black walnut trees a couple of counties away, and his truck was impounded. The officer compared the original paint sample to match-



An investigator examines paint evidence.

ing paint from the truck. A receipt in the truck from a veneer mill (veneer is the thin layer of high-value wood put on the surface of low-quality woods to be used in furniture) suggested that the man had been selling logs for some time.

The paint on his truck was consistent with paint found at the crime scene, and his fingerprints matched the fingerprint found on the beer can at the scene. Based on the evidence, he was convicted, fined, and sent to prison for six years. An observant investigator was able to collect sufficient evidence for a jury to find the man guilty of stealing the trees.

### SCENARIO

What evidence was the most valuable in convicting the suspect? Why?  
What tools did the investigator use to gather the evidence?

## KEY SCIENCE CONCEPTS

**Biology:** DNA, genetic code

**Psychology:** brain information processing, using the five senses to gather information

### OBJECTIVES

By the end of this chapter, you will be able to:

- 1.1 Define *observation* and describe what changes occur in the brain.
- 1.2 Describe examples of factors influencing eyewitness accounts of events.
- 1.3 Compare the reliability of eyewitness testimony to what actually happened.
- 1.4 Relate observation skills to their use in forensic science.
- 1.5 Define *forensic science*.
- 1.6 Practice and improve your own observation skills.



### VOCABULARY

**analytical skills** the ability to identify a concept or problem, to isolate its component parts, to organize information for decision making, to establish criteria for evaluation, and to draw appropriate conclusions

**deductive reasoning** deriving the consequences from the facts using a series of logical steps

**eyewitness** a person who has seen someone or something and can communicate these facts

**fact** a statement or assertion of information that can be verified

**forensic** relating to the application of scientific knowledge to legal questions

**logical** conclusions drawn from assumptions and known facts

**observation** what a person perceives using his or her senses

**opinion** personal belief founded on judgment rather than on direct experience or knowledge

**perception** interpreting information received from the senses

### Teaching Resources

- Instructor's Resource CD-ROM includes:
  - PowerPoint Presentation
  - Lesson Plan and extended Objective Sheets
  - Instructor Notes and Activities
  - Activity Forms
  - Rubric
- ExamView CD-ROM
- E-book on CD-ROM

Web site: [school.cengage.com/forensicscience](http://school.cengage.com/forensicscience)



## Engage

Before students enter the classroom, set up a few things that are out of the ordinary, such as a stack of papers spread out on the floor and a desk chair turned upside down. First, ask students to describe what they see. Then, ask for their possible explanations of what might have occurred. Ask them what skills they used to come up with their explanations.

## Science



### Psychology

Ask students to name the five senses. Then discuss brain research, which has identified the regions of the brain that control each sense, as well as the parts responsible for thought and emotions.

## INTRODUCTION

One of the most important tools of the **forensic** investigator is the ability to observe, interpret, and report **observations** clearly. Whether observing at a crime scene or examining collected evidence in the laboratory, the forensic examiner must be able to identify the evidence, record it, and determine its significance. The trained investigator collects all available evidence, without making judgments about its potential importance. That comes later. Knowing which evidence is significant requires the ability to recreate the series of events preceding the crime. The first step is careful and accurate observation (Figure 1-1).

**Figure 1-1.** A crime scene is often laid out in a grid to ensure that all evidence is found.

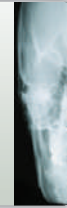


©MP Photo/Charles Bennett

### Digging Deeper

With Forensic Science e-Collection

Can a beer can in the woods lead to a conviction? A smashed dial on a safe betray the suspect? They have, and now it's your turn. Search the Gale Forensic Science eCollection on [school.cengage.com/forensicscience](http://school.cengage.com/forensicscience) to find a case study and demonstrate in writing how good observation skills led to the solution of a crime.



Obj. 1.1  
and 1.4

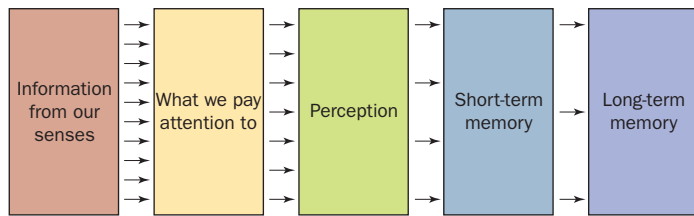
## WHAT IS OBSERVATION?



