

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 led Andrew Ellicott Douglass to begin studying tree rings initially?

- (A) An effort to calculate the age of ancient wooden buildings
- (B) A desire to establish a connection between solar activity and Earth's climate
- (C) An interest in determining the seasonal rainfall levels of Arizona
- (D) A project to identify extinct tree species in temperate regions

2. Which of the following factors is essential for trees to produce distinct annual growth rings?

- (A) Growing in tropical rainforest environments
- (B) Growing in temperate or high-altitude regions
- (C) Being preserved in peat bogs after dying
- (D) Exposure to constant, unvarying weather year-round



3. The word "waned" in paragraph 2 is closest in meaning to

- (A) declines
- (B) accelerates
- (C) begins
- (D) transforms

4. According to paragraph 2, latewood is characterized by

- (A) rapid spring cell division
- (B) light color and thin cell walls
- (C) dark color and dense wood cells
- (D) formation during periods of abundant rainfall

5. What causes trees of the same species in the same region to share matching ring patterns?

- (A) They share identical genetic mutations.
- (B) They experience identical regional climate conditions.
- (C) They absorb nutrients from the same soil depth.
- (D) They were planted in the exact same calendar year.

6. What is the process of "cross-dating" described in paragraph 4?

- (A) Comparing carbon levels in living trees with fossilized wood
- (B) Matching ring patterns of living trees with those of older timber samples
- (C) Measuring the thickness of tree bark across different regions
- (D) Counting rings from outer bark to the core of a single living tree

7. The word "uniformity" in paragraph 4 is closest in meaning to

- (A) rarity
- (B) complexity
- (C) consistency
- (D) instability

8. According to paragraph 5, how do archaeologists benefit from dendrochronology?

- (A) It allows them to identify where ancient timber was originally harvested.
- (B) It helps them determine the exact year ancient wooden structures were built or felled.
- (C) It reveals the building techniques used by prehistoric cultures.
- (D) It explains why early humans chose specific tree species for building.

9. The word "proxy" in paragraph 5 is closest in meaning to

- (A) substitute
- (B) obstacle
- (C) creation
- (D) visual

10. What can be inferred about paleoclimatologists from the final paragraph?

- (A) They rely exclusively on modern electronic instruments for weather data.
- (B) They focus only on studying weather trends from the last century.
- (C) They use tree rings to study historical climate conditions that predated human weather tracking.
- (D) They study living trees to predict future solar activity cycles.