

Future Literacy 100-3

Unit 1. What Did Dinosaurs Really Look Like?

Early paleontologists used to think that dinosaurs all resembled lizards with hairless skin. However, well-preserved fossils of dinosaur feathers were discovered in the 1990s in a sedimentary deposit in Liaoning, China. The fossils that were found there preserved the dinosaurs' remains in very fine detail. This was due to the fact that repeated volcanic eruptions in Inner Mongolia had covered many of the creatures in the area in fine-grained ash. The feathered dinosaur fossils were among the most important discoveries in Liaoning. Scientists who studied the fossils believed that some dinosaurs' behavior was similar to that of bird. The oviraptorosaur, for example, was found to have folded forearms similar to that of a bird's. These would have been used to protect its nest from danger. Dinosaur feathers have also been found preserved in amber. The featured tail of a non-bird theropod was found preserved in amber at a market in Myitkyina, Myanmar.

Unit 2. How to Make a Fossil

The chances that a fossil will form from a dead animal are actually incredibly small. One expert suggests that only about one bone in a billion ever gets fossilized. If a bone is lucky enough to become fossilized, it also takes a lot of luck for someone else to discover it. However, there are a few factors that may increase the likelihood of fossilization. Firstly, the body should be buried as quickly as possible. This ensures that the body does not get eaten and scattered by other animals. Sometimes, natural disasters such as flash floods or volcanic reactions that smother things in mud or ash can help with a quick burial. Secondly, the body is more likely to be fossilized if death occurs near water. Many well-preserved fossils are found near lakes and river systems because the bones are quickly smothered in sand and mud. If all goes according to plan, any creature can be preserved as a fossil!

Unit 3. Mass Extinctions

Global warming is often cited as a danger to humans as it threatens people living near coastlines. However, climate change also has a great impact on non-human animals and their habitats. Unlike humans who have better methods of transportation and technology to combat harsh weather conditions, animals are often limited in their ability to escape the effects of global warming. In fact, mass extinctions of animals and plants have already begun in parts of the world. In Australia, for example, the widespread destruction of mangrove forests and coral reefs is already well underway. Because mangroves and coral provide vital habitats and food resources for many creatures, the mass extinction of a range of species seems highly likely. Some scientists predict that animals will adapt to the changes in climate and weather. However, there is also concern that many species will fail to adapt quickly enough.

Unit 4. DNA Coding

The *Jurassic Park* franchise introduced many people across the globe to the imagined world that resulted from cloning dinosaurs back into existence. The film franchise has spawned more films like *Jurassic World* and it seems that people are still fascinated by the idea of cloning animals. Realistically, however, there are limits to using dinosaur DNA, as DNA samples only remain useful for one million years with the current technology. However, other animals that are more recently extinct or endangered have become more likely candidates for cloning. For example, some scientists are working on implanting white rhino embryos into surrogates to revive the extinct species. Another example is the Jahava, a banteng (a type of wild cattle) that was cloned at San Diego Zoo using frozen skin samples. Unfortunately, studies have shown that the mortality rate for cloned animals is still very high. Thus, it will be a number of years before animal cloning can be perfected.

Unit 5. Sailing Around the World

Ferdinand Magellan was a Portuguese explorer most famous for being the first European to sail around the world. His journey was very important because it proved that the Earth was round. Magellan was born in 1480 to a noble family. After the death of his parents, Magellan became a page for the queen at the age of ten. He learned many useful skills, such as map-making, navigation, and astronomy. Magellan then joined the navy in 1505 and traveled to many different places, such as India, the Spice Islands, East Africa, and Morocco. While he was in Morocco in 1513, Magellan was wounded and acquired a limp. Afterward, he was falsely accused of illegal trade and eventually lost his job working for the King of Portugal. He then went to work for the King of Spain, to whom he proposed a plan to find a shorter and more advantageous route to the Spice Islands. During the voyage, Magellan was killed in battle in the Philippines in 1521.