Every single moment, we are gathering information about what is around us, through our senses—sight, taste, hearing, smell, and touch. We do this largely without thinking, and it is very important to our survival. Why are we not aware of all the information our senses are gathering at any time? The simple answer is that we cannot pay attention to everything at once. Instead of a constant flow of data cluttering up our thoughts, our brains select what information they take in; we unconsciously apply a filter (Figure 1-2). We simply pay attention to things that are more likely to be important. What is important is decided by various factors, including whether the environment changes. For example, if you are sitting in a room and everything is still, you are unlikely to be filled with thoughts about the color of the sofa, the shade of the light, or the size and shape of the walls. But if a cat walks in, or you hear a loud bang, you will perceive these changes in your environment. Paying attention to the details of your surroundings requires a conscious effort.

It is difficult to believe, but our brains definitely play tricks on us. Our **perception** is limited, and the way we view our surroundings may not accurately reflect what is really there. Perception is faulty; it is not always accurate, and it does not always reflect reality. For example, our brains will fill in

Figure 1-2. How information is processed in the brain.



information that is not really there. If we are reading a sentence and a word is missing, we will often not notice the omission but instead predict the word that should be there and read the sentence as though it is complete.

Our brains will also apply knowledge we already have about our surroundings to new situations. In experiments with food coloring, a creamy pink dessert is perceived to be strawberry-flavored even though it tastes of vanilla. Our minds have learned to associate pink with strawberries and apply that knowledge to new situations—even when it is wrong. An interesting aspect of our perception is that we believe what we see and hear, even though our ability to be accurate is flawed. People will stick to what they think they saw, even after they have been shown that it is impossible.

If you are feeling like your brain is rather defective, do not worry: the brain, while faulty, is still good at providing us with the information we need to survive. Filtering information, filling in gaps, and applying previous knowledge to new situations are all useful traits, even if they do interfere sometimes. Understanding our limitations helps us improve our observation skills, which is extremely important in forensic science. Criminal investigations depend on the observation skills of all parties involved—the police investigators, the forensic scientists, and the witnesses.

## OBSERVATIONS BY WITNESSES

One key component of any crime investigation is the observations made by witnesses. Not surprisingly, the perceptions of witnesses can be faulty, even though a witness may be utterly convinced of what he or she saw. Have you ever noticed that you can walk along the street or ride in a car and be totally unaware of your surroundings? You may be deeply involved in a serious conversation or hear some disturbing news and lose track of events happening around you. Your focus and concentration may make an accurate accounting of events difficult.

Our emotional state influences our ability to see and hear what is happening around us. If people are very upset, happy, or depressed, they are more likely not to notice their surroundings. Anxiety also plays a big part in what we see and what we can remember. Our fear at a stressful time may interfere with an accurate memory. Victims of bank robberies often relate conflicting descriptions of the circumstances surrounding the robbery. Their descriptions of the criminals committing the robbery often do not match (Figure 1-3).



China, 1248: The suspect in a stabbing death confessed after flies were used to determine which knife in the village had blood on it. All of the knives of the village were collected, and when the flies all landed on just one knife, the man confessed.

Obj. 1.2,  
1.3,  
1.4,  
and 1.6

## Explore

*Perception* may be a difficult term for some students to understand. Have students perform an activity that illustrates perception, such as touching an unseen object and guessing how he or she perceives the object. Did the students guess correctly? Ask them what information they used to form their perception.

We use our five senses to make observations. Ask students what observations they can make about the classroom. Was a test given during the previous class period? Was a demonstration of some kind given? What evidence do they have? Have students recall what you were doing as they entered the classroom. Can they remember details? Why or why not? Have students brainstorm situations when their senses are heightened and they are more conscious of their surroundings. What similarities do these situations share?

Paul Ekman, who is featured in the Careers section, can tell if someone is lying. Discuss with students how they can tell if someone is not telling the truth. What factors do they look for?

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## Differentiated Learning

### Teaching At-Risk Students

Ask for a student to volunteer to empty his or her backpack contents on a table and leave them there for a few minutes, while the others observe. Put the items back, and have the students return to their desks. Now ask them to write down all of the items they remember. How much detail can they recall? Was anything missed? Why did students remember certain items and not others?



## Evaluate

Ask students to discuss why eyewitness accounts of a crime often differ. They should note that the accounts are based on different individuals' observations, and that each person brings a different set of physical and emotional tools to the observation.

**Figure 1-3.** The success of a police lineup depends on an eyewitness's ability to recognize a person seen at a crime.



In an unusual situation, however, our ability to observe is often heightened. For example, most people can recall exactly where they were when they first heard of the attack on the World Trade Center towers in Manhattan on September 11, 2001.

Other factors affecting our observational skills include:

- Whether you are alone or with a group of people
- The number of people and/or animals in the area
- What type of activity is going on around you
- How much activity is occurring around you

All of these factors influence the accuracy of a witness's observations.

