



## Optical Illusions



Figure 1 Young/Old Lady?



Figure 2 Man Liar?

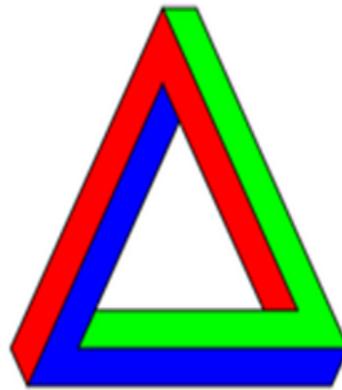


Figure 3 Penrose triangle

*Say the color, not the word*

<b>YELLOW</b>	<b>BLUE</b>	<b>ORANGE</b>
<b>BLACK</b>	<b>RED</b>	<b>GREEN</b>
<b>PURPLE</b>	<b>YELLOW</b>	<b>RED</b>
<b>ORANGE</b>	<b>GREEN</b>	<b>BLACK</b>
<b>BLUE</b>	<b>RED</b>	<b>PURPLE</b>
<b>GREEN</b>	<b>BLUE</b>	<b>ORANGE</b>



## Vocabulary

**Ambiguous** [adj.] / Ambiguity [n.]—uncertain, vague; having more than one meaning

**Bizarre** [adj.]—unusual in appearance, outlandish in the extreme, odd, strange

**Credible** [adj.]—worthy of belief, reliable, dependable

**Cursory** [adj.]—hurried; hence, superficial

**Elicit** [v.]—to draw out, evoke

**Exploit** [v.]—to use for one’s selfish purpose; utilize [n.]—a heroic act, feat

**Fraud** [n.]—a deception; deceit, trickery [chicanery]; duplicity, fallacious

**Meticulous** [adj.]—fussy about minute details, fastidious

**Paradox** [n.]—a self-contradictory statement; something that appears to be absurd and yet may be true; oxymoron [incongruous words]

**Tantalize** [v.]—entice [tempt], raise hopes that cannot be realized [torture], tease [joke]

Optical illusions are visually perceived objects that differ from reality. They **tantalize** the brain as it tries to make sense of the images and symbols to create meaning. There are three main classes of illusions: physical, physiological and cognitive. Each of these has four categories: ambiguities, distortions, paradoxes and fictions.

The **ambiguous** young lady/old lady illusion elicits a switch between alternative interpretations of an object. This face illusion **exploits** similarities between the two objects; for example, the mouth of the old woman is the necklace of the young woman.

The man/liar illustrates a cognitive visual illusion. Human brains are hard wired for facial recognition, so a **cursory** look will reveal a man. However, if a **meticulous** viewer looks at the image from the top left corner to the bottom right corner, the “eyes” form the letter “L”, the nose forms the “i”, the mouth forms an “a” and the neck forms the “r”.



The color/word illusion challenges the brain to do two things at once. As a person tries to say the color of the word and not the word itself, the right-side of the brain sees the color of the word; simultaneously, the left side of the brain is trying to say the word. This **bizarre** combination demonstrates the cognitive split of the human mind.

Featured in the works of artist M.C. Escher, the Penrose triangle is an impossible figure. The **paradox** is achieved as the brain tries to make sense of the shape. The 2D figure is subconsciously interpreted as a 3D object. Although such an object cannot exist, the brain attempts to create a **credible** interpretation of what the eye sees.

### Same or Different

1. ambiguous—clear
2. bizarre—odd
3. credible—believable
4. cursory—thorough
5. elicit—suggest
6. exploit—achievement
7. fraud—deception
8. meticulous—careless
9. paradox--inconsistent
10. tantalize—entice
11. credible—fraudulent
12. exploit--utilize

Answer Key 1. D, 2. S, 3. S, 4. S, 5. S, 6. S, 7. S, 8. D, 9. S, 10. D, 11. D, 12. S

Fill in the blanks with words from the Word Bank.



