

READING COMPREHENSION

A nanometer is a billionth of a meter. A DNA molecule is 2 nanometers in diameter. Protein molecules are about 10 nanometers in diameter. A human hair is 100,000 nanometers in diameter. But what is a nanometer and how does it relate to technology? Nanotechnology is defined as the understanding and control of matter at dimensions of roughly 1 to 100 nanometers, a scale at which unique properties of materials emerge that can be used to develop novel technologies and products. At the nanoscale, the physical, chemical, and biological properties of materials differ from the properties of matter either at smaller scales, such as atoms, or at larger scales that we use in everyday life such as millimeters or inches. Nanotechnology involves imaging, measuring, modeling, and manipulating matter only a few nanometers in size. Gold nanoparticles are made of the same material as in jewelry. But when light interacts with particles of gold, different colors are reflected. The different colors can be used in simple medical tests to indicate infection or disease. Metals such as copper become extremely rigid at the nanoscale, rather than bendable as in copper wires seen in everyday use.

What is the major difference between matter at the nanoscale and matter at larger scales such as millimeters or inches?

- A. At the nanoscale, metals are bendable, and at larger scales they are rigid.
- B. **Matter has different and special characteristics at the nanoscale.**
- C. At the nanoscale, matter has the same properties as matter at the atomic level.
- D. There is no difference.

Which claim from the passage best describes the benefits of nanotechnology?

- A. **Scientists can develop novel technologies and products.**
- B. Nanotechnology is defined as the understanding and control of matter at dimensions of roughly 1 to 100 nanometers.
- C. The different colors can be used in simple medical tests to indicate infection or disease.
- D. Unique properties of materials emerge.

What is the author's primary purpose in writing this essay?

- A. To explain how to utilize the nanoscale
- B. To review the conversion between the nanoscale and nanotechnology
- C. To advocate for the usage of more nanotechnology
- D. **To describe nanotechnology and what it is**

Neurologists and biological psychologists have witnessed a sharp increase in the knowledge and understanding of particular structures of the brain over the past two decades. As technology becomes ever more advanced, scientists are able to isolate the functions of even small regions of the human brain. One noteworthy discovery is the role of the amygdala in human fear and aggression. The amygdala, a small, almond-shaped conglomerate, is just one part of the limbic system. Located at the very center of the brain, the limbic system is the core of our 'emotional brain;' each individual structure in the limbic system is somehow connected to an aspect of human emotion. Scientists have found that electrode stimulation of the amygdala can elicit

extreme and aggressive acts. Patients or experimental subjects who experience this utter rage and fearlessness have no rational foundation for their reaction. In other words, this aggression is wholly attributable to electrode stimulation. On the other hand, patients with trauma or damage to this structure exhibit a complete absence of aggression. Researchers find that no amount of poking, prodding or harassment will evoke even remotely aggressive responses from these subjects.

The author suggests that persistent passivity and imperturbability may be a direct result of which of the following?

- A. Drug-induced stimulation of the amygdala.
- B. **A stroke that resulted in severe tissue damage in the limbic system**
- C. Encephalitis as a result of head trauma
- D. Activation of a strategically implanted electrode in a patient's amygdala.

Which statement is not listed as a detail within the passage?

- A. Electrode stimulation of the amygdala can elicit extreme aggressive acts.
- B. Scientists are able to isolate the functions of even small regions of the human brain.
- C. **Typically, temperamental rhesus monkeys with amygdala damage are completely imperturbable.**
- D. Subjects who experience this utter rage and fearlessness have no rational foundation for their
reaction.

What is the main idea of the passage?

- A. The human brain is as complex as it is mysterious.
- B. Patients with damaged amygdalas are less aggressive than individuals with healthy ones.
- C. Electrode stimulation is a valuable tool for researchers who study the human brain.
- D. **Scientists have learned a lot about how the amygdala affects human emotion.**

The ability to see at a distance, in good light, does not diminish as a result of aging to the extent that other visual acuities do. Myopia, or nearsightedness, is more common to younger eyes, while presbyopia, or farsightedness, more commonly afflicts people as they age. The word presbyopia comes from Greek presbys, "old man," and opia, "eye," and names a condition in which, because the lens of the eye hardens slightly and loses elasticity as a person ages, one cannot as easily focus sharply on nearby objects. This condition leads to the familiar habit of lifting up one's glasses and bringing an object or reading material close to the face so that the eyes can more easily focus on it. The function of the lens is to accommodate different focal points so that sensory data can be correctly directed to the retina for interpretation into images by the brain. Corrective lenses, particularly bifocals or progressive lenses, adjust for the focal point aberration. In essence, they do the work that the eye can no longer do for itself.

In the context of the passage, “accommodate” means to

- A. Arrange lodging for
- B. Contain
- C. **Make allowances for**
- D. Excuse

The author of the passage would probably agree with which of the following statements relating corrective lenses and aging eyes?

- A. A dancer with a broken bone needs a cast to protect it.
- B. **A hiker reinforces a fraying backpack strap with duct tape.**
- C. A traveler gets a passport before going abroad.
- D. An athlete stretches before a game to avoid a potential injury.

What was the author’s primary purpose for writing this essay?

- A. To define what presbyopia is
- B. **To describe how eyes age and the function of corrective lens**
- C. To compare and contrast nearsightedness with farsightedness
- D. To review the anatomy of the human eye

The Bicycle V2

Today, bicycles are so common that it’s hard to believe they haven’t always been around. But two hundred years ago, bicycles didn’t even exist, and the first bicycle, invented in Germany in 1818, was nothing like our bicycles today. It was made of wood and didn’t even have pedals. Since then, however, numerous innovations and improvements in design have made the bicycle one of the most popular means of recreation and transportation around the world. In 1839, Kirkpatrick Macmillan, a Scottish blacksmith, dramatically improved upon the original bicycle design. Macmillan’s machine had tires with iron rims to keep them from getting worn down. He also used foot – operated cranks like pedals, so his bicycle could be ridden at a quick pace. It didn’t look much like a modern bicycle, though, because its back wheel was substantially larger than its front wheel. In 1861, the French Michaux brothers took

Highlight the passage. Which word and idea should be underlined?

The main idea of this passage is best explained in which sentence?