### EYEWITNESS ACCOUNTS

What we perceive about a person depends, in part, on his or her mannerisms and gestures. How a person looks, walks, stands, and uses hand gestures all contribute to our picture of his or her appearance. Think about your family members. How would you describe them? What makes them unique? We also form images of familiar places. Our homes, school, and other places we might often visit (e.g., a favorite store or restaurant) are burned into our memories and easy to recognize and remember.

**Eyewitness** accounts of crime-scene events vary considerably from one person to another. What you observe depends on your level of interest, stress, concentration, and the amount and kind of distraction that may be present. Our prejudices, personal beliefs, and motives also affect what we see. Memory fades with time, and our brains tend to fill in details that we feel are appropriate but may not be accurate. These factors can decrease an eyewitness's reliability in reporting a crime. The testimony of an eyewitness can be very powerful in persuading the jury one way or another; knowing the shortcomings of eyewitness testimony is necessary to ensure that justice is carried out appropriately.

## THE INNOCENCE PROJECT

The Innocence Project at the Benjamin N. Cardozo School of Law at Yeshiva University in New York was created by Barry C. Scheck and Peter J. Neufeld in 1992. Its purpose was to reexamine post-conviction cases (individuals convicted and in prison) using DNA evidence to provide conclusive proof of guilt or innocence (Figure 1-4). After evaluating more than 200 wrongful convictions in the United States, the Innocence Project found that faulty eyewitness identification contributed up to 87 percent of those wrongful convictions. Eyewitness errors included mistakes in describing the age, and facial distinctiveness of the suspect. These mistakes resulted from disguised appearances, brief sightings of the perpetrator, cross-gender and cross-racial bias, and changes in the viewing environment (from crime scene to police lineup).

When evaluating eyewitness testimony, the investigator must discriminate between **fact** and **opinion**. What did the witness actually see? Often what we think we see and what really happened may differ. The act of someone fleeing from the site of a shooting might imply guilt but could also be an innocent bystander running away in fear of being shot. Witnesses have to be carefully examined to describe what they saw (eyewitness evidence), not what they thought happened (opinion).

On completion of witness examination, the examiner tries to piece together the events (facts) preceding the crime into a **logical** pattern. The next step is to determine if this pattern of events is verified by the evidence and reinforced by the witness testimony.

**Figure 1-4.** Gary Dotson was the first individual shown to be innocent by the Innocence Project.



©AP Photo/Seth Perlmutter



## Science



### Biology

Why is DNA used in forensics? What is unique about it?

Review students' understanding of DNA. Make sure they understand that DNA is the blueprint of who we are. Everyone's DNA is different, with the exception of identical twins.

### Teaching Tip

A quick activity going over quantitative data and qualitative data can help students pull out observations from an object. Some students have trouble distinguishing between a factual statement and an opinion. A brief exercise defining the two may be helpful.

For example, a fact about a maggot might be: 2.1 cm. long, with two long black hooks on the anterior end, and a posterior end wider than the anterior end. The associated opinion might be: "That's gross!"

## HOW TO BE A GOOD OBSERVER

We can apply what we know about how the brain processes information to improve our observation skills. Here are some basic tips:

1. *We know that we are not naturally inclined to pay attention to all of the details of our surroundings.* To be a good observer, we must make a conscious effort to examine our environment systematically. For example, if you are at a crime scene, you could start at one corner of the room and run your eyes slowly over every space, looking at everything you see. Likewise, when examining a piece of evidence on a microscope slide, look systematically at every part of the evidence.
2. *We know that we are naturally inclined to filter out unimportant information.* However, at a crime scene, we do not know what may turn out to be important. In this situation, we can consciously decide to observe everything, no matter how small or how familiar, no matter what our emotions or previous experiences. So we train ourselves to turn off our filters, and instead act more like data-gathering robots.
3. *We know that we are naturally inclined to interpret what we see, to look for patterns, and make connections.* To some degree, this inclination can lead to us

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## Digging Deeper

Have students compare the case study they chose with those chosen by others. They should analyze the observation skills used in each, and compare any similarities or differences. Challenge students to think outside the box. Ask: "Do you think the outcome of the case would be different if one of the observations was not made? Why?"

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## Digging Deeper

with Forensic Science e-Collection

Observation is often as much about finding evidence as it is about spotting patterns of criminal behavior. We know that, on average, most thieves who come in through a window will leave by a door. Search the Gale Forensic Science eCollection on [school.cengage.com/forensicscience](http://school.cengage.com/forensicscience) for the two articles by Carl S. Klump and Kim Rossmo. Write a brief essay comparing the two contrasting views on investigating crimes through observing patterns.

