

Animal Crime Scene Investigator

Expected Learning Outcomes

Students will understand predation and how nature controls the over-population of species. Students will have an understanding of how crime scene investigation requires the skill of measuring with a tape measure and accurately reading the tape measure. Students will have an understanding of how graph paper is used to sketch crime scenes and how investigators use a block on the graph paper to represent inches or feet in the sketch. Students will have an understanding of how to make a plaster cast of a shoeprint. Students will have an understanding of why observation in everyday life is just as important as in the crime scene investigation. Students will have an understanding of how to use and calculate body anthropometrics to establish height, weight and size of an individual or animal.

Materials

Paper and pen, graph paper, magnifying glasses, zip lock bags, synthetic gloves, measuring tapes, hair spray, plaster of paris, water and mixing container as well as a shoe box, Tape which represent crime scene tape, small colored pieces of paper shapes (use circles, squares, triangles, etc.), a small blanket, or other cloth, plastic eggs, small bowl, animal tracking stamps (how to make these stamps can be found on the internet) or realistic looking paper track shaped prints. If a natural tracking site such as a sand is in the area, real animal tracks may be seen and explained. Human shoeprints will be used for the casting portion of the lesson.

Learning Strategies (K-3)

Explain to the students that in the cycle of life, all animals must find food. Some animals and birds are known as predators. Predators actively seek eggs or the young of birds and animals as a food source for their young.

1. Show the students photos of predators such as skunks, raccoons, foxes, opossums, owls, hawks, otters, alligators and eagles. Ask the students to identify a food source for each of the predators.
2. Have students go outside. Designate one student as a fox and one student as the hen. Have the rest of the students represent eggs. (If too large a class, divide the class into two groups). Have the hen whisper into each student's ear the color of egg that they will represent. Do not let the fox hear the colors. Have the egg students stand 10 feet from the hen facing her. The fox will stand directly in front of the hen and pretend to knock on the door. The hen will ask: Who's there? The fox will state that he is the fox and the hen will ask what he wants. The fox will state that he wants a colored egg and the hen will respond that she doesn't have any colored eggs. All students representing the eggs will laugh and the fox will hear them. The hen will then ask the fox what color of egg he wants. When the fox states the color, the student representing that color egg will take off running and will need to get safely behind the Hen before he/she is tagged. If the student is tagged before reaching safety, a new hen and fox will restart the game with new colors being assigned. If the fox can't catch the first egg, he must call out another

- color egg and try to tag the next student egg. Continue the game for several series.
2. Have the students draw a natural habitat with many types of birds and animals depicted. Ask the students which of the animals or birds in their drawings are predators.

Related Activities

1. Have students match the names of animals or birds with the words predator and non-predator.
2. Have students imitate various animals and have the class identify the animal as being a predator or non-predator.

Assessment

The instructor will administer a paper and pen test appropriate for grade level.

Preparation

For use in (4-12) grade levels, the instructor will need to construct a “crime scene” near a nesting site. Crime scene materials should include: colored pieces of paper with the name “egg shell” written on the paper, animal tracking stamps or paper track shaped prints, human shoeprints, colored pieces of paper with DNA and that of the species written on the paper (i.e., have DNA from raccoon, DNA from bird, etc.). For high level grades include different types of fake feathers, tufts of appropriately colored fake fur, and material representing spoor. A small blanket or cloth will be designated as the nesting site with a bowl of plastic eggs sitting on top representing the nest with eggs. Place specific evidence on the blanket (i.e., feather, tuft of fur) to show the swans got a piece of the predator as he was taking the eggs. Use a crime scene like tape to mark the crime scene and let the students know the borders of the crime scene. Mix and scatter the evidence throughout a large section of the crime scene so students will have to work to find the evidence. Use several animal and bird tracks, different kinds of feathers and various tufts of furs (with the number appropriate to grade level) to throw off the investigators. Ensure that the true predator’s tracks and other evidence are prominently displayed so that students will be able to solve the crime. In an envelope, have the true predator listed so that when students complete the tasks required, they can find out if their investigatory techniques identified the correct predator.

Learning Strategies (4-12)

Explain to the students that many animals and birds, including humans are considered predators. Sometimes, farmers or swan keepers may lose young animals or birds to the predators. In order to prevent further losses, the farmers or swan keepers must identify which animal or bird was the predator and try to prevent the animal or bird from getting to other young animals. Explain the following scenario to the students: A swan keeper counted 10 eggs in the nest yesterday. Today, the swan keeper went out the nest and found only 8 eggs. Two eggs were missing and the eggs or their remnants could not be found anywhere near the nesting site. Therefore, the swan keeper

had to call in an animal crime scene investigator to identify which predator may have taken the eggs. Explain to the students that they are going to be the Animal Crime Scene Investigators who will examine the evidence and try to provide the swan keepers with answers to the missing eggs.

