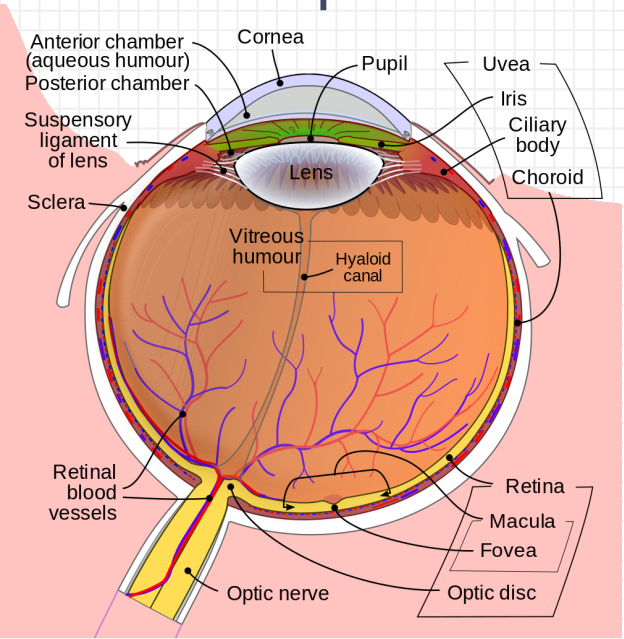
THE EYE

The Eye

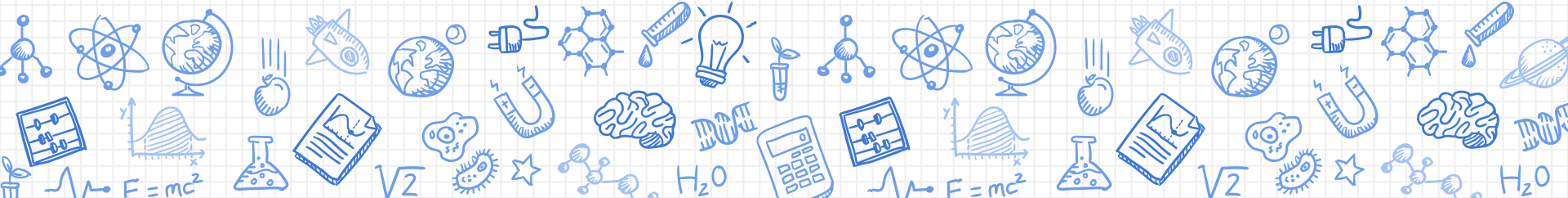
The human eye is the organ in our body responsible for vision.



It is a highly complex organ, with many different components.

(Some) Parts of the Eye

…and what they do



Cornea

- ✘ The **cornea** is the front of the eye. It protects the eye, and is slightly domed.

- ✘ The shape of the cornea helps direct light into the iris and lens by **refraction** (bending of light rays).

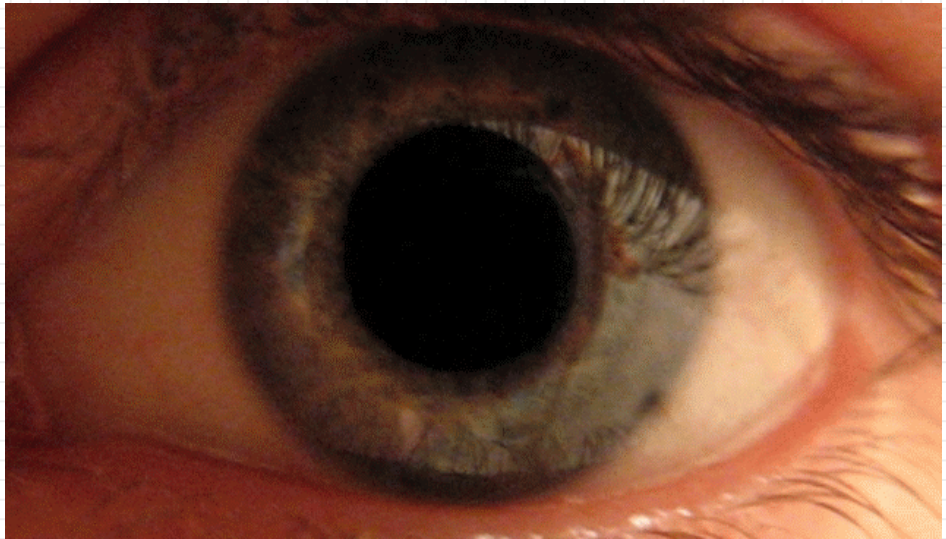
Iris

- ✘ The **iris** is behind the cornea (and aqueous humour).
  The centre of the iris is a hole called the **pupil**.

- ✘ The iris is a circular muscle that **controls how much light can enter the eye**, by opening or closing the pupil.

