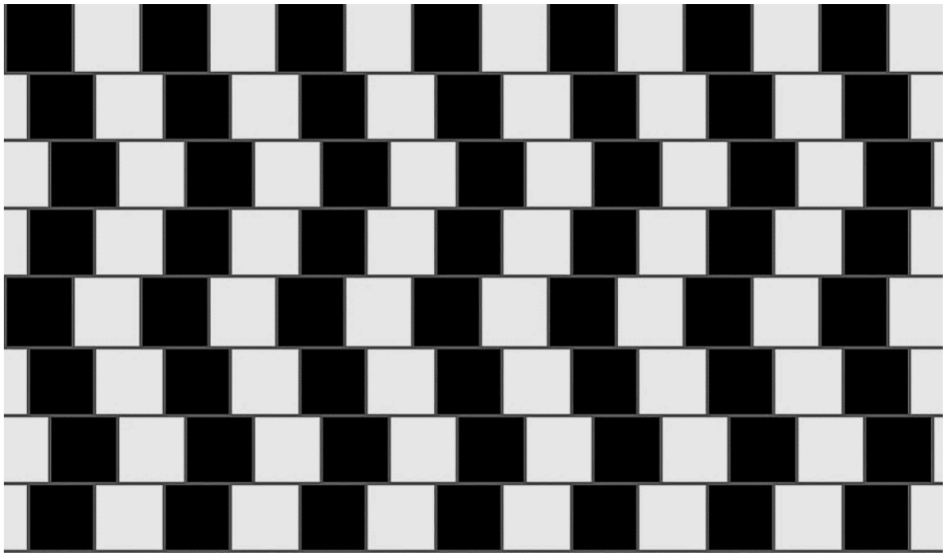
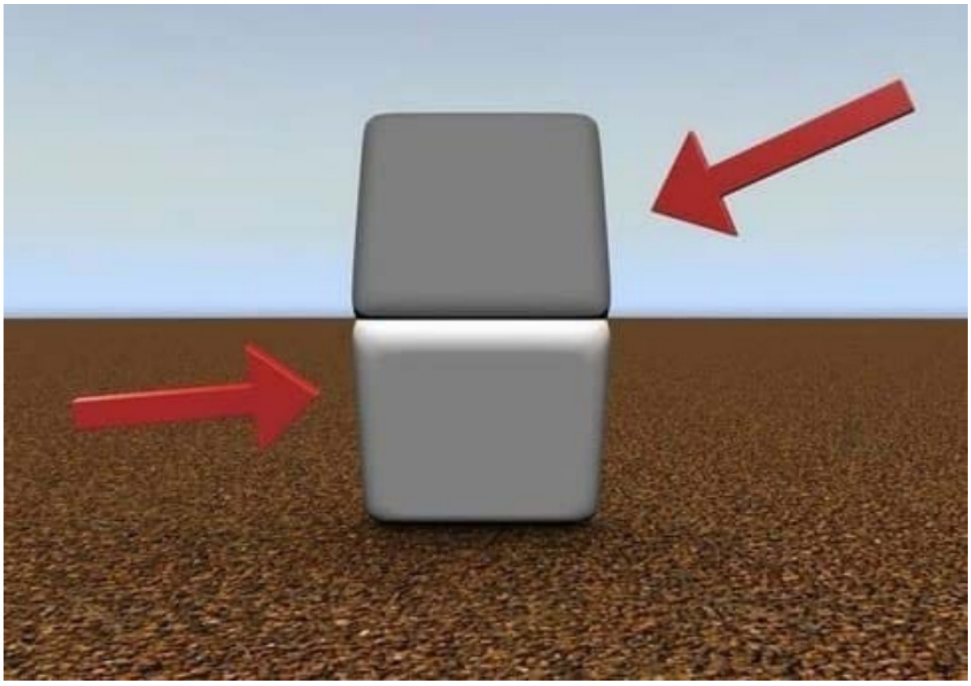
Are the horizontal lines straight or crooked?



Are the two blocks the same color?



