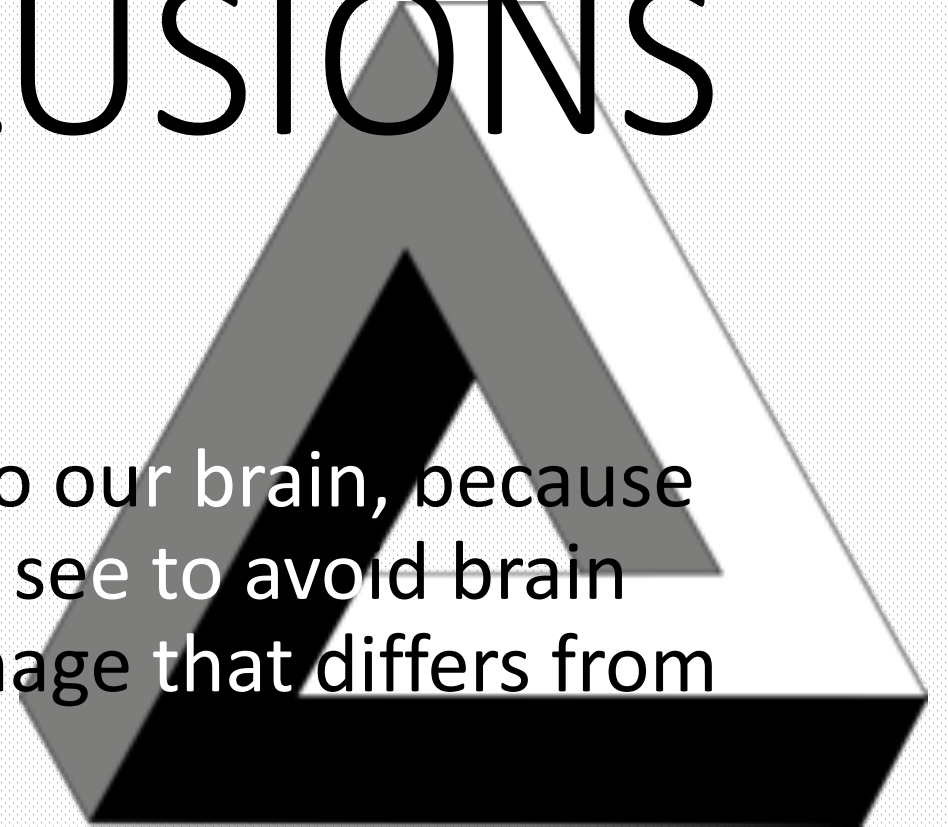


OPTICAL ILLUSIONS

Visual illusions are deceptive images to our brain, because our visual cortex processes what we see to avoid brain damage, so we might experience an image that differs from reality



Optical illusions categories

There are 3 main visual illusions categories studied throughout the years from the 19^o century to today, classified by Richard Gregory