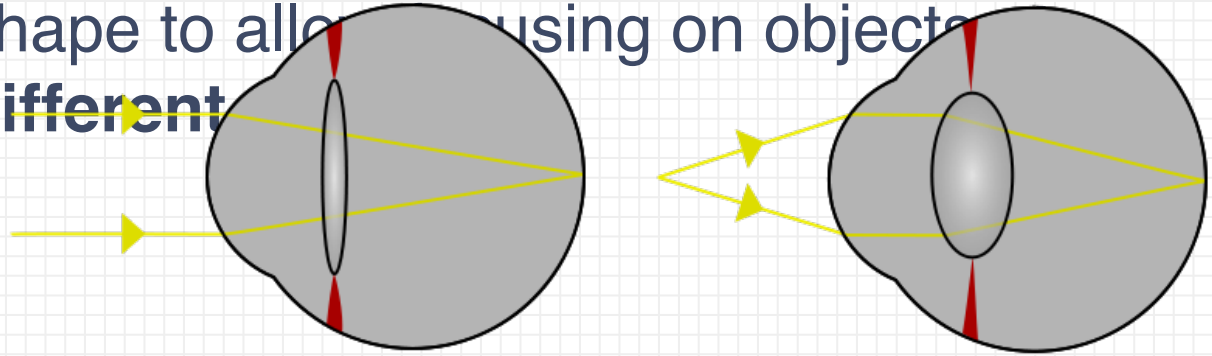
Iris

- In bright light, the iris closes the pupil to reduce the amount of light entering the eye. And in dim light, the iris opens up to let mo



Lens

- The **lens** in the eye is responsible for creating a sharp focus in our eye (on the **retina**).
- The lens **is flexible** and can change shape to allow focusing on objects at **different** distances.

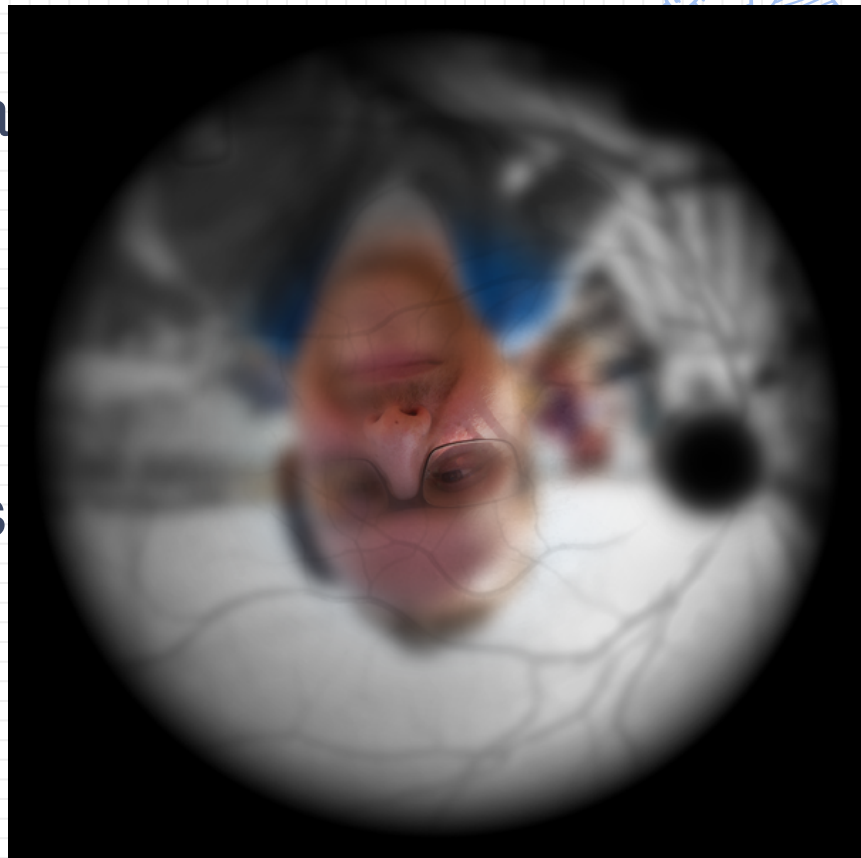


Retina

- ✘ The **retina** is a **light-sensitive layer of tissue** that coats the back of the eye.
- ✘ The retina collects light in **ro** **cells** (which detect **light**) an **cone cells** (which detect **colour**) to create an “image” of the light passing through the lens.

Retina

- ✘ This is an illustration of wha is “seen” by the retina.
- ✘ The image is upside down, sharpest at the centre, and decreases colour and focus clarity moving out from the centre.