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Answers

Are the horizontal lines straight or crooked?

The horizontal lines are straight, even though they do not seem straight. In this illusion, the vertical zigzag patterns disrupt our horizontal perception.

Specific combinations of color, light, and patterns can trick our brains into visually perceiving something that is not there.

Image by Barsukov Vladimir

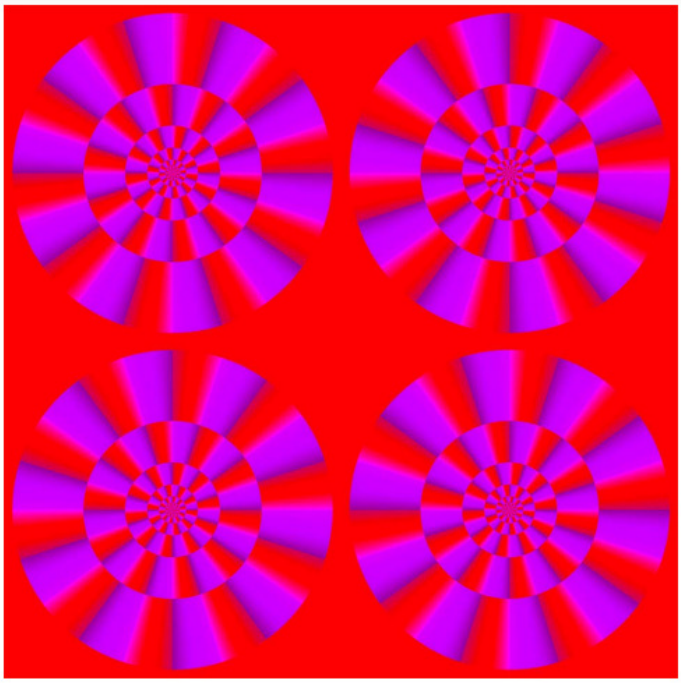
Are the two blocks the same color?

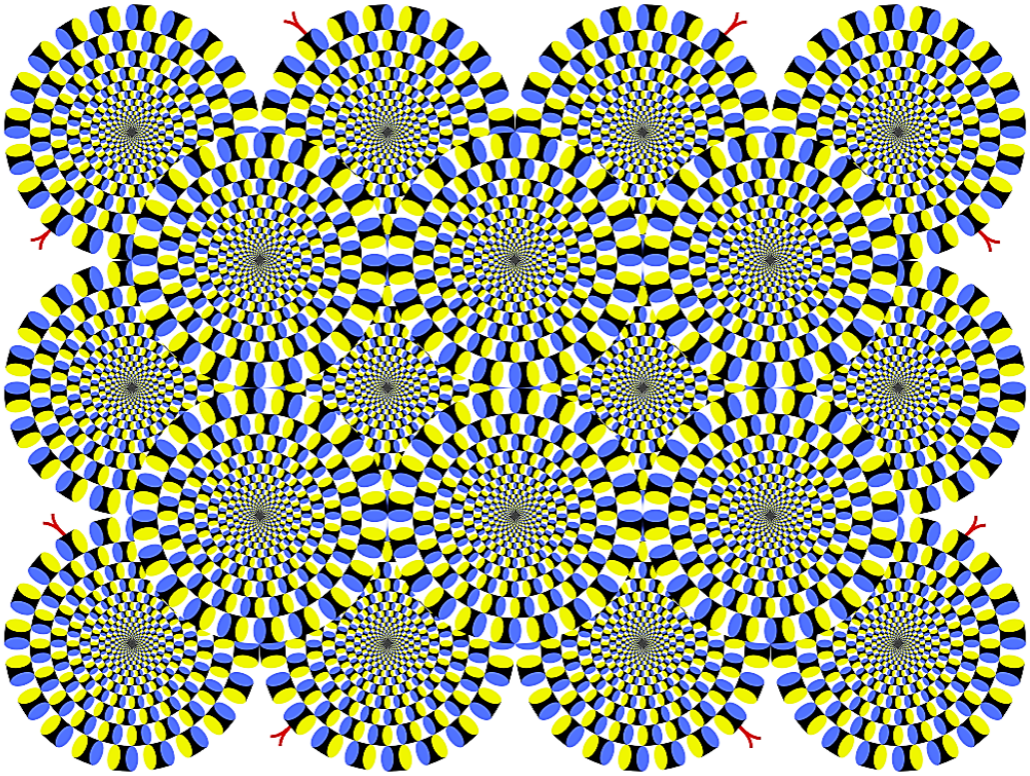
Place a finger between the two and you will see that they are the exact same color. This is the Cornsweet illusion. Tom Cornsweet found that humans perceive color and shade of 3D images depending on where shadows fall and how the objects are lit.

