

What do we mean by the following statement?

Vision has to cope with information from the eye that is *underspecified*.



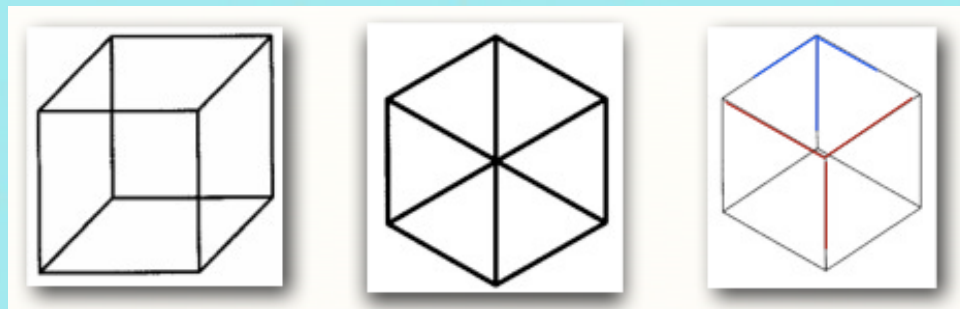
Helmholtz argued that vision requires a kind of unconscious inferencing. What did he mean by this?

Why do we say that this unconscious knowledge is domain-specific?

What do we mean by the generic view of an object?

What do we mean by an accidental view?

What is the difference between a generic view and an accidental view?



Why is the shape in the middle harder to see as a three dimensional object ( a cube) than the shape on the left and the shape on the right?

What is a Y-junction and what is an arrow-junction?

What role do these junctions play in the visual system's ability to extract surfaces from the image on the retina?

Do you understand this sentence?

Helmholtz referred to his influential theory of perception as a '*sign-theory*', because his general assumption was that there is no simple resemblance between the neural events that give rise to sensations and physical objects in the world.



In what way is Helmholtz's sign theory of perception similar to Descartes' view of perception?

In what way does Helmholtz's sign theory differ from Descartes' view of perception?

What is meant by the following statement?

The common experience of the *contingencies between actions and their perceptual consequences* in different sensory systems provides the foundations that allow us to acquire the unconscious principles that generate three dimensional representations of objects.

What does the word "common" in "common experience" refer to? Does it mean "frequently occurring" as in "a common cold" (answer -- no it doesn't).

What is the relationship between "common" in the above sentence and Aristotle's use of the term "common" in the "common sense".

## Explain this sentence to a friend:

Spatial representations are domain-specific but not modality-specific. Hint: The domain of a cognitive function in psychology refers to the kind of knowledge that must be brought to bear on a particular problem or set of problems (compare for example, learning to play chess versus learning to play the piano versus learning a language). A domain general ability applies to many different domains, otherwise the ability is domain-specific.

Alternative way of stating the above: Spatial representations are domain-specific but modality-independent.

## Question:

Consider the following description of Aristotle's notion of the Common Sense.

Apart from using our eyes to see and our ears to hear, we regularly and effortlessly perform a number of complex perceptual operations that cannot be explained in terms of the five senses taken individually. Such operations include, for example, perceiving that the same object is white and sweet, noticing the difference between white and sweet, or knowing that one's own senses are active. Observing that other animals must be able to perform such operations, and being unprepared to ascribe any share in rationality to them, Aristotle explained such operations with reference to a higher-order perceptual capacity which unites and monitors the five senses. This capacity is known as the 'common sense'.

Is the common sense domain-specific?

Is the common sense modality-specific or modality-independent?

Helmholtz's emphasized movement as being fundamental to establishing visual representations of space and objects.

What is the fundamental role, according to Helmholtz, that movement plays in developing perceptual representations of space?