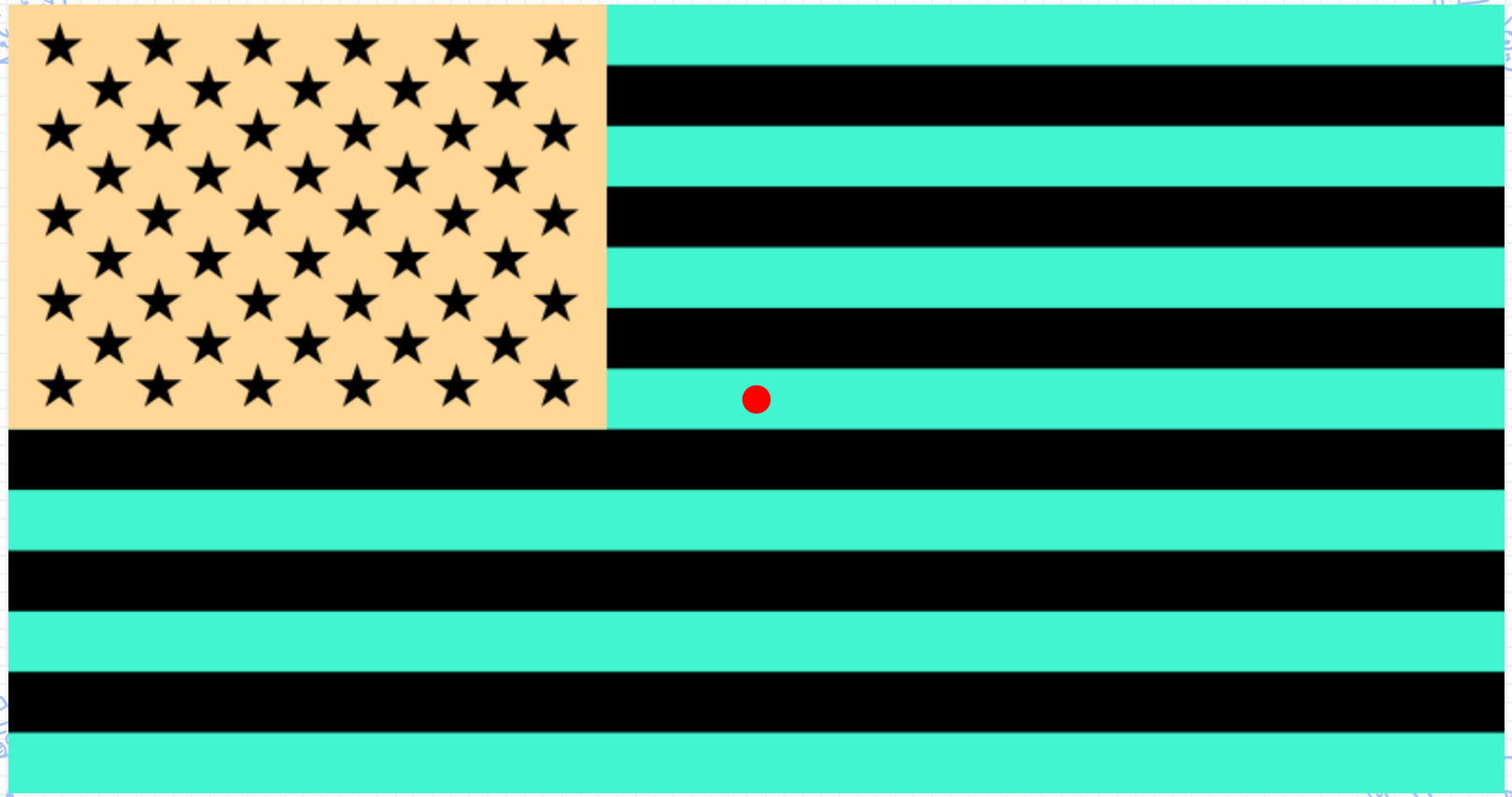


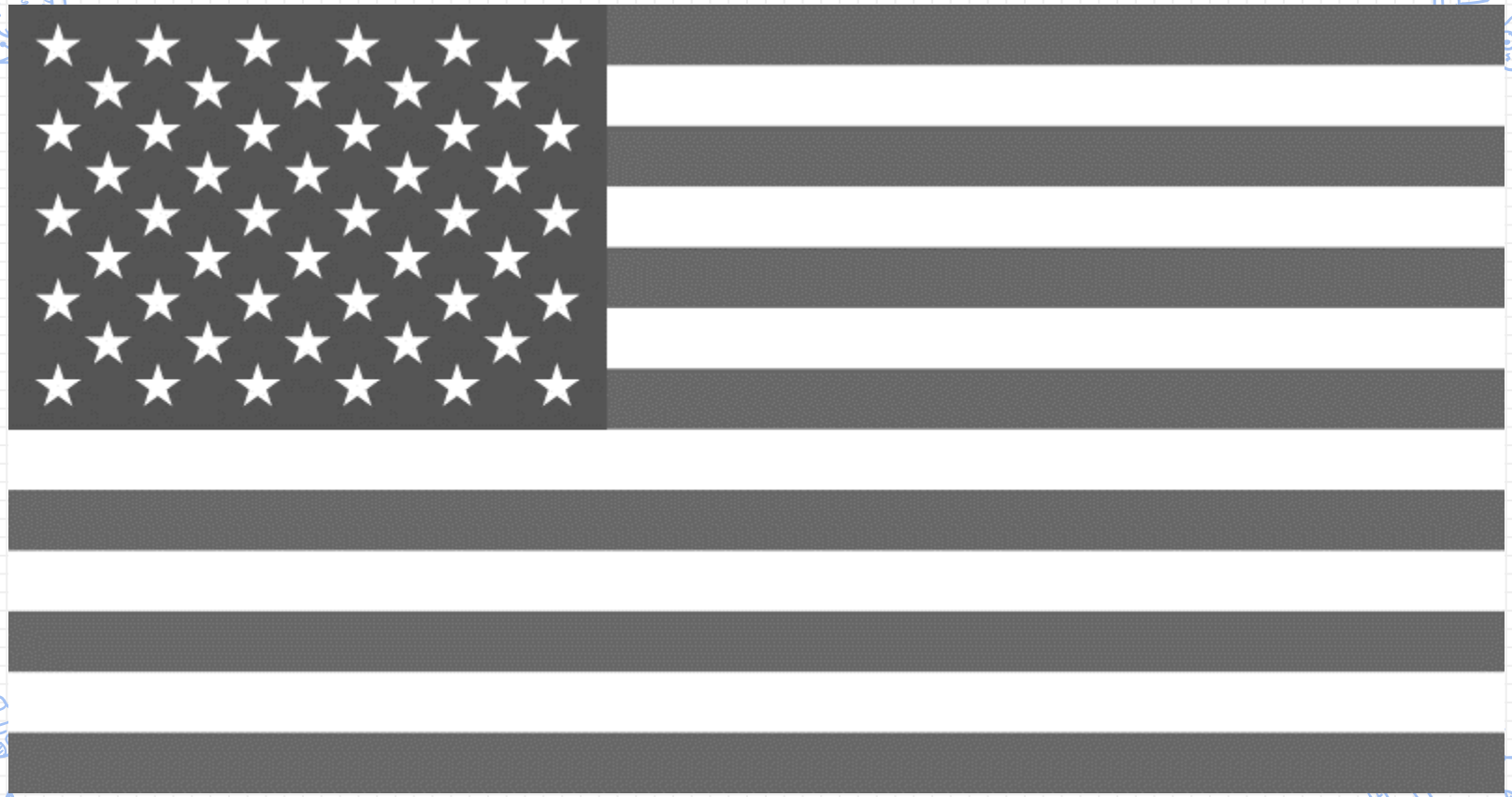
Retina

- ✘ Your retina does not have complete colour and sharpness perception throughout your entire field of vision.
- ✘ To compensate this, your brain “fills in the gaps” for you.

Stare at the dot in the following image for thirty seconds *without moving your eyes*.

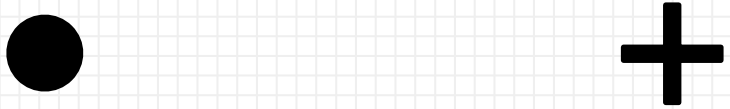
After thirty second the image will automatically change:





Blind spot test

- ✘ Set up your page with the following two symbols, roughly 10cm apart:

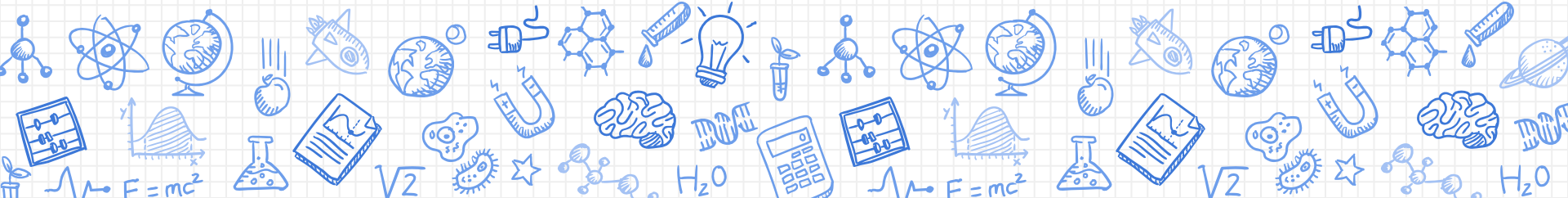


- ✘ Cover your right eye and stare at the cross. Move your page slowly towards your eye; at a certain distance, the dot will vanish!
- ✘ This is your “blind spot”; where your retina joins with the **optic nerve**. You can’t see anything here: your brain just fills in the gap!