1. Show the students how to accurately use and read a measuring tape. Explain to the students that they should use mathematical triangulation to provide the exact location of evidence. This triangulation is achieved by measuring the distance between the evidence and three non-movable objects in the area. For instance, if a piece of trace evidence is found near an oak tree, the distance between the oak tree and the evidence should be measured and the oak tree marked for later identification. Then, other objects directly behind and adjacent to the evidence need to be measured and the objects marked for later identification. If evidence gets moved prior to the completion of the investigation, the investigators will know exact location from which the evidence was moved. For upper levels, Have students develop grid search pattern before beginning. Objects are to be identified as to which grid zone the evidence was found. It is up to the students to decide the dimensions of the grid zone.
2. Show the students how to make one block on the graph paper represent inches or feet in a sketch and how to convert the image to full scale.
3. Introduce the concept of body anthropometrics and explain to the students how these body measurements can be used to calculate height, weight and size of an individual or animal.
4. Divide the class into six groups. Two groups will be given paper and pens to sketch the crime scene. The next two groups will be given zip lock bags and gloves to collect the evidence. The last two groups will be given paper and pencil to catalog the evidence.
5. Out of these six groups, two teams of investigators will be formed so that each team will have sketchers, collectors and catalogers. Collectors and Catalogers will share magnifying glasses. Collectors will measure evidence and distances between objects using measuring tapes. Animal tracks should be measured so that through body anthropometrics, the size, height and weight of the predator can be calculated. The crime scene should be split down the middle with one team working the left side of the crime scene and the second team working the right side of the crime scene. Inform all students that they should be extremely careful of where and how they step so as not to destroy evidence.
6. Ensure that all evidence is collected prior to leaving the crime scene. Once all evidence is collected, have the students help clean up the area.
7. Have students go back into the classroom and have each team compare notes. Have the catalogers record the number of pieces of evidence pointing to a specific predator and have the student investigators present their findings and name a predator. Identify the actual predator and see how the students' investigatory processes worked.
8. For upper levels, have students research DNA and how it is extracted and used to solve real crimes.
9. For upper levels, have the students make casts of the human shoe prints by

placing cutting out the bottom of a shoe box. Place the sides of the shoe box around the shoeprint to protect the print and the eventual cast. Lightly spray the shoeprint with hair spray and wait for the print to dry. Apply several light coatings of spray to prevent the dirt or sand from falling or blowing from the shoeprint as well as the print from cracking once the plaster of paris dries. Place a small amount of plaster of paris in a mixing container and slowly add water. Do not make the mixture too thick or too runny. The plaster of paris mixture should be easily poured and you should make extra so that in the event more is needed, you do not have to stop and remix. This time lapse will hamper the appearance and the durability of the print. Slowly and gently cover the print with the plaster of paris mixture. Make sure that the entire print is covered. Wait for an hour and gently touch the entire cast to ensure adequate drying. If more time is needed, wait an additional hour before trying to remove the cast. Once the cast is removed, bring it into the classroom.

10. For upper levels, have the students measure the shoeprint and through body anthropometrics, establish the size of the shoe and the height of the person who wore the shoe. Have students observe marks on the shoe to ascertain if the shoe is new or old, if it is a left shoe or a right shoe, if the wearer has a limp or pronates while walking, if the wearer is a male or female. Based upon their observations and body measurements, have the students discuss their findings.

Related Activities

1. Have the students prepare a chart regarding the benefits and drawbacks of predation.
2. Have the students prepare a chart depicting specific predators and their specific prey. Have the students list common prey among all predators.
3. For upper levels, have the students prepare a research report on animal predation and its impact on endangered species.
3. For upper levels, have the students research the cost of lost animals to predation, (i.e., cattle to coyotes, etc.).
4. For upper levels, have students discuss the pros and cons of various grid zone sizes. Types of grid searches can also be discussed.
6. If you have several different grade levels (or possibly a IB class), have the higher level students make the crime scene material. Students can investigate types of food eaten and makes spoor, color or paint feathers, make fur patches, etc.

Assessment

The instructor will use research papers, the casting exercise, measuring exercises regarding evidence collection, triangulation, body anthropometrics and a written paper and pen test to evaluate the students.