

The Eyes Have It: Organization and Observation

OBJECTIVES

Students will:

- Use senses to make written observations
- Use the properties of color, texture, size and shape to record observations
- Use written information to identify objects
- Measure to collect data

MATERIALS

Instructor:

- 1 set of property cards (color, size, shape, texture, odor, sound)
- black marker
- 1 business envelope
- 1 ruler with inches and centimeters
- masking tape
- foreign coins
- 10+ paper cups
- 10 paper bags
- 10 textured objects
- supply bins

Students (groups of four):

- student activity books
- 4 pencils
- 2 rulers with inches and centimeters
- 2 cups of foreign coins (5 in each)
- 4 magnifiers
- 2 paper bags with 1 textured object inside each
- 4 business envelopes
- 2 black markers

PREPARATION

1. Organize 10 bags of textured objects.
 - Number the bags one through ten.
 - Put 1 object into each of the bags.
 - Fold top over securely.
2. Put 5 foreign coins into each of 10 cups. Try to have 2 very similar coins in each bin.
3. Assemble supply bins.
4. Place set of property cards, markers, business envelope and masking tape within easy reach.

5. Group students in pairs matching younger with older students. Then, group 2 pairs together to create a group of four students.



Notes for the Instructor

While science is defined as the study of the natural and physical worlds through observation and experimentation, forensic science is science applied to evidence. In this case, the information can be used in court. Forensic comes from *forensis*, the Latin word for forum; meaning a public meeting place for discussion. In Roman times, if one was accused of criminal acts, then the case had to be presented in public. Both the accused and the accuser had to give speeches based on their sides of the story. The decision in the case was based on who most convincingly presented their information.

Many different kinds of scientists can be part of forensic study. Forensic anthropologists are responsible for the recovery and identification of skeletal remains. Conducting DNA testing of body fluids for the purpose of identifying an individual is one job of a forensic biologist. Soil, mineral and petroleum evidence are handled by forensic geologists. Forensic odontologists, dentists, study teeth: their development, structure and diseases. Forensic pathologists are often mentioned on television shows. They study diseases and changes in the body to determine the cause of death. Analyzing the effects of drugs and poisons on a body is the responsibility of forensic toxicologists.

Forensic entomologists have an interesting and rather bizarre task. They rely on insects in, on and around remains. From this, they hope to determine the time and location of the death. In China, in 1248, there was an investigation of a



murder involving the use of a sickle. As part of the investigation, people were asked to report to a location with their sickles. While there, flies became attracted to the blood on the sickle of the murderer. The murderer confessed.

Obviously, crime scene investigators must be trained to do their jobs. One thing they must learn to do effectively is to observe using all of their senses: sight, hearing, taste, touch and smell. Once observations have been made, an investigator must tackle the process of recording the observations accurately and completely. The recorded observations may be in the form of notes or drawings, such as a crime scene map. Qualitative information, such as the color of eyes, hair and clothing, are included. Information related to numbers of any kind, such as the height and weight of a suspect and the number of criminals involved, is referred to as quantitative data.

The crime scene investigator is an important part of the legal process, and often testifies during trials. The more facts and details the investigator can supply, the more likely the correct suspect will be convicted. If information is incomplete or mishandled, then the guilty person could be set free. One of the first instances of using forensic science in a legal case was in 1016 in Harwick, England. A maid had been assaulted and drowned. Nearby were footprints and an impression made by corduroy fabric; the impression showed that a patch had been sewn on the fabric. Wheat particles were also found in the area. Based on the impression made by the corduroy and revealing the shape of the patch, and the wheat particles, a man who worked in a local wheat field was convicted of the crime.

In this activity, students will be introduced to the process of criminal investigation. It will be crucial that students observe and record accurately the details of the evidence from the crime scene. Students will have the opportunity to work in pairs and groups to practice their own observational skills

using a variety of objects. Recording will be done in the form of lists and data tables. The properties of foreign coins—size, shape, color and texture—will be used to complete the tables. In addition, measurement and the appropriate abbreviations for specific units will be addressed. An evaluation of these skills will take place as students attempt to identify specific objects based on their peers' data.