- Physical
- Cognitive
- Physiological

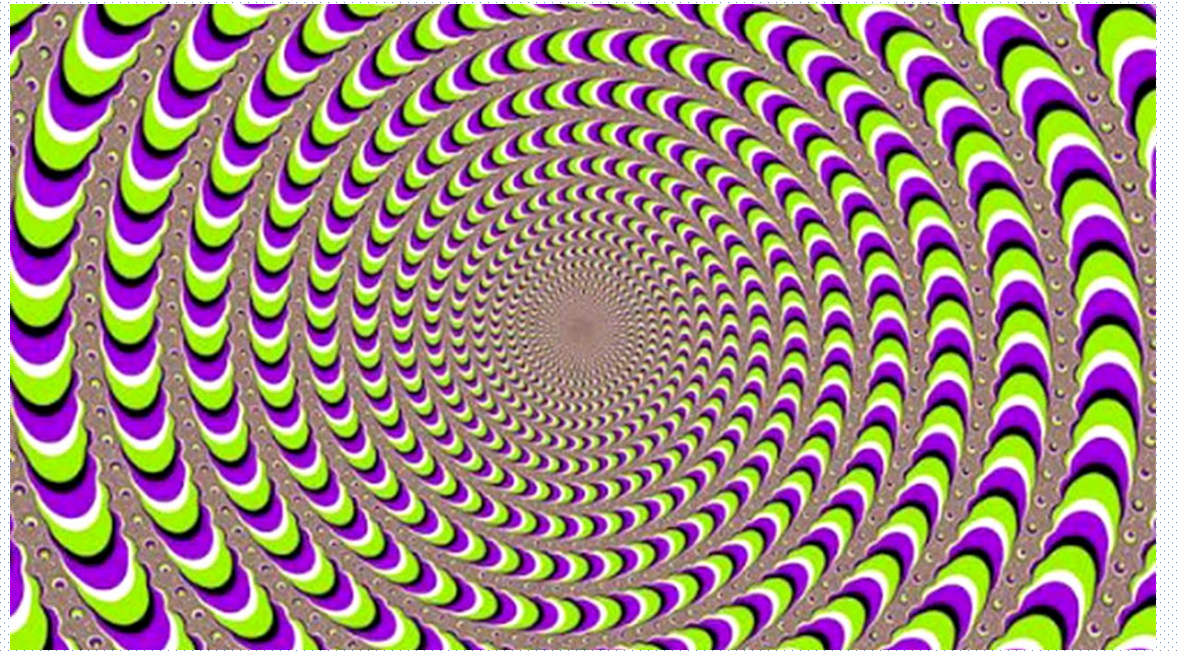
Each one has 4 sub-categories

- Ambiguities
- Distortions
- Paradoxes
- Fictions

| Kinds of visual illusions | Classes of visual illusions | | |
|---------------------------|---|---|---|
| | <i>Physical</i> | <i>Physiological</i> | <i>Cognitive</i> |
| <i>Ambiguities</i> | mist shadows | size - distance for a single stationary eye real - apparent motion | Necker cube Jasrow's duck-rabbit Rubin's vases |
| <i>Distortions</i> | (of space) stick in water (of velocity) stroboscope (of colour) filters refraction diffraction scattering | (of space) adaptations to length or tilt or curvature Café wall (of brightness and colour) simultaneous and sequential contrast | Ponzo Poggendorff Orbison Hering Müller-Lyer Zöllner figures |
| <i>Paradoxes</i> | mirrors (eg seeing oneself in the wrong place, and duplicated) | when visual channels disagree aftereffect of motion: moving yet not changing position or size | Penrose impossible objects Escher's pictures |
| <i>Fictions</i> | rainbows Moiré patterns | afterimages autokinetic effect migraine patterns | Kanizsa's triangle filling-in of the blind spot and scotomas |

