



How Does a Horse See?

Horses have eyes that are located on the sides of their heads. This means that they can see almost all the way around them. This is very important to animals, such as horses, that are preyed upon by other animals in the wild. Horses need to be aware of possible dangers in their surroundings.

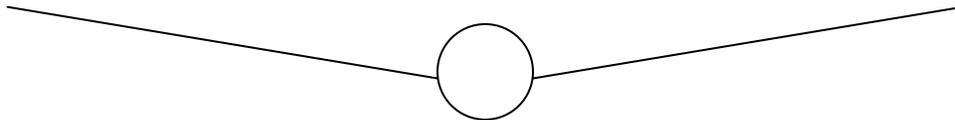
Peripheral Vision

Because their eyes allow them to see so much around them, horses can see objects and movements that you would miss. Let's do an experiment to see how much peripheral vision you have. (Peripheral vision is the vision that allows you to see "out of the corner of your eyes.")

To do this experiment

- Stand up and look straight ahead
- Hold your arms out straight at your sides to make "airplane wings"
- Wiggle your hands as you move your arms toward the front of your body until you can see your hands wiggling out of the corners of your eyes.

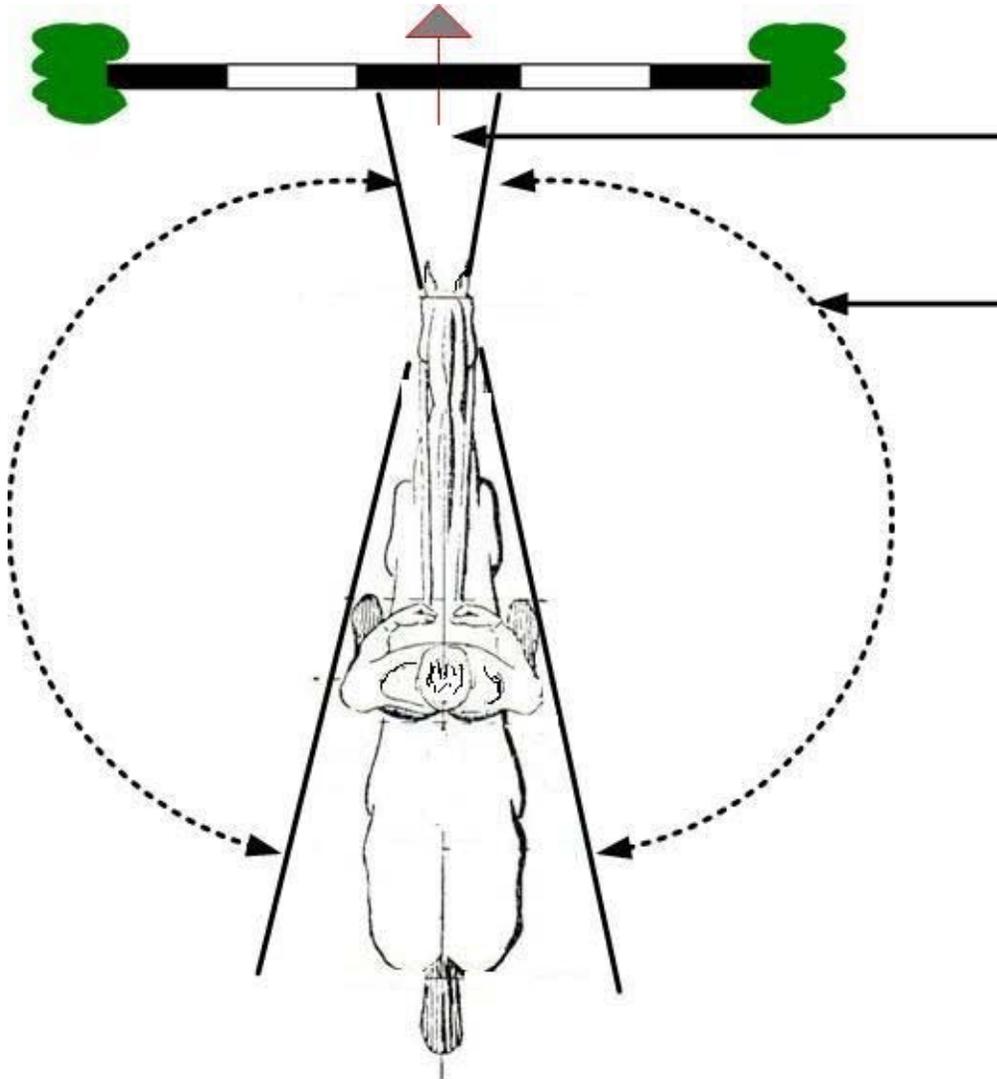
Your arms probably make an angle about like this one



