



The Visual Perception System

Is what you see is what you get?



 This topic covers both how we process environmental stimuli when we view the world around us, the structures of the human eye and how our brain organises and interprets the visual sensory information it receives.

 Visual perception principles are 'rules' that we apply to visual information to assist our organisation and interpretation of the world around us.

Differences between visual sensation and visual perception

Visual Sensation

- a physiological process involving the eye, the sensory receptors (rods and cones) and the optic nerve
- is fundamentally the same for all sighted people
- the same visual stimuli will lead to the same visual sensations in different people, assuming their eyesight is intact

Visual Perception

- involves physiological but also mental and psychological processes
- varies according to individual factors such as experience, knowledge, expectations, emotional state
- since psychological processes such as memory, learning and motivation vary from person to person, the same visual sensory information may be interpreted in different ways.

Visual sensation

- **physiological**
- fundamentally works in the same way for all sighted people
- two people who view the same image, assuming the same light conditions and angle of view, should receive the same **visual sensory information** and process it in the same way
- their visual sensory experience is basically similar

Visual sensation

means...



getting light
(**reception**),



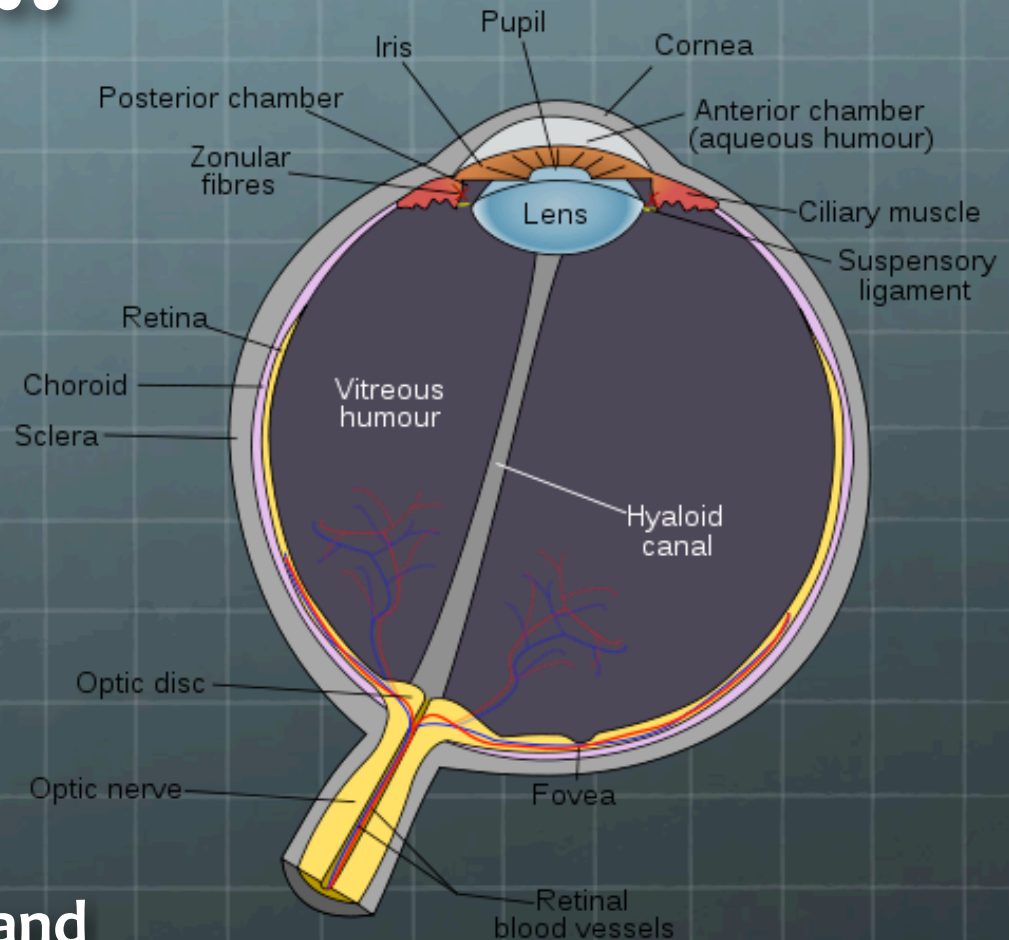
changing it into
electrochemical energy
(**transduction**)



sending it to the brain
(**transmission**)



This process is automatic and
physiological.