In this case, it is believed the upper square to be darker because that's what is logical and what our brain expects. This, combined with contrasting shading in between the two blocks, makes us perceive the top block as dark gray and the bottom one as light gray.

Image by Tom Cornsweet

Are the circles still or rotating?





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Answers

Are the circles still or rotating?

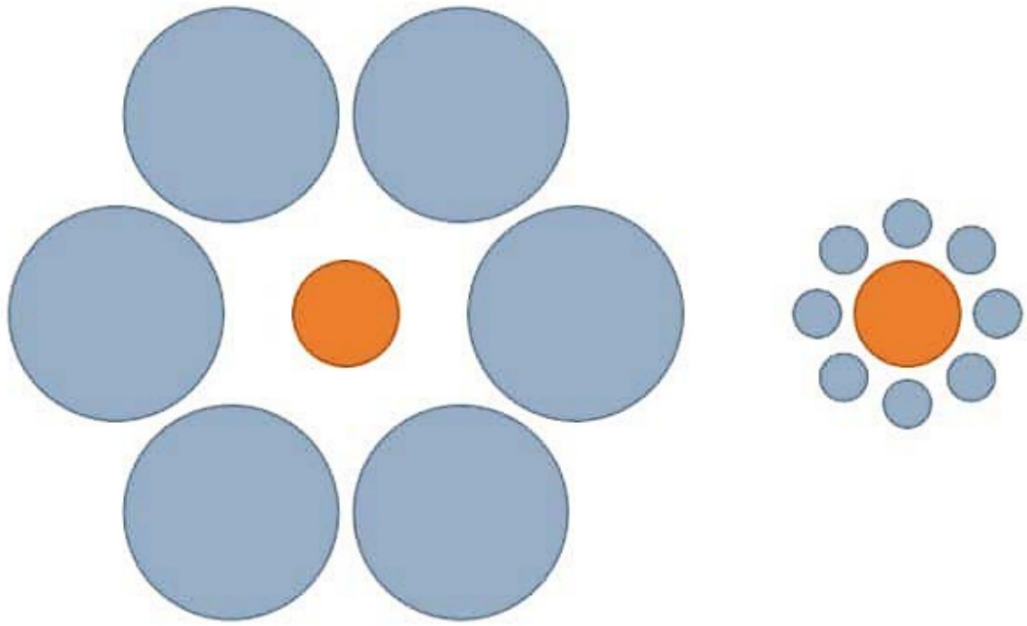
Clearly there is no motion in the images. The rotating illusions are called “Peripheral Drifts” and are a motion illusions based on repeating, asymmetric luminance patterns.

These illusions work on our peripheral vision (hence the illusion technical name) — when you don’t look directly at something but instead keep it away from your center of vision. The rotating images grind to a halt if you stare at just one part of the image. On the other hand, it keeps going if you keep looking around. So eye movements are important. However, the illusory motion is not actually caused by the motion of the image across your retina. Instead, what matters is that the image be at different positions on the retina from time to time. In fact, briefly flashed images appear to rotate like crazy, even if there’s no time to move your eye across the images.