Carl Stanton Klump. "Taking your cue from the clues." (using deductive reasoning in investigations) *Security Management* 41.9 (Sept. 1997): p. 123(3). From *Forensic Science Journals*.

D. Kim Rossmo. "Criminal investigative failures: avoiding the pitfalls." *The FBI Law Enforcement Bulletin* 75.9 (Sept. 2006): p. 1(8). From *Forensic Science Journals*.

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jumping to conclusions. While observing, we need to be careful that we concentrate first and foremost on gathering all of the available information and leaving the interpretation until we have as much information as possible. The more information we have, the better our interpretations will be. That does not mean that we should not think about what we see. If we analyze what an observation might mean at the time, we may be led to look more closely for further evidence.

4. *We know that our memories are faulty.* While observing, it is important to write down and photograph as much information as possible (Figure 1-5). This will become very important later when we, or our investigating team members, are using our observations to try to piece together a crime. Documentation also is important when acting as an expert witness. A judge will only accept hair evidence that has been documented in writing and with photographs taken at the crime scene. The verbal testimony of a forensic scientist alone may not be entered into evidence without the proper documentation.

Figure 1-5. Documentation is an essential part of observation.



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## Differentiated Learning

### Teaching English-Language Learners

Have students work in pairs. One student closes his eyes while the other student changes something about his physical appearance, such as removing a watch or a piece of jewelry. After opening his eyes, the other student must try to describe the change.



Forensics: the word conjures up images of *CSI: Miami*, lab coats, and darkly lit laboratories, but that is not where the word comes from. Forensic derives from the Latin word, *forensis*, which means “of the forum.” The forum was an open area where scholars would gather to debate and discuss issues. The forum is the historical equivalent of modern-day courts. Two thousand years ago, crimes were solved by debate. Sides for the suspect and victim would give speeches, and the public would decide who gave the best argument. Today, debating is often still called forensics.

However, debating and arguing is not forensic science. Forensic science is strictly concerned with uncovering evidence that stands as fact. It is using science to help in legal matters, such as crimes. A forensic investigator is not interested in making the suspect look guilty; he or she is only interested in collecting and examining physical evidence, reporting this to investigators, and possibly later to the courts. The lawyers then partake in a more Roman-style forensics and try to convince the jury by constructing a plausible story around these facts.

**Figure 1-6.** A forensic scientist acting as an expert witness in court.



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## WHAT FORENSIC SCIENTISTS DO

So what do forensic scientists do? Their first task is to find, examine, and evaluate evidence from a crime scene. One of the key skills in doing this job well is observation. Forensic science and observation go hand in hand. Forensic scientists also act as expert witnesses for the prosecution lawyers (Figure 1-6). Generally, specialists deal with certain types of evidence. Ballistics experts work with bullets and firearms; pathologists work with bodies to determine the cause of death through the examination of injuries. Textile experts, blood-spatter experts, vehicle experts, and animal experts all rely on observation skills to do their jobs.

Police officers and examiners are trained to have good observation skills. This does not always come naturally, even to police officers. Part of their training is learning to take in the entire scene before making a final assessment based on their observations. They are told to avoid tunnel vision when they observe a crime scene, and they learn the same things that you are learning in this chapter. Police are trained to not only observe but also to carefully analyze what they see. The ability to solve a crime depends on observing all of the evidence left at a crime scene. **Analytical skills** of this type require patience and practice.

The character Sherlock Holmes had excellent observation skills that made him a phenomenal detective. He could look at a situation and find clues in the ordinary details that others missed. Then, he worked backward from the evidence to piece together what happened leading up to the crime. Holmes used **deductive reasoning** to verify the actual facts of the case. The abilities to observe a situation, organize it into its component parts, evaluate it, and draw appropriate conclusions are all valuable analytical skills used by forensic examiners. Forensic scientists are all, in their own way, modern-day Sherlock Holmeses.



High-ranking police officers in New York City are trained in observation skills at a local art gallery, the Frick Museum. The police learn to identify details in the paintings and draw conclusions about the paintings' subjects. They apply their new skills out in the real world.

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## Differentiated Learning

### Teaching Gifted Students

Ask students to develop a scenario that explains the following observations: a strong odor inside a house; two people lying on the floor of a room in the house, one of them grasping a newspaper in his hand; three other people standing or sitting in other rooms in the house; a group of five-year-olds playing outside the house; and a fire truck outside the house.





## Engage

Discuss with students the fact that the brain processes information, and certain factors affect how the brain filters information. A person's experiences strongly influence what he or she sees and hears. Ask students to discuss what they think happens in such a situation.