Visual perception means...



organising the sensory information received from the eye and...



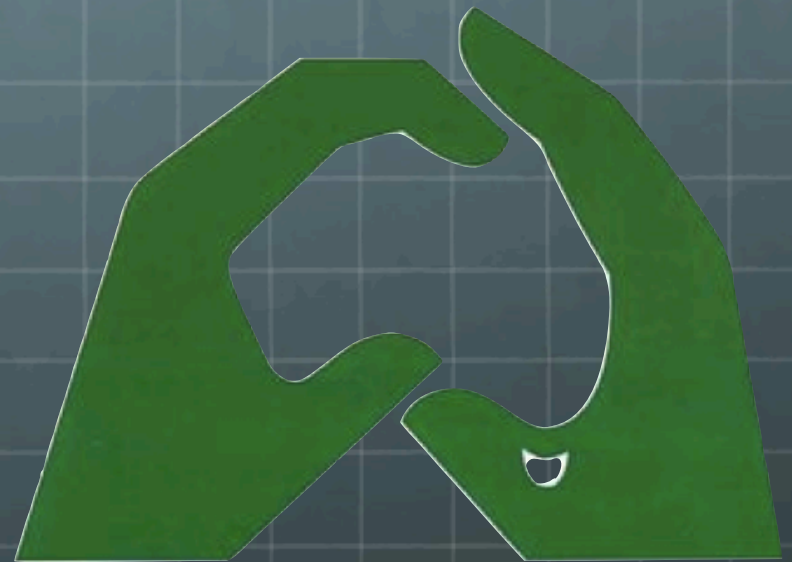
ORGANISATION occurs in a similar way for different people, though it can be influenced by cultural background and past experience.



interpreting the organised sensory information so that it becomes meaningful. This can occur in a very different way from person to person, because our differing motivations and emotions, experiences and attitudes come into play.

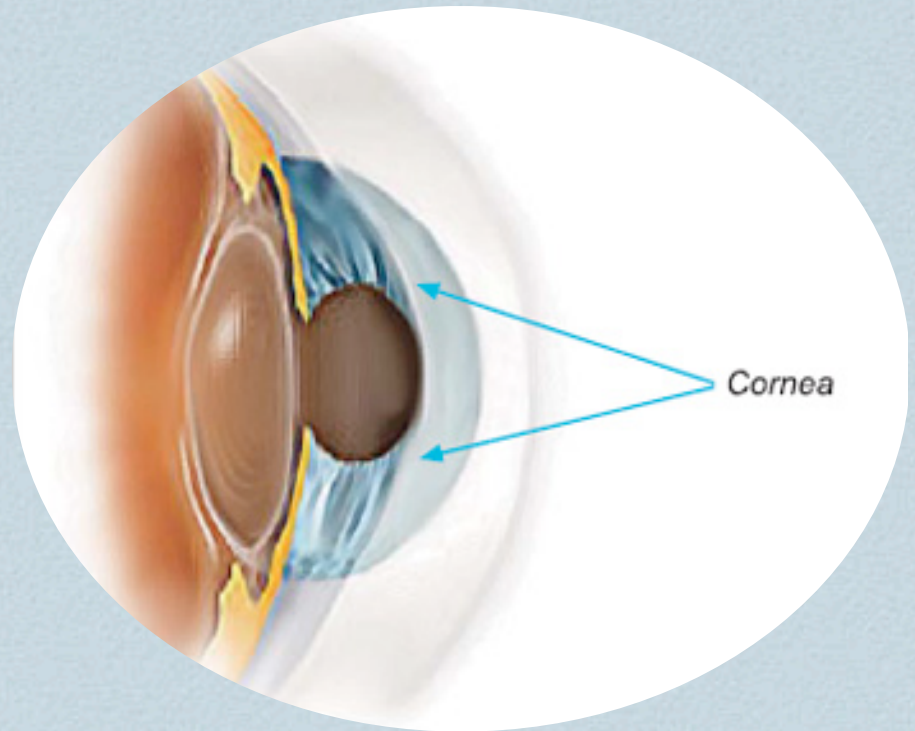
Visual perception is therefore...