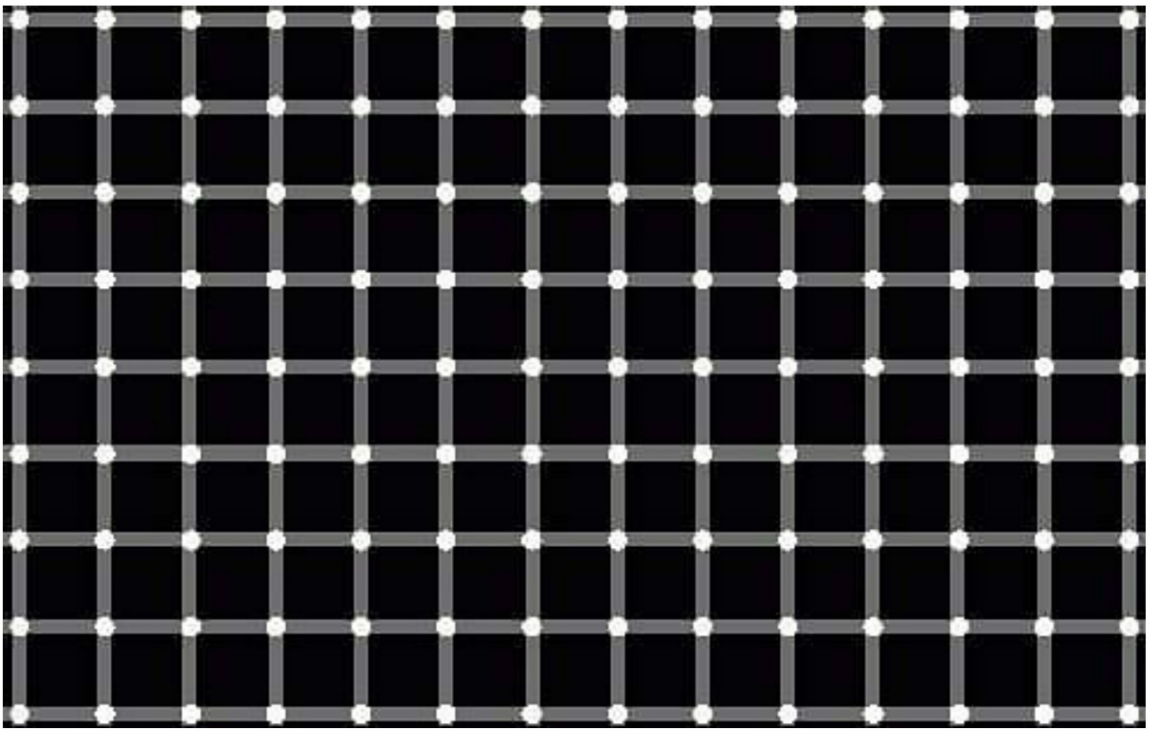
There have been several papers published trying to explain these illusions, but the mechanics of it (why it works) are not fully understood. You need to have a series of shapes that change in luminance (brightness, that is, or have a change in contrast from shape to shape) and it helps to have them arranged in a circle.

One idea is that our brains process high contrast regions (like where the yellow meets the black in the second image) faster than low contrast ones (like where blue meets black). If you have a series of shapes of different contrasts, they are physically processed at different times in the brain. This is a separate mechanism in your brain than the part that processes motion, however, and that part gets the data from high and low contrast areas at different times, so it’s fooled into thinking there’s motion.

Are the orange circles same size?



How many black dots are there?



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Answers

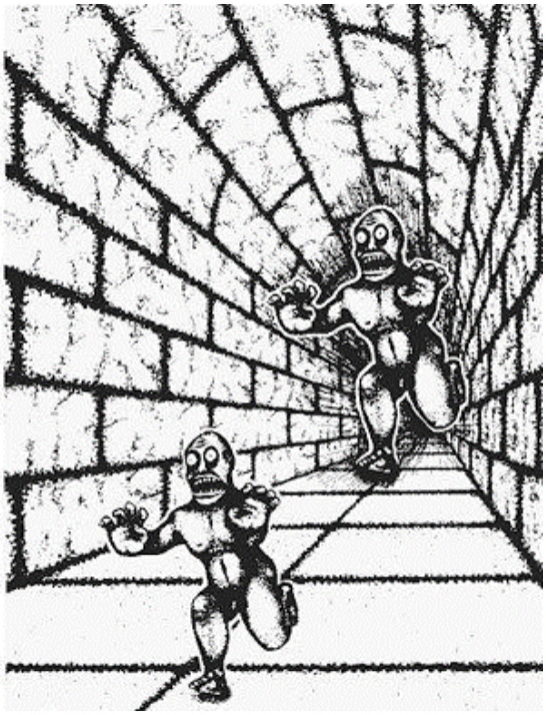
Are the orange circles same size?