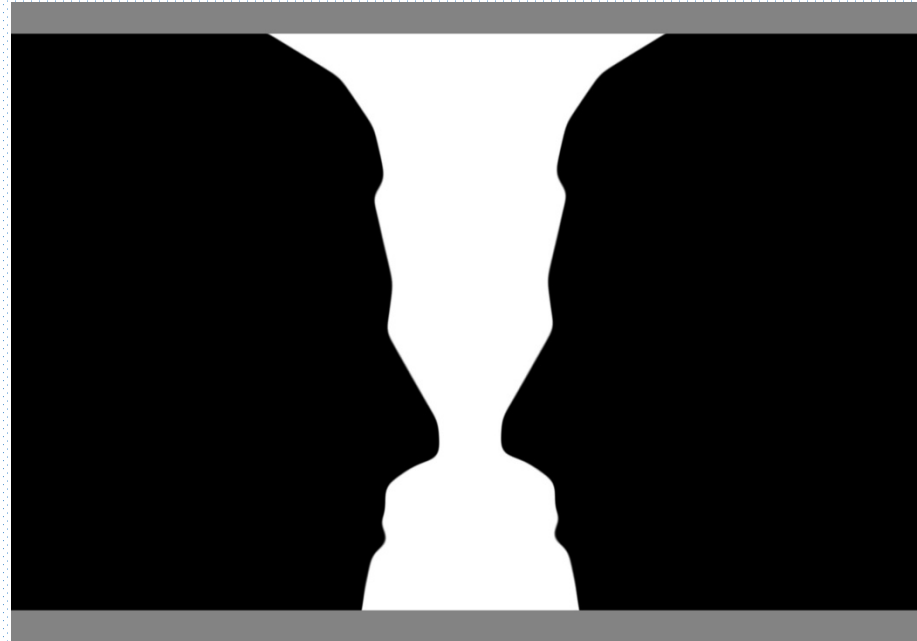
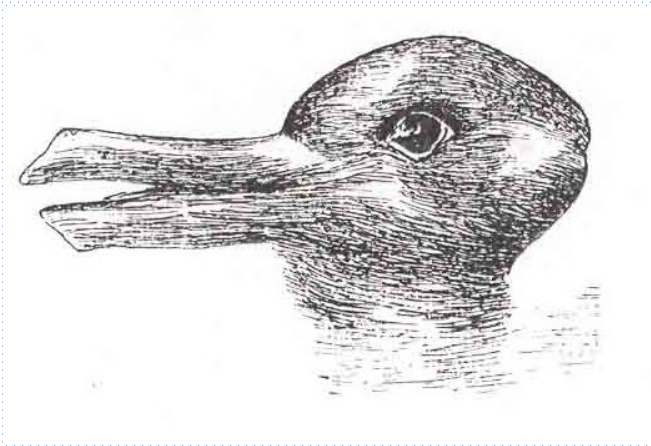
Physical illusions

Also called «literal illusions» are the category of illusions characterized by the difference in the image and the actual physical object that make the picture. This type of illusion was studied by Ptolemy in 150 b.C., is the simplest of all and is present in our everyday life, like the distortion of an object in the water.