- not simply physiological
- but also psychological
- The process may well deliver quite different perceptions for different people.



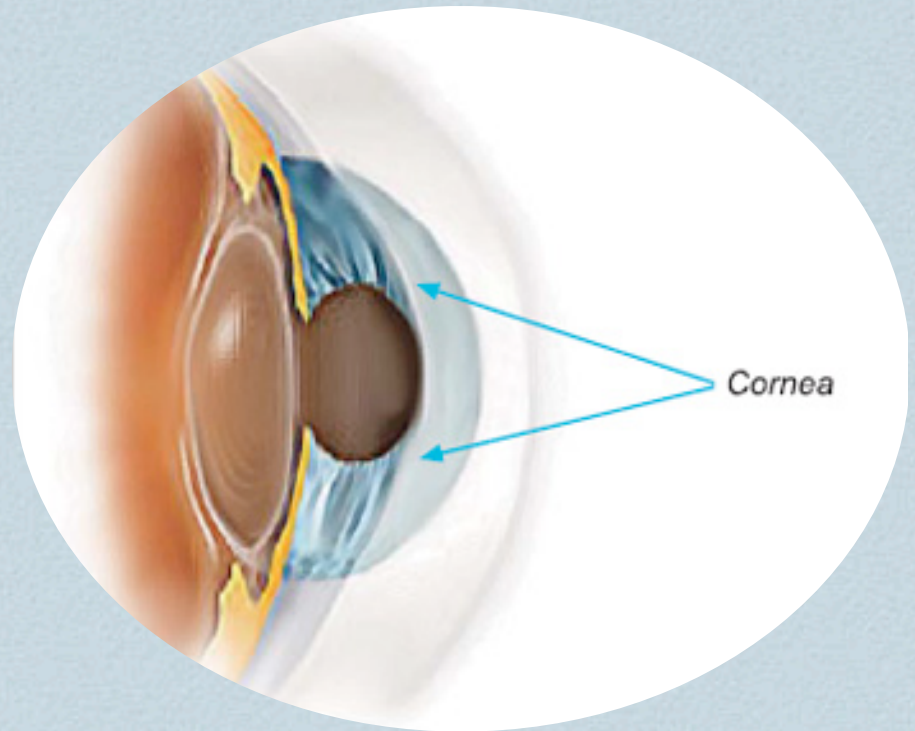
Role of the Eye in the Visual System

- ❖ The eye is the sensory organ for vision.
- ❖ Light initially enters the eye through the cornea, a transparent, convex-shaped covering which protects the eye.