*Qualitative* data is descriptive data, such as color, shape, and size. We collect qualitative data using our senses. *Quantitative* data is numerical data, such as weight, height, and mass. Scientists have established a rigorous study procedure called the Scientific Method. The steps are 1) state the problem or question, 2) propose a hypothesis based on prior knowledge or observation, 3) conduct an experiment, 4) collect data, 5) analyze results, and 6) draw a conclusion based on the data.

A hypothesis is an investigator's initial (and untested) possible explanation to the question or problem based on prior knowledge or observation. It is not a guess.

## SUMMARY

- Our ability to observe is affected by our environment and the natural filters of sensory information in our brains.
- The observations of witnesses to crimes can be partial and faulty, but in some cases also precise.
- The Innocence Project has found that 87 percent of their wrongful conviction cases resulted from flawed eyewitness testimony.
- Police officers and crime-scene investigators are trained in good observation practices.
- Forensic scientists find, examine, and evaluate evidence from a crime scene and provide expert testimony to courts.

## CASE STUDIES

### Carlo Ferrier (1831)

In 1831, three men aged 33, 30, and 26 were tried in a court in London, England, for the murder of a 15-year-old Italian immigrant, Carlo Ferrier. John Bishop, James May, and Thomas Williams brought the body in a sack to a local university, King's College, seeking money in exchange for the corpse. It was common practice at the time for universities and hospitals to buy bodies that had died from natural causes to use for anatomy lessons and

research. However, the university staff member noticed that this body looked particularly fresh, and he turned the three men over to the police because of his suspicion. The conviction of the suspects rested on a variety of evidence that was collected because of excellent observation skills. A surgeon carefully examined the body and noticed that all of the organs were healthy; the cause of death did not appear natural. Blood pooled around the spinal cord at the back of the neck was the only sign of violence, and was in keeping with what would be expected from a blow to the back of the neck. Other evidence included bloodstained clothes belonging to the dead boy, which were found buried in the back garden of the accused. These articles were recovered when a policeman inspecting the residence noticed a patch of soft earth in the garden. Bishop, May, and Williams were sentenced to death.



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### Three Wrongful Convictions

In August 2003, charges were dropped against two men who were wrongly identified and imprisoned for 27 years based on a faulty eyewitness account. In 1976, Michael Evans and Paul Terry were tried and sent to prison for the rape and murder of nine-year-old Lisa Cabassa. They were convicted on the testimony of one purported witness. Recent DNA tests proved that the men were not guilty of the charges.

In a Florida case, death row inmate Frank Lee Smith died of cancer in January 2000 while in prison. He was convicted in 1986 of the rape and murder of an eight-year-old child, even though no physical evidence was found. He was found guilty largely on the word of an eyewitness. Four years after the crime, the eyewitness recanted her testimony, saying she had been pressured by police to testify against Smith. Despite this information, prosecutors vigorously defended the conviction and refused to allow Smith a postconviction DNA test he requested. After his death, the DNA test exonerated him.



©AP Photo/Jamie Reector



**Think Critically** Review the Case Studies and the information on observation in the chapter. Then state in your own words how eyewitness evidence impacts a case.

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#### Web site

Gale Forensic Sciences eCollection, [school.cengage.com/forensicscience](http://school.cengage.com/forensicscience).

### Close

Review the five senses and how each one contributes to observation. Make sure students understand that while we rely strongly on the senses of sight and hearing, the other senses are important in observation.

Have students identify factors that can influence observation. Create a class list on the board or overhead projector. Select factors from the list and ask students to explain how and why that factor affects observation.

## CAREERS

Discuss other professions with students in which psychology would be a valuable component (e.g., detective, interrogator, post-trauma counselor, or rehabilitation counselor). For example, a post-trauma counselor provides counseling and evaluation for the survivors of tragedies and disasters and their families and associates.

Invite interested students to read Paul Ekman's *Emotions Revealed* or *Unmasking the Face*. Encourage volunteers to report to the class what they learned.

For more information on careers in psychology visit: [www.psychjobs.cjb.net](http://www.psychjobs.cjb.net).



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### Paul Ekman

Very few people can lie to Paul Ekman and get away with it. He can read faces like an open book, spotting the most subtle changes in expression that reveal if a person is lying. A psychologist who has spent the last 50 years studying faces, Ekman is a leading expert on facial analysis and deception. This skill puts him in high demand by law-enforcement groups around the world, such as the Federal Bureau of Investigation (FBI), Central Intelligence Agency (CIA), Scotland Yard, and Israeli Intelligence.