and you can see the area between the two lines. This is called your *field of vision*.

A Horse's Field of Vision

A horse has a much larger field of vision than you have. In the following diagram, you are looking down at a horse and his rider. The horse is approaching a jump. He can see the areas shown by the dotted lines on either side of his head.



In the above diagram, the horse has two *blind spots*, one directly in front of him and one behind him.

Blind Spots

A horse has a blind spot right in front of his head. It is shaped like a triangle. He isn't really "blind", but everything in that area is either missing part of the image or very

blurry. The area isn't very large but is located right between his eyes about four feet in front of his face. If you approach a horse from the front, he can't see you until you are about six inches from his face. Because of this blind spot, a horse must raise and lower his head in order to see objects in their proper focus. This explains why a horse will raise his head when a person walks up to him and reaches to pet his forehead. Most likely, he is just trying to focus better on what he cannot see clearly.

A horse also has a blind space directly behind him. This is why you need to be very careful when you are approaching a horse from the back. If you are in his blind spot, he may become frightened and might kick out at you to protect himself from what he can't see.

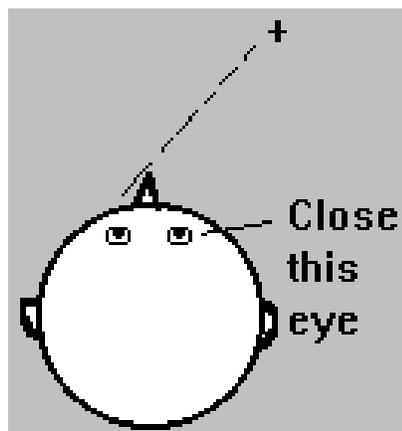
You also have a blind spot. Do the following experiment to see where it is.

Experiment: Finding your Blind Spot

The blind spot is the area on your eye's retina without receptors that respond to light. Therefore an image that falls on this region will NOT be seen. It is in this region that the optic nerve exits the eye on its way to the brain. To find your blind spot, look at the image below or draw it on a piece of paper:



To draw the blind spot tester on a piece of paper, make a small dot on the left side separated by about 6-8 inches from a small + on the right side. Close your right eye. Hold the image about 20 inches away. With your left eye, look at the +. Slowly bring the image (or move your head) closer while looking at the +. At a certain distance, the dot will disappear from sight...this is when the dot falls on the blind spot of your retina. Reverse the process. Close your left eye and look at the dot with your right eye. Move the image slowly closer to you and the + should disappear.



Binocular and Monocular Vision

Because both of our eyes are in the front of our heads, we have what is called binocular vision. Both of our eyes focus on the same object. A horse has both binocular and monocular vision. He can look straight ahead and look at the same object with both of his eyes. However, most of the time, he uses his monocular vision. He is looking at different things with each of his eyes. This allows him to watch in front of him with one eye and in back of him with the other. This is especially useful when watching for predators.

When a horse sees movement using monocular vision, he will usually turn his head to see with both eyes, switching to binocular vision so that he can focus on the moving object. Horses cannot use binocular and monocular vision at the same time. When a horse switches from monocular vision to binocular vision, this causes objects to jump and distort until he can focus his eyes again.

You can also cause objects to jump when you look at them with one eye and then the other. Try this experiment:

- Close your left eye
- Hold your right arm straight out in front of you and point to an object
- Open your eye. Notice that where you are pointing becomes fuzzy.
- Keep your arm pointing at the same object and close your right eye.
- Has your pointing finger jumped over to the right?