

❑ **Part 4 Synthesis:**

Where would the new sentence most logically occur in relation to the marked sentences in the passage?

This process is familiar to many of us who look forward each year to the beautiful autumn foliage as the leaves change from green to gold and red.

The Wonder of Trees

An oft-quoted American poem begins “*I think that I shall never see a poem as lovely as a tree*”. Most of us take little notice of the wonder of trees, but they offer us great beauty and play an important ecological role in the “biosphere”, the interconnected web of life on Earth. To imagine a world without trees would be to imagine a very different, drab, and possibly lifeless, planet.

Ecologically, trees have been an important part of our natural environment since evolving out of plant life about 370 million years ago. Their life-sustaining functions were essential to the further evolution of life on Earth. Trees produce oxygen and absorb carbon dioxide, thus maintaining our atmosphere. They also regulate climate, direct and regulate the flow of water, build and conserve soil, and provide habitat for wildlife.

But the great contribution of trees to the beauty of our planet is also worth remaking. *A The variety and abundance of trees make Earth a planet of brilliant green that complements the blue of the oceans. The two maintain varieties of trees, “deciduous” and “evergreen”, contribute to this beauty in different ways. Deciduous trees shed their leaves for part of the year. *B Evergreens stay green all year long. *C

The lushness of Earth is also a result of the abundance and staying power of trees. There are estimated to be approximately 100,000 species of trees today. Most of them are in the tropics. The Amazon Rainforest alone is home to thousands of tree species. Trees can live for thousands of years and grow quite large. *D A tree in Sweden is considered the oldest at over 9,500 years of age. The tallest tree in the world is thought to be a Giant Sequoia in California’s Redwood Forest. It stands over 117 meters tall with a diameter of about 10 meters.

Where would the following sentence most logically occur in relation to the marked sentences in the passage?

Soon it became common for people to send cards for birthdays and other celebrations.

The Greeting Card Industry

While certain industries seem to thrive and then disappear according to the whims of ever-changing markets, the greeting card industry has shown incredible staying power. In the United Kingdom, for instance, it is estimated that the average person sends 55 cards per year, generating over a billion pounds per year in revenue.

The custom of sending greeting cards can be traced back to the ancient Chinese, who exchanged scrolls with New Year’s messages. By the 15th Century handmade paper greetings were exchanged in Germany and soon throughout other parts of Europe.

*A In the 19th Century, due in large part to the proliferation of printing presses and inexpensive postage rates, greeting cards became very popular. Christmas card companies began hiring artists as designers for mass-produced cards featuring their illustrations. *B Today cards range from classic, simple messages to timely, humorous cards that mock popular figures. *C

Even as email has largely replaced traditional mail for communication in many instances, most people have retained their appreciation of traditional cards for special occasions. *D So long as people wish to send messages of good cheer to help celebrate birthdays, anniversaries, weddings and births as well as major holidays on a folded card with a printed funny message, the industry will continue to thrive.

Reading mixed practice 1:

1. The word “mythological” as used in the second paragraph most closely means the same as:
 - a. Inspiring
 - b. Religious
 - c. Old-fashioned
 - d. Inverted
2. The author mentioned the example of cladistics in the last paragraph in order to:
 - a. Show how a new taxonomic method leads to new views of reality.
 - b. Provide an example of modern Linnaeun taxonomy.
 - c. Show how John Ray’s definition of species still holds true.
 - d. Show how the theory of evolution has not really been proven.
3. Where would the following sentence most logically occur in relation to the marked sentences in the passage?

Thus, a horse and a donkey, although appearing similar, are not the same species, since their mating leads to a sterile animal, the mule.

Taxonomy and Scientific Knowledge

Most people think of science as a set of facts about the world. But more fundamental to science than the facts are the methods. In fact, many theorists believe that it is not objective reality that steers science, but rather the method of science that determines what we come to know as real. This reversal of what is commonly thought is exemplified by the development of taxonomy, the method of identifying and classifying organisms. Modern taxonomy, primarily developed by Carolus Linnaeus in the 18th Century, initially gave scientists a greater and more precise knowledge of nature. Today, however, taxonomic advances have led to question what they thought they knew about basic biological reality.

Taxonomy has been in use since Aristotle’s work in the fourth century B.C.E. But early taxonomies were not very specific. Many contained such mythological creatures as griffins, right alongside existing animals. Further, it was thought that offspring could be produced by mating completely different creatures, like a lion and a bird.^{*A} Aristotle, himself, used reason rather than observation, to divide animal life into two basic groups: animals with vertebrae (or backbones) and those without. Although this system proved inaccurate, it wasn’t until Linnaeus’ work that empirical observation became the basis for a modern taxonomy that excluded creatures of fantasy.

The movement toward a more modern system took its first big step in the 17th Century, with naturalists John Ray’s definition of the concept of “species”. A species is a group of organisms capable of reproduction. The result will be an individual similar to the parents and also capable of reproducing. ^{*B} Armed with this definition, Linnaeus was able to catalog over 4,000 species of animals and over 7,500 species of plants. He began with plant-life, dividing plants into species based on the number of pistils and stamens (the sexual organs) of each plant. This method allowed other botanists to contribute to the taxonomy. ^{*C} They simply had to observe and count, and a new specimen was added. Thus, biological knowledge grew tremendously.

