

**Question 1-11 are based on the following passage.**

This passage is adapted from Ferris Jabr, “The Reading Brain in the Digital Age: The Science of Paper versus Screens.” ©2013 Scientific American.

How exactly does the technology we use to read change the way we read? As digital texts and technologies become more prevalent, we gain new and more mobile ways of reading—but are we still reading as attentively and thoroughly? Should we be worried about dividing our attention between pixels and ink or is the validity of such concerns paper-thin?

Understanding how reading on paper is different from reading on screens requires some explanation of how the brain interprets written language. We often think of reading as a cerebral activity concerned with the abstract—with thoughts and ideas. As far as our brains are concerned, however, text is a tangible part of the physical world we inhabit. In fact, the brain essentially regards letters as physical objects because it does not really have another way of understanding them. After all, we did not invent writing until relatively recently in our evolutionary history. So the human brain improvises a brand-new circuit for reading by weaving together various regions of neural tissue devoted to other abilities.

Although many old and recent studies conclude that people understand what they read on paper more thoroughly than what they read on screens, the differences are often small. Some experiments, however, suggest that researchers should look not just at immediate reading comprehension, but also at long-term memory. In a 2003 study Kate Garland of the University of Leicester and her colleagues asked 50 British college students to read study material from an introductory economics course either on a computer monitor or in a spiral-bound booklet. After 20 minutes of reading Garland and her colleagues quizzed the students with multiple-choice questions. Students scored equally well regardless of the medium, but differed in how they remembered the information.

Psychologists distinguish between remembering something—which is to recall a piece of information along with contextual details, such as where, when and how one learned it—and knowing something, which is feeling that something is true without remembering how one learned the information. Generally, remembering is a weaker form of memory that is likely to fade unless it is converted into more stable, long-term memory that is “known” from then on. When taking the quiz, volunteers who had read study material on a monitor relied much more on remembering than on knowing, whereas students who read on paper depended equally on remembering and knowing. Garland and her colleagues think that students who read on paper learned the study material more thoroughly more quickly; they did not have to spend a lot of time searching their minds

for information from the text, trying to trigger the right memory—they often just knew the answers.

Additionally, when reading on screens, people seem less inclined to engage in what psychologists call metacognitive learning regulation—strategies such as setting specific goals, rereading difficult sections and checking how much one has understood along the way. In a 2011 experiment at the Technion–Israel Institute of Technology, college students took multiple-choice exams about expository texts either on computers or on paper. Researchers limited half the volunteers to a meager seven minutes of study time; the other half could review the text for as long as they liked. When under pressure to read quickly, students using computers and paper performed equally well. When managing their own study time, however, volunteers using paper scored about 10 percentage points higher. Presumably, students using paper approached the exam with a more studious frame of mind than their screen-reading peers, and more effectively directed their attention and working memory.

1

- Over the course of the passage, the main focus shifts from
- A) a presentation of objections to the practice of reading on screens to an examination of research that weakens those objections.
  - B) a discussion of how the brain comprehends written text to an explanation of experiments addressing the impact of different mediums on learning.
  - C) an analysis of general questions about reading on paper versus reading on screens to an assessment of the merits of reading on both mediums.
  - D) an account of the author’s perspective on reading on paper versus reading on screens to a description of several researchers’ perspectives on the subject.

2

- A main purpose of the questions in the first paragraph is to
- A) hypothesize whether the results of a technological study will cause people to reconsider their engagement with mobile devices.
  - B) argue that people are relying too much on technology to understand the information that they read.
  - C) emphasize a common perception about the effect of technology on people’s reading skills.
  - D) criticize people’s use of popular technologies to complete everyday tasks.

3

In line 7, the phrase “paper-thin” is most clearly used to indicate that

- A) an ongoing debate lacks depth.
- B) a particular reaction may be unwarranted.
- C) an unpleasant situation may ultimately be unavoidable.
- D) a prominent position has less popular support than expected.

4

The main purpose of the second paragraph (lines 8–20) is to

- A) provide context for the information that follows.
- B) introduce an argument that follows.
- C) answer the questions posed previously.
- D) support a claim made previously.

5

As used in line 21, “old” most nearly means

- A) advanced.
- B) experienced.
- C) worn.
- D) past.

6

The main purpose of lines 35–40 (“Psychologists . . . information”) is to

- A) summarize major criticisms of two theories about reading.
- B) describe and recommend two approaches for studying.
- C) note advances in two areas of psychological research.
- D) define and contrast two kinds of learning.

7

Based on the passage, the researchers who conducted the 2003 study have which perspective on reading on paper versus reading on screens?

- A) Reading on screens is more effective than reading on paper for helping students score well on tests administered shortly after they read.
- B) Reading on screens is more suitable than reading on paper for learning introductory information about a given subject than is reading on paper.
- C) Reading on paper results in stronger and more efficient acquisition of information than does reading on screens.
- D) Reading on paper is as effective as reading on screens for helping students retain information for a long period of time.

8

Which choice provides the best evidence for the answer to the previous question?

- A) lines 26–30 (“In a . . . booklet”)
- B) lines 30–34 (“After . . . information”)
- C) lines 40–42 (“Generally . . . then on”)
- D) lines 46–51 (“Garland . . . answers”)

9

It can reasonably be inferred from the passage that experts consider which of the following to play an important role in learning?

- A) Learners’ ability to memorize large amounts of information when under pressure to read quickly
- B) Learners’ awareness of what they want to accomplish when reading and how they approach a complex section of a text
- C) Learners’ ability to make sense of difficult concepts without outside assistance while reading
- D) Learners’ willingness to read equally challenging materials on paper and on screen

10

Which choice provides the best evidence for the answer to the previous question?

- A) lines 52–56 (“Additionally . . . way”)
- B) lines 56–59 (“In a . . . paper”)
- C) lines 59–61 (“Researchers . . . liked”)
- D) lines 61–63 (“When under . . . well”)

**11**

Based on the passage, which evidence would most severely undermine the proposed explanation for the differences in performance between groups of students provided in lines 65–68 (“Presumably . . . memory”)?

- A) In interviews conducted after the experiment, students who took the exam on computers reported engaging in as many metacognitive learning strategies as did students who took the exam on paper.
- B) In a group discussion conducted after the experiment, students who took the exam on paper indicated that they felt confused by many of the same sentences in the expository texts that confused the students who took the exam on computers.
- C) In an analysis of students’ scores on the multiple-choice exams administered as part of the experiment, researchers report that students answered a particular question correctly regardless of whether they were taking the exam on computers or paper.
- D) In a subsequent experiment modeled after the 2011 experiment, students who took the exam on paper and who managed their own study time scored an average of 20 percentage points higher than students who took the exam on computers and who managed their own study time.