



Non-fiction

Group 3

AI and Angeleye

Canadian International School of Hong Kong, Yu, Ethan – 11

AI is a wonder of technology, and has a huge potential to assist humanity in making the world a better place. Most people use AI to assist them in writing, or grammar checking. Some ask them questions. Some have doubts about AI, skeptical about its ability to take over the world.

Pros:

1. Security and investigation : AI could be of good use in investigations, as it could help with facial reconstruction, a key to finding criminals. Some could use it to ID people in security checkpoints or high security areas.
2. Assistance in Daily life : AI, such as openAi, can help with questions from the user. It is better compared to the internet as it could provide a more direct answer.some AI is built with doing specific tasks, but on the other hand, can also do more broad tasks, like finding something about a specific subject
3. Innovation in design : AI can be used to do mathematical problems, such as calculating materials for construction, and also physics to make sure the infrastructure is reliable and safe.
4. Medical and surgery : AI can be used to help doctors and surgeons with medical surgeries as humans do not have as much accuracy as machines. AI is very accurate, and that factor could prove very useful in dangerous and risky surgeries. It can also be used for diagnosis, as it could narrow down bacteria and virus strains to find the correct statement.
5. Automation: easier tasks can be done by the computer, humans can accomplish tasks that require skills.

CONS

Now we move onto the cons, where it starts getting bad and AI will not seem like the angel it is.

1. Economical : AI could hugely impact the economy due to the jobs it could replace. It could especially affect repetitive jobs like cashers, or waiters. It could possibly do better, due to memory and memorization of customers, tables, etc.
2. Privacy : privacy is a huge problem on the internet, as it could cause data leaks and personal information being online, and risk accounts hacked and data lost. There has already been countless data leaks, and if AI gets breached, countless peoples data will be released to hackers.
3. Education : AI can be a problem to education due to students using AI to cheat, and causing them to get in trouble, or getting expelled. It could also lead to a bad future, due to it being on their reports, and lowering the chances of them getting good schools or jobs.
4. Social Interaction : this may sound weird, but it is a problem with the rise of AI. when people use AI, they can chat with them, and not talking or playing with friends or family
- 5.

Glasses that can give blind people vision

You have probably never heard of Angeleye. It is a pair of glasses built for blind people to help them see. It can detect objects, bank notes, and text reading.

Pros :

1. Detecting Bank notes
Payments are difficult when you can't see, as it is hard to figure out which bill is which. For example, say you have a 10 and a 100 dollar bill. You can't see it, and you have to pick which one is which. It feels the same, so it would be a 50/50 chance, unless you have braille on the bills. With angeleye, it will fix this problem. With banknote detection, blind people are less likely to mess up payments.

2. Text reading and headphones

Text reading might be one of the most important features, as blind people have difficulties reading without braille. With this feature, it can be used as an audio player for books, letting them have a better view of the story. It can also be used to listen to music, making it better for a single pair of glasses.

3. Object detection

Object detection could be used to help blind people with observing their surroundings, and on walks, it postpones the need to use guide dogs. It could help massively with urban areas, due to lots of dangers, like car crashes, posing threats to blind people and when they cross roads.

Inventions of Ancient China

Chinese International School, Lent, Annabella – 13

Our ancestors from Ancient China contributed to a plethora of inventions that have profoundly shaped the way we live our lives today and the very course of human civilization. Arguably, the four most significant inventions that have changed our world include papermaking, printing, gunpowder, and the compass. Paper and printing is used everywhere by everyone and is extremely versatile, being used in books, writing, and arts and crafts. Gunpowder, while more controversial, has nevertheless also left its mark on the world, being used for warfare to mining and construction, to even pyrotechnic firework displays that children love. Compasses have been crucial in the past for sailors, and, later, influenced our modern world by being the template and making maps and GPS possible.

Of these four inventions, papermaking is particularly notable. It is used by people all around the world for many different reasons, for writing books, for children to do homework, for arts and craft purposes, etc. Currently, it is the most used of the four inventions. In fact, there are probably many pieces of paper on your desk right now. Before paper, China had been etching writing onto things like bamboo, animal bones, and even turtle shells. As one might imagine it was not ideal or even practical since people had to spend a considerable amount of time etching and carving onto hard surfaces that were not even easily accessible. With paper, writing and drawing became more practical and efficient, and people had access to it in their everyday lives. Imagine carrying around a turtle shell with etchings! Paper was significantly more practical, and it completely changed the course of China over a span of centuries.

The first piece of paper was invented in the Han Dynasty in roughly 105 CE. It was invented by Cai Lun, an excellent craftsman originally known for creating and crafting ceremonial weapons. He took materials such as fiber, rags, fishing nets, and even nature's raw materials like mulberry bark and hemp, and created something new. He combined all of these materials together and spread them flat, hanging and leaving them out to dry in the sun. The piece of paper was thin, lightweight and presented quite a rough texture as it was made with raw materials. It wasn't bad, but it still had a long way to go. After this original attempt, the papermaking technique of ancient China was modified to include hemp and recycled fishing nets. After roughly 14 years spent developing the Chinese papermaking process (206–220 CE), it changed significantly. It now included plant stems and grass stems, and bits of vegetables like roots and leaves. Most notably, the hemp originally used was replaced by rattan and bamboo because bamboo is a fast growing plant using it allowed for not only quicker but also higher quality production. Paper slowly began resembling the thin, lightweight sheets we know of today.

Paper's evolution did not stop here. Soon, there were multiple and diverse variations of paper. Colors, sizes, materials and textures became available options. Special variations of paper for calligraphy, books, and art etc. were produced, and they were typically made of softer materials that gave the paper a more refined texture ideal for art and literature. These were typically made from vegetable and plant stalks and stems, seaweed, and straw. Since paper made the world of literature and art more accessible, it led to China experimenting in the arts. Overtime, arts and literature flourished in China because more practical and accessible paper led to more people creating stories, writing books, poems and calligraphy. Paper afforded more people the creative liberty and freedom to dabble and experiment in arts and literature, making it accessible to commoners and not just the wealthy who had access to art by etching it onto animal bones and shells. Paper became the engine that drove the advancement of China in the field of arts and literature. To this day, calligraphy, art and poems are a staple of Chinese culture, and without paper, this simply would not have been possible, and our world today would have been starkly different.

Over time, papermaking techniques spread beyond China and reached other parts of the world. China's papermaking quality eventually became so desirable that it began to spread along the Silk Road. The Middle East began using paper soon after its' appearance on the Silk Road Market in about the 8th Century, and it spread to Europe and other western countries in approximately the 12th Century, slowly becoming a global phenomenon.

Today, paper remains a staple of our lives, and we simply can't think of a world without it. Children use it in school for writing, business people use it for important documents, educators use it to teach new generations of students to read and write, and artists use it to create literature like paintings, origami and calligraphy. Papermaking and paper was one of ancient China's most influential and important inventions. It truly had a profound impact on our modern lives and still continues to, despite all of the recent technological advances. It truly changed our lives and made life much easier and practical.

Another Chinese invention that helped shape the course of history was the invention of gunpowder. The invention of gunpowder from ancient China quickly spread all throughout Asia and Europe, before further extending its branches globally. It has contributed to significant parts of our history, and it remains a crucial part of our modern lifestyle.

The invention of gunpowder, unlike the invention of paper, is not exactly credited to one person and its history is more complicated, since multiple people contributed to its discovery over a span of time. The earliest documentation of substances similar to gunpowder was when the renowned alchemist Wei Boyang, or "the father of alchemy" kept an official record in 142 AD about a specific substance made of a mixture of powders. The mixture's explosive properties made it react to stimuli dynamically and "fly and dance," being highly reactive.

After this, Taoist alchemists tried to recreate what Wei Boyang did— yet they didn't do it to intentionally produce gunpowder. They thought the substance Wei Boyang wrote about would help them create a solution that would help them live longer. Their original goal was to develop a medicine that would help them "unlock the secrets of eternal life," and they investigated materials like saltpeter and sulfur. Obviously, their pursuit of eternal life was fruitless, however since they researched materials like saltpeter and sulfur, their quest for eternal life ironically contributed to the invention of gunpowder. The Taoist philosopher Ge Hong, upon hearing the Taoist alchemist's investigations of saltpeter and sulfur and other powders, documented these ingredients in his books, marking an official record of it.

At this point, alchemists were quickly realizing that these ingredients for gunpowder could be used in warfare and for military purposes, so after the ingredients were written down by Ge Hong, the gunpowder continued being developed and researched. A few decades later, the first official "formula" of gunpowder surfaced in the Tang Dynasty in the military manual "Wujing Zongyao", and it included a mixture of 6:6:1 saltpeter to sulfur to birthwort herb.

Similar to paper, once gunpowder was widely renowned and used for warfare in China, it took to the Silk Road where it swiftly became popular and traded by merchants everywhere, known as one of China's most coveted goods at the time. It swiftly spread to countries along the Silk Road with it spreading to other parts of Asia, and even extending to Europe. After it also became a global phenomenon, gunpowder started becoming especially prevalent in warfare starting from the 10th century. It was first utilized in bombs, cannons, and fire arrows, before firearm weapons were invented in the 13th century.

The invention and the discovery of gunpowder completely revolutionized warfare. Gunpowder significantly contributed to how warfare has changed over time, making new inventions like firearms and cannons possible. However, gunpowder has also revolutionized other industries, not only being used for warfare purposes. Gunpowder has helped to enhance the entertainment industry through pyrotechnic firework displays, which as insignificant as it may originally seem, has actually become thoroughly integrated into many cultures, traditions, and festivities around the world, for example during New Year's. Gunpowder has also advanced the mining and construction industries, being used in tunneling underground, mining, construction and architectural purposes, like constructing railways, roads and paths.

Gunpowder has been one of the most influential discoveries and has largely shaped the vast majority of technological advancements. It remains extremely prevalent today, yet again reminding us of its lasting impact on our society.

Throughout the course of history, very few civilizations have managed to leave an impact with their legacy of inventions as impressive as that of ancient China. China's innovations have contributed to shaping human civilization's past and present, and these four only represent a miniscule portion of the inventions, merely scratching the surface of the wonders China has gifted the world with.

Inventions Throughout History

Diocesan Girls' School, Lai, Wing Luen Vian – 14

German Philosopher Thorsten J Pattberg once said that “The Four Great Chinese Inventions – compass, gun–powder, paper, and print – are legendary. Less talked about are meritocracy and banknotes.” I, too, am particularly enchanted by the technology and inventions of China. From toys like kites to cooking ingredients like noodles and ketchup, from daily essentials like indispensable toothbrushes to handy umbrellas, these materials that improved the quality of our lives originated in China.