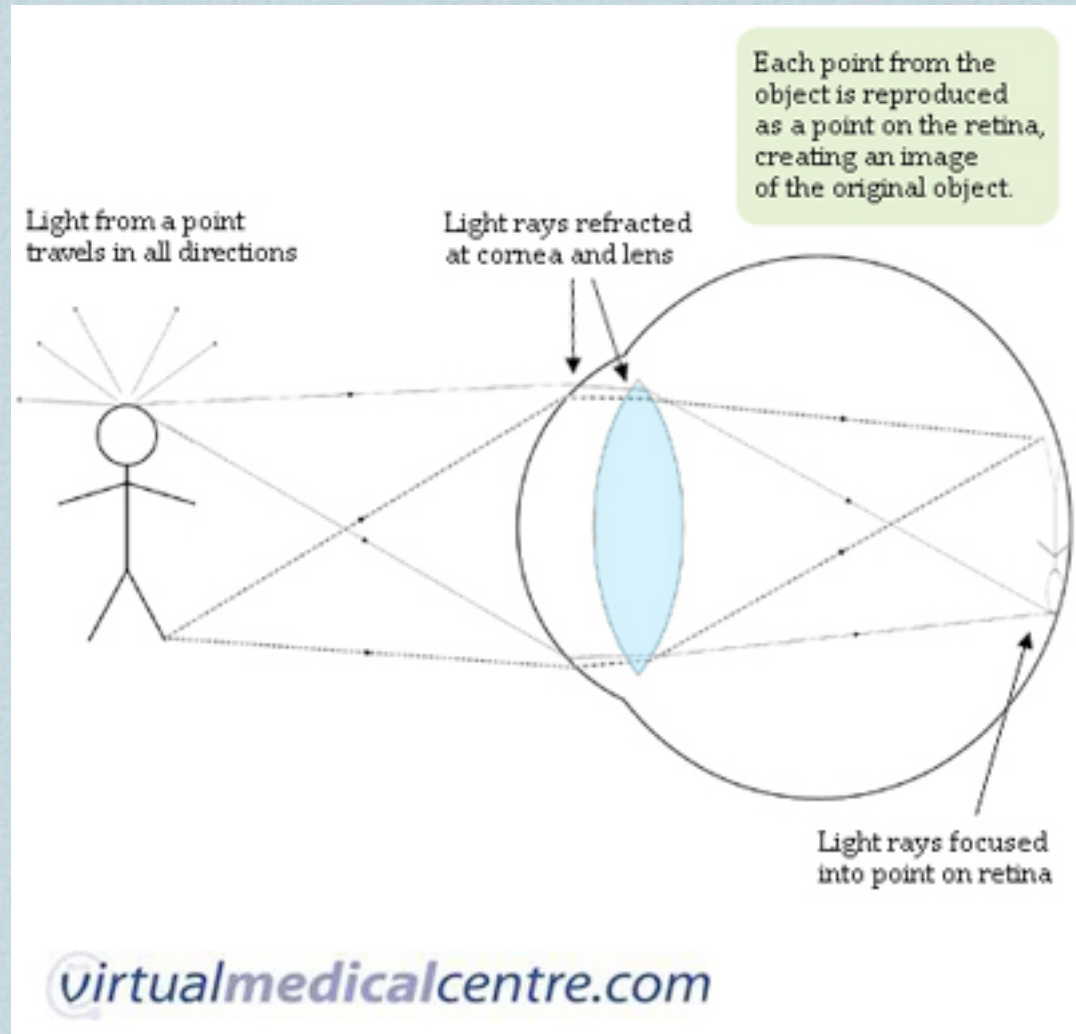
Role of the Cornea in Visual Sensation

- ❖ The cornea not only protects the eye but bends the incoming light so that it is focused on the retina.