Unit 6. Antarctic Adventurer

Roald Amundsen was born in 1872 not far from Oslo, Norway. He studied medicine before deciding to explore the sea. In 1897, he sailed as a member of a Belgian expedition. It was the first expedition to brave the winter in the Antarctic. In 1903, Amundsen and his crew began a mission to sail through the Northwest Passage and around the northern Canadian coast. When the expedition concluded in Nome, Alaska, they were welcomed as heroes. This achievement motivated Amundsen to continue with his expeditions. He later established a successful shipping business with the funds that resulted from his Antarctic expeditions. Although he acquired a new ship, he quickly turned to airplanes as a better method to reach the North Pole. In 1926, he passed over the North Pole and landed in Alaska. In 1928, Amundsen died while flying to rescue a friend who had crashed. His legacy lives on as one of the greatest explorers to have lived.

Unit 7. The Deep Dive

Jacques Piccard was born on July 28, 1922 in Brussels, Belgium. In 1943, he studied at the University of Geneva, taking a year off to serve with the French First Army. After graduating, Piccard helped his father design bathyscaphes, a free-diving vehicle that can be submerged deep in the ocean for deep-sea exploration. In 1953, the father and son went on a dive of 3,099 meters off the island of Ponza, Italy in their bathyscaphe named Trieste. To further their studies, Jacques Piccard sought funding from the United States. The United States took an interest in the Trieste, and later, the U.S. Navy bought it and hired Jacques Piccard as a consultant. In early 1960, Piccard and Lieutenant Don Walsh of the U.S. Navy broke submarine depth records by descending over 10,000 meters into the Marian Trench in the Pacific Ocean. Piccard continued his work in deep-sea research as a consultant scientist and founded the Foundation for the Study and Protection of Seas and Lakes in Switzerland.

Unit 8. The First Female Astronaut

Valentina Vladimirovna Tereshkova was born on March 6, 1937 in Maslennikovo, Russia. She left school when she was sixteen to work in a textile company but managed to continue her education through correspondence courses. Inspired by Yuri Gagarin's successful trip to space in 1961, Tereshkova volunteered for the Soviet space program. She was accepted to the program thanks to her skill in parachute jumping. At the time, cosmonauts (astronauts) had to parachute from their capsule just seconds before they hit the ground on returning to Earth. Tereshkova trained for 18 months with four other women. Of the five women, she was the only one to go to space. In total, she spent over 70 hours in space and orbited the Earth 48 times. It was later revealed that she almost died on the journey as an error in the navigation software caused the ship to move away from Earth, an error that was thankfully corrected in time.

Unit 9. Oshibana

Oshibana is the art of marking pictures using pressed dried flowers and plants. Oshibana means “pressed flowers” in Japanese and was invented in the 16th century. The art form became popular in both England and America during the Victorian era as trade between Japan and the West increased. The art is very time-consuming and requires several stages. First, the flowers and plants are selected. They must be picked at the right time to preserve the correct color. Next, these materials are dried and pressed, a skill that requires experience and much patience. After this, the artist can rearrange the materials to create intricate designs. This process requires multiple rearrangements and reviews of the artistic concept. Only after the artist is completely satisfied with the arrangement can they move on to the final step: sealing the artwork in glass and removing the air so as to preserve the colors for centuries.

Unit 10. Art Toys

Be@rbricks are plastic bear-shaped figurines that were created by the Japanese company Medicom Toy. They were first released on May 27, 2001, and were handed out for free to attendees of the World Character Convention in Tokyo, Japan. The design of the Be@rbricks was loosely based on the Kubrick, another line created by Medicom Toy. Be@rbricks come in different sizes and designs. They are usually made of plastic, but some have metal and wood incorporated into the figurine. Although toys are typically thought of as playthings for young children, Be@rbricks have been featured in art galleries and are collected by celebrities like Pharrell Williams and Ben Baller. Since their creation, these collectible toys have become the most recognizable and sought-after characters in the world. The demand for Be@rbricks is reflected in their steep price. One model of Be@rbricks actually sold for nearly 200,000 USD at auction.

