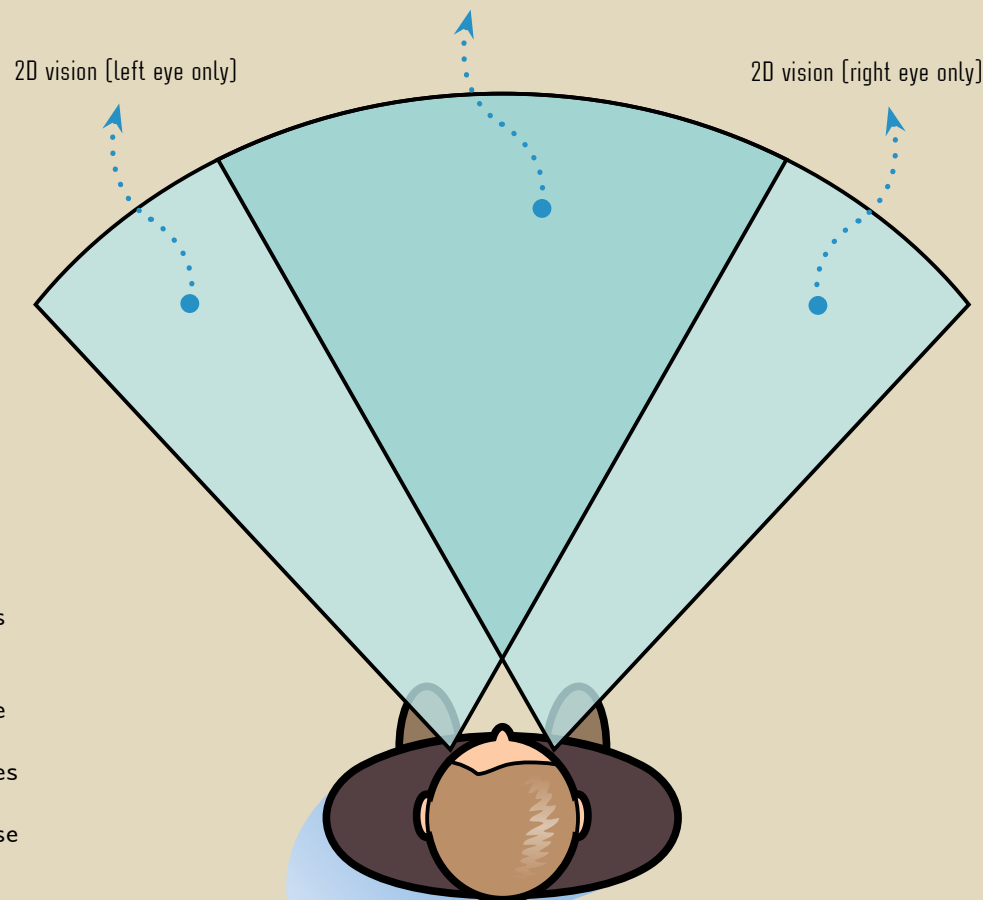


TWO IS BETTER THAN ONE

So far, we've mostly looked at one eye at a time. Now, let's see how they work as a pair. Your eyes are placed on the front of your head to give you good vision ahead of you and poorer vision to the sides. Some creatures such as birds, horses and lizards have almost complete all-round vision by having their eyes on the sides of their head, but they tend to have less overlapping vision from both eyes.

Your eyes are spaced about 5 centimetres apart. This small distance is a surprisingly big deal as it means each eye sees a slightly different view of the world. The small difference in viewing is one of the major ways your brain calculates depth and the distances to objects. It does this by comparing the different angles of the objects it views. If you don't believe two eyes are better than one, try catching a ball or threading a needle with one eye closed and see how much harder it is.