Did you know that the bristle toothbrush was invented in 1498 by the Chinese? They created toothbrushes with coarse horse hairs attached to bone or bamboo handles. The bristles were the stiff, coarse hairs taken from the back of a hog’s neck and attached to handles made of bone or bamboo. It was later brought to the new world by Europeans. Imagine what our lives would be like without these handy tools for our teeth. Everyone would be talking with sickening breath, stinking up the hallways at school. Dentists would have endless job hours, considering the fact that everyone would be having tooth decay and would need to get their teeth pulled out. Our appearances would also look worse, without our ivory white teeth but teeth covered in yellowish plaque. It just fascinates me how this one single tool can turn our lives around by 180°.

Strolling down the streets of Jordan, it is suddenly pouring like cats and dogs. My initial thought would be to open up my umbrella in hopes that I would not get wet upon arriving at school. The sole reason why this practical tool exists is thanks to the ingenious minds of our ancestors. Without it, we would be drenched in rain and experience severe sunburn under the scorching sun, bringing discomfort to our eyes.

While the Chinese invented these handy–dandy tools in the past, they are also elevating themselves in the advancements of technology. China’s most powerful modern technology, facial recognition system, logs nearly every single citizen in the country, with a vast network of cameras across the country. It controls human behavior and makes the country a safer place to live in by classifying citizens based on their ethnicity while singling them out for tracking, mistreatment, and detention. This system further proves its notability through the way it encompasses punishments and rewards in order to improve governance and stamp out disorder and fraud.

Aeroplanes burn fossil fuel which releases CO2 emissions and many other toxic gases, which take a toll on the environment and increase the rate of global warming. However, three in four Americans who have traveled in the last five years went for the food, according to SWNS Digital. An absurd thought of a new gadget that I have full confidence that the Chinese could invent would be a machine that allows people to share food across the internet. The idea of this new invention is that food will be put into the machine. It would then be sent to space through advanced technology that travels at the speed of light. In the blink of an eye, the food will be transported to another city, country, or even, another planet. With this sophisticated technology, it is possible that in the near future, carbon emissions will be lessened with people having access to various foods from other countries without the need to even step foot out of our houses!

While ancient inventions certainly captivate me, there is no limit to new ideas and state–of–the–art technologies. With ambition, determination, and wild thoughts of imagination, each household might just have machines that bring us access to foods across the globe in a few decades!

New Tales of China's Inventions

Diocesan Girls' School, Qian, Yan Tung Angela – 13

Although it may not seem like it, this Chinese invention is a treasure chest that contains hidden, shimmering treasures and may be one of the greatest inventions ever created. It sounds crazy, but the invention I'm talking about is paper.

Some say it's just a sheer sheet to be written on. However, they failed to realize the vitality of a mere sheet of paper. It's the same thing that preserved all the cultural heritage and history from the olden times which have been passed down by generations. Think about it. Loads of things happen to be in the presence of paper. It doesn't matter if it is the most famous Chinese watercolor painting or if it's the least popular novel in the city. They all come to life on paper.

Paper is used for note taking, baggaging, origami, art, and much more purposes. and if Cai Lun, a Chinese official in the Han Dynasty, didn't create paper, then none of these could have easily taken place.

Creating paper was no easy task for Cai Lun. Wanting to create another material for people to write on except for heavy bamboo and turtle shells, he embarked on a journey to create paper. He failed numerous times, due to either the paper being too soggy or too hard to write on. However, on one particular day, Cai Lun mixed mulberry bark, hemp and rags with water, mashed it all together, squeezed out the water and left it under the sun to dry. After thousands of times of attempts, to his surprise, the result was exactly what he wanted. The paper was soft and light, making it easy to write on as well as to carry around. Just like that, the first ever piece of usable paper was created.

Cai Lun serves as a great representation of the Chinese to this day. He was an extremely open minded executive and listened to others' suggestions hoping to improve and enhance the making of paper. He did not falter even when his multiple attempts failed. He continued to improve his paper making even after he succeeded, constantly aiming for perfection.

The creation of paper illustrates the driving force behind Chinese inventions. The greatness of Chinese inventions lies in the respect for freedom and openness. The magnificent and inclusive Chinese culture embraces diversity. Just like Cai Lun, the diligent nature and resilience of the Chinese people further increase the probability of success for each invention. Therefore, even as dynasties rise and fall, great inventions continue to emerge: when the Han Dynasty hit its rock bottom, Cai Lun's invention rose to the top.

If the 5000 years of Chinese history can be used to predict the future, I can joyfully predict that an invention equally significant to world civilization, like paper, is currently brewing within the wisdom of the Chinese people. It is on its way.

Living the Dream Life

Diocesan Girls' School, Sung, Zhi Yin – 13

A while ago, I was having lunch with my aunt and her baby daughter when suddenly, the little 8-month-old started wailing. Her cries pierced through the air but my aunt calmly told me the little one was just hungry and needed to be fed. But here's where things got interesting.

In a very composed way, my aunt said, "Let's finish our dessert here first. After that, can you come back to my home with me to get a bottle for her before I drop you off at your place?" I readily agreed, but couldn't help but wonder: Wouldn't it take too long to go home, boil the water, and make the milk?

Little did I know, my aunt had a secret up her sleeve. Seeing the confusion on my face, she chuckled mischievously, pulled out her phone, and pressed a couple of buttons. She then explained her ingenious solution as she finished the rest of her New York Cheesecake on her plate. "I can boil the water here on my phone digitally while choosing the temperature I want. By the time we get home, it will be ready for me! It saves me so much time."

I was astounded! This is such a simple yet so thoughtful piece of technology, I thought. With my best friend's birthday just around the corner, I couldn't help but think of the perfect gift for her in icy cold Scotland. So, I had to ask my aunt what this incredible invention was.

She smiled and said, "That's the Xiao Mi Smart Kettle I'm using. With China's advanced technology, there are so many things we no longer have to do manually."

At my aunt's words, an idea started to take shape in my head. Since China is already making these cutting-edge techno products so affordable and accessible, wouldn't it be possible to digitalize our entire home in the near future?

Let's imagine this: after a long day at school packed with classes and ECAs, I arrive home. The moment I set foot inside my home, the entire space springs to life. The bathtub is filled with warm water infused with my favorite lavender bath salts, heated to the perfect temperature. My favorite Taylor Swift music plays softly in the background, and the indoor light is tuned to a warm white light for a spa-like experience. As I emerged from the bathroom after a heavenly 20-minute bath, the milk shaker in the kitchen stopped. It has crafted a powerhouse of nutrients based on precisely calculating my daytime movements from my smartwatch: Sweet ripe bananas, mingle with a medley of juicy blueberries, strawberries, and raspberries. To add a final touch, a tablespoon of almond butter and a drizzle of honey that I always love. Yum!

Then a faint beeping sound alerts me to my afternoon tea dish— Char Siu Sakura Pancake. It is a personalized dish based on my taste: a Chinese-style savory pancake with a Japanese twist, infused with the essence of cherry blossoms. While I am in the bath, the meal preparation robot's mechanical arms and sensors, poised for action, have already measured and combined the required ingredients and heated the perfect batter in the griddle. The aroma wafts through my nose as it emerges from the griddle with a texture that only 3-star Michelin chefs can make. The perfectly crispy golden outer layer's surface glistens under the kitchen lights. With every gentle bite, the thin layer melts away to reveal a soft and tender interior. Oh, what a treat that comforts and satisfies my weary stomach!

Then a beeping sound catches my attention. 'Giselle,' announces our virtual home butler, 'your parents are on the speaker.' Then my parents' faces were projected onto the wall, and I saw them tightening their seat belts in the car, asking me about my day. Then Mum asks our butler, 'So, what's good for dinner today?' 'Well, it's around 15 degrees today, so I suggest either preserved sausages with sticky rice, or pepper salt pork stomach so—' 'Pepper salt pork stomach soup!' Dad and I chant at the same time. Mum laughs in agreement and confirms it with our butler.

Thirty minutes later, as my parents walk through the front door, the simmering pot of soup is already at the dining table for our family. Gone are the days when my parents had to scramble to put something together from the fridge after a hard day's work and sweat in the kitchen. Now, we can wind down and enjoy our nutritious meal, laughing and talking, catching up with each other about our busy day. Then, our butler put on the newest episode of Little Master Chef for us, and we picked a recipe that we wanted to attempt together that weekend as a family activity. Our butler notes it down and places an order for the ingredients to be delivered as we call it a day and get ready for bed.

From gunpowder and the compass to TikTok and Wechat, Chinese ingenuity has influenced the world we live in for thousands of years. As descendants of the dragon, we carry within us an inherited spirit of innovation and limitless imagination. Just as our ancestors revolutionized the world in their time, we too can also push boundaries and shape the future world. As Jack Ma, the founder of Alibaba Group, once said, 'The seeds in the hearts of young people will one day change the world.' As long as we let our minds soar, there are simply no limits to what we can achieve!

The History of China's Inventions

ESF Island School, Chung, Jayla – 13

China, Zhongguo, Cathay, they're all names for one of the world's biggest exporters of commodities and industrial economy. Many different countries claim that they invented some of the world's greatest inventions from ancient times but China is currently leading the world in the realm of technology. Alibaba, Meituan, and Tencent have made the world shake with their products. Of course we can never forget about the big 4 inventions our ancestors made like papermaking, gunpowder, the compass and printing. Without our ancestor's advances in inventions we wouldn't have the foundation for education and many jobs would cease to exist. If our oriental ancestors never invented the papermaking techniques then we wouldn't be taking exams and writing would've stayed on bones. The compass was the starting point for the age of exploration, 200 years later Columbus was able to explore the world and discover the world as we know it today. Fireworks and war, the same essential powder in both, gunpowder was also another one of the many inventions. Let's dive into deeper detail about the great Chinese inventions.

