

TOEFL ITP® Reading Practice

DIRECTIONS: Read the passage below and answer the 10 questions that follow. Choose the best answer (A, B, C, or D) for each question based on what is stated or implied in the text.

Reading Passage

The Rise of Dendrochronology

Dendrochronology, or the science of tree-ring dating, was developed in the early twentieth century by Andrew Ellicott Douglass, an astronomer at the University of Arizona. Seeking to establish a connection between solar activity and terrestrial climate variations, Douglass began studying the annual growth rings of trees. What began as an astrophysical inquiry eventually revolutionized the fields of archaeology, paleoclimatology, and ecology.

The underlying principle of dendrochronology relies on how trees grow in temperate and high-altitude regions. Each year, a tree adds a single layer of wood beneath its bark, forming a visible concentric ring in a cross-section of its trunk. During the spring, rapid cell division creates light-colored, thin-walled cells known as earlywood. As the growing season wanes in late summer and autumn, growth slows, producing darker, dense wood called latewood. The combination of earlywood and latewood represents one calendar year of growth.

Because climate conditions vary annually, the width of these growth rings fluctuates predictably. In years with abundant rainfall and favorable temperatures, trees produce wide rings. Conversely, during periods of prolonged drought or unseasonably cold weather, rings are distinctly narrow. Because all trees of the same species within a given region experience identical overarching climatic conditions, they display matching patterns of wide and narrow rings.

This regional uniformity enables scientists to employ a technique known as cross-dating. By overlapping ring patterns from living trees with those from older, dead timber—such as logs used in historic wooden buildings or preserved in peat bogs—researchers can construct continuous chronologies extending thousands of years into the past.

Through cross-dating, dendrochronologists can pin down the exact calendar year a tree was felled, providing archaeologists with precise dates for ancient wooden structures and artifacts. Furthermore, because tree rings serve as a high-resolution proxy record of past weather, paleoclimatologists routinely consult these natural archives to reconstruct historical climate trends long before human instruments existed.

1. What is the main purpose of the passage?

- (A) To argue that solar activity directly controls terrestrial weather patterns
- (B) To explain the principles and historical applications of tree-ring dating
- (C) To describe how earlywood and latewood differ in chemical composition
- (D) To compare ancient wooden artifacts with modern building materials

2. The word "terrestrial" in paragraph 1 is closest in meaning to

- (A) global
- (B) atmospheric
- (C) Earth-related
- (D) celestial

3. According to paragraph 2, how does earlywood differ from latewood?

- (A) Earlywood is formed in late summer and autumn.
- (B) Earlywood has thicker cell walls and a darker color.
- (C) Earlywood consists of lighter, thin-walled cells formed in the spring.
- (D) Earlywood is located on the outer bark of the tree trunk.

4. According to the passage, narrow growth rings indicate that a tree experienced

- (A) abundant rainfall and warm temperatures
- (B) rapid spring cell division
- (C) dry or unseasonably cold conditions
- (D) damage caused by wood-boring insects

5. Why does the author mention "logs used in historic wooden buildings" in paragraph 4?

- (A) To contrast ancient architectural styles with modern designs
- (B) To illustrate sources of timber that help extend ring chronologies backward in time
- (C) To show that early builders preferred using old trees over young ones
- (D) To explain why certain tree species resist decay better than others

6. The phrase "pin down" in paragraph 5 is closest in meaning to

- (A) establish precisely
- (B) hold firmly
- (C) estimate roughly
- (D) search for

7. It can be inferred from paragraph 3 that two trees of the same species growing in different regions would likely

- (A) produce identical ring patterns regardless of weather
- (B) have different ring patterns reflecting local climate conditions
- (C) grow at exactly the same rate each year
- (D) fail to produce earlywood during severe droughts

8. Which of the following fields is NOT mentioned as having been impacted by dendrochronology?

- (A) Archaeology
- (B) Paleoclimatology
- (C) Ecology
- (D) Astronomy

9. The author implies that tree rings are valuable to paleoclimatologists because they

- (A) are more accurate than modern electronic weather instruments
- (B) provide climate data from periods before human record-keeping
- (C) show how trees adapted to modern industrial pollution
- (D) prove that solar activity has remained constant over time

10. Which sentence below best expresses the essential information in the highlighted sentence in paragraph 3: *"Because all trees of the same species within a given region experience identical overarching climatic conditions, they display matching patterns of wide and narrow rings."*

- (A) Trees in the same area show similar ring patterns because they share the same local climate.
- (B) Climate conditions vary so greatly within a region that trees rarely display matching ring patterns.
- (C) Trees of different species always display identical growth ring patterns during climate changes.
- (D) Regionally uniform climate conditions cause trees to grow at unpredictable and inconsistent rates.