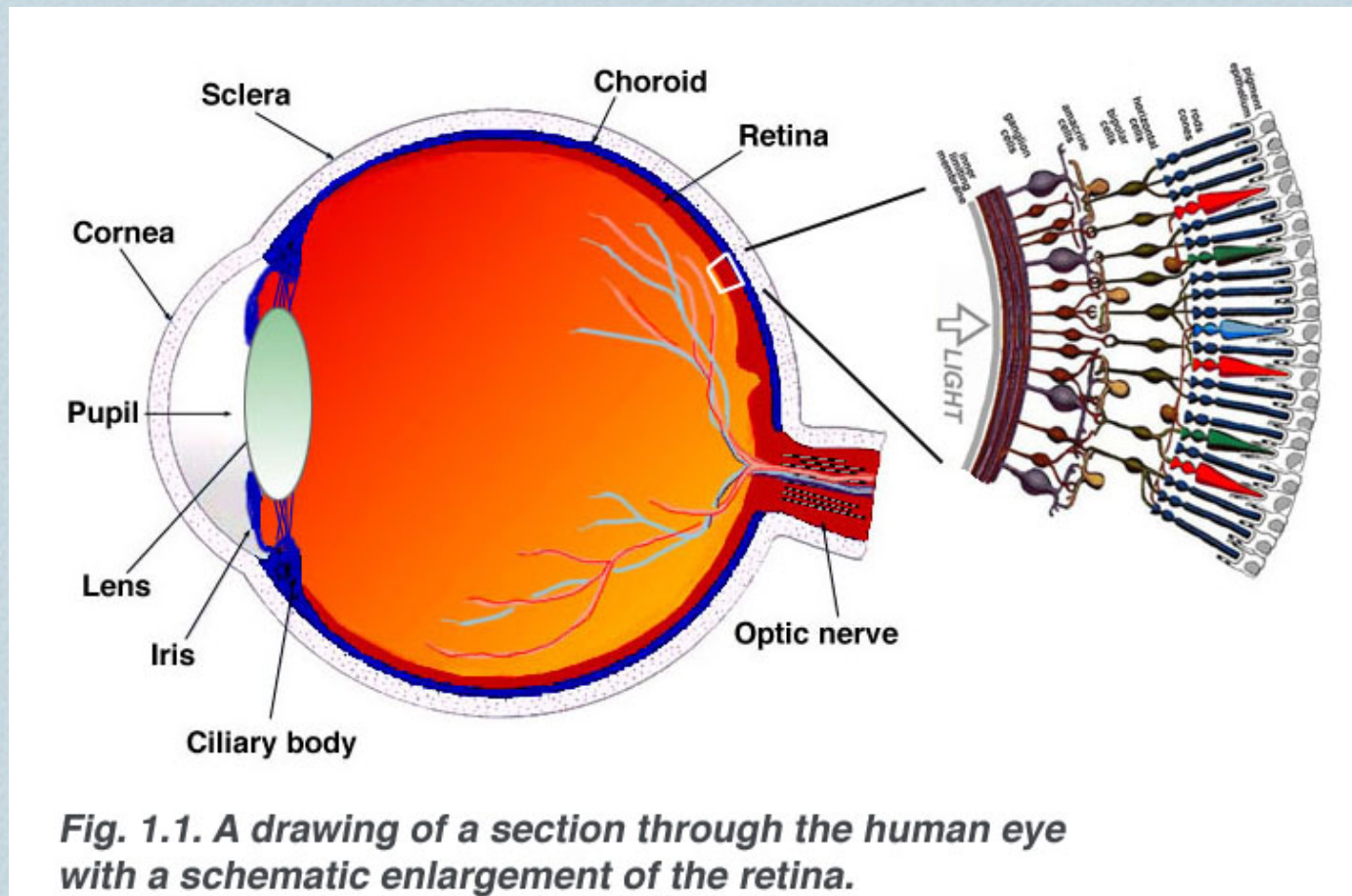
Role of the Lens in Visual Sensation

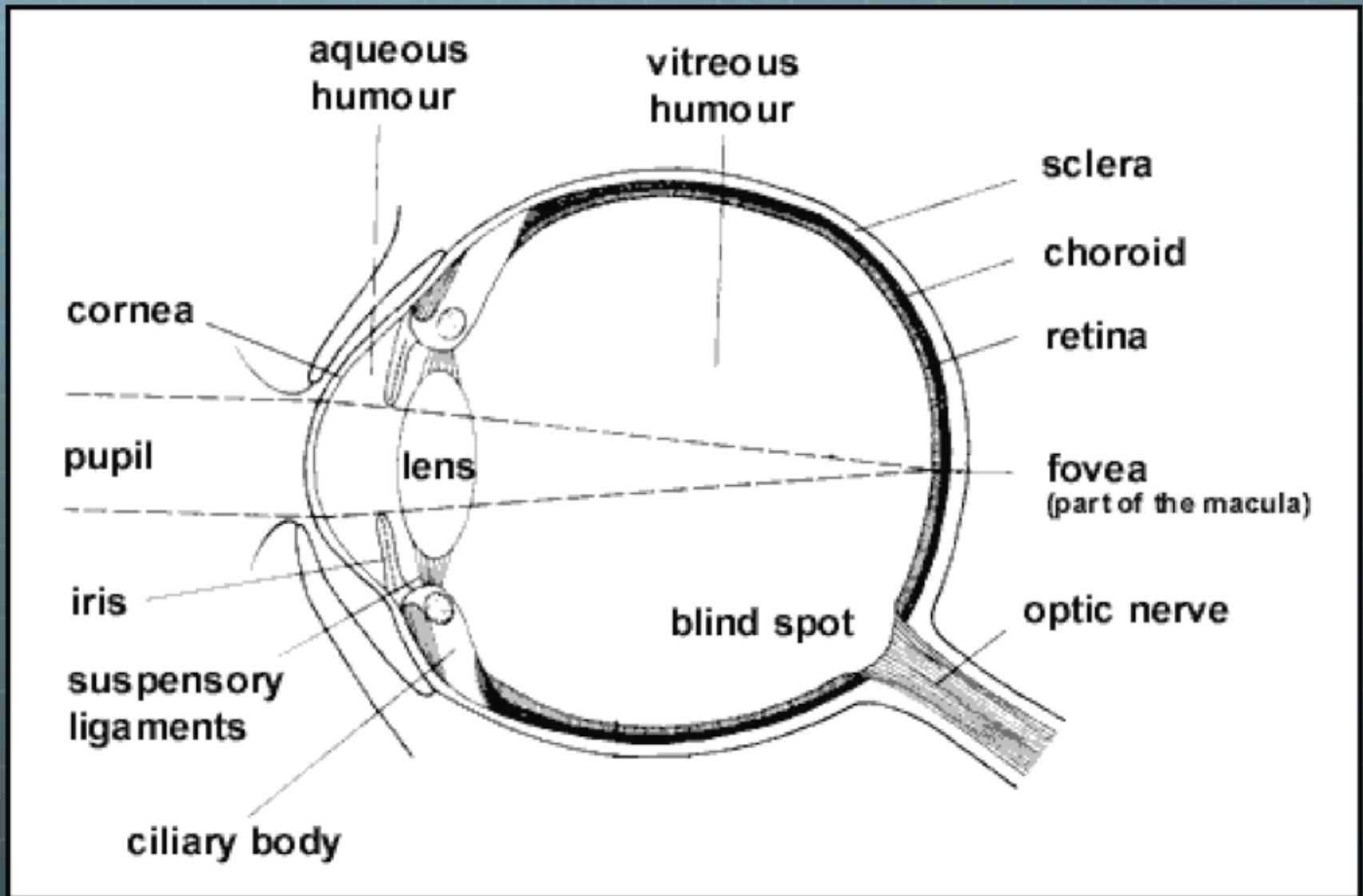
- ❖ The lens is the other structure involved in bending the incoming light so that it is focused on the retina.