The most recognisable invention in the Big 4, papermaking. While the exact beginnings of papermaking in ancient China are still largely unknown, it can be linked to the Han and Eastern Han dynasties (206 BCE–220 CE and 25–220 CE). At first, the Chinese recorded information using a variety of materials, including silk, bamboo, and even animal pelts. Nevertheless, these resources were costly, time-consuming, and scarce. The pivotal moment came when Cai Lun, an eunuch working in Emperor He's court in the Eastern Han Dynasty, asserted that paper had been invented in 105 CE. Cai Lun combined mulberry bark, hemp, rags, and old fishing nets, pounding them into a pulp and laying it out in thin sheets to provide a sturdy, lightweight writing surface. Papermaking was invented in China and soon expanded throughout the country, finally making its way to the Islamic world in the eighth century. Due to the use of heavy iron coins in the Sichuan region in the 11th century CE, wealthier people were forced to store their money in public warehouses, where it was safer. Around 1023 CE, the Song government began distributing paper certificates to individuals showing how much money they had in their savings accounts. Additionally, these certificates can be used in transactions instead of transporting physical currency. During the 12th century CE, merchants in other parts of China once again switched from carrying bulky coin bags to using lighter paper bills for transactions. They eventually helped create paper money around 1120 CE, when the Chinese government monopolised the issuance of these receipts, producing the first paper money in history. By 1260 CE, paper money had become what we now call real paper money: it could be held for as long as desired, used across the country to make purchases, and converted into gold or silver at any time. About 300 years after Cai's discovery, in the 8th century, the secret made its way to what is now the Middle East. But papermaking did not reach Europe for another 500 years. Spain saw the construction of one of the first paper mills, and soon paper was produced in mills all throughout Europe. The 12th century saw the spread of papermaking skills throughout Europe, which completely changed how information was kept and shared. The invention of paper had a significant influence on literature, education, bureaucracy, and the arts. It also promoted knowledge dissemination and cross-cultural interaction. Papermaking replaced expensive and limited materials with a lightweight, long-lasting writing medium, revolutionising the recording and dissemination of knowledge. The development of education, administration, and knowledge preservation can be attributed to the discovery of paper in ancient China. It made it possible for literacy to grow, for ideas to flow, and for literature, art, and science to flourish. The advent of paper money changed the economic environment by enabling larger-scale trade and transactions. Paper money further developed from papermaking techniques.

The Chinese are credited with creating the compass during the Han Dynasty (2nd century BCE). Originally, instead of being a navigational aid, it was employed as a divination tool. The first compass was a "south-pointing chariot," which was made of a magnetic spoon-shaped object that was oriented along a central axis. It constantly pointed south as it matched the Earth's magnetic field. During the Song Dynasty (960–1279 CE), the full potential of the compass for navigation was realised. Compasses were first used by Chinese seafarers to navigate the seas, giving them more accuracy and confidence when venturing into unknown waters. This discovery made it easier for ideas to travel great distances and for marine trade and exploration to flourish. Throughout his travels, the renowned Chinese explorer Zheng He relied heavily on his compass and later became instrumental in European exploration during the Age of Discovery. "The Book of the Devil Valley Master" contains the first recorded mention of a compass and its

application. The compass, or "south pointer," as the Chinese called it, might be carried by jade hunters in addition to its primary function in order to save them from being lost while travelling, according to the author. Earlier versions of these kinds of compasses have other indications in addition to its fundamental parts. The eight principal directions (north, south, east, west, northeast, northwest, southeast, and southwest) were marked on the metal plate with Chinese characters. Further signs indicated more precise directional gradations and connected directions to images from the "I Ching", a famous work of Chinese philosophy. There was another kind of early compass with a completely different design. The Chinese also used a gadget that involved submerging a wooden fish with a magnetised needle in a water-filled bowl to detect direction. The invention of more accurate tools that made it possible for explorers to precisely traverse the seas and essentially alter the course of history was made possible by both the fish- and spoon-type compasses. It made the Age of Exploration easier by enabling the finding of new places and the mingling of cultures. The compass evolved into an essential tool for international travel and had a big impact on the development of the contemporary world.

In conclusion, the Chinese inventions of papermaking and the compass stand as remarkable achievements that have shaped the world as we know it today. These inventions, part of the Big Four Inventions, have had a profound and lasting impact on human civilization, both in ancient times and in the present day. These were the foundations for the inventions and technological advances we have today. Without first using the compass, we wouldn't have such great cultural diversity all around the world. If those cultural exchanges never happened, we humans wouldn't be so advanced. It's teamwork that lets us reach big goals, but it would never happen without the tiny steps humanity has taken before.

China's Ancient Inventions And Discoveries

ESF Island School, Lin, Kwan Ting Quentin – 12

China is well-known as "the world's factory." Picking an item from a shelf in a supermarket, you would find "Made in China" in one way or another. But did you know that these are not China's only inventions? China has been inventing new and unheard concepts for thousands of years. For example, they created papermaking, printing, gunpowder, and the compass, now known as China's Four Great Inventions.

One of the most amazing discoveries of ancient China was silk production, which was discovered by Empress Leizu (西陵氏) about 2700 BCE when she unintentionally unwound the strands while removing silkworm cocoons found in her cup. She started experimenting with it and learned how to weave it into cloth. The process of making silk was once kept a secret, which made it a very desirable good. However, the secret of silk became known in Western countries. News about China's silk manufacturing started to get out there. Two monks dispatched spies to China in the sixth century CE to study agriculture. The Western Hemisphere's silk industry began when they smuggled mulberry seeds and silkworm eggs.

Silk is still a valued resource nowadays, cherished due to its luxurious feel. It is used in home furnishings, luxury goods, and more. Silk's texture and feel make it ideal for high-quality clothing and accessories. Silk production is now a global industry, with China being a significant producer. On the contrary, in ancient times, only China knew how to produce them throughout the Silk Road Trade. Silk has been a valuable resource since 2700 BCE, and it is still just as cherished now. It has been a valuable commodity in the Silk Road Trade, and it still is nowadays in the economy and marketing. The practices and processes of creating and manufacturing it into different forms, such as clothing, accessories, and furnishing, have changed a lot.

Another commodity China discovered was paper, discovered during the Eastern Han Dynasty around the 2nd century CE by Cai Lun (蔡伦) by combining mulberry bark, hemp, old rags, and plant fibers to create wet pulps. It would later be dried and pressed to create an early prototype of paper sheets. This invention was a breakthrough, as paper was much more affordable, lighter, and easier to make than bamboo slips and wooden tablets, materials used for writing long before the invention of paper. It eventually spread across the world.

After undergoing many developments and innovations, the paper we use is much different than the paper Cai Lun discovered and invented because it is much easier to manufacture and is much cleaner and whiter than Cai Lun's prototype. The quality of paper was also significantly different, as Cai Lun's prototype was coarse and uneven, while modern-day technology allows us to create more consistent and refined products from it. In the old days, paper was an expensive commodity because of the amount of manual labor involved in its production. In modern days, it is now massively manufactured using automatic machines, making it more and more easily available than in ancient times.

To conclude, paper is a staple in life, cheap and available in modern days, though scarce and expensive in ancient times. The quality of paper gradually increased over the centuries because of many developments and innovations made to it. The practices in making these started with pressing and drying a wet pulp made by four ingredients, which is still almost the same thing but made with slightly different materials and much better quality thanks to the use of machinery instead of manual labor.

A third significant Chinese invention is tea, a beverage Chinese people enjoy. It was discovered in 2737 BC by Emperor Shen Nong. According to the legend, the invention of tea happened while he was boiling water; a few leaves from a *Camellia sinensis* tree fell into the pot. He found the beverage to be enjoyable, and the rest was history.

Today, tea is still a widely consumed beverage throughout the world, but there have been a few tweaks to the commodity, for example, in processing, packaging, price tags, and availability. Tea has even been changed to a cold drink, making it more versatile. Overall, it is still as popular worldwide as it was in ancient times.

To summarize, tea is a Chinese invention that is processed into different types, enjoyed hot or cold, and has many potential health benefits. It changed from being used for medicine to a worldwide drink and a significant product for beverage companies and restaurants around the world. It has expanded from just China to Japan, then also Great Britain, then the United States of America, and finally, tea is now culturally significant as a beverage worldwide.

One more commodity China has created was the invention of porcelain, usually a white scorched transparent ceramic, such as bowls, pots, vases, and a lot more. It was created during the Eastern Han Dynasty as well, by an unknown group of potters and kiln operators experimenting with types of ceramic materials and changing pottery production practices. The process of how porcelain was invented in ancient times wasn't well documented, so unfortunately, the details became lost to history.

In modern times, porcelain has continued to be highly valued and widely used, and the characteristics of it have remained unchanged, while the production process has changed quite a lot, with the process being first mixed into a slip, then shaped, dried, and scorched at high temperatures in kilns. Glazing can be added as an option.

Porcelain's appearance and properties have not changed much, but the materials and process used to make it have changed drastically, becoming more mass produced since it is easier to manufacture them and also being able to use easily available materials everywhere to create it. It is also in Chinese houses everywhere due to its importance to them and to Chinese culture.

In conclusion, these inventions are all necessary to our daily lives nowadays, and they make our lives more convenient. For example, paper is a lot more affordable and cheaper, and silk is now a luxury household furnish for cloth and furniture, and so much more. Inventions are great for mankind, but the key is to be able to identify the problem, be imaginative, be resilient, try countless times, use trial and error, sometimes asking for help, and refine and innovate the prototype as much as possible. Remember, an eleven-year-old Frank Epperson invented ice popsicles, and Louis Braille invented the universal language for the blind at fifteen years old, so all you need is a spark of imagination and you might be able to create something revolutionary!

Chinese Inventions: Exploring the Legacy of Innovation

ESF Renaissance College, Yuen Ting Chan, Natalie – 11

China, a land renowned for its ancient civilisation and rich cultural heritage, has left an indelible mark on the world through its astonishing inventions. China has a rich history spanning across various dynasties and its contributions to Chinese civilisation are remarkable. Many of the Ancient China inventions are still used today and the Chinese inventors have revolutionised various fields, shaping our understanding of science, technology, agriculture, traditional medicine, health and modern innovations. Ancient China has Four Great Inventions, paper making, printing, magnetic compass and gunpowder are the four most important inventions which originated from the Chinese.

The first of the “Four Great Inventions” of Ancient China is the invention of paper, which greatly affects human history. Paper gets its name from the Egyptian ‘papyrus,’ despite not being an Egyptian invention. Paper was invented in China in 105 AD by Ts’ai Lun, a bright Chinese court official. His advanced paper making technology spread to central Asia and the world through the Silk Road. Prior to the invention of paper, the Chinese communicated through pictures and symbols carved into tree bark, painted on cave walls, and marked on papyrus or clay tablets. Ts'ai Lun invented paper by mixing mulberry bark, hemp and rags with water, mashed it into pulp, pressed out the liquid and hung the thin mat to dry in the sun. It was 300 years later, after Ts’ai’s invention, during the 8th century, the secret of paper invention travelled to the region that is now known as the Middle East. It took another 500 years for papermaking to enter Europe with Spain being the first place where the first paper mills were built, and soon, paper was being made at mills all across Europe. Once paper was easier to make, books, bibles and legal documents were printed on paper. The American paper mills tried the Chinese method of shredding old rags and clothes into individual fibres to make paper. The mills changed to using fibre from trees when the demand for paper grew as wood was less expensive and more abundant than cloth.