Notes for the Students

Read the following note from Mr. Pfister to the students, which was found in the box of supplies he has sent. Students can follow along in their activity books.

Dear Students,

I want to begin by thanking you very much for your willingness to help me solve the mystery of the missing money. Inside this box, you should find various items: bags of evidence, photographs, supplies for forensic testing and notes that contain both factual scientific information, as well as my own personal comments about what I am learning regarding the crime that took place in my classroom at Oakwood Elementary.

Quickly, before my students arrive, I'd like to share some information with you about what I learned from the FBI (Federal Bureau of Investigation) website. Although I do love all science, my interests are really in the field of environmental science. This information was fairly new to me.

*I learned that forensic science is really just lots of different kinds of science. It's science combined with evidence. There are lots of **forensic scientists** who help during an investigation: chemists, biologists, geologists and others. The information they present must be the result of careful **observations**. Forensic scientists must be trained to use their five senses to make these observations, which can be used in a court during a trial.*

I've included some things to help you practice your observational skills. This first activity will relate to a clue that you will be receiving from me later.

Vocabulary



Data: information, often in written form.

Forensic scientist: any type of scientist who can supply information that can be used in court or in a legal manner. For example, forensic anthropologists recover and study skeletons so the skeletons can be identified.

Observation: to study something using your five senses (sight, hearing, taste, touch and smell).

Properties: descriptive characteristics such as color, texture, shape and size.

Activity 1: Properties and Observations



15 minutes

1. Have one student from each group of four obtain a supply bin.
2. Students should each put their name on an activity book.
3. Read “Notes for the Students” aloud while students follow along in their activity books.
4. Have each student take out a business envelope. Hold up the business envelope and ask the students, using only their eyes, to give you a descriptive word about the envelope, such as:
 - white
 - rectangular/four-sided
 - long

Tell them that these words are examples of **properties**, which are words used to describe. Tape the appropriate property cards (color, size, shape) on the wall.

5. Next, ask the students to use their sense of touch to describe their envelopes:

- sharp edges
- smooth
- flexible

Tell them that these words are also examples of properties. Tape the texture property card to the previous list of properties.

6. Have students remove rulers from bin. Ask: What do you notice about your ruler?
 - has 12 inches
 - has 30 centimeters
 - the abbreviation for centimeter is cm
 - plastic
 - black numbers
 - lines between numbers
7. Tape your envelope in a highly visible spot. Ask students to measure their envelopes as you measure yours.
 - Begin with the short side and use inches.
 - Ask three students what measurements they have. Write measurements on the edge of the envelope with the correct abbreviation.
 - Ask: How do we abbreviate inches? Check to see that children are using the correct side of the ruler.
 - Follow this process with the longer side.
 - Follow this process using centimeters.
8. Return envelopes to bin when finished.

Activity 2: Bag of Stuff



10–15 minutes

(This activity is for pairs of students, so children should return to their original pairings.)

1. Read the following additional information from Mr. Pfister while students follow along in their activity books:

*On the website, I did come across more information about observations. Forensic scientists must make careful observations of the **properties** of evidence. Properties might be size, color, shape, texture or how something smells or tastes. Somehow all of this*



information, or **data**, has to be written down. Charts, lists, drawings and graphs can be ways to record data. Eventually, this data could be presented in court, so it has to be accurate and detailed. I have found that certain items, like the envelope, make it easier to practice observational skills. I think you will like this next game that I have for you!

- Have each pair take a paper bag from the bin. **They are not to open it!**
 - Pairs should spread out around the room, so they cannot be seen by any other pairs.
 - In each pair, one person is the observer and the other is the recorder. The jobs will switch, so they will each have a turn doing both.
 - The observer puts one hand in the bag, feels the object and describes it to the recorder using some of the properties posted on the wall: shape and texture. Taking a guess here at what the object is might be fun!
 - The recorder lists these observations on “Activity 2: Bag of Stuff.”
 - Have the observer remove the object from the bag and continue with observations using sight, smell and hearing. This would be a good time to mention the importance of safety when observing: no tasting and careful smelling. Some objects, not these, could give off fumes that are poisonous. Remind pairs of the property cards taped to the wall.
 - Magnifiers and rulers are in the bins for use.
- Students should return objects to the bags and fold down the flaps.
- Have pairs switch paper bags and observer/recorder roles, then follow the same process.
- Have students return objects to paper bags and place in supply bins. While students are replacing these, ask several students to share what they discovered.