The Role of the Retina

- ❖ The photoreceptors that cover the retina transduce light into electrochemical energy that can be transmitted to the brain.





Revision

-  Word for the conversion of one kind of energy into another
-  Word for sending electrochemical energy to the brain
-  Word for getting the energy at the site of the sensory receptor
-  The two kinds of sensory receptors in the eye
-  Two parts of the eye responsible for bending light and focusing it on the retina
-  Part of the eye that controls the amount of light entering the eye
-  The part of the eye responsible for accommodation

RODS AND CONES

Characteristic	Rods	Cones
Kind of vision	Black and white	Colour
Number	125 million	7 million
Distribution	Not in fovea	Throughout retina, concentrated in fovea
Lighting conditions required for best functioning	Dimly lit	Well-lit
Acuity	Poor	Excellent
Sensitivity	Excellent	Poor
Dark adaptation	Slow, but low threshold	Fast, but high threshold

Gestalt Principles




-  Gestalt means 'organised whole'
-  Gestalt principles of visual perception refer to the ways in which we organise the features of a visual scene by grouping them to perceive a whole, complete form.
-  Gestalt principles help us to construct a meaningful whole object from an assortment of parts.

Figure-ground




-  We organise visual information by perceptually dividing a scene into a 'figure' which stands out from the 'ground', which is the surroundings.
-  When we separate the 'figure' and 'ground' the line or boundary between the figure and ground is called the contour.
-  This line may not exist in the scene. The contour is always seen to belong to the figure.

Figure-Ground

-A Gestalt Principle-



See more examples
of figure-ground on
pages 105 - 107

Landcare Australia has made use of this principle in designing its logo.

The image is an ambiguous stimulus.

If you focus on the hands, the map of Australia becomes the ground.