Printing is the second of the “Four Great Inventions” of Ancient China. Printing was first invented in China around the year 700, during the Tang Dynasty (618–907), before it spread across Southeast Asia. Woodblock printing and movable type printing were the two types of printing that were invented in China. Woodblock printing was already a widely used technique in the Tang Dynasty. However, this kind of printing technology was expensive and time-consuming. During the Song Dynasty, a man named Bi Sheng (972–1051 AD) invented movable type printing, making printing quicker and easier. He first carved individual characters on pieces of clay and then hardened them with fire. These movable type pieces were later glued to an iron plate to print a page and then broken up and redistributed for another page. However, this printing technology was not widely used within China itself, except for very large jobs. Due to the considerable number of characters used in the Chinese language and the relatively lower cost of the technology, wood or metal block printing remained the dominant technology. By the mid 19th century, newer printing technology from the West started to decline the traditional printing in China. However, Europeans also re-imported print technology to Southeast Asia in the 16th century, spreading the technology to new areas. New research continues to examine the global connections underlying the spread of this amazing technology.

Another “Four Great Inventions” of Ancient China is the invention of the magnetic compass, which was invented by the Chinese during the Han dynasty (206 BC– 220 AD). Shen Kuo (1031–1095), a Han Chinese scientist and public official of the Song dynasty provided the first explicit description of a magnetized needle in 1088 and Zhu Yu mentioned its use in maritime navigation in the text Pingzhou Table Talks, dated 1111–1117. The magnetic compass invented by the Chinese was initially for the use of feng shui evaluations. The magnetic compass

was later adopted for navigational purposes by the Song dynasty during the 11th century and later in Western Europe and Persia in the 13th century. During the 10th century, the magnetic compass played a large part in European history when a magnetic compass was used by Christopher Columbus on his first Trans-Atlantic trip. The magnetic compass has been widely used in almost every form of transport across the world. In this modern era, compasses are being used not only on boats, but also on planes, cars and even hikers use them regularly for directions.

Gunpowder, one of the “Four Great Inventions” of Ancient China, is the first explosive to have been developed. The gunpowder was invented by Chinese Taoist Alchemists about 901 AD and it was invented when they tried to find a potion to gain human immortality by mixing elemental sulphur, charcoal and saltpetre. The earliest possible reference to gunpowder appeared in 142 AD during the Eastern Han dynasty when the Alchemist Wei Boyang, also known as the "Father of Alchemy", wrote about a substance with gunpowder-like properties. The gunpowder invented by the Chinese was used in warfare and in later years, the gunpowder enabled the invention of the cannon and guns which replaced swords and bows. The Chinese later developed fireworks, another gunpowder related invention which its uses are a complete contrast to war. The Chinese believe that the fireworks help to drive off evil spirits and today, the fireworks are enjoyed as a means of celebration all over the world during the lunar new year.

China’s scientific and technological skills extended far beyond ancient times. The abacus, an extraordinary counting device, laid the groundwork for the development of mathematics and commerce. Porcelain is another great invention of ancient China. Porcelain was highly prized in the world and many artworks had been introduced to the West through the Silk Road. The invention of porcelain not only produced exquisite works of art but also revolutionised pottery and influenced global trading networks. A seismograph, a ground breaking device for detecting earthquakes was invented by Zhang Heng (78–140 AD) in 132 AD during the Han Dynasty. The invention of the seismograph displays China’s profound understanding of natural phenomena and its commitment to scientific exploration. Furthermore, China’s expertise in silk production not only enriched its cultural heritage but also fostered international trade and diplomacy.

China’s contributions to Traditional Chinese Medicine (TCM) continue to impact global healthcare practices. TCM’s holistic approach to health and its natural healing methods has led to it gaining recognition among non-Chinese communities. TCM’s holistic approach to health which focuses on the balance and harmony of the body, mind and spirit offers an alternative treatment option for individuals who are seeking alternative to Western medicine. TCM is often used alongside conventional Western medicine as part of integral healthcare, leading to increased interest and acceptance among non-Chinese communities. There has also been a growing interest worldwide in natural and alternative healing methods. The non-Chinese individuals may incorporate TCM treatments such as acupuncture, herbal remedies and other non-invasive techniques into their overall healthcare plan. Acupuncture, a key component of TCM, has gained widespread acceptance and usage among non-Chinese communities. The art of acupuncture with emphasis on stimulating specific points in the body has provided alternative therapeutic options for pain management, stress reduction and healing. Furthermore, practices like Tai Chi have not only promoted physical well-being but also cultivated a harmonious connection between mind and body.

China’s rise as a global power has been accompanied by modern inventions. The development of high speed rail networks has revolutionised transportation, connecting vast regions and facilitating economic growth. E-commerce platforms such as Alibaba have transformed the retail landscape, enabling convenient online shopping experiences on an unprecedented scale. Moreover, China’s pursuit of renewable energy technologies such as solar and

wind power has positioned it as a leader in sustainable practices contributing to global efforts in combating climate change.

It is ever so interesting to learn about the “Four Great Inventions” of Ancient China. The invention of papermaking elevated the dissemination of knowledge, propelling the development of literature, education and record keeping. The magnetic compass unlocked mysteries of navigation, allowing explorers to traverse the seas and discover new lands. Without the compass, navigation would have certainly taken longer and it is possible that certain places may have never been discovered. Gunpowder not only has played a huge part in civil engineering but gunpowder has also revolutionized warfare. The invention of printing revolutionised communication, making books accessible to a broader audience and nurturing intellectual growth.

The Chinese are responsible for countless inventions. China’s remarkable inventions have shaped the course of human history leaving an indelible mark on civilisation. From ancient times to the modern era, Chinese inventors have constantly pushed the boundaries of innovation, enriching various fields and improving the lives of people worldwide. The enduring legacy of China’s inventions serves as a testament to the creativity and intellectual skills of its people, inspiring future generations to continue exploring the frontiers of human knowledge.

Papermaking

ESF Sha Tin College, Chao, Serena – 11

The first paper was made by Cai Lun, a Chinese dynasty court official who had a great love for his city's people. He was well-known for both harsh punishments to lawbreakers and for providing financial aid and essential supplies to the poor to help them through harsh winters. Additionally, he would even assist with crop harvesting during the autumn.

One day, while maintaining peace in the city's marketplace, he heard sobbing coming from a paper stall. Upon investigating, he found a woman in deep distress. After comforting her, the woman explained her predicament – her son needed writing materials for a significant assessment, but bamboo sticks were too heavy, and silk was too expensive.

Upon returning home, Cai Lun was deeply affected by the woman's sorrow. He sat in deep contemplation, his serious expression resembling a tragic comedy mask, while his mind raced with thoughts. Two days of intense pondering led to a groundbreaking idea, and he created the first paper by mixing fishing nets, plants, and charcoal into a watery substance, which he then dried in the sunlight.

Paper, which is lighter than wood, as well as more animal-friendly than animal skin, and cheaper than silk, gained widespread use throughout China. In the 1800s, the production of paper spread to Europe, initially sparking concerns that it was linked to Satan, but eventually paper became the primary medium for writing worldwide.

Thanks to Cai Lun, the paper has become an indispensable tool for written communication.

How was the Compass Invented

ESF Sha Tin College, Chiu, Jensen – 13

Before the compass was invented, people could only determine the directions through the sighting of landmarks or sampling mud from the seafloor. Other cultures such as the Polynesia would observe birds, winds, sea debris, and sea state. The Norse used a type of sun compass, Vikings used a refracting crystal during the day and astronomical knowledge at night.

In 206 BC, the Han dynasty of China, the first compass was created with lodestone which is a type of magnetized iron. At that point, the compass was not used for navigation, instead it was used for fortune-telling and geomancy. During the Song dynasty, it was called the "south pointing fish" or the "south-governor" and it was used for land navigation. Originally, the compass was a model of a fish made with lodestone which its head would always point south if placed in a bowl of water. The Chinese people had a geomantic principle of "feng shui" where compasses were used to order and harmonize buildings as lodestone would always point in a specific direction if suspended. That made the Chinese think that the areas the lodestone pointed towards are the best areas to grow crops, build houses, and search for treasures.

Only until the year 1040, during the Song dynasty of China, was the compass used by Chinese scientists and Chinese armies for land navigation. In the year 1111, compasses were also used for sea navigation which was very useful as it allowed travelers to travel to unknown areas of the world without known landmarks, travel during times of heavy fog, as well as allow sailors who wanted to travel far from land to know the direction they are headed towards. This was the beginning of the discovery age.

The first account of the compass was in "Kuan Shih Ti Li Chih Meng" which translates as ("Mr Kuan's Geomantic Instructor"). Another account of the compass was called "Chiu Thien Hsuan Nu Chhing Nang Hai Chio Ching" which translates as ("Blue Bag Sea Angle Manual") which was more detailed as it also implicitly depicts magnetic declination. In the text "Chung Hua Ku Chin Chu" by Ma Kao written in the 920s, the compass was described as a mysterious needle and the needle's shape was compared to a tadpole, lodestone spoon, and iron needle. In the 11th century. The first reference to a direction finder device was found in a book from the Song dynasty that dates to the 1040s. In the book, there was a description of a "south-pointing fish" made of iron and put in a bowl of water which is best used for orientation during nighttime. In another book translated as "Collection of Most Important Military Techniques", the "south-pointing fish" is used when troops encounter dark and gloomy weather and cannot orientate using landmarks as a guide.

It is widely accepted that China invented the compass, however some say that the Arabs brought the compass into Europe from China, while others say that the compass was brought to Europe and the Islamic world through the Indian ocean. Some scholars have even suggested that Europeans made an independent discovery of the compass. In the year 1190, Europe had been acquired with the compass which, unlike the Chinese where their compass pointed south, the compass of the Europeans pointed north. By the year 1232, Muslim explorers also used the compass for navigation. However, unlike both the Chinese and Europeans, Muslim compasses, which were called Qibla, pointed towards the Kabba in the province of Mecca as it is the holiest site in Islam.