Activity 3: Foreign Coins



15 minutes

- Read the following from Mr. Pfister while students follow along in their activity books:

I am sure that you are doing a fantastic job learning about observations and recording data. The next activity has to do with foreign coins. It might not be as easy as the previous activity, but now you will have a chance to put your observation and data skills to the test. Remember, you may use any items in the bin to help you with your observations.

- Tell pairs they will use the list of properties and the supplies in the bins to make written observations of at least one coin. Both students should record the same information on “Activity 3: Foreign Coins!” Allow a short period of time for this.
 - Coins should be returned to the cup after information is recorded.
 - Pairs may make observations of additional coins in the space provided in their activity books until other students are finished.
 - Make sure that all coins are returned to the cup.
- Each pair should exchange books **and** cups of coins with another pair.
 - Using each other’s written data, students should try to identify the correct coin.
 - Once pairs believe they have identified the correct coin, they should check with the other pair.
- Students should return activity books to the owners and materials to the bin.

Wrap-up



5–10 minutes

- Ask: What do we know about observations? Responses will vary:
 - use your senses
 - senses are sight, hearing, smell, taste and touch
 - observations can be recorded in a list or table

Lesson 1

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Mr. Pfister

On the website, I did come across more information about observations. Forensic scientists must make careful observations of the **properties** of evidence. Properties might be size, color, shape, texture or how something smells or tastes. Somehow all of this information, or **data**, has to be written down. Charts, lists, drawings and graphs can be ways to record data. Eventually, this data could be presented in court, so it has to be accurate and detailed. I have found that certain items, like the envelope, make it easier to practice observational skills. I think you will like this next game that I have for you! It has to do with money!

Lesson 1

Activity 2: Bag of Stuff

Directions:

1. In pairs, take a paper bag from the bin. **Do not to open it!**
2. Spread out around the room, so you cannot be seen by any other pairs.
3. One person is the **observer** and the other is the **recorder**. Jobs will switch, so you will each have a turn doing both.
4. Observer puts one hand in the bag, feels the object and describes it to the recorder (in a low voice) using some of the properties posted on the wall: such as shape and texture. Taking a guess here at what the object is might be fun!
5. Recorder lists these observations below. **Make sure to record the bag number!**
6. Observer removes the object from the bag and continues with observations using sight, smell and hearing: no tasting and be careful smelling. Magnifiers and rulers are in the bins for use.
7. Switch paper bags with another pair.
8. Switch observer/recorder roles with each other.
9. Repeat steps 4–8.
10. Return items to paper bags and place in supply bin.

Properties	Bag # _____	Bag # _____	Bag # _____
Shape			
Texture			
Size			
Color			
Odor			
Sound			



Lesson 1

Activity 3: Foreign Coins!

I am sure that you are doing a fantastic job learning about observations and recording data. The next activity has to do with foreign coins. It might not be as easy as the previous activity, but now you will have a chance to put your observation and data skills to the test. Remember, you may use any items in the bin to help you with your observations.

Directions:

1. Pick a coin from the cup and observe it carefully. Feel free to use the magnifiers and rulers in your supply bin.
2. Record your observations below. Make sure to return the coin when you are done.

	Coin #1	Coin #2	Coin #3
Color Is it one color, many colors? Are the outer edges a different color than the top & bottom?			
Texture How does it feel? Smooth, bumpy? Do the outer edges feel different from the top & bottom?			
Shape Is it round? Does it have angles?			
Size Use the ruler!			
Image Use the magnifier! Look at the edges, top and bottom.			
Make a drawing of the coin.			