VISION PROBLEMS

Myopia

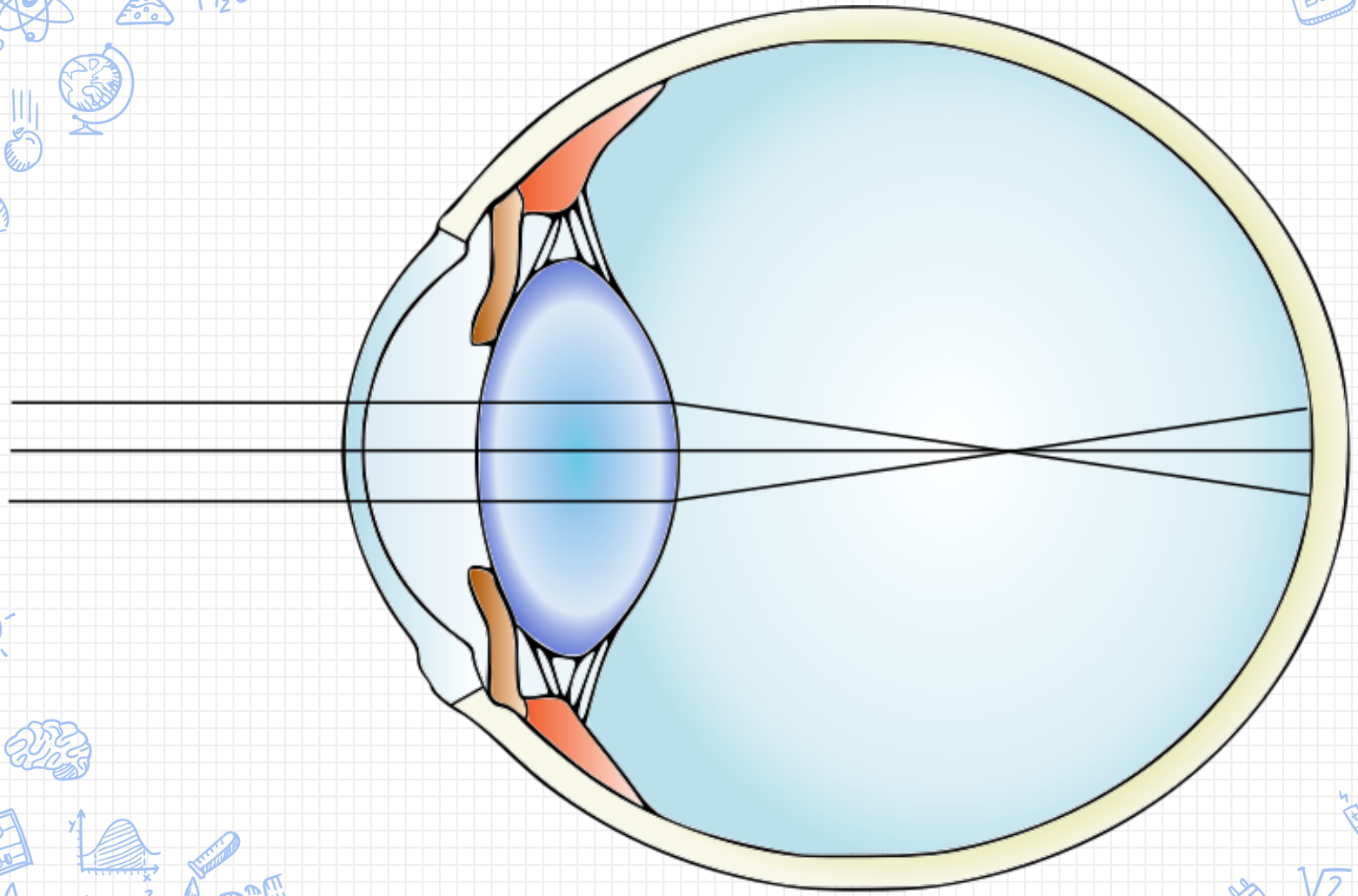
Short-sightedness



Myopia

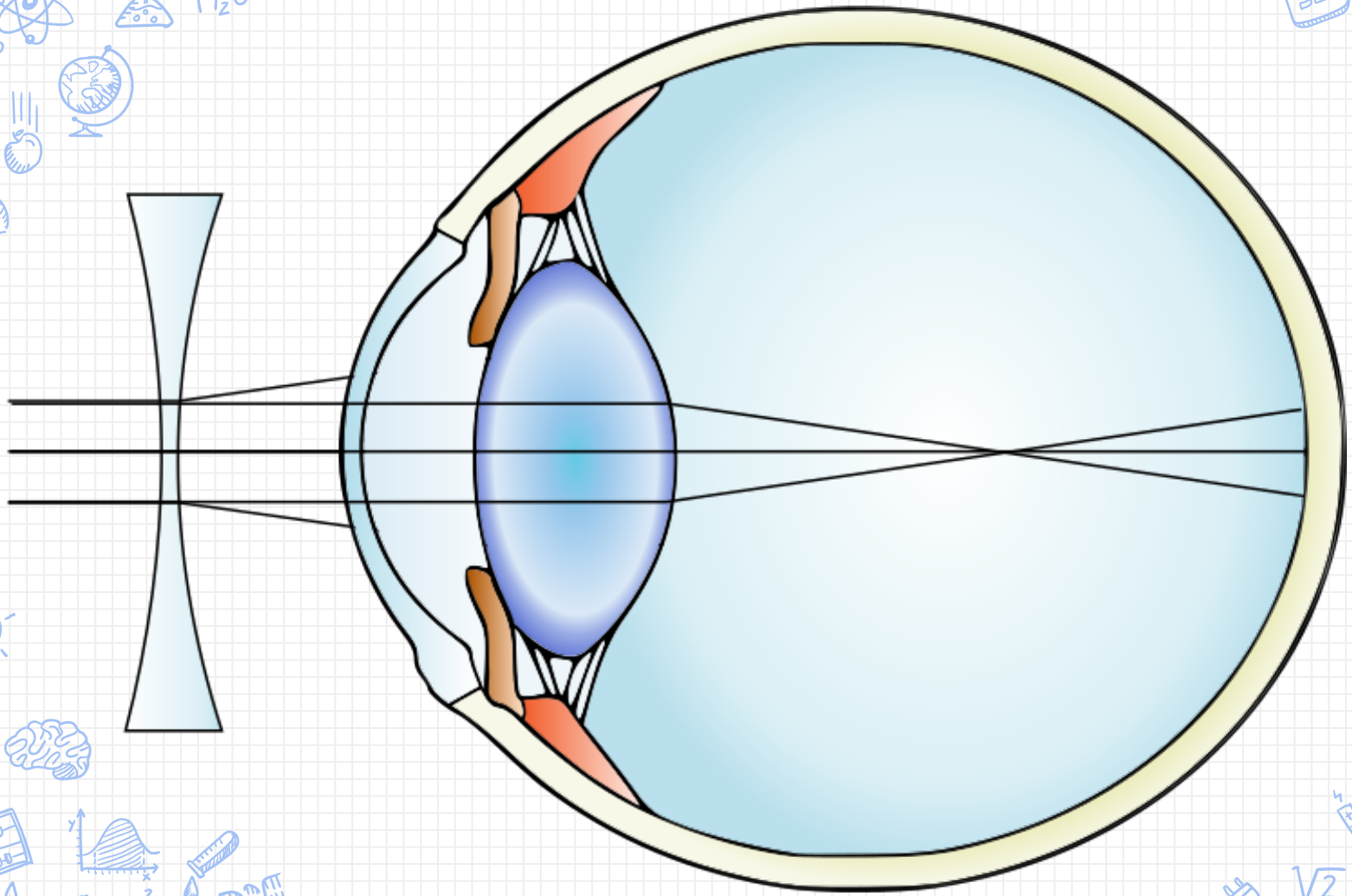
- ✘ Myopia (also known as *short-sightedness* or *near-sightedness*) is a condition where light focuses **in front of the retina**, instead of on it.