When looking for deception, Ekman watches for inconsistencies, such as facial expressions that do not match what is being said. He can also detect what are called *microexpressions*—rapid changes in expression that last only a fraction of a second but reveal a person's true feelings. It is a rare talent to be able to spot these microexpressions. Only 1 percent of people are able to do so without training.

Ekman was the first to determine that a human face has 10,000 possible configurations and which muscles are used in each. He then created the Facial Action Coding System. This atlas of the human face is used by a variety of people looking to decode human expression, including investigators, psychologists, and even cartoon animators.

Ekman has turned his expert gaze onto many famous faces. He thinks the mysterious Mona Lisa is flirting, and he can identify the exact facial



Courtesy, Paul Ekman

Paul Ekman

muscles Bill Clinton used when he lied about Monica Lewinsky. He has studied tapes of Osama Bin Laden to see how his emotions changed leading up to the 9/11 terrorist attacks.

Ekman first became interested in facial expressions at the age of 14, after his mentally ill mother committed suicide. He hoped to help others like her by understanding emotional disorders. From his experience as a photographer, he realized that facial expressions would serve as a perfect tool for reading a person's emotions.

Ekman's early research led to a major discovery that changed how scientists view human expression. Experts used to believe that facial expressions

were learned, but Ekman thought otherwise. He traveled around the world and found that facial expressions were universally understood, even in remote jungles where natives had never before seen a Westerner. It could mean only one thing: our expressions are biologically programmed. This opened the door for Ekman to study human expression in a completely new way.

Fifty years of groundbreaking research followed Ekman's discovery. He served first as Chief Psychologist for the U.S. Army, and then as a professor at the University of California. Now in his seventies, Ekman continues to train others to detect deception and improve safety and security. Liars will never have it easy again!



#### Learn More About It

To learn more about Paul Ekman and the work of forensic psychologists, go to [school.cengage.com/forensicscience](http://school.cengage.com/forensicscience).

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# CHAPTER 1 REVIEW

## Chapter 1 Review

### True or False

### True or False

1. The word *forensic* refers to the application of scientific knowledge to legal questions. *Obj. 1.5*
2. Good observation skills come naturally to investigators; they do not need to be trained. *Obj. 1.1*
3. If we remember seeing something happen, we can trust that it happened just as we think it did. *Obj. 1.2 and 1.3*
4. Most wrongful convictions seem to be the result of faulty eyewitness testimony. *Obj. 1.2 and 1.3*
5. The Innocence Project is an organization that seeks to get convicted killers out of prison. *Obj. 1.2 and 1.3*

1. True
2. False
3. False
4. True
5. False

### Multiple Choice

### Multiple Choice

6. A forensic scientist is called to a court of law to provide *Obj. 1.5*
  - a) fact
  - b) opinion
  - c) judgement
  - d) reflection
7. Our state of mind affects how we observe our surroundings. What mental state is the best for observing? *Obj. 1.2 and 1.4*
  - a) happy
  - b) relaxed
  - c) nervous
  - d) excited
8. The Innocence Project found that most faulty convictions were based on *Obj. 1.2 and 1.3*
  - a) out-of-date investigating equipment
  - b) poor DNA sampling
  - c) inaccurate eyewitness accounts
  - d) officers not thoroughly observing a crime scene
9. All of the following are ways to improve our observational skills **except** *Obj. 1.2 and 1.4*
  - a) be sure to look at the entire area, not just the body, weapons, or signs of break-in
  - b) observe everything no matter how big or small
  - c) when collecting evidence, record only those things that you are sure are important
  - d) write down and photograph everything you find
10. The forensic scientist has many duties. Which of these is **not** a job for a forensic scientist? *Obj. 1.4 and 1.5*
  - a) give evidence in court
  - b) question a suspect
  - c) sign a Cause of Death document
  - d) search for evidence

6. a
7. c
8. c
9. b or c
10. b

**Short Answer**

11. Observation skills help in identifying the events that happen at a crime scene.
12. Examine the environment systematically, observe everything, and do not jump to conclusions.
13. It may alter it by filtering information and filling in gaps.
14. Two people may perceive a situation differently due to these factors:
  - Some people are more observant than others.
  - The situation may be more distracting for one person than another and therefore, they would not notice the same things.
  - People may be focused on different things, such as a person, object, or action, so they notice different things.
  - People's memories differ.
15. We can learn what facial muscles are used in deception. Facial muscles are often used to note deception. If a person is lying, then small microexpressions may be noted. His or her face may reveal inconsistencies between what is being said and his or her facial expression.

