

- The term "serendipity" is often defined as a "happy accident" or "pleasant surprise." Throughout the course of human innovation and invention, serendipity has played almost as significant a role in the discovery and application of new products as intentional planning and long-term experimentation has. A number of products that we commonly use today were developed quite by accident. There are many examples of this concept that came about when an insightful person realized a potential benefit in a negative situation.
- One of these accidental inventions is the leotard, a close-fitting, one-piece garment worn today by dancers, gymnasts, and acrobats, as well as practitioners of Pilates, yoga, and other forms of exercise. In 1828, a circus performer named Nelson Hower was faced with the prospect of missing his performance because his costume was at the cleaners. Instead of canceling his part of the show, he decided to perform in his long underwear. Prior to Hower's wearing of the comparatively form-fitting underwear, acrobats and dancers wore more modest, looser fitting attire in which to perform, and even rehearse. Soon after the debut of Hower's outfit, other circus performers began performing the same way. When popular acrobat Jules Leotard adopted the style, it became known as the leotard.
- The inventions of various new foods and beverages have also come about through serendipity. One example is the Popsicle. In 1905, 11-year-old Frank Epperson stirred up a drink of fruit-flavored powder and soda and then mistakenly left the drink, with the spoon in it, out on the back porch until the next morning. As the temperature dropped overnight, the soda water froze around the spoon, creating a tasty treat. Years later, remembering how enjoyable the treat had been, Epperson went into business producing Popsicles.
- Another success story involving food and chance is the invention of the chocolate chip cookie, today considered the most well-known type of cookie in the United States. Yet, it has only been around since about 1930 when Ruth Wakefield substituted broken pieces of chocolate bars for the baker's chocolate that she traditionally used but had run out of for making her already famous chocolate cookies. Instead of melting into the sweet, buttery cookie dough, as Wakefield had hoped, the small bits of chocolate remained separate from the rest of the dough, making a new delicious type of cookie that quickly gained popularity throughout the nation.
- Some accidental discoveries have resulted in improvements to already existing products that increase their functionality or practical use for individual consumers. The inventor of Teflon, a nonstick coating frequently applied to the surface of cooking implements to prevent food from sticking, had the original intention of devising a new refrigerant for producing cool temperatures. As the inventor, Roy Plunkett, experimented with the different properties of chemicals to create the cooling substance, he noticed an odd reaction occurring in one of the pressure bottles containing the chemical mixture. After cutting open the bottle to investigate further, Plunkett observed a waxy substance that was slippery to the touch. Though far from what he had intended to produce, the material sparked an idea in Plunkett and his employers, and Teflon was trademarked in 1945.
- Like Teflon, Super Glue started from the concept of something entirely different than the resulting product. During World War II, scientists were striving to create materials to make plastic gun sights for soldiers that provided exceptionally clear visibility. In the course of their research, they manufactured a substance, cyanoacrylates, that stuck to everything it touched. Initially rejected as completely useless because of its strong adhesive quality, the cyanoacrylates were set aside as a failure. However, less than a decade later, researchers working for the company Eastman Kodak rediscovered the formulation, creating the popular glue that went on to be advertised as strong enough to attach and hang a car from a crane.

Look for relationships between the key words in the highlighted sentence in the answer and transitional words in the sentences marked by the black squares that indicate comparison, contrast, or additional ideas.

9. Look at the four squares that indicate where the following sentence could be added to the second paragraph of the passage.
- They enjoyed the comfort of performing in underwear rather than costumes.**
- Where would the sentence best fit? Click on a square to add the sentence to the passage.
10. Look at the four squares that indicate where the following sentence could be added to the third paragraph of the passage.
- It was a taste sensation that stayed on his mind.**
- Where would the sentence best fit? Click on a square to add the sentence to the passage.
11. Look at the four squares that indicate where the following sentence could be added to the fifth paragraph of the passage.
- Teflon is a prime example of this.**
- Where would the sentence best fit? Click on a square to add the sentence to the passage.
12. Look at the four squares that indicate where the following sentence could be added to the sixth paragraph of the passage.
- The iconic commercial remains an important symbol of the product to this day.**
- Where would the sentence best fit? Click on a square to add the sentence to the passage.