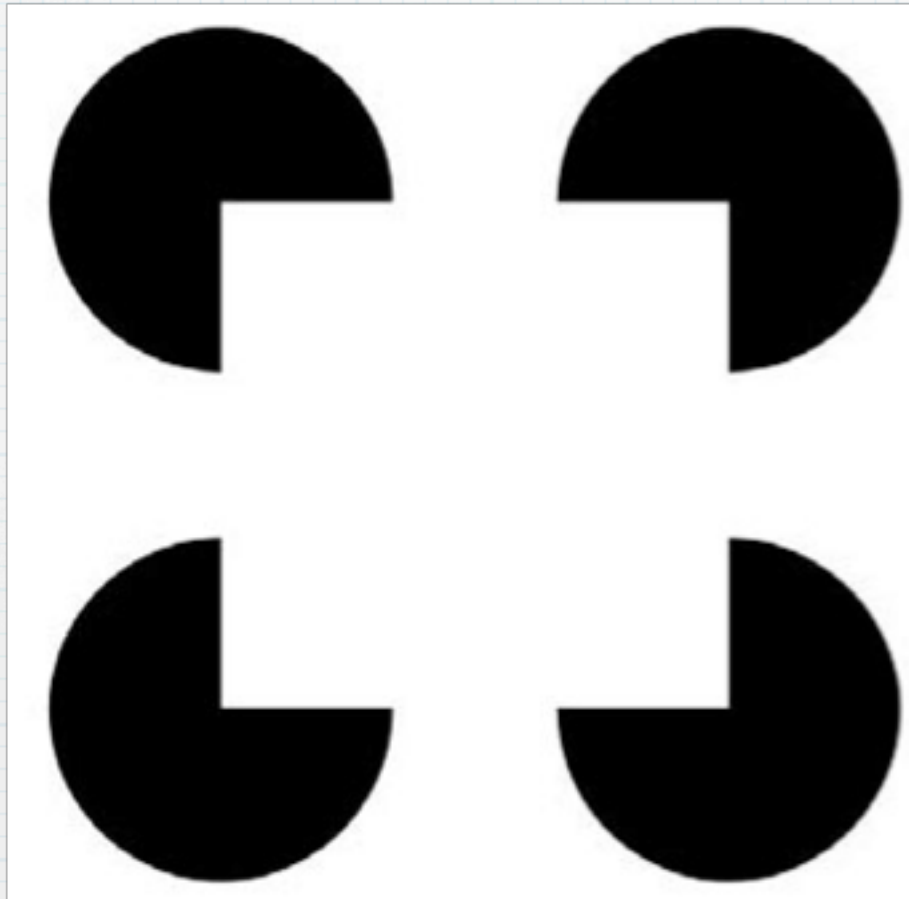
If you focus on the map of Australia, the hands become the ground.

The perceptual hypotheses that you create and test in perceiving this image quickly cause you to grasp the concept of the caring hands shaping the land.