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**Short Answer**

11. Why are observation skills important to forensic science? *Obj. 1.4*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
12. Name three ways you can improve your observation skills. *Obj. 1.4 and 1.6*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
13. Describe two ways that your brain may alter sensory information. *Obj. 1.1, 1.2, and 1.3*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
14. Describe a situation where two different people might perceive a crime scene in different ways. *Obj. 1.2 and 1.3*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
15. Briefly describe what can be detected by observing facial expressions. *Obj. 1.2, 1.3, and 1.4*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## ACTIVITY 1-1 *Ch. Obj. 1.2, 1.3, 1.4, and 1.6*

### LEARNING TO SEE



#### Objectives:

By the end of this activity, you will be able to:

1. Describe some of the problems in making good observations.
2. Improve your observational skills.

**Time Required to Complete Activity:** 25 minutes

#### Materials:

lab sheets for Activity 1-1  
pencil

#### Safety Precautions:

None

#### Procedure:

1. Your teacher will provide you with Photograph 1 and a question sheet.
2. Study Photograph 1 for 15 seconds.
3. When directed by your teacher, turn over your question paper and answer as many of the questions as you can in three minutes.
4. Repeat the process for Photographs 2 and 3.
5. Discuss the answers to the questions below with your classmates.

#### Questions (for class discussion):

1. Did everyone answer all of the questions correctly?
2. If everyone viewed the same photograph, list some possible reasons why their answers differed.

## ACTIVITY 1-1

### Background

During this activity, students will use their observation skills to answer questions about three photographs they studied for a few seconds each. They will then compare their answers with the rest of the class and discuss reasons why they think some answers differed.

### Safety Precautions

None

### Procedures

1. Print and copy Activity Sheets from the IRCD.
2. Print Question Sheets for the photographs. These question sheets should be copied and handed out separately to avoid students reading questions in advance of activity.
3. Do not give all three photographs to the students at once.
4. Do not let students read the questions before studying the photographs.
5. Make sure all students are able to see the pictures in the given time.

### Answers

1. Answers will vary.
2. Possible answers: the time allotted to answer the questions, everyone's brain fills in gaps differently, the mood of the investigator.

Observation Skills 15

### Future Research and Extensions

Look at the photos from this activity and answer the questions about them again several days later. Tell students that this is similar to revisiting a crime scene. Did students notice different things the second time? Did they fill in more details?



## ACTIVITY 1-2

### Background

During this activity, students will be given a time limit of three minutes to observe a photograph of a crime scene and then answer questions about the scene. They will get an idea of how good an eyewitness they might be by how well they answer the questions. Students will also have an opportunity to access their observation skills.

### Safety Precautions

None

### Procedures

1. Print and copy Jane's Restaurant from the IRCD.
2. Print and copy the questionnaire for Jane's Restaurant.
3. Do not let the students see the picture before the activity has begun.
4. Do not let the students read the questions before studying the picture.
5. Make sure all students are able to see the picture in the given time.

### Answers

1. Answers will vary.
2. Not all eyewitness testimony may be helpful in court. Eyewitnesses may not remember everything correctly. One witness's account may differ from another's.
3. Possible answers: my mood, the time I had to observe the crime scene and write down my answers, and my own experiences.
4. Possible answer: learn to look at everything and do not judge whether something is important or not.



## ACTIVITY 1-2 *Ch. Obj. 1.2, 1.3, 1.4, and 1.6* YOU'RE AN EYEWITNESS!

### Objectives:

*By the end of this activity, you will be able to:*

1. Assess the validity of eyewitness accounts of a crime.
2. Test your own powers of observation.

**Time Required to Complete Activity:** 45 minutes

### Materials:

(per student)

A copy of the scene of Jane's Restaurant

A copy of the questionnaire concerning Jane's Restaurant

### Safety Precautions:

None

### Procedure:

1. Obtain the image of a crime scene from your teacher.
2. Study the image for three minutes.
3. When given the signal, turn over the image, and answer the questions about the crime scene.

### Questions:

1. How well did you do in remembering the details in this picture?
2. What do the results of this activity say, if anything, to you about the usefulness of eyewitness accounts in a court?
3. What factors influenced your observations?
4. How could you improve your observation skills?

### Future Research and Extensions

Have one student look at a crime scene and then dictate his or her observations to another student to see if that student can sketch what the person is describing. How similar is the sketch to the observations?

## ACTIVITY 1-3 Ch. Obj. 1.2, 1.3, 1.4, and 1.6

### WHAT INFLUENCES OUR OBSERVATIONS?



#### Objectives:

By the end of this activity, you will be able to:

1. Test your ability to make observations during events.
2. Design an experiment involving a television or print commercial that demonstrates how different factors influence one's ability to observe.

#### Introduction:

Familiar TV commercials can be the basis for testing your observational skills.

