**Unit 1 How We Smell**

You come home from school. You open the door, and you smell something nice. Right away, you know your mom is baking cookies. But, how do you know that?

Smelling is a complicated process. Your nose and brain must work together. There are hundreds of odor particles in the air. When you breathe in or sniff, these odor particles get into your nose. Inside your nose, there are a lot of smell receptors. These receptors catch odor particles and send signals to the brain. Then, the brain interprets the signals and recognizes the smell.

Your sense of smell is amazing. Some experts say that you can distinguish a trillion different kinds of smells. But did you know that your sense of smell gets tired of the same smell easily? You smell freshly baked bread when you enter a bakery. But soon, you do not smell it as much. That is because your nose is getting ready for new smells.

Your sense of smell works closely with your sense of taste. That is why you cannot taste foods well with a stuffy nose. Your nose is always working hard.

**Unit 2 How Some Animals Smell**

Most animals have a sense of smell. It tells them where predators and food sources are. Some animals use their noses to smell, but other animals use different body parts.

Marine crabs smell with their antennas. Marine crabs have two pairs of antennas between their eyes. A marine crab moves quickly along the ocean floor and waves its antennas up and down. The antennas pick up different scents in the water. The antennas are covered with tiny hairs. These thin, short hairs identify different smells. This is how the crab knows if any food sources are nearby.

Snakes smell with their tongues. They move smoothly through the grass, raise their heads, and stick out their wet tongues. The tongue picks up different scents in the area. The tongue goes back into a snake’s mouth. It touches a special organ called the Jacobson’s organ. The Jacobson’s organ identifies the smell. It tells the snake whether the smell is a predator or prey.

The sense of smell is important for all animals. It is a way for animals to understand their environments, find food, and avoid predators.

**Unit 3 Town Squares for Everyone**

Many people live in cities. Their cities reflect their cultures. Most cities have one common feature. It is a central open area called a town square. The town square is a place for people to gather and share their cultures.

The history of the town square goes back centuries. Ancient Greek cities like Athens had town squares 2,500 years ago. The Greeks called their town square the agora. It was the heart of the city. The Greeks discussed politics and held elections in the agora. It was also a marketplace. People traded different goods there.

As time passed, town squares spread to other places. The Romans called their town square the forum. It was the center of daily life for the Roman people. It had similar functions as the Greek agora. There were also temples around ancient town squares. The Greeks and Romans worshipped their gods and goddesses there.

Today, people use town squares for meetups. They also go to town squares for special events such as concerts, open markets, and rallies. Town squares are just as important today as they were in ancient times.

**Unit 4 Famous Town Squares**

Town squares are frequently economic, political, and cultural centers. For these reasons, some have become world famous.

Plaza de Mayo is a town square in Buenos Aires, Argentina. Today, it is a financial and political hub. The national bank of Argentina and numerous businesses are located there.

Plaza de Mayo became famous two centuries ago. In May 1810, the people of Argentina rebelled against their Spanish colonizers. The May Revolution started in Plaza de Mayo. Six years later, Argentina gained its independence. Plaza de Mayo is named after this revolution. Mayo means May in Spanish. Ever since then, people have gathered there for different rallies.

Times Square in New York City, US, is called “the crossroads of the world.” It is a major tourist attraction and entertainment center. On New Year’s Eve, more than one million people gather to celebrate the new year there. Every year, around 50 million tourists visit Times Square for sightseeing and entertainment.

Plaza de Mayo and Times Square are famous town squares in the world. Is there a town square in your city? What is it famous for?

**Unit 5 Projection Mapping**

What famous building is this? It is the Sydney Opera House! How did the images get onto the Opera House? It was done with projection mapping!

Projection mapping is a technique that turns any 3D object into 3D digital art. 3D objects become display surfaces for projection mapping. They can be any shape at all. Artists can project images on objects like buildings, cars, or even cakes. Before this technique, image projection was possible only on flat screens.

Artists need projectors, computers, and special software for projection mapping. First, artists choose a 3D object. It is like choosing the right canvas for their painting. Next, they create images to cover the object. After that, they use the software to map the object. Then, the software works with projectors to fit the images onto every surface of the object. The images cover the object like wrapping paper around a gift. At last, the 3D object turns into 3D digital art.

Artists can use any kind of image. It can be still like a photograph, or moving like a video. Anything is possible with projection mapping!

**Unit 6 VR Painting**

What kind of art is this? It is VR painting! VR means virtual reality.

Virtual reality creates a simulated world. It is not a real world. The VR world can seem quite real, but physically it does not exist. However, you can enter the VR world and be a part of it by wearing a VR headset.

Virtual reality is changing how we do things, including making art. Did you ever want to step inside your painting and walk around it? With VR painting, now you can!