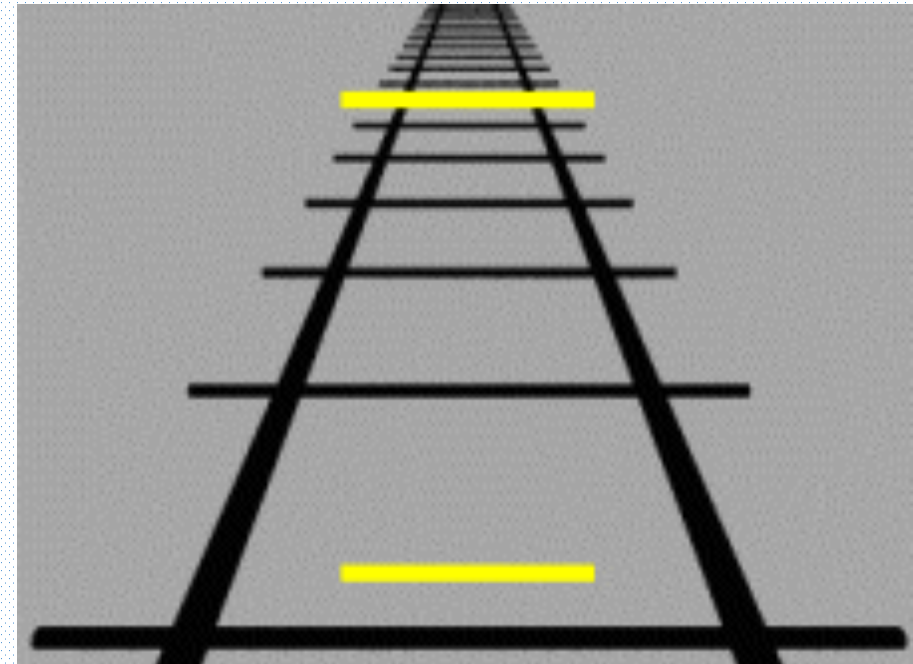
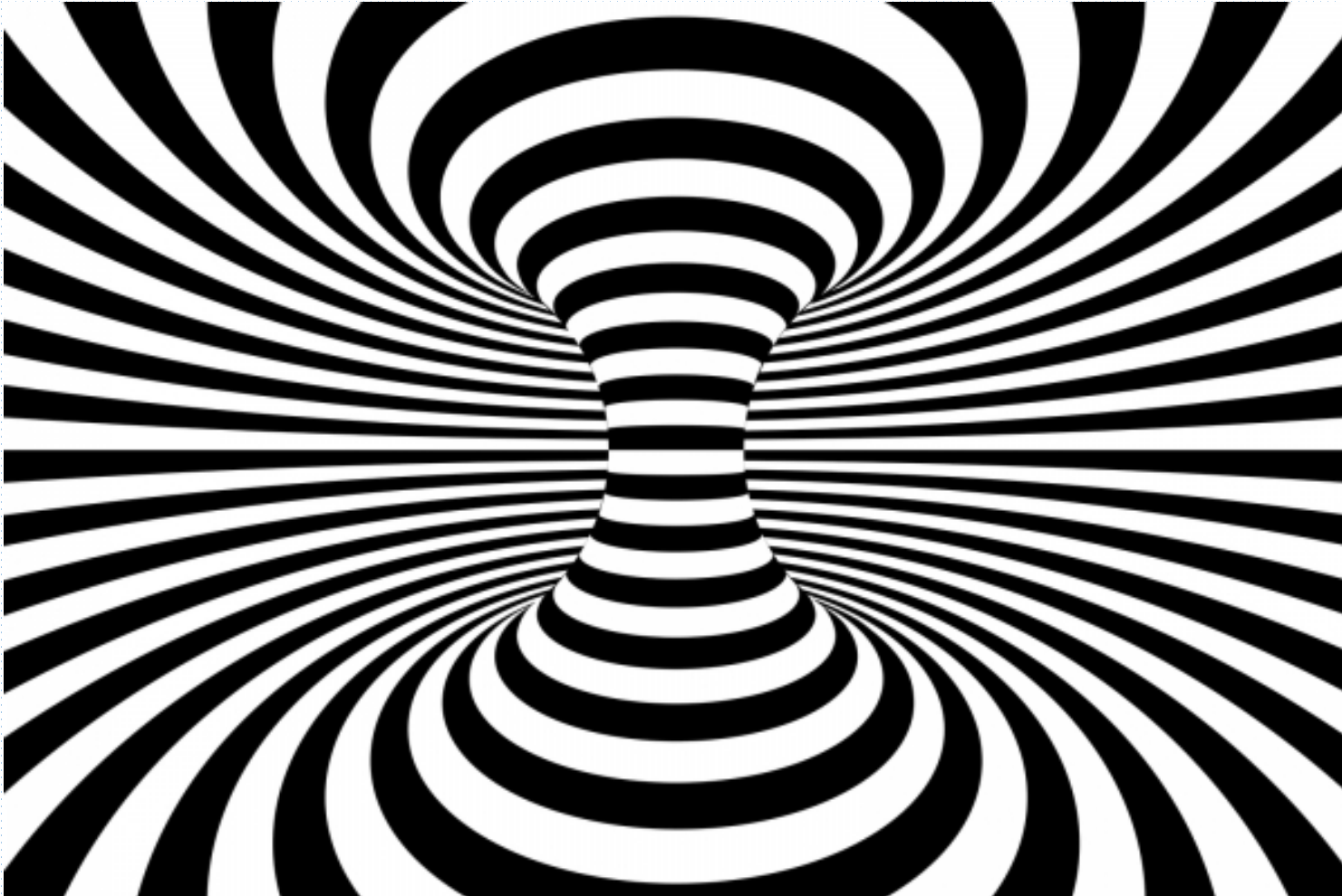
Cognitive illusions

This type of illusion works with the perception of reality as we know it, the brain relates the objects in the image to the built in assumptions or knowledge. These illusions are very common and this is the only category where the sub-categories really matters.