- Neon is a nonmetallic chemical element revealed when air is liquefied and then heated. It is the second-lightest of the noble gases—the Group 18 gases of the periodic table of elements—falling only behind helium. While the most prevalent commercial use for neon remains in the manufacturing of neon advertising signs, it is also utilized in certain types of lasers and as a cryogenic refrigerant.
- In the 1770s, researchers discovered that oxygen and nitrogen were present in air, and in fact made up 99 percent of it. Up until that decade, air was believed to be a single element. In 1894, the chemical element argon was identified as a third component of air by Sir William Ramsay. However, it represented only 0.934 percent of air, leaving 0.034 percent still a mystery. Ramsay and Travers continued to research the tiny amounts of gas that remained after nitrogen, oxygen, and argon were removed.
- In 1898, Sir Ramsay and William Travers discovered neon as another component of air. (Ramsay later went on to win the Nobel Prize in Chemistry for discovering all of the noble gases.) They named it for the Greek word *neos*, which means *new*. Although neon is a colorless gas under normal conditions, when an electrical discharge is passed through it, it generates an incredibly bright reddish-orange hue. Ramsay and Travers observed this by chilling air until it became a liquid, and then heating the liquid to catch the gases that boiled off. Adding the electrical discharge to the new gas in a rudimentary version of a mass spectrometer produced the glowing light. Neon actually discharges the most intense light at normal currents and voltages of all the noble gases.
- It is a monatomic element, comprised of a single atom (it forms no compounds). Neon has three stable isotopes, all of which are produced in the formation of stars. In the universe, neon is the fifth most abundant gas, but it is comparatively rare on Earth, comprising only 1 part in 65,000 of Earth's atmosphere. This is due to its relative lightness, which allows it to escape into outer space. Much smaller amounts are believed to exist deep within the Earth's crust. Interestingly, an increased amount of Ne-20 is found in diamonds. Researchers believe this suggests a solar neon reservoir inside Earth.
- In the early 1900s, George Claude of France produced large quantities of neon as a byproduct of his air liquefaction company. But its commercial application wasn't fully realized until 1912, when Claude's business associate Jacques Fonseque demonstrated an electrified sealed neon tube that could be used in advertising. The first neon sign was displayed at a Paris barbershop in 1912. Neon signs soon gained in popularity throughout the United States, especially demonstrated by their prevalence in the city of Las Vegas, Nevada. Another commercial use of neon is in cryogenic refrigeration, which cools items to very low temperatures. It has 40 times the refrigerating capacity of liquid helium, and 3 times that of liquid hydrogen. Other uses of the element include the production of high-voltage indicators and—prior to the advent of LCD flat screens—television tubes.

13. Look at the four squares that indicate where the following sentence could be added to the second paragraph of the passage.
- But after the determination that air was composed of multiple elements, new measuring techniques evolved, allowing scientists to recognize that there was something else besides the two known elements present in air.**
- Where would the sentence best fit? Click on a square to add the sentence to the passage.
14. Look at the four squares that indicate where the following sentence could be added to the third paragraph of the passage.
- This process of separating out parts of a mixture through collection of vapors is called fractional distillation.**
- Where would the sentence best fit? Click on a square to add the sentence to the passage.
15. Look at the four squares that indicate where the following sentence could be added to the fourth paragraph of the passage.
- The stable isotopes of neon are Ne-20, Ne-21, and Ne-22.**
- Where would the sentence best fit? Click on a square to add the sentence to the passage.
16. Look at the four squares that indicate where the following sentence could be added to the fifth paragraph of the passage.
- The first American equivalent was lit in 1923 at a Los Angeles Packard car dealership.**
- Where would the sentence best fit? Click on a square to add the sentence to the passage.