**Time Required to Complete Activity:** 45 minutes

#### Materials:

videotape of a commercial provided by your teacher  
question sheets provided by your teacher  
pen or pencil

#### Safety Precautions:

None

#### Procedure:

1. Watch the commercial taped by your teacher.
2. Answer the questions on the sheet provided.

#### Questions:

1. How many people are in the video?
2. Describe the main character(s) in the commercial in terms of
  - a. Size
  - b. Age
  - c. Skin color
  - d. Height
  - e. Weight
  - f. Hair: style, color, length
  - g. Clothing
  - h. Hat
  - i. Glasses
  - j. Distinguishing features
  - k. Jewelry
  - l. Beard or no beard
  - m. Any physical limitations

## ACTIVITY 1-3

### Background

Students will test their observation skills when viewing a series of events. They will then design an experiment to test factors affecting people's observation skills.

### Safety Precautions

None

### Procedures

1. The template for the student-designed experiment will be on the IRCD. Print and make copies for your students.
2. You may need to provide variables that students can alter in designing their experiment, such as altering the number of people or their ages, the activity, other distractions such as children, animals, noise level, or by altering the emotional state of the students who are making the observations.

### Answers

Answers will vary.

## Student-Designed Commercial Activity

Provide the following format for students:

- Question
- Hypothesis
- Experimental Design
- Observation and Data
- Conclusion

## Observation Experiment Template

**Question:** Does the absence of sound affect observational skills?

**Experimental design:** Play a commercial to Group 1 with sound and then Group 2 without sound. Students may need to test several groups to get sufficient data.

**Factor:** Sound

**Group 1:** No sound

**Group 2:** With sound

How will you measure your data? Does one group provide more detailed the information than the other?

## Procedure

1. Print and copy the template from the IRCD.
2. Group 1 will watch the commercial with sound, then answer questions.
3. Group 2 will watch the commercial without sound, then answer questions.
4. Students may need to test with new groups for additional data.
5. Remind students that they need to *describe* the experiment and explain *what* is to be measured and *how* it is to be measured.



3. Describe the other people in the commercial.
4. Describe the area where the video was located.
5. What furniture, if any, was in the commercial?
6. Was the time noted?
7. Was it possible to determine the season?
8. What were the people doing in the commercial?
9. Were there any cars in the commercial? If so, describe the:
  - a. Model
  - b. Year
  - c. Color
  - d. License plate number
10. How long was the video?

### Student-Designed Commercial Activity:

Design an activity involving commercials that would demonstrate how different factors influence our ability to observe. You should include the following:

1. Question
2. Hypothesis
3. Experimental design
  - a. Control
  - b. Variable
4. Observations
  - a. What you will measure and how you will measure it
  - b. Include data tables
5. Conclusion based on your data


### Suggested Factors to Be Tested:

1. Will the number of people in the room affect someone's observational skills?
2. Will someone's observational skills be affected if he or she is listening to music while making the observation?
3. Are men less observant of the surrounding environment if the commercial features an attractive woman?
4. Are women less observant of the surrounding environment if the commercial features a handsome man?
5. Are young people less observant of an older person in a commercial as opposed to a younger person?

## Future Research and Extensions

Find some real-life experiments similar to yours. Researchers for political candidates create experiments for campaign ads. Write a report on the findings.



- 
6. Are older people less observant of younger people in a commercial as opposed to an older person?
  7. Will famous people (e.g., actors, actresses, singers, athletes) in a commercial encourage someone to watch the commercial and therefore be more observant of the product information?
  8. Does racial background affect someone's ability to recognize someone of a different race?
  9. Does the color of someone's clothing make the person more noticeable?
  10. Are bald men more difficult to recognize than men who have hair?
  11. If the person wears a hat, does that make him or her more difficult to recognize or more likely to be recognized?
  12. Does a person's style of clothing make him or her more noticeable or less? (For example, are there differences with responses with a man in a suit as opposed to a man in jeans?)
  13. Does the presence of a beard make someone less noticeable or more noticeable?
  14. Is an overweight person less likely to be observed than someone of normal weight?

Successful advertisement agencies realize that their commercials need to appeal to that segment of the population that is most likely to purchase the product. The better they target their commercial to the prospective buyers, the greater the chance that particular audience will listen and observe the information given in that commercial.

As a result of these commercial observational activities, students will be able to note how many factors influence our ability to observe. Police collect eyewitness accounts of a crime understanding that this is not the most reliable source of information used in solving a crime.

### **Future Research and Extensions**

Choose several different commercials and describe specific factors in each that are used to target children, parents, teens, and senior citizens.