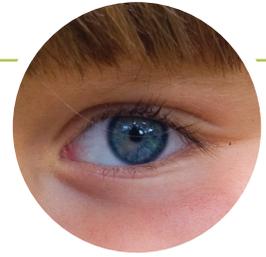


Ocular Dominance

A Carolina Essentials™ Activity

Student Worksheet



Overview

Study the giraffe and the human shown to the right. What difference do you notice in the position of the eyes of these two mammals?

Did you notice that the man's eyes are positioned at the front of his head and the giraffe's eyes are positioned on the sides of its head? Eye position tells us about the type of vision an organism has and its relative position in the food chain.

Predators, including humans, have **binocular vision**, with eyes located toward the front of the head, looking in the same direction. Each eye sees a slightly different image. **Ocular dominance** is the tendency of the brain to favor the images produced by one eye over the other. It is estimated that about two-thirds of all people have a dominant right eye, and one-third have a dominant left eye. In rare cases, neither eye is dominant. When the brain of an animal with binocular vision interprets 2 images, the organism perceives a complete picture with enhanced depth. Depth perception is necessary for a predator that must hunt for food. Without binocular vision and proper depth perception, a predator would have a more difficult time finding and capturing prey.

Giraffes have **panoramic vision**. Their eyes are located toward the sides of the head, allowing them to see in different directions at the same time. Prey need to be aware of their surroundings or they could fall victim to a predator. Panoramic vision provides a larger range of sight, making it easier for prey to spot a predator and attempt to hide or escape. This greater range of vision comes with a cost, however; panoramic vision does not allow organisms to perceive depth accurately.



SAFETY REQUIREMENTS

No PPE needed

MATERIALS

Geometric image in black and white or another image provided by your teacher

Essential Question

1. How does the brain process information from both eyes?

Activity Objectives

1. Determine individual student eye dominance.
2. Analyze class data to determine group eye dominance.
3. Determine if there is a relationship between eye dominance and the hand you write with.

Activity Procedures

1. Locate an activity image close to you.
2. Stand directly on the line with a clear, straight-ahead view of the graphic.
3. Raise your arm to shoulder height and extend it fully in front of you with your thumb pointing up.
4. With both eyes open, hold your thumb at arm's length and "cover" the object with your thumb.
5. Close your right eye.
6. If your thumb appeared to move to the right, the right eye is dominant. If your thumb did not seem to move, your left eye is dominant.
7. Repeat step 5 using the left eye.

Continued on next page.

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Data

Eye	Type of movement
Right eye closed	
Left eye closed	

Analysis and Discussion

1. Which type of ocular dominance do you have? (right eye dominant, left eye dominant, or neither)
2. Are you right-handed, left-handed, or ambidextrous?
3. Does your ocular dominance match your handedness?
4. Record your information on the class data table.
5. Calculate the percentage of right, left, and no ocular dominance.
6. Calculate the percentage of right- and left-handedness.
7. Were your class proportions what you expected they would be? If your class proportion is different, why do you think this was so?
8. Based on the class proportions, does there seem to be a relationship between ocular dominance and handedness? Use data to justify your answer.