- ✘ People with myopia generally have **blurry distance vision**, but **good near vision**.



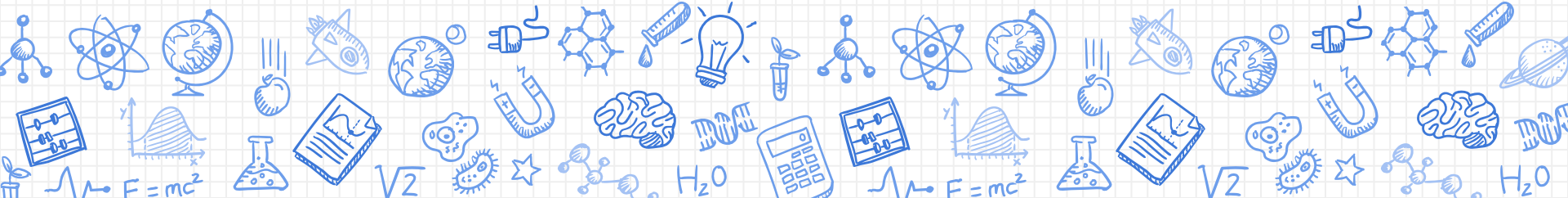
Myopia

- ✘ To correct myopia, a **concave lens** is placed in front of the eye.
- ✘ This lens refracts the incoming rays of light, so that they **diverge** more before entering the eye.