One of the methods that the Ancient Chinese used to create the compass was to rub lodestone onto a needle's tip with lodestone before hanging it on a strand of silk. When prepared this way, the needle would sometimes point north and sometimes point south. In the 11th century, the Chinese found another method of creating the compass which is by heating a piece of steel of a really high temperature then rapidly cooling the steel in water. The cooling in water allowed the steel to orientate itself towards the Earth's magnetic field. This type of magnetization is called "Thermoremanent Magnetization" and can be used to understand the magnetic fields of ancient Earth.

The compass is one of China's greatest inventions as it allowed the world to be mapped and guided explorers into unknown areas of the world. Without the compass, we would need to use stars to navigate. However, we cannot see

stars in foggy places. Moreover, a hike in the forest or flying a plane would be impossible without the compass as we would easily get lost. Christopher Columbus needed the compass to be able to discover North and South America without getting lost in the middle of the ocean. It allowed explorers to spend more time on necessary work such as finding food and shelter instead of wasting their time navigating without a true idea of their direction. The compass has allowed us to trade technology and knowledge as well as create maps of the Earth. Developing from the ancient Chinese lodestone spoon, we now have dry compasses, bearing compasses, liquid compasses, electronic compasses, just to name a few. The world would be a completely different place if the compass never existed; many say that it is the greatest invention of mankind.

In conclusion, the invention of the compass allowed the world to be discovered to its true extent. Before the invention of the compass, sailors would avoid the open sea in fear of getting lost. When the compass was created in 206 BC, it was used for fortune-telling and feng-shui to point towards the best positions for farming, growing crops, and searching for treasures. In the year 1040, the compass was used for navigation and it was described as the "south-pointing fish". Many decades later, needle compasses were created which alleviated the fear for Chinese sailors of getting lost when they explore the open sea. There were many accounts in ancient China of what we now call a compass for uses of geomancy as well as navigating. In the year 1200, compasses were brought to Europe and the Islamic world, but it is not clear how they were acquired with it. In spite of this, it is clear that Europeans chose to point their compass towards the north pole, while the Muslims chose to point their compass towards Kabba. The Chinese also had more than one method to create the compass such as by rubbing lodestone onto a needle's tip or by heating and quenching steel in water. From the ancient geomantic use of the compass, to the great maps created of the world for many to explore, the invention of the compass in ancient China has changed the earth in many ways that we are affected by everyday.

China's Four Inventions

ESF Sha Tin College, Ng, Missou – 11

Today, China is known for a lot of famous places like the Great Wall and its population as well, being known for being the first country that has the most people. China also has great companies that are convenient like “Taobao” which is a very convenient online shopping platform that is popular everywhere, especially in Hong Kong. Yet, did you know that China’s history is as incredible as it is now? China is also well known for its inventions that it made for the world and is still making for us now. People call China “The Factory Of The World” since the other countries make ideas and China creates them all. Today’s inventions are made by China like the four inventions which impacted the world and China a lot. This essay will discuss the four inventions which are gunpowder, printing, paper making, and a compass.

The first invention was known to be Papermaking. This whole invention happened when the Western Han Dynasty created paper in 202 BC – 9 AD and was later improved in the Eastern Han Dynasty by Cai Lun. After Cai Lun improved it, the paper was soon named after him Cai Hou paper. Cai Lun was a court official who invented the paper-making process which mostly used rags as the raw material for making paper. The full list of materials used to make this was mulberry, other coarse fibers such as fishing nets, old rags and hemp waste. This kind of paper using these materials was much lighter and cheaper than previous materials and more suitable for Chinese calligraphy. Before paper was invented, people around the world wrote on many different kinds of natural materials. For example, Ancient Egyptians used papyrus scrolls to write down history, Ancient Europeans wrote on animal skins, while in Ancient China, people wrote on bones, tortoise shells, and bamboo strips that were all used for writing in China. However, that stopped because it was soon later proved that it was not suitable because of their size and weight. With time, paper has been used for paper wrapping in China since the 2nd century B.C. and was not widely used for writing until the 3rd century. By the 6th century, paper also began to be used as toilet paper while during the Tang Dynasty, paper was folded into square bags to preserve tea bags. Therefore, lots of people used to write on different kinds of natural material but when China invented paper, it spread across the whole world and the paper making soon evolved into toilet paper.

On to the second invention, printing. Printing was invented over a millennium years ago, around the year 700 during the Tang Dynasty. This invention soon spread across East Asia, Southeast Asia, and soon all over the world. They also discovered how to print on paper using blocks of wood and other materials. Seals were the first form of printing used in China, starting around 250 BCE, seals were stamped on official documents, personal letters, and works of art. However, Woodblock printing was the most popular form of printing in China back then. By the sixteenth century, colored wooden blocks used for printing became very popular in China, and printers produced many beautiful book covers. At first, woodblock was mainly used for printing books about agriculture and medicine as well as for printing calendars, calligraphy, and auspicious charms. In the year 762, the first printed books were sold in the markets of Chang’an, the Tang capital. Furthermore, in the year 782, printed papers were available in the marketplace as receipts for business deals and tax payments. How did they use wooden blocks to print? Well first, the text had to be written on a sheet of paper. Then the paper was glued face-face down onto the wooden block. Using a knife, the words were carefully engraved on the wood. The surface of the wooden block was then inked and covered with a sheet of paper. Gently brushing the paper over the engraved words. In conclusion, when printing was invented, the most popular way of printing was Woodblock printing and it soon started to print beautiful book covers and lots more other objects.

The third invention is Gunpowder. The invention of gunpowder can be traced back to the ninth century when Chinese alchemists made “immortal pills” that were imagined to keep a person living forever. Of course, they did not find a drug but invented the formula of gunpowder in the process of refining. What was gunpowder made of? Gunpowder is made of Sulfur, Saltpeter, and charcoal. Many Western history books over the years have stated that the Chinese only use gunpowder for fireworks which is not true. After they used gunpowder for fireworks, they used it as an explosive substance in the military, such as cannons and fire arrows. Cannons and muskets were already quite popular in China during the Song Dynasty, making China's technology a world leader. The first ever weapon to use

gunpowder was called a “Fire Lance”. This was a spear that had a gunpowder charge in the bamboo stick which was attached near the end of the shaft. How did a fire lance work? When you light up the gunpowder in the tube with a burst of flame, it would eject toward the target. Soon later, pellets were added and that made it a combination of shrapnel and fire. The ancient Chinese also learned about charcoal when firing pottery and used it as fuel. During the Shang and Zhou dynasties, charcoal was widely used in metallurgy which is one of the processes of making metal. Charcoal produces less ash than firewood and burns hotter, making it a better fuel. In conclusion, when gunpowder was invented, the first weapon to use gunpowder was called a “Fire Lance” and it slowly upgraded by adding pellets.

The last invention was a compass. Many types of compasses look different but almost work the same such as “The South Pointing Fish” or “The South Pointing Spoon” and the “Dry compass” which is in the shape of a turtle, these three types of compasses were the most popular ones. The first compasses were made out of lodestone, a naturally magnetized stone of iron, in Han Dynasty China called the “South Pointing Fish”. It was a wooden fish with a magnetized iron needle in it, that floated in a bowl of water. The second type of compass was the “South Pointing Spoon” which was the first compass ever made. During the Han Dynasty, the Ancient Chinese found that a naturally magnetic iron called lodestone would always turn around to point south. They carved a spoon out of the material and put it on a polished board. The third type of compass is the “Dry Compass” and in Chinese tradition, a live tortoise should be kept in the north or north-east part of the house. The north direction is associated with Kubera, the god of wealth. Therefore, there are lots of types of compasses that look different but work the same way.

To conclude, China made all these wonderful four inventions. Paper was first created in the Western Han Dynasty and was later improved in the Eastern Han Dynasty by Cai Lun. The materials he used to make paper were mulberry, other coarse fibers such as fishing nets, old rags and hemp waste. These materials made paper much lighter and cheaper than the previous materials and more suitable for Chinese calligraphy. Second, Printing was invented over a millennium years ago, during the Tang Dynasty and it soon spread all over the world. Woodblock printing was the most popular form of printing before, and seals were the first form of printing used in China. Third, Gunpowder was made when Chinese Alchemists were trying to make immortal pills but failed to make them. Instead, they didn’t find the drug but made gunpowder in the process of refining. The first ever weapon to use gunpowder was called a “Fire Lance”. This weapon soon improved by adding pellets that made a combination with shrapnel and fire. Lastly, many types of compasses looked different but worked the same and the first compasses were made out of lodestone. Even though China is a very beautiful place, we still cannot forget what great inventions they made and be grateful for what we have now. In this essay, we learnt about what great inventions China made and even some information about Chinese tradition as well.

The Unforgettable Impact of Gunpowder

ESF South Island School, Cheung, Pak Hei Zani – 12

Gunpowder, a groundbreaking invention known as one of China's "Four Great Inventions," is an extraordinary and dangerous creation that has left an unforgettable mark on the world. Although its origins lie in China, its influence has transcended borders. The advent of gunpowder completely transformed the nature of warfare, making battles more lethal and reshaping the course of human conflicts. Almost every military weapon incorporates gunpowder in some shape or form, whether it be through bombs, cannons, dynamite, firearms, or various types of ammunition. However, gunpowder also possesses positive applications, such as its use in fireworks, mining operations, and signalling flares. Its radiant and illuminating properties make it particularly invaluable for lost hikers or explorers in need of rescue.

At first, China used gunpowder to frighten and surprise their enemies. However, once they realised the incredible potential of their invention, the Chinese quickly shifted to using gunpowder for deadly purposes. Since 904 A.D, the military of the Song Dynasty has been utilising a variety of gunpowder devices to combat the Mongols. These weapons included innovative creations like "flying arrows," which involved attaching a burning gunpowder tube to an arrow. Moreover, they had basic hand grenades, shells filled with poisonous gas, flamethrowers, and landmines. As time went on and the 11th century arrived, the Chinese even started loading bombs with gunpowder and launching them from catapults. These fiery cannons required the combined strength of two individuals to transport them and were unleashed from mobile platforms strategically positioned near the fortifications of the enemy city.

