

Are You as Agile as a Cat?

All animals have evolved adaptations that allow them to survive in their environment. The mountain lion is no exception. Today you will look at the adaptations that make the mountain lion a good predator, capable of hunting its food, and compare these adaptations with those of humans.

You will be divided into small groups. Everyone in your group is expected to participate in each activity. This will increase your "sample size," or the amount of data you collect. Why is it important for scientists to have a large sample size? _____

JUMPING

Mountain lions are very agile creatures. Part of their agility is related to their tremendous jumping ability. To compare your agility with that of a mountain lion, you are going to test how well you can jump.

Procedures

1. Move to a clear space in the classroom or outside.
2. Use chalk or tape to mark the starting point.
3. Without getting a running start, jump forward from this mark as far as you can.
4. Have a partner mark where you landed.
5. Measure the distance from the starting point to your landing point and write this under "Jump Distance" in Data Table 1.
6. Stand next to a wall.
7. Without getting a running start, jump as high as you can.
8. Have a partner mark the height on the wall.
9. Measure the distance from the floor to this mark and write this under "Jump Height" in Data Table 1.
10. Repeat steps 3 through 9 for each person in your group.
11. Calculate the average jump distance and height for your group.

Data Table 1: Jumping Ability of Group

Name of Student	Jump Distance	Jump Height
Average		

Questions

1. A mountain lion has been recorded as jumping a distance of 45 feet forward. How does this compare with your group's average? _____
2. A mountain lion has been recorded as jumping to a height of 15 feet. How does this compare with your group's average? _____
3. Why is this tremendous jumping ability important to a mountain lion? _____

VISION

For predators such as mountain lions, vision is an extremely important sense. The better an animal can see, the more likely it is to find prey that does not want to be seen. One important visual characteristic is the "field of vision," which is defined as the amount of space, in all directions, that an animal can see. This includes the peripheral or outer part of the field of vision.

You can calculate field of vision by measuring how far to the sides an animal can see when looking straight ahead. To compare your vision with that of a mountain lion, you are going to measure your field of vision.

Procedures

1. Draw a circle on a piece of butcher paper that is large enough for you to stand inside (approximately three feet in diameter). Mark the circle's center.
2. Draw a mark on the circle and label it 0° .
3. Use a protractor to mark off every five degrees on the circle.
4. Stand on the center of the circle facing the 0° mark.
5. Focus on an object straight in front of you, and do not move your eyes.
6. Have a partner stand in front of you and move slowly clockwise around the circle.
7. Tell your partner to stop when you can no longer see him or her.
8. Place a mark where your partner stopped.
9. Repeat steps 4 through 8 but have the partner move counterclockwise.
10. Determine your total field of vision by counting the number of degrees between the two marks.
11. Write this number in Data Table 2.
12. Repeat steps 4 through 10 for all members of your group.
13. Calculate the average field of vision for your group.

Data Table 2: Field of Vision for Group

Name of Student	Field of Vision
Average	

Questions

1. How many degrees does a circle have? _____
2. A mountain lion has an average field of vision of 287° . How does this compare to your group's average? _____
3. Why would a large field of vision be beneficial to a predator? _____

4. Many prey species have their eyes on the sides of their heads. How would this affect their field of vision? _____

HEARING

Another important sense for predators is hearing. The cone-shaped ear of a mountain lion can be turned in many directions to collect sound and channel it into the eardrum.

Famous naturalist Joseph Cornell developed the concept of a sound map. This is a map on which you put together all of the sounds, in all directions, that you hear in a certain location. You will be making two sound maps, one with your regular hearing and one with modified hearing.

Procedures

1. Find a quiet space outside.
2. Sit down and face in one direction. You will face in this direction the entire time.
3. Spend five minutes completing a sound map in Figure 1 using your regular hearing. The "x" represents where you are sitting. Every time you hear a noise, draw a symbol that represents that sound at the approximate location where you hear it.
4. Spend five minutes completing a sound map in Figure 2 using modified hearing. Cup your ears with your hands so that they are focused in a particular direction. Periodically change the direction, but do not forget to mark any sounds you hear.
5. Compare your two sound maps with those produced by your partners.

Figure 1: Normal Sound Map

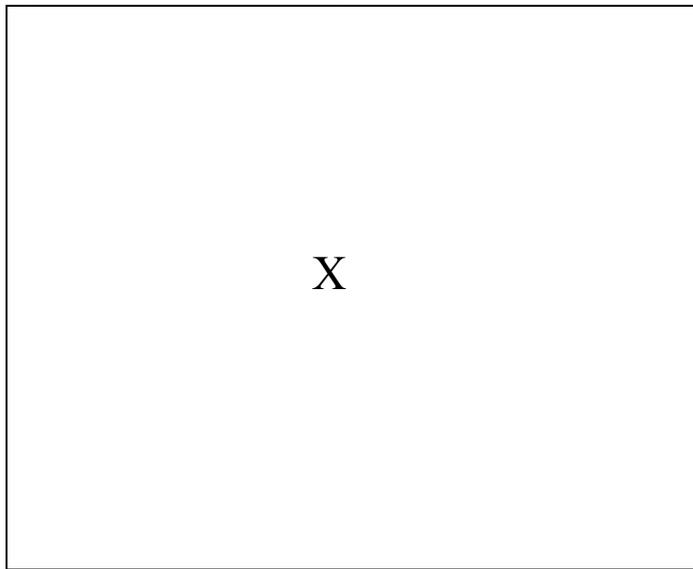
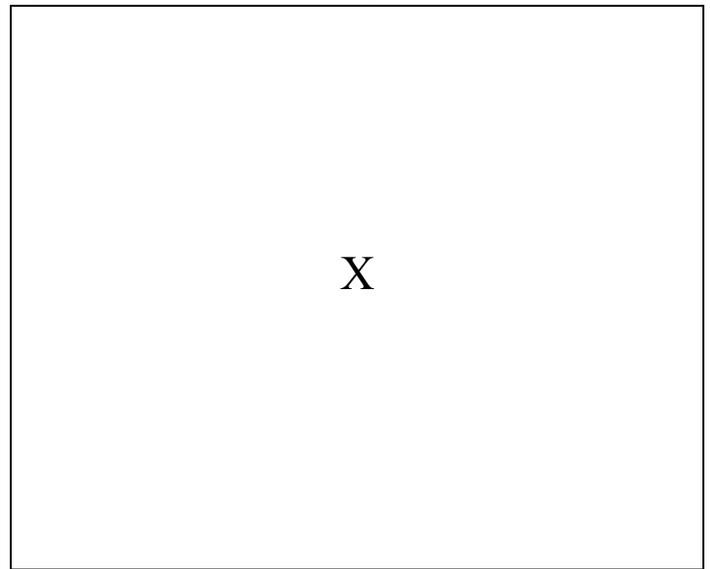


Figure 2: Modified Sound Map



Questions

1. What differences do you notice between the sound maps? _____

2. Which one do you think is most accurate? Why? _____

3. Why is the ability to focus in on sounds important to the mountain lion? _____

CONCLUSION

In a brief paragraph, compare the abilities of humans with those of mountain lions and explain why all of these adaptations make the mountain lion an efficient predator. You may use the back of this page for your paragraph.