To do VR painting, you need special tools such as a VR headset and controller. The controller is your paintbrush. With your headset on, the place you enter becomes your canvas. You can walk around and paint as you go.

The controller can also be a digital palette. You can change your paint colors or choose brushes using this palette. You can also add decorations to your artwork. When your VR painting is finished, you can share it with others online.

It is exciting how virtual reality is changing the art world. Painting is only the beginning. Now, photography and sculpting are going virtual too!

**Unit 7 Unmanned Aerial Vehicles**

Did you ever wish you could fly your toy plane? Now, people can fly drones for fun. They really fly in the sky. Drones are unmanned aerial vehicles (UAVs). It means there are no pilots on board. They are controlled by computers on board or by remote controls on the ground.

Drones were first developed in the early 20th century. They were not for fun at all. They were used in the military to attack enemies. In World War I and II, they were used to drop bombs. Drones are still used widely in the military around the world.

Nowadays, drones are more efficient with advanced technology. They are an important innovation in our modern world. Many activities are possible now because of drones. Climate scientists use them to study climate change. Rescuers use them in emergency situations. Photographers use them to take aerial photos. Delivery companies use them to deliver packages quickly. And many people use them as recreational tools.

Drones can fly almost anywhere. And they are changing our lives. Can you imagine what other activities will be possible with drones?

**Unit 8 How Drones Save Lives**

Drones are very helpful at a disaster site. They collect information and provide real-time data from high above. This is very useful in emergency situations.

2020 was a terrible year for wildfires in California. More than 1.6 million hectares of forest burned down. Thousands of houses and buildings burned too. Drones worked hard with firefighters. Firefighters used real-time data to predict where the fires were heading. The drones’ thermal cameras helped find people trapped in the fires. Without drones, the damage would have been worse. And more lives would have been lost.

In 2019, a hiker in Utah got stuck on the ledge of a 20-meter-high cliff. Hikers in the area heard a man yelling for help. By the time rescuers arrived, it was dark. Rescuers used drones with lights on them to find the man. They flew the drones over the area where he was trapped. The lights allowed them to find and rescue the man.

Drones are more than just toys. They are useful in emergencies. Thanks to drone technology, firefighters and rescuers are able to save more lives.

**Unit 9 Folk Wrestling**

Many countries around the world have developed their own folk wrestling. Sumo and ssireum are two styles of traditional folk wrestling in East Asia.

Sumo in Japan and ssireum in Korea are alike in several ways. They are both very old and began more than a thousand years ago. In both sports, matches take place between two wrestlers in large rings. Also, wrestlers wear special belts in both sports. Sumo wrestlers wear a cloth belt. It is called a mawashi. Ssireum wrestlers wrap a belt around their bodies. It is called a satba.

There are also some clear differences between the two sports. Sumo wrestlers tie their hair into special knots, whereas ssireum wrestlers do not. Sumo wrestlers are strong, but they are overweight. Ssireum wrestlers are strong too, but they are not overweight. In sumo, the goal is to push the other wrestler out of the ring. In ssireum, the goal is to make the other wrestler touch the ground with any body part above the knee.

People everywhere enjoy folk wrestling. The rules are different in each country. But the fun is always the same.

**Unit 10 Thumb Wrestling**

Have you ever played a game of thumb wrestling? It is fun and simple. All you need is a friend and thumbs!

The rules are easy for a casual thumb wrestling match. First, stand face to face with your opponent. Next, lock four fingers together with your opponent. Then, put your thumbs up. After that, say the thumb war rhyme: One-two-three-four, I declare a thumb-o-war! Finally, pin down your opponent’s thumb for three seconds to win the match.

If you think you are good enough, go to Beccles, UK. There is the World Thumb Wrestling Championships every summer. The rules at the championships are a little different than the ones of a casual match. To win, players must pin down their opponent’s thumb long enough to say, “one-two-three-four, I win thumb-o-war!” If no one wins within 60 seconds, they play a second round. If no one wins that round, the winner is decided by playing rock, paper, scissors.

Do you think you have a chance to be the world champion? Go to Beccles this summer and find out!

**Unit 11 Why We Get Sick**

Achoo! You suddenly sneeze. Your throat is itchy, and you have a runny nose. You are getting sick. Why is this happening?

One major cause of sickness is germs. These are tiny organisms. They include viruses and bacteria. Germs cause infectious diseases such as colds, the flu, and chickenpox. First, germs invade our bodies through the mouth, nose, and cuts in the skin. Then, they attack our bodies and make us sick. Infectious diseases spread from person to person. Fortunately, we can defend ourselves from germs. We can wash our hands often and get vaccinated.

However, there are other kinds of diseases that are not caused by germs. These are noninfectious diseases. They are generally caused by genetic factors or unhealthy lifestyle choices. For instance, if your mom has diabetes, then you have a high chance of getting diabetes. Cancer may also run in the family too. And bad eating habits and smoking can cause heart and lung diseases. So choosing a healthy lifestyle is important.