Unit 11. Optical Illusions

Optical illusions create deceptive images by manipulating color, light, and patterns. The human eye can gather information and process the images in the brain. With the right combination of color, light, and patterns, the brain can be tricked into believing that it sees something that doesn't actually match reality. One of the most well-known optical illusions is one that shows a young girl and an old woman in the same picture. The earliest depiction of this image comes from an anonymous German postcard that dates back to 1888. Another example was part of an advertisement for the Anchor Buggy Company that was circulated in 1890. For a long time, many people believed that the original creator behind the image was a British Cartoonist named W.E. Hill who published an image with the optical illusion in a magazine in 1915. However, the aforementioned examples that predate the magazine issues suggest that the image of the young girl and old woman has been around for a while longer.

Unit 12. Sand Animation

The techniques used in sand animation were pioneered by Caroline Leaf when she was an art student at Harvard University in 1968. Her first sand animation film was titled *Sand, or Peter and the Wolf*. She used beach sand on a light box and manipulated the material to create figures and textures which moved frame by frame. Along with sand animation, she is known as the pioneer of paint on glass and hand etching on film stock. Her techniques are known for their “fluid transitions,” a variation of which she uses to tell different stories in her narrative-based artwork. She describes herself as being “a storyteller first,” a statement that rings true in her relatable characters dealing with complex issues. Leaf is also known for including Canadian cultural elements in her many films, most notably in *The Street*, *The Owl Who Married the Goose*, and *Kate and Anna McGarrigle*.

Unit 13. A Disappearing Job

A knocker-up was a profession that was introduced as a result of the Industrial Revolution. As the number of factories increased, the number of workers who needed to wake up early in the morning for work also went up. With alarm clocks not readily available at the time, people hired knocker-ups to get up in the morning. This profession was especially useful for those who had shifts that started as early as 3 o'clock in the morning. Knocker-ups would go around to houses and use a long stick with a knob attached to the end to rap on the windows. This was necessary as simply knocking on the door or ringing the doorbell would wake up the entire household instead of the one person who needed to go to work. Knocker-ups were so common that they are even mentioned in Charles Dickens' 1861 novel *Great Expectations*. Eventually, the entire profession died out as a result of advances in technology.

Unit 14. Dangerous Jobs

Being a lumberjack can be hazardous to one's health. In fact, the U.S. Bureau of Labor Statistics found that over the last few years the number of fatalities among loggers has actually been going up. It is one of the most dangerous jobs an American can have. In 2015, for example, the number of deaths per 100,000 loggers was higher than among the same proportion of truck drivers or farmers. Due to the timber industry's dangerous nature, the Bureau of Labor Statistics has projected that the number of loggers will decline in the future. Some workers have noted that the biggest danger in logging is caused by the fact that the logger cannot see broken tops of trees or limbs hidden by live branches. These broken tops that snag in the canopy are called "widow-makers" as they tend to come loose and injure the lumbermen below. However, some in the industry note that ongoing improvements in equipment and safety training will make logging safer than in the past.

Unit 15. Automation

Although automation has been demonized for taking jobs from people who need the work, it also has many benefits. For example, increased worker safety is an important benefit that comes with automation in industrial operations. In this case, automated systems can remove workers from hazardous workplaces. This has influenced the automation and the use of robotics in factories. On the other hand, automation has downsides that disadvantage the owners. For example, the cost of automation and the required level of maintenance compared to manually operated machines may impact the company. This is especially true in terms of the variety of products that can be created, as automated machines lose a level of flexibility compared to manual systems. However, many agree that automation will benefit humans if it is used wisely and effectively. As the development of technology continues at a rapid pace, it is up to the users of technology to ensure that it is used to empower and benefit people's livelihoods.

Unit 16. Future Skills

Cloud computing allows people to work together on projects regardless of where the members live. It allows users to share resources, software, and information via the Internet. There are several advantages and disadvantages to using cloud computing in the workplace. As previously mentioned, collaboration becomes easier. It also makes the project more accessible for each individual member, as they can seamlessly access the project from any device. Cloud computing is also inexpensive, as there are numerous applications that offer sizable storage options for free or at a low cost. The downsides of cloud computing include security issues. Information that may be valuable must be handed over to a third party in order to use the cloud service. The service provider may not have the best security, which means that the information may be hacked or stolen. For top-secret information, it may be best to abandon cloud computing and just keep everything on one secure hard drive.