They are the same size. This is the Ebbinghaus illusion, an optical illusion of relative size perception. The size differences are caused by the shapes, visual cues, surrounding the circles and the way the brain processes these.

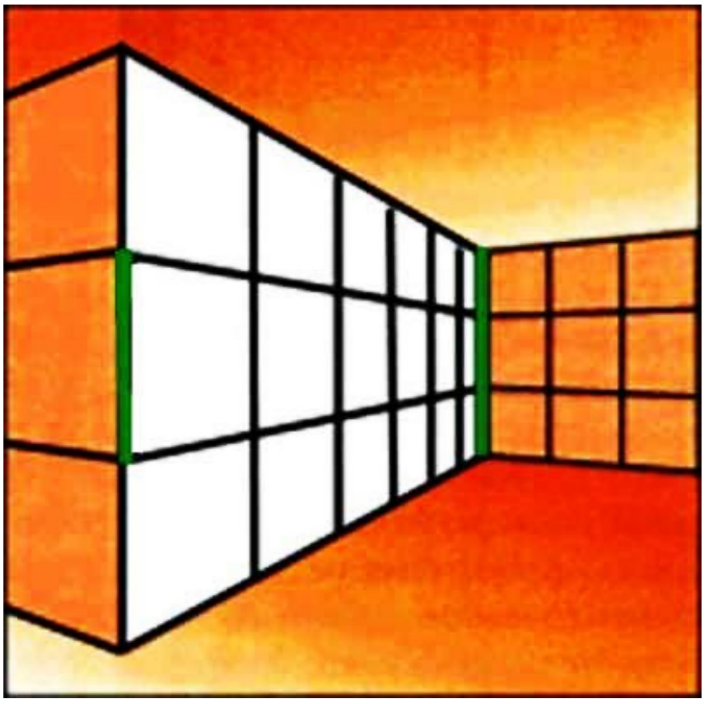
How many black dots are there?

This is the scintillating grid illusion, discovered by E. Lingelbach in 1994. It looks like there's a black dot inside each white circle. Once you focus on each individual white circle, you'll realize that it was never there.

Which monster is larger?



Which green line is longer?



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Answers

Which monster is larger?

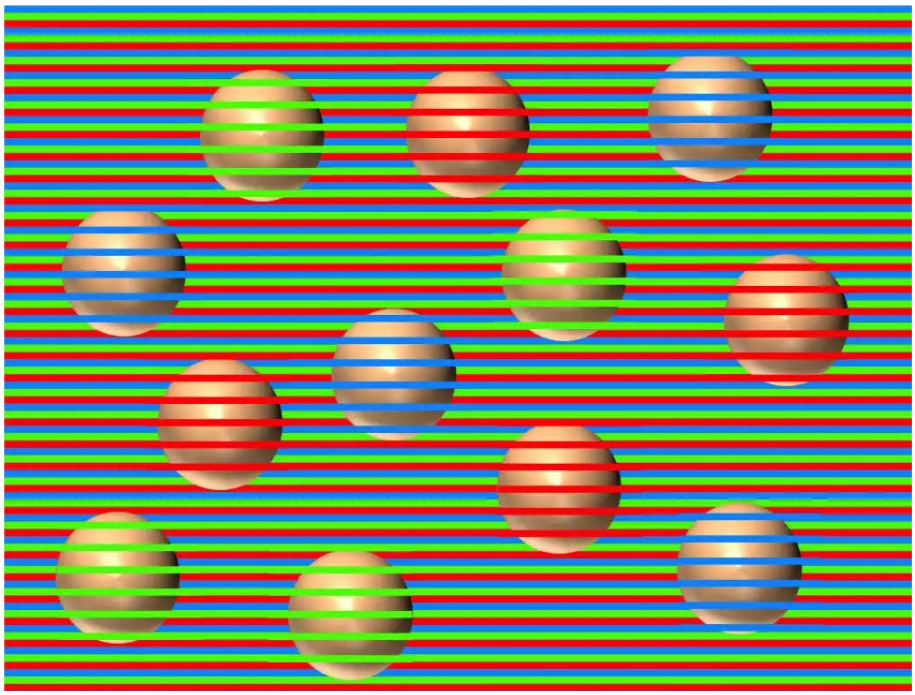
They are the same. Or are they?

