

How many black dots can you see?



Answer: There aren't any!

What causes this? Something called lateral inhibition. Excited neurons in our brain reduce the activity of neurons around it. The fewer neurons that are stimulated at the same time, the stronger it responds.

As you move your eyes across this grid, different neurons activate or become inhibited depending on where you're looking.





Look at the picture - is it moving?

Answer: No, it's just a picture – it can't move!

What causes this? Answer: Clever use of colour!

This a type of motion illusion. Our brain tries to adjust what we're seeing so that the size and brightness appear constant. Our brains can't quite bring it into proper focus.



Look at the squares marked with 'x' – are they the same or different colours?



Answer: They are the exact same shade of grey!

This is the checker shadow illusion. Our brains don't just look at one bit of colour – they look at the colour and shading of what's around something. The brain thinks that the top 'x' is just covered by a shadow and that there's a light shining down.

Your brain likes to work in a 3-dimensional world, so is trying to compensate for you!



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What shapes are in this picture?







There aren't really any triangles in this picture! At least, not completely drawn ones. This is called a Kanizsa Triangle illusion. Your brain 'fills in' the shapes and makes it looks whiter than the surroundings. Our brains like to try to find the edges of things, probably to help us survive.



Are the blue lines on the railway tracks the same size?









Answer: yes! They are the same as the lines on the right (between the red lines). This is called a Ponzo illusion. Because the train tracks seem to get closer together, your brain thinks they must be getting further away from you and so assumes the blue line is also further away. Our brains like to work in 3-dimensions!



Look at the picture - is it moving?





Answer: No, it's just a picture – it can't move!

What causes this? Answer: Clever use of shape and colour! This is a type of motion illusion.

Your eyes make constant tiny movements without you realising. Every time they move, the image it sees is very briefly held on the retina in the eye as an 'after-image'. This image overlaps with the next one, and then the next, merging at slightly different angles to give an illusion that it's moving.



The two tables on the left are the same size!







You can see this by looking on the picture on the right, which shows the exact same two tables when lined up! This illusion is called 'Shepard tables' and it makes your brain miscalculate the size by about 20-25%!



Do you know what this real-life optical illusion is?





This is called a mirage.

When the weather is hot and you look into the distance, the ground sometimes looks like it's wet. This is because hot air bends light slightly and makes it seem like there is an upsidedown image on an object on the ground – which is what might happen if the ground was wet.

Mirages famously appear in the desert, making people think there might be an 'oasis' in the distance.