China now possesses a lethal and deadly weapon, but how did it manage to get worldwide? Well, there are two primary reasons. First, let's delve into the Silk Road. Despite its name, the Silk Road wasn't a literal road but rather an expansive trade route connecting Rome to China. It was a remarkable and awe-inspiring path that facilitated the exchange of goods between various nations. In those times, there was no concept of Bitcoin or modern currency; instead, valuable items unique to each country were traded. For example, India offered herbs and spices, while China provided gunpowder and silk. This is how gunpowder found its way to other corners of the globe. However, the Silk Road is no longer in use today. Our advanced technology has paved the way for superior and more efficient trade routes. Another route in which gunpowder spread was the Mongolian Invasion. In simple terms, the Mongolians acquired gunpowder and employed it in their conflicts against Europe. Although they ultimately failed, they left behind the knowledge of gunpowder. The Europeans stumbled upon this revelation when they encountered the bombs launched by the Mongolians through catapults. In a way, Europe then expressed gratitude to the Mongolians by attributing the introduction of gunpowder to them.

As time progressed, the Europeans delved into the potential of gunpowder, leading to an astonishing amount of innovative creations. From firearms to mining explosives and even fireworks, gunpowder became the main inspiration and ingredient for these inventions. Initially, it was used in its simplest forms like fire arrows, fire lances, and basic bombs, mostly during sieges and naval battles. However, as knowledge and technology surrounding gunpowder advanced, so did its applications on the battlefield. By the 14th century, hand cannons and early arquebuses emerged, utilising the explosive power of gunpowder to propel projectiles. Although these early firearms were not highly efficient and had slow reloading times, they marked a significant advancement in warfare. Over time, gunpowder found its way beyond military applications. It became indispensable in mining, where explosives were used to extract valuable minerals, as well as in construction projects involving explosives. Additionally, gunpowder became an important part of celebratory events, such as the captivating fireworks displays introduced during the Renaissance in Europe. However, it is important to recognize that gunpowder's primary purpose in Europe was for

military use. Its invention completely changed warfare and played a crucial role in shaping European history. Gunpowder quickly spread throughout Europe and soon had a global influence.

Now, let's delve deeper into the inner workings of gunpowder. Beware, it may get a little bit scientific from this point. Black powder is composed of three key parts: charcoal as the fuel, saltpetre or niter as the oxidizer, and sulphur as the stabiliser to maintain a consistent reaction. Without the oxidising agent, the reaction would be slow, almost the same as a teenager waking up on a Monday morning. However, gunpowder's saltpetre supplies the necessary oxygen. As soon as it is heated, the sulphur takes the lead and starts a fire, causing the charcoal fuel to catch fire and increasing the temperature to a level where the nitrate molecules break down. This breakdown releases oxygen, which plays an extremely important role in an explosion process. When potassium nitrate, sulphur, and carbon come together, they produce nitrogen and carbon dioxide gases, along with a big amount of heat energy and potassium sulphide. As the gases quickly expand due to the heat, they create an explosive force, pushing action into movement. Confused? No need to fret! This topic is quite scientific and might require a bit of chemistry knowledge to maintain a full grasp. However, I've already done my best to simplify it as much as possible (Although it's still quite scientific, I must admit).

Gunpowder left an indelible mark on history, reaching far beyond the conflicts of the battlefield. Its impact was impressive, shaping the course of exploration, colonisation, and the rise and fall of mighty empires. The introduction of gunpowder-based weapons overturned the balance of power, altering geopolitical landscapes and redefining the strength of nations. However, alongside its immense potential, the widespread use of gunpowder also presented significant changes to the way we extract minerals and celebratory events. When mishandled or misused, its destructive capabilities led to devastating loss of life and widespread devastation. The emergence of gunpowder weapons constructed a new era of warfare, as shown in the increased casualties and civilian suffering of wars, and also the abandonment of old fashioned weapons of the 12th century.

China's Enduring Legacy of Inventions

ESF South Island School, Kim, Jiyoo Jennifer – 12

China's rich history of inventions has left an indelible mark on the world, shaping our daily lives and pushing the boundaries of human ingenuity. From ancient wonders like paper and gunpowder to visionary advancements in energy distribution and social platforms, Chinese inventors have consistently pioneered groundbreaking ideas. This essay delves into both the remarkable inventions of the past and explores the exciting possibilities for future innovations, showcasing the enduring spirit of Chinese creativity.

China's ancient inventors were masters at blending practicality with innovation, resulting in creations that continue to influence modern society. Among China's most influential inventions, paper revolutionized communication and knowledge dissemination. Its invention in the Han Dynasty (around 200 BCE) transformed the way information was recorded, preserved, and shared, laying the foundation for the development of written culture. This remarkable creation led to the proliferation of literature, the preservation of historical records, and the democratization of knowledge.

Similarly, gunpowder, initially developed as an elixir of immortality, eventually found its way into military applications. The discovery of gunpowder's explosive properties revolutionized warfare, enabling the invention of powerful weapons and changing the course of history. However, its peaceful uses, such as in vibrant fireworks displays, showcase the versatility of Chinese inventiveness and their ability to find beauty and joy in their creations.

Chinese cuisine is a testament to the country's culinary ingenuity, with two remarkable contributions standing out. The invention of noodles, dating back over 2,000 years, demonstrates China's early mastery of gastronomy. Noodles quickly spread across the Silk Road, becoming a staple food worldwide and a symbol of cultural exchange. Today, noodles come in an array of shapes, sizes, and flavors, offering a versatile and delicious culinary experience.

Moreover, the origins of ketchup can be traced back to China. The Chinese sauce "ke-tsiap," made from fermented fish, became a favorite condiment. This sauce eventually evolved into the tomato-based ketchup we know today, signifying the enduring influence of Chinese culinary inventions and their impact on global taste preferences.

China's influence extends beyond technological achievements; it also encompasses economic systems and financial innovations. The Chinese experimented with different economic systems,

from the early agrarian-based model to the establishment of market towns during the Song Dynasty. These experiments laid the groundwork for China's later economic prowess and contributed to the development of trade and commerce.

One of the most remarkable financial inventions was the creation of paper money during the Tang Dynasty (7th century CE). This revolutionary concept replaced cumbersome metal coins and facilitated trade and economic growth. The introduction of paper money transformed the way people conducted business, making transactions more efficient and expanding economic opportunities. This innovation became the precursor to modern currency systems and played a pivotal role in the rise of China as an economic powerhouse.

China's inventors demonstrated remarkable resourcefulness in harnessing their natural environment. Centuries ago, they discovered natural gas and ingeniously used bamboo piping systems to distribute it to villages. This early energy distribution system, reminiscent of modern infrastructure, showcases their foresight and sustainable practices. By utilizing bamboo, a renewable resource, they created an efficient and environmentally friendly means of delivering energy to communities. This invention highlights the Chinese commitment to finding innovative solutions that harmonize with nature.

Furthermore, the invention of toilet paper, albeit several centuries after the appearance of toilets, exemplifies the Chinese commitment to hygiene and sanitation. In the 6th century, during the Sui Dynasty, the use of paper for personal hygiene gained popularity. The invention of toilet paper reflects their dedication to improving the quality of life for their people and their foresight in addressing public health concerns.

Chinese inventors also made significant strides in military technology, including the development of early missile systems. Their understanding of projectile mechanics allowed them to create advanced weapons that greatly enhanced military capabilities. These advancements showcased their scientific prowess and propelled military strategies to new heights.

China's inventive spirit extends to the present, with impactful contributions that shape the modern world. Chinese social media platforms, such as WeChat and TikTok, have revolutionized communication and connectivity. These platforms have become integral parts of people's lives, enabling instant messaging, video sharing, and content creation. Their innovative features and user-friendly interfaces have inspired global imitations, highlighting China's ability to create innovative digital ecosystems that transcend borders.

Chinese video-sharing websites have also left an indelible mark on the digital landscape. Platforms like Youku and iQiyi have cultivated a thriving online entertainment industry, providing a vast array of content to millions of viewers. These platforms have not only transformed the way people consume media but have also influenced the evolution of online content consumption worldwide.

China has emerged as a global leader in the production of solar panels, fostering the growth of renewable energy. With a commitment to sustainability and environmental conservation, China's investment in solar technology has propelled the world towards a cleaner and greener future. By harnessing the power of the sun, China has reduced reliance on fossil fuels and contributed to mitigating climate change. Their advancements in solar energy technology have made renewable energy more accessible and affordable, paving the way for a sustainable energy transition on a global scale.

Furthermore, China's advancements in electric vehicle (EV) technology have contributed to the global shift towards eco-friendly transportation. Recognizing the need to reduce carbon emissions and combat air pollution, China has prioritized the development and adoption of EVs. Through government incentives and investment in charging infrastructure, China has become a driving force in the pursuit of sustainable mobility. Their efforts have not only reduced dependence on fossil fuel-powered vehicles but have also stimulated innovation in EV technology, making electric transportation more efficient and affordable.

In conclusion, China's rich history of inventions is a testament to the country's enduring spirit of innovation. From ancient marvels like paper and gunpowder to visionary advancements in technology and sustainability, Chinese inventors have consistently pushed the boundaries of human creativity. Their inventions have shaped our world, revolutionizing communication, warfare, cuisine, finance, and more. As we look to the future, inspired by the past, we can anticipate even more remarkable inventions emerging from the depths of Chinese ingenuity.

The legacy of China's inventors serves as a reminder that the spirit of innovation knows no bounds and that the pursuit of new wonders continues to shape our world. China's inventors, both ancient and contemporary, have left an indelible mark on society, improving the quality of life and driving progress in various fields. As we embrace the future, we must recognize the importance of fostering an environment that nurtures creativity, supports scientific research, and encourages collaboration across borders. By unleashing the full potential of Chinese ingenuity, we can envision a future where groundbreaking inventions continue to transform our lives, inspire generations to come, and contribute to the betterment of humanity as a whole.

Invisible Stars

German Swiss International School, Ling, Sophia – 12

In the vast night sky filled with stars named after famous inventors, many are Chinese inventors, such as Shen Kuo, who invented the first magnetic compass, and Zhang Heng, who created the first seismoscope. They have all made immense contributions to science and technology. However, one Chinese pioneer whose invention established China as the global leader in the textile industry remains conspicuously absent.

Her name is Huang Daopo. She invented the pedal spinning wheel almost 500 years before the spinning jenny was invented in Britain. She paved the way for the development of textile manufacturing in China, and is commonly known as “The Mother of Textile”. Despite this, we have many unknowns about her: we’re uncertain about her hometown, we do not know her actual name, we’re not even sure if her family name is Huang. She mechanised textile manufacture with her invention, yet faded into obscurity.