Hyperopia

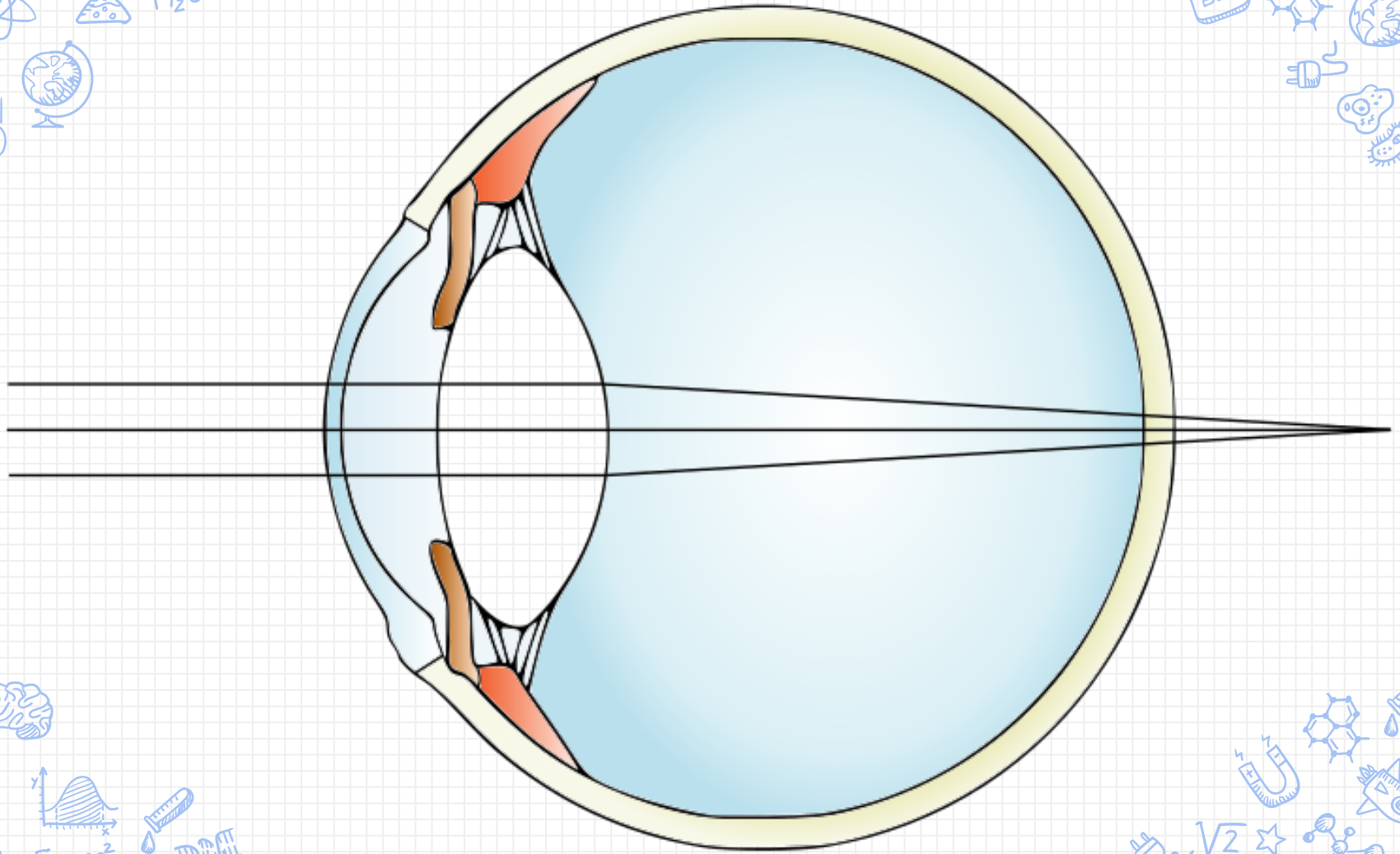
Long-sightedness



Hyperopia

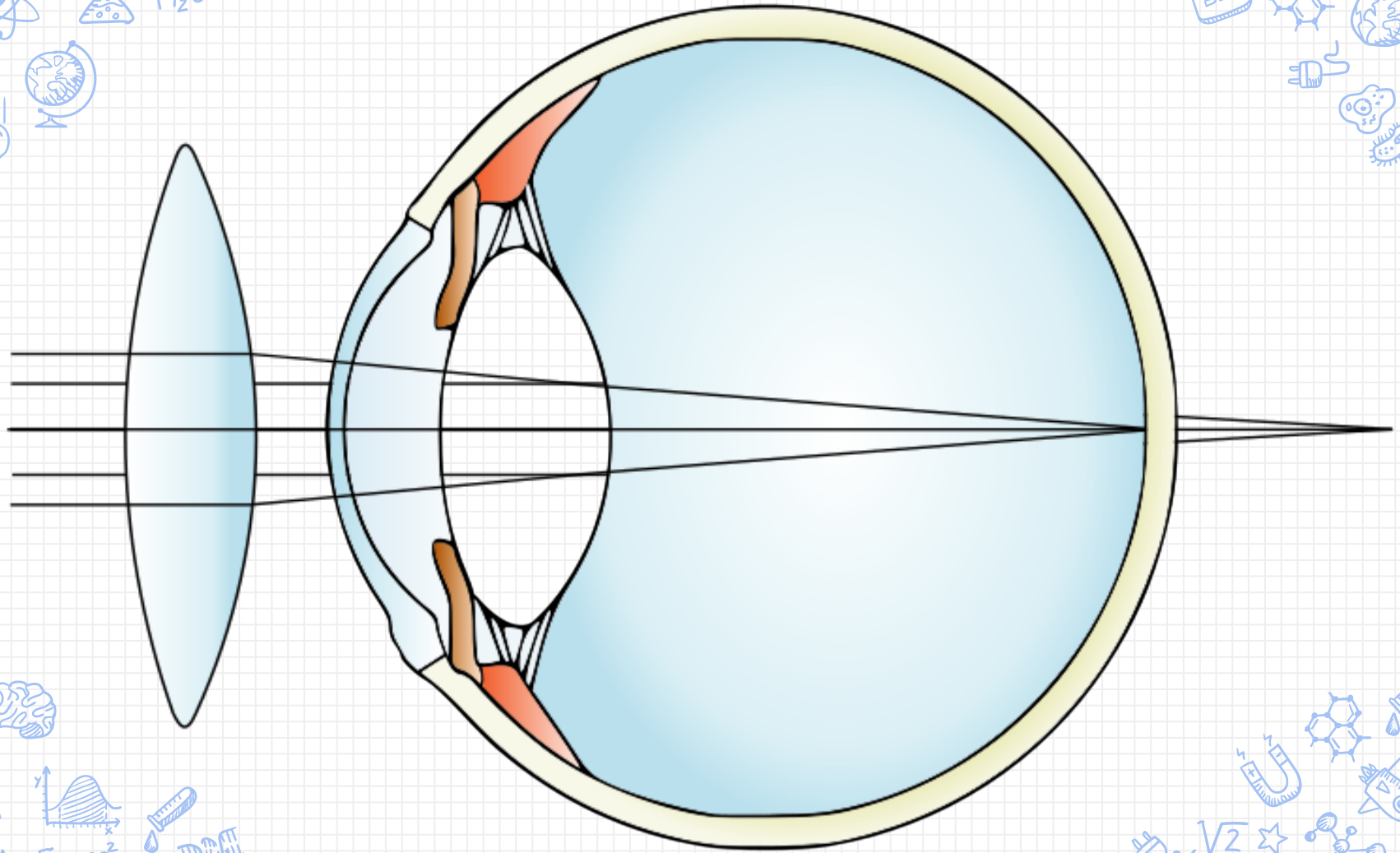
✘ Hyperopia (also known as *long-sightedness* or *far-sightedness*) is a condition where light focuses **behind the retina**, instead of on it.

✘ People with hyperopia generally have **blurry near vision**, but **normal distance vision**.



Hyperopia

- ✘ To correct hyperopia, a **convex lens** is placed in front of the eye.
- ✘ This lens refracts the incoming rays of light, so that they **converge** more before entering the eye.



Credits

Special thanks to all the people who made and released these awesome resources for free:

- ✘ “Friar” presentation template by SlidesCarnival. CC BY 4.0.
- ✘ “Diagram of the human eye in English. It shows the lower part of the right eye after a central and horizontal section.” by Rhcastilhos. Public Domain. https://en.wikipedia.org/wiki/File:Schematic_diagram_of_the_human_eye_en.svg
- ✘ “Animation that illustrates the pupillary light reflex. When the light is turned on, the pupil reacts by constricting. Video was taken with a Canon A610 digital camera, then stabilized in Adobe After Effects 6.5 and converted into an animated GIF in Ulead GIF Animator.” by Greyson Orlando. Public Domain. https://commons.wikimedia.org/wiki/File:Eye_dilate.gif
- ✘ “This diagram shows how light from afar is bent by the stretched lens to strike the retina, and how light from a closer source is bent even more sharply by the relaxed lens to strike the retina.” by Erin Silversmith. CC BY-SA 2.5. https://commons.wikimedia.org/wiki/File:Focus_in_an_eye.svg
- ✘ “A fundus photograph of the back of the retina. The white area is the beginning of the optical nerve (optic disc). The image in this photo is the right eye of eric anthamatten.” by TheGoose aPrisoner. CC BY-SA 4.0. https://en.wikipedia.org/wiki/File:FundusPhotoAntha.jpg
- ✘ “Illustration of image as 'seen' by the retina independent of optic nerve and striate cortex. Takes into account fall off of colour vision and acuity away from fovea (proportional to difference in cone density between fovea and periphery), subtle interference of blood vessels and the blind-spot. Derived from CC BY 2.0 licensed image by Stig Nygaard: http://www.flickr.com/photos/stignygaard/7851689130/sizes/l/ and public domain image of retina (https://en.wikipedia.org/wiki/File:Fundus_photograph_of_normal_left_eye.jpg)” by Ben Bogart. CC BY-SA 3.0. https://en.wikipedia.org/wiki/File:Retinal_Image.png
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