Closure




Closure




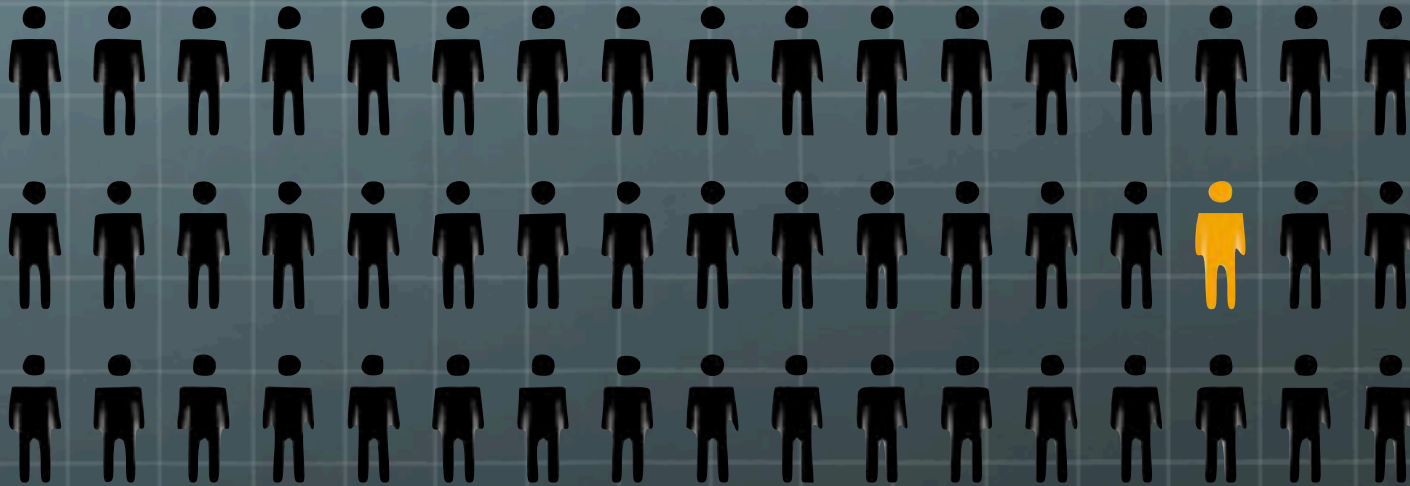
Closure



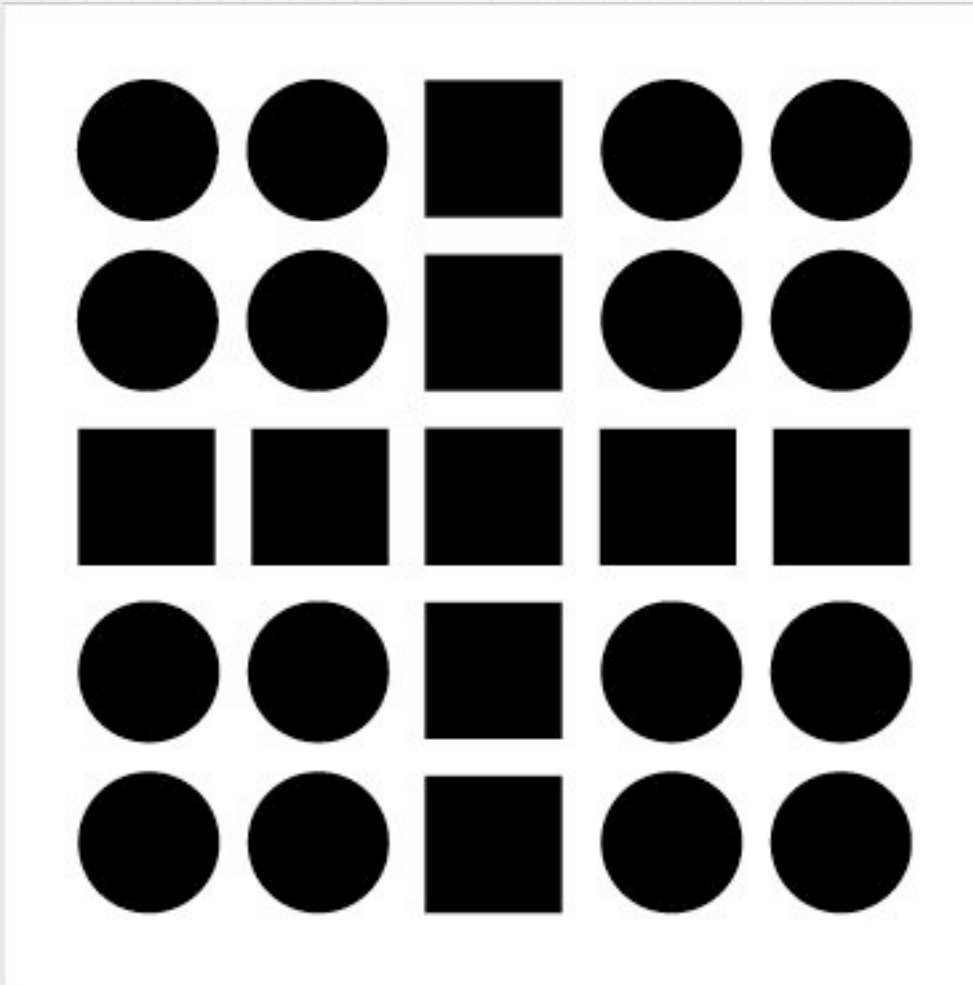
Proximity

 The tendency to perceive parts of a visual image which are positioned close together as belonging together in a group.

 For example, a group of letters that are positioned closely together might be perceived as a word.



Similarity



- * The tendency to perceive parts of a visual image that have similar features (size, shape, texture or colour) as belonging together in a unit or 'whole'.
- * For example, when we group people wearing the same uniform and identify them as belonging to the same school.

How are the
Gestalt
principles
reflected in this
cartoon?

Discuss this
with a partner
and explain.

If you fail, the
monster will
devour you.



When the monster came, Lola, like the peppered moth and the arctic hare, remained motionless and undetected. Harold, of course, was immediately devoured.