The widely told story of Huang Daopo begins in 1255 CE when she was just twelve years old. Huang Daopo was one of the unlucky girls at the time – a child bride sold into marriage. After bearing constant abuse, she decided to sneak out of her house. She boarded a ship to the distant isle of Hainan – not just fleeing the oppressive fate of an unwilling marriage, but also choosing to write her own destiny. On the island of Hainan, she learned advanced cotton weaving techniques from the local Li people and eventually became an expert in weaving. During her time in Hainan, she unleashed her potential. She improved cotton planting methods and innovated various techniques related to cotton processing and weaving. After spending four decades in Hainan, Huang Daopo returned to her hometown Songjiang. Upon her return, she discovered that the local women were struggling with the inefficient technique of peeling cotton seeds, which affected their ability to meet the demands of the cotton levy. Huang Daopo spent many nights designing a machine to solve this problem. With the help of a local carpenter, she brought this vision to light. Not content with the initial design, Huang Daopo further improved the machine, changing the original one-foot-long bamboo bow to a four-foot-long wooden bow. She also had the bold idea of transforming the original hand-operated spinning wheel with one spindle into a pedal spinning wheel with three spindles. This innovation spread throughout Songjiang and revolutionised cotton production.

Huang Daopo's invention brought about a dramatic transformation in the lives of Chinese women by making their daily tasks significantly easier and more efficient. But if her invention was so helpful, why did she not achieve the same degree of fame as other male inventors? Was this because her invention was not as significant as the others? Or was it because she was just a woman?

There are a few key reasons for this oversight. Historically, China has discriminated against women. During a time when education was not available to women, there were very few literate women, let alone women inventors. Womens’ achievements may not have been properly documented or attributed to them as historical records at the time tended to focus on the accomplishments of male figures.

Additionally, her invention centred around textiles and manufacturing efficiency, which was considered an unimportant field. The pedal wheel was also an incremental improvement rather than an entirely new technology or flashier breakthroughs like gunpowder, so its significance may have been underappreciated. As a result, Huang Daopo slipped through the cracks of history despite leaving such an indelible mark in China’s textile industry.

Huang Daopo's story of being overlooked despite her groundbreaking contributions is not unique.

In the past, women have faced social and cultural barriers that have hindered their participation in innovation. Societal expectations dictated traditional roles for women, often relegating them to domestic responsibilities rather than encouraging their involvement in intellectual pursuits. Moreover, limited educational opportunities barred women from accessing scientific and technical knowledge, further exacerbating the gender gap in inventing. These societal and educational constraints prevented many talented women from exploring their inventive potential and realising their ideas.

Despite the challenges, very few pioneering women inventors have still emerged and made significant contributions. However, their achievements often went unrecognised or were attributed to male counterparts. For example, Hedy Lamarr, an accomplished actress, co-invented frequency-hopping technology during World War II that laid the foundation for modern wireless communication. However, her work received limited acknowledgment during her lifetime, and it was only in recent years that her contributions have been more widely recognized. This pattern of women's inventions being overshadowed or attributed to men has had a long-lasting impact on the visibility and representation of women inventors.

Even today, the problem persists to some degree.

The underrepresentation of women in science, technology, engineering, and mathematics (STEM) fields has had a direct impact on the number of women inventors. Stereotypes and biases perpetuate the notion that women are less capable or suited for technical and scientific pursuits, discouraging their involvement in innovation. From an early age, girls are often steered away from STEM subjects, limiting their exposure to the fields where many inventions originate. The lack of female role models and mentorship further exacerbates this gender gap. Without sufficient representation and encouragement, women face an uphill battle in pursuing inventive careers and gaining recognition for their contributions.

A study of US patent applications by Yale researchers found that only around 10% of all US patent inventors are female. This is despite women making up half the population. The study also found that applicants with an obviously female name were less likely to have their application approved. The lack of patents does not entirely capture the full scope of women's innovative work, but it does demonstrate their continued underrepresentation. Some breakthrough women inventors like Margaret Knight, who invented the flat-bottomed paper bag folding machine and cloth winding machine, saw their patents questioned on grounds that "a woman couldn't have invented it." Mary Anderson, who invented the windshield wiper, also faced immense obstacles in securing her patent.

Contemporary woman innovators face issues like difficulty securing funding from male-dominated venture capital networks and being taken less seriously in technical fields dominated by men. However, there are now also encouraging signs of progress. The number of women awarded patents has more than doubled in the past two decades. Recently, Jane Poynter became the first woman to be granted a patent for her work on life support systems for space habitats. Today's young girls are also becoming more inspired by the achievements of contemporary women in STEM. Role models like Mimi Aung, who was the project manager of Ingenuity, the Mars helicopter, and Tu You You, Nobel Prize winner for her medical research and had a star named after her, have the potential to light a passion for invention in a new generation. Hopefully, at the current rate of increasing proportion, we can reach gender parity by 2070 or sooner.

In China too, efforts are being made to uncover 'invisible' women inventors from history, such as Huang Daopo. As more women inventor's stories are shared more widely, today's Chinese girls can find inspiration in these 'new' tales and unleash their own potential as an inventor. While much remains to be done to overcome disparities, I believe we can see more 'Huang Daopos' as stars in the future night sky.

From Dust to Discovery

German Swiss International School, Yan, Joanna – 12

Bronze, an enduring symbol of wealth and prestige, continues to hold a significant place in the history and culture of China today. It was an invention birthed within the borders of an advanced nation that delighted in its dominance, and continues to shape our understanding of the ancient civilization that mastered the techniques of bronze casting and related metallurgical knowledge. To this day, bronze remains a testament to this nation's pride in its technological prowess. As we gaze back at the vast tapestry of human history, the legacy of innovation and ingenuity witnessed in ancient China has undoubtedly left an indelible mark on the world, and will certainly continue to act as catalysts for the advancement of humanity in the future.

As I strode into the new exhibition at the West Kowloon Cultural District, namely “Gazing at Sanxingdui”, I couldn’t help but marvel at the appealing collection of archaeological discoveries at the Sichuan excavation site. This was the first time that discoveries from Sanxingdui had been exhibited outside Sichuan province, and I was eager to set my eyes on the artefacts. Stepping into the exhibition, something immediately caught my attention.

A bronze statue, consisting of a cylindrical-shaped head, adorned with intricate engravings, a prominent nose, protruding eyes, and an enigmatic smile stood erect at a towering height. Its body was slim and slender, with enlarged features of the arms at an angle perhaps suggesting the hold of a vessel. The rear of the statue was tinted by a small patch of precious gold pigment – the original colour of the bronze relics that had the fortuitous yet lucky chance to be preserved through the annals of history. These relics were the beacons of another great civilization in its prime, the light of human ingenuity shining through the ages. Every detail, every nook and cranny, was the masterpiece of our ancestors, whispering stories of the unknown. Engraved on the relics were peculiar shapes of Taotie, a totemic motif in the form of a dragon, and uncanny spiral patterns, shapes, animals, eyes... The bronze heads appeared neither melancholy nor enthusiastic, but emanated the daunting sense of solemnity, as if pondering a serious matter at hand, or contemplating a dismal yet inevitable fate. Some of them even looked inhumane... Who were they? What were their stories? I was desperate for an answer.

Largely discovered in 1986, with a preliminary finding in 1927, Sanxingdui is an archaeological excavation site and major Bronze Age culture in modern Guanghan city, Sichuan, China. What is peculiarly unique about the Sanxingdui artefacts is their striking appearances. Coupled with the many theories that circled around their origins, the numerous proposals in regards to their use, and the scant information about the ancient Shang dynasty, Sanxingdui has long been enshrouded in a veil of mystery.

Shu was an ancient state in what is now Sichuan Province in southwestern China. Dating back approximately 4800 to 2600 years ago, Sanxingdui alters the traditional view of China’s origin of civilization. Previously, it has been believed that Chinese civilization had originated from the central plains of China’s Yellow River Valley, providing the idea of a singular, linear development of the ancient civilization. There was also the theory that the Yellow River civilization was the sole cradle of Chinese civilization. However, the unearthing of Sanxingdui suggests the presence of a sophisticated civilization far from the Yellow River that had perhaps co-existed, or even predated the traditionally established narrative, shedding light on the possibility of a diverse development of ancient Chinese cultures.

Sanxingdui also hints at the plausible cultural exchange and interaction in ancient China. Artefacts from the Sanxingdui culture have reflected a certain degree of cultural commonality with other cultures, extensively absorbing bronze casting techniques, ritual systems, and decorations from the Xia and Shang dynasties situated in the Yellow River basin. This displays a profound connection between the Shu civilization and other civilizations at the time, presenting a nuanced and multifaceted picture of China's history.

The construction of a bronze object was widely attributed to a method known as "piece-mold casting". First, workers produced a model using malleable materials, replicating the desired object. Then, the workers proceeded to apply layers and layers of clay to the model, creating a mold that flawlessly replicated all the textures and shapes of the model. Channels and vents were added in addition, to allow molten metal to flow into the mold, and also to ensure that air could escape during the casting process. Once the mold was completed, the model was removed, to leave a cavity that resembled the same shape. The mold was subsequently divided into multiple pieces where decorations could be refined. Moving on, the separate pieces were reassembled and heated, with molten metal poured in to fill the cavity of the model. When the metal had finally cooled down and solidified, the mold was removed, revealing the casted object, where workers completed it with some further refining.

From bronze heads with protruding eyes to altars, bronze figures, masks, the purposes of these relics, however, had long been a puzzle to researchers and archaeologists. When found in the sacrificial pits, most have been destroyed, shattered into pieces with no familiarity. Researchers have suggested that they were used for ritual purposes, to be sacrificed as means of communication with the supernatural realms in sacred ceremonies and worship. Some larger artefacts, for instance the upright bronze figure, symbolised the Shang Dynasty's flourish in its bronze culture, as well as the royalty's pride in its power and prestige.

Legend has it that the ancient Shu people believed in the lore of the ten suns. They marvelled in the idea that birds carried the other nine suns so that only one sun could be seen in the sky, and in their minds, the nine suns transformed into nine holy birds that resided on a revered tree. This was the narrative behind one of the most transcendent relics at the Sanxingdui site – the bronze heavenly tree. It took an interminable duration of 8 years to reassemble the broken pieces of the relic to what is now a 3.96 metre tall bronze holy tree, consisting of a main body and a base, with three branches emerging from three levels on the trunk, each bearing three fruits. The nine fruits each had an intricate bird perched on top, reflecting the ancient Shu people's worship of the solar deity.