Word Bank:

**ambiguous, credible, elicited, meticulous, tantalize**

While the most widely known illusions are the (1.) \_\_\_\_\_ [vague] cognitive visual illusions, the physical and physiological also (2.) \_\_\_\_\_ [tempt] the human brain. The Moon illusion is a physical illusion which causes the Moon to appear larger near the horizon than it does higher up in the sky. Ptolemy, a [n] (3.) \_\_\_\_\_ [careful] ancient astronomer wrote about the Moon illusion and attributed it to the difficulty of looking upward. Over the centuries, the phenomenon has (4.) \_\_\_\_\_ [produced] some (5.) \_\_\_\_\_ [believable] explanations, but none has been universally accepted.

Word Bank:

**bizarre, cursory, exploit, fraudulent, paradoxically**

Afterimages, which occur because of the continuing photochemical activity in the retina, are physiological illusions. A [n] (6.) \_\_\_\_\_ [quick] example is the visual snow that people experience after a camera flash. Among the more (7.) \_\_\_\_\_ [odd] photographed illusions can be found on the seenox.org website. While some of the “Thirty Weird & Funny Optical Illusions” appear to be (8.) \_\_\_\_\_ [faked], photo-shopped pictures that (9.) \_\_\_\_\_ [take advantage of] viewers’ perceptions, (10.) \_\_\_\_\_ [unexpectedly] each picture is a perfectly-timed photo.

Answer Key: 1. ambiguous, 2. tantalize, 3. meticulous, 4. elicited, 5. credible, 6. cursory, 7. bizarre, 8. fraudulent, 9. exploit, 10. Paradoxically

Multiple choice: Select the correct answer



Optical illusions are visually perceived objects that differ from reality. They **tantalize** the brain as it tries to make sense of the images and symbols to create meaning.

1. The word **tantalize** in this context most nearly means

- A. torture
- B. torment
- C. tease
- D. tempt

The **ambiguous** young lady/old lady illusion elicits a switch between alternative interpretations of an object.

2. The word **ambiguous** in this context most nearly means

- A. having an unclear, fuzzy image
- B. having an uncertain perspective
- C. having a vague point of view
- D. having more than one meaning

This face illusion **exploits** similarities between the two objects; for example, the mouth of the old woman is the necklace of the young woman.

3. The word **exploits** in this context most nearly means

- A. heroic acts
- B. utilizes
- C. accomplishments
- D. unfair advantages

The man/liar illustrates a cognitive visual illusion. Human brains are hard wired for facial recognition, so a **cursor** look will reveal a man.



4. The word **cursor** in this context most nearly means

- A. superficial
- B. obscene
- C. mean
- D. prolonged

However, if a **meticulous** viewer looks at the image from the top left corner to the bottom right corner, the “eyes” form the letter “L”, the nose forms the “i”, the mouth forms an “a” and the neck forms the “r”.

5. In this context a **meticulous** viewer

- A. carefully looks at the image
- B. briefly gazes at the image
- C. intuitively guesses the meaning of the image
- D. confusedly looks at the image

This **bizarre** combination demonstrates the cognitive split of the human mind.

6. The word **bizarre** in this context means all of the following **EXCEPT**

- A. unusual
- B. uncommon
- C. infrequent
- D. inexplicable

The **paradox** is achieved as the brain tries to make sense of the shape.



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7. The word **paradox** can best be illustrated by using which of the following examples?

- A. oxymoron, icy hot
- B. mythological, shape shifter
- C. biological, photosynthesis
- D. mathematical, long division

Although such an object cannot exist, the brain attempts to create a **credible** interpretation of what the eye sees.

8. The word **credible** in this context most nearly means

- A. the brain is inclined to believe anything
- B. the brain is trying to produce a praiseworthy answer
- C. the brain is constructing a trustworthy meaning
- D. the brain is unable to process the information

Answer Key: 1. C, 2. D, 3. B, 4. A, 5. A, 6. D, 7. A, 8. C