We cannot avoid getting sick completely. However, eating right, getting enough sleep, and exercising regularly will help greatly.

**Unit 12 The Immune System**

Everyone gets sick at times. People often become ill because tiny germs like viruses and bacteria enter the body. When that happens, the body’s immune system begins working extra hard.

The immune system defends the body from all kinds of diseases, including infectious diseases. The immune system is made up of cells, tissues, and organs. White blood cells are part of this defense system. They are made in bone marrow.

White blood cells are found throughout the body, including the blood. They patrol the body and look for invaders. White blood cells do many different jobs to keep the body safe. First, they attack and destroy germs invading the body. Second, they recognize invaders that have previously attacked the body. Third, they make special chemicals called antibodies to fight off invaders.

The immune system works hard to keep people healthy. However, sometimes the immune system needs extra help to fight off certain germs. That is why it is important for people to get vaccinated. This helps the body get ready for attacks by germs.

Keep your body healthy. That will keep your immune system healthy too.

**Unit 13 Hexagons in Nature**

Bee hives, dragonflies, and turtles have something in common. Can you guess what it is? They all have hexagons! A hexagon is a six-sided shape. You may not know it, but there are many hexagons in nature.

Bees build their home using hexagons. There are hundreds of hexagons inside their hive. They are packed tightly together. Hexagons are the most efficient shape for packing. If hives were made from circles, there would be empty spaces between the circles. But hexagons leave no empty spaces in the hives.

Look closely at a dragonfly’s eyes. Dragonflies have “compound eyes.” Their eyes are made up of around 30,000 lenses. Those lenses are hexagons. And they are packed together in the dragonfly’s eyes. Because of their compound eyes, dragonflies have the best vision in the animal world.

Everyone knows that turtles have hard shells. But did you know that there are hexagons on turtle shells? Hexagons are used to help cover the curved shape of the shell.

Now can you recognize hexagons? Take a close look at your surroundings. What did you find? How many hexagons can you spot?

**Unit 14 The Shape of a Soccer Ball**

Soccer has been around for a long time. It goes back about 2,000 years. However, the first rubber soccer balls were created in 1855. What did the players use before then? Soccer players kicked around an inflated pig bladder! It was difficult to control because of its irregular shape. Now, soccer balls are made in a factory. Every ball has the same, regular shape.

At first sight, a common soccer ball looks like a perfect sphere. After a closer look, however, you will see something different. The soccer ball is made from 32 polygons. A polygon has at least three straight sides and angles. The soccer ball is made from two types of polygons. It has 12 pentagons and 20 hexagons. Pentagons are five-sided, and hexagons are six-sided. Every pentagon on the soccer ball is surrounded by five hexagons. The pentagons are black, and the hexagons are white.

The black-and-white ball was introduced at the Mexico World Cup in 1970. Its pattern helped people see the ball more clearly on black-and-white TVs. Nowadays, soccer balls have many different colorful designs. However, the iconic black-and-white pattern still remains today.

**Unit 15 The Danger of Video Games**

Gaming is a multi-billion dollar industry. One of the most popular games is video games. Video games include computer games, console games, arcade machine games, and mobile games.

Some people spend a lot of time playing video games. Doctors say that people who spend too much time playing games may have an addiction. When people cannot stop themselves from doing something, they have an addiction. Video game addiction is a mental health problem. It can happen to people of all ages, including children and teenagers.

Video game addicts usually play for ten or more hours a day. They play games instead of doing homework or studying for tests. Also, they do not spend enough time with their family and friends. Game addicts commonly have poor diets. They use energy drinks to stay awake and eat instant foods while playing games. The more they play video games, the more their quality of life decreases.

Playing video games is a fun way to spend time alone or with friends. You can play them as a reward after hard work. But always remember to set a time limit for yourself.

**Unit 16 Computer Vision Syndrome**

How many hours a day do you spend using electronic devices? Do you ever experience eye discomfort when viewing digital screens? Your eyes have to work extra hard when viewing something on an electronic device. Staring at a screen for too long is not good for your eyes. You could develop computer vision syndrome.

The symptoms of computer vision syndrome are eyestrain, blurred vision, dry eyes, headaches, and neck and shoulder pain. The longer you stare at a screen, the worse the symptoms become. Most times, the symptoms fade away once you stop looking at the screen. However, they will return and can become even worse when you look at the screen again.

Thankfully, computer vision syndrome is preventable if you follow the simple 20-20-20 rule. Take a 20-second break every 20 minutes. And look at something that is 20 feet (about 6 meters) away. Your eye muscles will relax when you look far away. Also, you should try to reduce your screen time and get regular eye exams.

Be careful with your eyes. They are your windows to the world!