- Ambiguous : Objects or images that will be perceived with different appearance of views or images, as our brain keeps “switching” between them.

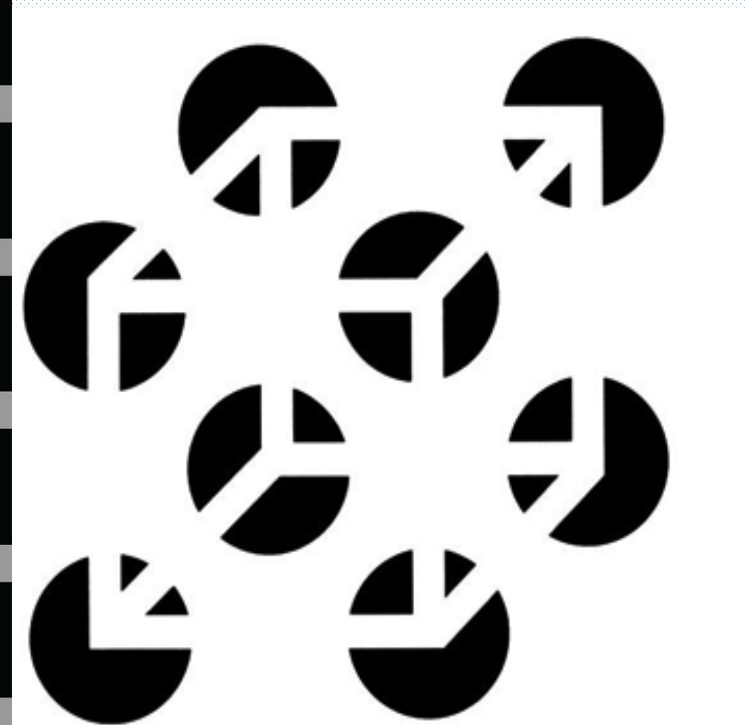
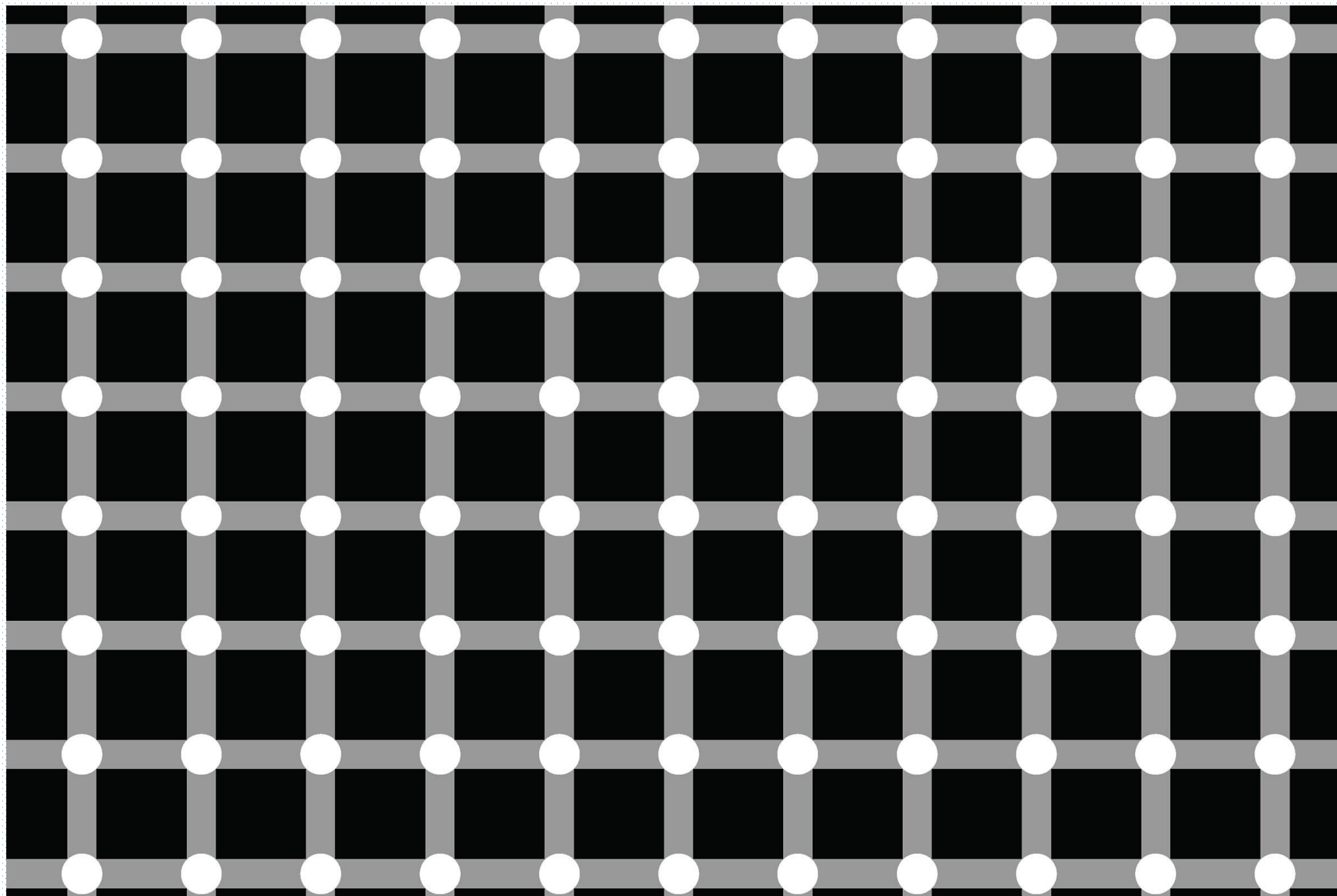
- Distorting or geometrical : Characterized by distortions of size, length, position or curvature, that can trick our brain in misjudging the dimensions of an object.