However, since Linnaeus’ time, biology has developed new taxonomic systems. One such example, cladistics, makes use of genetic analysis to classify organisms based on evolutionary descent (parent and child), rather than observable features. The problem is that this system has revealed relationships that are quite different from those of Linnaeun taxonomy. ^{*D} Furthermore, organisms have been discovered that violate the rules of species inclusion. An example is where one organism may be able to reproduce with another, while that other one is capable of reproducing with a third, but the first and third cannot reproduce with each other. These and other surprises have scientists today questioning whether we understand species at all. Do species actually exist in nature, or only in our taxonomies? Perhaps this question will lead to new methods and technologies that will, in turn, radically change the nature of reality as we know it.

4. The following is a sentence that begins a summary of the main points of the passage:

Most people think that science is a body of facts about the world, but more basic to science than facts are the methods used to obtain them

Continue the summary by choosing 3 of the 6 sentences below that best represent the underlined MAIN points in the passage. Mark 3 answers by selecting the appropriate checkboxes. To change an answer, click again on that checkbox to remove the check mark.

- a. Aristotle was the first to use taxonomy to classify organisms.
- b. Taxonomy is an important scientific method that distinguishes between fantasy and reality.
- c. Three different points in the historical development of taxonomy-ancient, Linnaeus, and contemporary-gave scientists three different understandings of the facts.
- d. More specifically, the concept of species changed with each new development in taxonomic methods.
- e. John Ray gave us the best and most precise definition for the concept of species.
- f. The historical development of taxonomy provides an example of how scientific method determines facts about the world.

Reading mixed practice exercise 2:

Homing pigeons

The homing pigeon is a variety of domestic pigeon capable of finding its way home over extremely long distances. This species of pigeon can fly distances of one thousand miles to return to its own nest, making it extremely reliable for carrying messages.

The practice of using pigeons to carry messages goes back over 3000 years. When these pigeons were used as "carrier pigeons", they carried small messages written on light, thin paper that was rolled into a small tube and attached to the leg of the bird.

One of the earliest recorded instances of carrier pigeons was when they were used to relay the results of the original Olympic Games in ancient Greece. Records show they may have been used even earlier than that in Egypt and Persia. When the outcome of the Battle of Waterloo was decided the news was first delivered by a pigeon, and in 1860 Reuters, founder of the Reuters News Service, used a fleet of 45 pigeons to carry news messages. As recently as the early 20th Century pigeons were used prominently in World War I and one was even awarded a medal for delivering vital messages despite being badly injured.

It is the carrier pigeons' natural instincts, combined with their special navigational abilities that make them uniquely qualified to serve as dependable messengers. The birds rely upon a combination of methods to orient themselves and return to their homes, including using what is called a "map and compass" system. Relying on the sun, a pigeon may locate itself using an innate compass and direct itself to its "home site". Pigeons can only, however, return to one place that they recognize as home. Thus to have an effective 'mail' system, one would need a stock of pigeons separated from their home, and they would only be capable of delivering "mail" to that single location.

In addition to gauging its position by the sun, a carrier pigeon may also use "olfactory" navigation, detecting the spatial distribution of atmospheric odors, as well as visual landmarks that guide them as they near their homes. Some research has even shown that homing pigeons navigate by following roads, avenues and structures, essentially guiding themselves in the same way that people do.

Certain bird experts, however, were not satisfied that the carrier pigeons only used superior sight and smell to find their way. University researchers tested an alternative theory, that the birds can actually detect the Earth's magnetic field. In testing their hypothesis, the researchers discovered that certain pigeon breeds were confused by magnetic irregularities in the Earth's atmosphere, while others were not affected.

In this century, however, the use of homing pigeons has practically disappeared, as they have been rendered obsolete by the spread of digital technology. They were last utilized in certain relief areas when natural disasters had dismantled communications infrastructure. But as more and more areas became populated the need for an older, though reliable, messenger service has vanished.

1. The word "innate" as used in the passage probably means:
 - a. Evolutionary.
 - b. Instinctive.
 - c. Preternatural.
 - d. Flying
2. The passage mentions the "single" location in paragraph 4 to emphasize:
 - a. Pigeons mate for life.
 - b. The limitations of pigeon mail.
 - c. The effect of sunlight on pigeons' navigation.
 - d. The effect of the magnetic field on pigeons' navigation.
3. It can be concluded from the passage that:
 - a. Not all carrier pigeons can detect the Earth's magnetic field.
 - b. All pigeon species can carry messages.
 - c. Pigeons have more than one nest.
 - d. The field of carrier pigeon research has recently expanded.
4. The passage attributes the decrease of use of carrier pigeons to:
 - a. Lack of proper research.
 - b. Changes in natural habitat.
 - c. Changes in the Earth's magnetic field.
 - d. Improvements in communications technology.
5. It can be understood from the passage that the idea of "homing":
 - a. Can refer to all bird species.
 - b. Relies only on 'olfactory' senses.
 - c. Is an important quality of certain pigeon species.
 - d. Was first introduced in Ancient Greece.
6. What is the purpose of mentioning Egypt and Persia in paragraph 3?
 - a. To demonstrate the great distances that pigeons can fly.
 - b. To show places where pigeons have been used by armies.
 - c. To illustrate how the use of carrier pigeons has changed.
 - d. To give an example of earliest uses of carrier pigeons.