This is perspective illusion. When you look at the picture, your brain automatically makes changes to the two images so that they match the way things would look like in a 3D environment. The brain “fixes” this because it expects objects to look smaller when they are farther away, based on what it understands about how things should appear in the real world.

Which green line is longer?

This is another perspective illusion. They are both the same length. This one is a geometric visual illusion called a Ponzo illusion, first demonstrated by Mario Ponzo, an Italian psychologist. The difference in length is based on our perception. Measure both lines to see for yourself!

What color are the spheres?



Where is the mouse?

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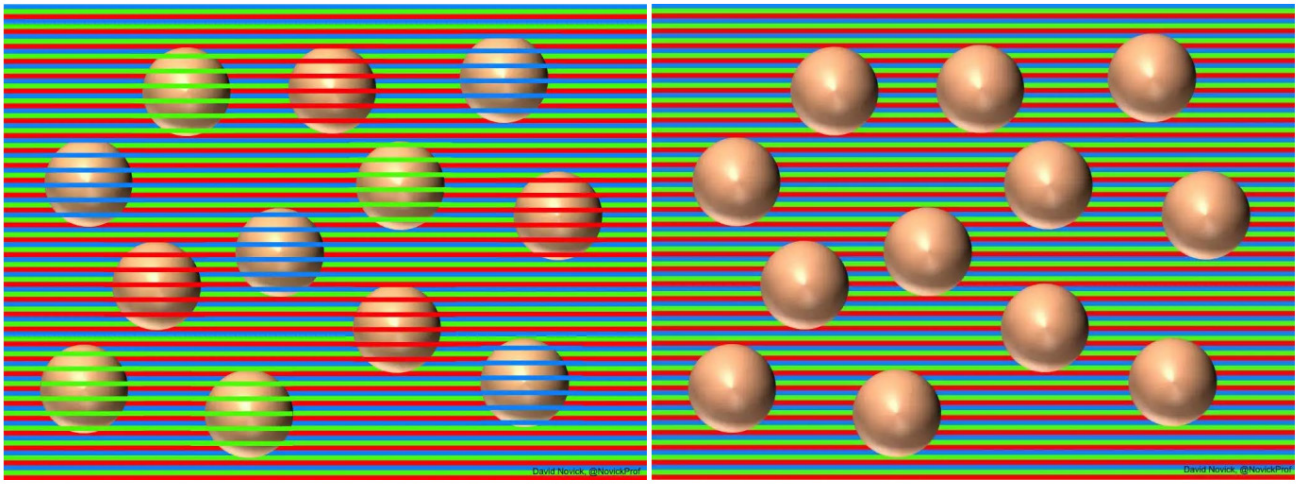
Answers

What color are the spheres?



This kind of op-art is known as the Munker-White Illusion. We perceive colors as they are on their own, and also by contrast with colors around them. This can be manipulated using stripes of different colors, for example. In the top row, note the colors of the stripes going across the balls. The left one has green stripes, the middle one red, and the right one blue. That changes how we see the balls.

We are deceived by this illusion because our brains not only process colors individually but also within the context of nearby colors.

Where is the mouse?