3D binocular vision (both eyes)



FIELD OF VIEW

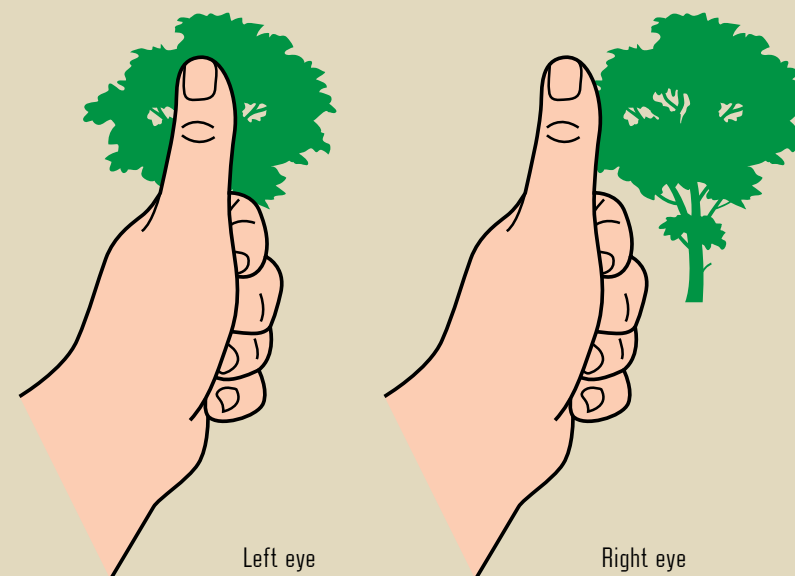
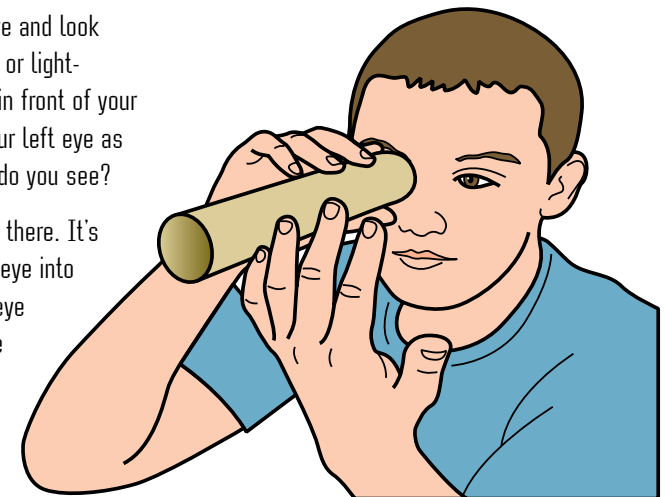
The "field of view" is how much of the world you can see at any one moment. The position of your eyes on your head gives you a wide field of view in front of you. A large portion of that view sees each eye's range overlap, providing you with around 120 degrees of binocular vision. This gives you good perception of depth and distances. The remainder - to your right and left sides - is with one eye only, so perception of depth in those fields is much poorer.

PUT A HOLE IN YOUR HAND!

Your eyes both take in different views that your brain then combines to create a single complete image. Here's a cool experiment to demonstrate this.

Get a long cardboard tube, hold it up to your right eye and look through the tube at a bright surface such as a white or light-coloured wall. Bring the palm of your other hand up in front of your face to the side of the tube and look at that with your left eye as you look through the tube with your right eye. What do you see?

Don't fret! That hole you see in your hand isn't really there. It's caused by your brain processing the view from each eye into a single image. As most of the view from your right eye is of dark tube, your brain pays extra attention to the small circle of bright light and combines that with the clear image of your hand from your left eye. For an added twist, ask someone to wiggle their finger in the far end of the tube. Freaky!



PARALLAX

Parallax is the difference in the apparent position of an object when viewed from two different locations, such as from your left eye and right eye. Your brain uses the parallax shift between your eyes as one way of measuring distances: the smaller the shift, the further away an object tends to be. You can easily see parallax in action by closing one eye and sticking out your thumb to cover an object like a tree, flag or distant building. Now close that eye and open the other and see how your thumb appears to have moved and changed position.