Paradoxes : Made by objects that are paradoxical, can't exist in 3D, most of the time impossible 3D paintings.



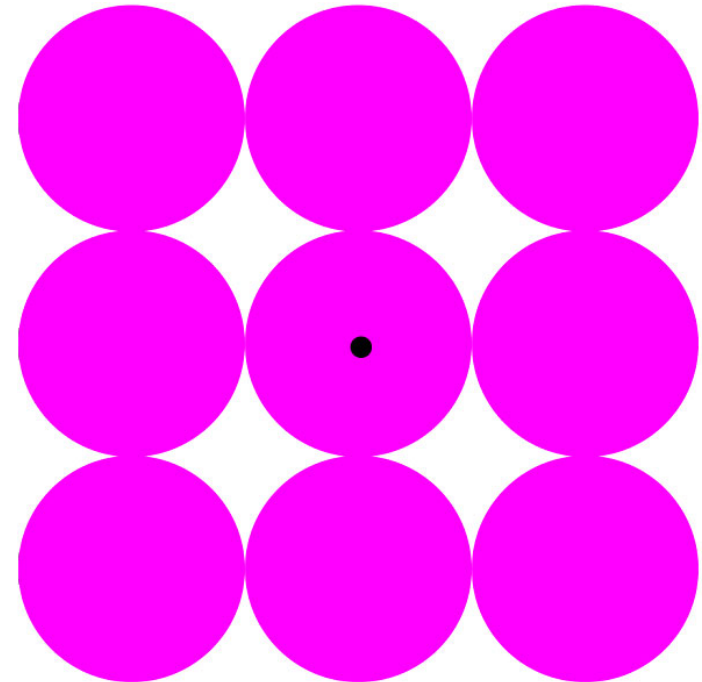
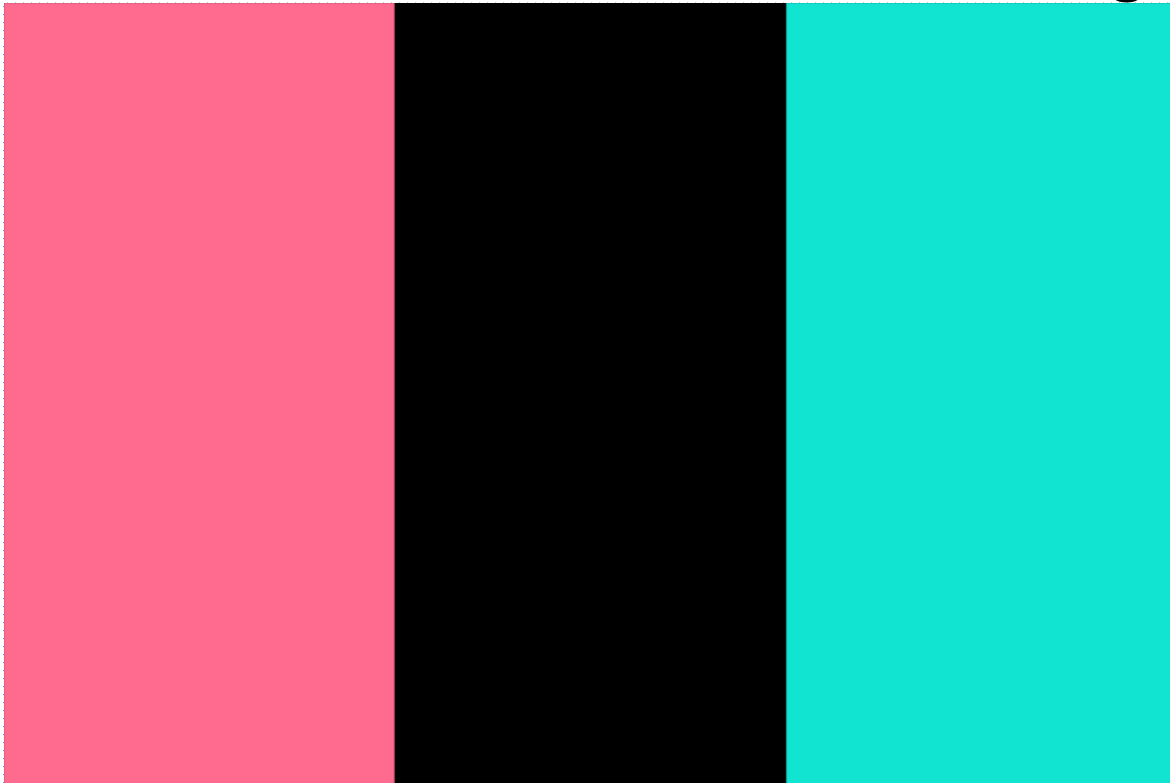
Fictional : Brain perceive a stimulus of a familiar pattern where none exists, like cloud forms.



Physiological illusions

This type of illusion acts on our brain , overstimulating it, processing motion in a static image or making us see something different.

A widespread illusion is the «after effect» which is the consequence of watching any static image for a long period of time and then looking a white surface. This leads to seeing the negative of the starting image.



This is caused by photoreceptors in our eyes that lose sensitivity, a very long exposure to a static image can lead to a permanent loss of sensitivity, recent studies also suggest that our brain is also involved

Another important exponent of this illusions

are the static images that our brain see as moving to prevent the «after effect», or filling a picture with non existing dots or lines, this happens because excited neurons inhibit his neighbour making them fill blank spaces.



Escher

Maurits Cornelis Escher was a Dutch artist who made optical-mathematical illusions, his works centered around impossible creations and studies about many other illusions related topics.

His paintings became really famous and many researchers studied them to understand how our brain works.



Escherer also worked with perspective, playing with our perception of reality



Sitography

[Www.wikipedia.org](http://www.wikipedia.org)

<https://www.google.com/amp/brainden.com/amp-optical-illusions.htm>

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