Another prominent discovery was the large bronze head with protruding eyes. Some believed it to be a depiction of the legendary founding king of Shu by the name of Cancong, who was described as having protruding eyes, corresponding to the many masks and figures of Sanxingdui that possessed this same feature. Other eye-shaped objects and related relics showcase the possible worship of the eye, providing insights to the ancient Chinese people's religious beliefs.

Undoubtedly, the extraordinary excavation work at Sanxingdui had raised international interests and attention, bringing with it the dire need for cultural relic preservation. Measures need to be taken to prevent the artefacts from experiencing physical damage, deterioration and theft, while research and documentation serve crucial responsibilities in the understanding of the artefacts. It is only through combined efforts can we ensure that the

legacy of the ancient civilization can be preserved, and that the bronze artefacts can be passed down through generations, to forever be an inspiration to others for the artistic beauty, historical value and most importantly – the cultural heritage that they represent.

Bronze is a significant part of Chinese culture, with Sanxingdui bringing China's Bronze Age to its epitome. Hopefully with the advancement of technology, we are able to uncover more secrets from the ancient civilisation, so that we can truly understand the compelling story behind its bronze artefacts, so as to better perceive China's history, cultural and societal development, and to truly recognise its value in not only the ancient society, but the ever changing world that we reside in today.

The Hidden Legacies of Ancient China: Unveiling the Origins and Secrets of Remarkable Inventions

HKUGA College, Sun, Yan Yuet Andrea – 14

China has always been renowned and praised for their remarkable inventions dating back to centuries ago, such as the “Four Great Inventions” being the most well-known, due to them being revolutionary to the world. Not long after, inventions from China soon spread to the rest of the world like wildfire, influencing our daily lives. However, many people may not realize most Chinese inventions possessed more important purposes in the past than they do today. Throughout this writing, I’ll dive deep into inventions we’ve used before but never quite knew the origin and original usage of!

Our first special invention can take you back to your childhood and give you a sweet taste of nostalgia. First built by philosophers, Mozi and Lu Ban in the 5th century BC, the kite is a light frame covered with vibrant, colorful cloth, with a string attached to it. Holding the string by its end, children would often run around while the kite flies in the air, a toy that’s simple yet fun. I myself still vividly remember the days when I always looked forward to releasing a kite whenever I went to outdoor meadows on weekends! The earliest form of a kite was made using wood and resembled the shape of a bird, also known as a “muyuan”. Although nowadays, a kite is mainly for entertainment purposes and is seen as a mere toy, it was first used as an important tool during wartime in ancient China. For example, in the Han Dynasty, General Han Hsin used a kite to fly over enemy territory and used the length of the string to estimate the distance soldiers needed to tunnel to reach under the city wall, ending up victorious through this strategy. Kites were also often used by the military to send secretive messages and signals to each other, helping to facilitate communication. Kites contributed immensely to China’s warfare, much more than you think.

Another invention we might’ve seen around a lot, especially when traveling mainland China, is oil-paper umbrellas. Whether they are displayed as art or sold in local souvenir shops on the bustling streets, you can find these umbrellas almost everywhere. Created using a bamboo frame and paper made of tree bark, the oil-paper umbrella embraced the cultural craftsmanship and beauty of China’s traditions through delicate paintings or poems drawn and written on them. Tracing back to the Warring States Period, the wife of Chinese carpenter and inventor, Lu Ban, invented the first ever umbrella in the world, known as oil-paper umbrellas, a type of paper umbrella. Though it is now used to provide shade from the scorching sun, oil-paper umbrellas, including the colors, served different purposes as well. Used as a traditional wedding item in Chinese weddings, the bridesmaid would cover the bride with a red oil-paper umbrella upon arrival, driving off evil spirits and bad luck. Meanwhile, purple umbrellas symbolize longevity for elders, and white umbrellas were used for funerals. Oil-paper umbrellas were also said to give wealth and prosperity to the person owning them, and what I found intriguing was that the colors of the umbrellas not only had multiple meanings, but also determined the bearer’s social status as well.

Next, the sky lantern, also known as a Chinese lantern, is a small, hot-air balloon designed like a thin paper shell, being launched for play or traditional festivities such as Mid-Autumn Festival and Lantern Festival. Invented by military strategist and sage, Zhuge Liang, also addressed as Kongming, in the 3rd century BC, the sky lantern came to life after he used a message written on the lantern in order to summon help when surrounded by enemy troops, ultimately saving his life. Following this folklore, sky lanterns were also called “Kongming lanterns” due to his sharp-witted intelligence, attribution to this invention, and resemblance of his hat. Even though sky lanterns are used to celebrate festivals and promote the unity of families now, they also used to be strategically used in wars. Similar to kites, sky lanterns acted as ways of transmitting signals, spying and surveillance during ancient China warfare. As the military laid siege on cities at night, the lanterns were launched, illuminating the sky. In present time, during

festivities, people would release lanterns in hopes of carrying away their troubles, and according to myths, the higher the lantern went, the better luck they would receive.

Lastly, we have an inkstone. Although it's rarely seen or sold nowadays, it was in great demand during the Tang dynasty, being even more popular in the Han dynasty. Dating back from the 3rd century BC, an inkstone is a traditional Chinese stationery made of stone, known as a stone mortar. Being used to grind ink sticks into liquid ink, it is commonly used for Chinese art and calligraphy. But before this, inkstones were often given as gifts to many, most importantly the imperial family, due their intricate and beautiful designs. It was even known that the Qianlong Emperor had his very own imperial collection solely dedicated to the precious inkstones. Even though they were mainly regarded as a form of art, it also served as both a token of friendship and a diplomatic gift between nations, having texts or images carved into them. The value of inkstones had a variety of ranges, depending on the design, quality and scarcity of them. Some could even go for thousands of dollars in today's money! To this day, despite the fact that the inkstones are still unfamiliar to many, there are still devoted collectors who collect old inkstones in antique shops as an expensive hobby, as well as inkstones artisans who craft these exquisite masterpieces by hand.

To sum it all up, past inventions in China served different, important purposes before its common use in the present day. Who would've known that a paper lantern was invented to save someone's life? As time goes by, humans will continue to let their creativity soar, much like the kites and lanterns. Eventually, we will discover new ways to use other inventions in different ways, contributing to the traditions passed on from generation to generation.

Throughout my research, it allowed me to have a more in-depth understanding of inventions from my motherland, as well as add onto my admiration and appreciation for these achievements. And what many should know by now, is that there are definitely more to China's inventions than what meets the eye!

The Renewable Energy of the Future: Human Power Plants

HKUGA College, Teoh, Kai You Bella – 14

China has always been known as a leading force in the manufacturing industry due to the abundance of lower-wage workers in the country. Indeed, 28.7% of the total global output for manufacturing can be attributed to China, yet it is unfairly overshadowed by the cloud of bad reputation surrounding our products. In many minds, the label “Made in China” represents poor quality, inexpensive, and pirated or counterfeit products. Regardless of the validity of that notion, when paired with the impression of an authoritarian government and coronavirus-related stigmas placed on the Chinese people, China is often seen by foreigners as a miserable or even barbaric place.

Yet, China has made undeniable progress in the technological field; this time not as a mass manufacturer but as a leading innovator. Applications, machinery, artificial intelligence...China has introduced top models in numerous fields that other nations scramble to replicate. The notoriously addicting Douyin has a copycat counterpart in the western world in the form of Tiktok; the all-in-one WeChat has yet to be beaten; the world’s first robot doctor and quantum satellite were shocking advancements in the medical and space exploration fields respectively; and over 130 language learning models developed account for 40% of the global total amount. It is clear that this is the age for Chinese inventions to grow and shine, and I have more than a few thoughts on our next breakthrough inventions.

To begin with, it is well known that renewable, sustainable energy is one of the hottest topics globally, and China has not been missing out on the action. We are the biggest producer of wind and solar energy as well as all-round renewable energy in the world, but with our large population and rapid urbanization, we are also the largest coal user. It is clear that the clean energy we are generating is not enough to offset our demand. So how will they increase their contribution to renewable energy? It will be through our most abundant resource: people.

As of 2023, China has 1.4 billion inhabitants, the second largest in the world after India. We should harness the power of physiological processes of our citizens. Mobilize each breath, heartbeat, and limb movement, each glucose oxidation, and each vibration in the inner ear... Even using body heat, blood flow, and urine or feces is feasible. All of them produce energy that can be used.

As crazy as I might sound, such technology already exists. Professor Xudong Wang has designed nanotechnology that generates small currents up to tens of microwatts when vibrated by air from breathing, bandages powered by the rising movement of the rib cage, and patches that channels the power of everyday body movements. Professor Rolf Vogel has achieved a vascular turbine that extracts energy from the flow of blood to power a cardiac pacemaker and is testing a device that uses electromagnetic induction to transform heartbeats into electricity. Physicist and chemist John Rogers has created a chip that generates energy from each heartbeat and stores it in a tiny battery. Engineer Wei Hsin Lao has built a device that could harness the energy from our knees when we walk. Human feces have been found to release biogas when digested by a bioreactor by Chinese researchers. Microbial fuel cells that can release electrons from human feces and urine have been made. More are definitely being developed.

Having said that, there are still two flaws in this idea. The first is that each tiny device can only generate a few watts of energy, barely enough to support a small lamp, let alone an entire country’s worth of infrastructure. The second is that they are costly to build and test, which would make mass manufacturing and giving out one to every citizen difficult. China undoubtedly has the capacity to overcome these challenges. Here’s how:

First and foremost, China has strength in numbers. Assuming each person is able to produce 80 microwatts per day using current technology and the entire population takes part, around 112,000 watts would be produced daily, enough to power a startling 1,400 lamp posts. Nevertheless, we have to start innovating to increase that number drastically for it to make a major difference. As the world leader in nanotechnology, we are more than capable of conducting research ourselves and finding more ways to make use of human power. We can find ways to extract more power safely from the aforementioned sources, since the current devices only dare to use the tiniest fraction of the power generated in fear of damaging the organs. We can creatively find other sources of energy in the human

body; whether a little windmill for our flatus or a device for our vocal cord vibrations. A million possibilities lie in wait to be explored, and China has the resources to explore them. If we succeed in finding a way to harness more energy from humans, the figures would far exceed 112,000 watts, maybe to the extent where it could power homes, buildings, and even entire cities.

Furthermore, China, being one of the richest countries in the world, can definitely afford to invest in these energy-harnessing devices. The testing and production in mass quantities will undoubtedly be expensive, but it will pay off in the long term by saving us costs in coal or other fuels, as well as creating a more sustainable power system that will advance China as a green country to discredit the current bad name on us.

There might be concerns or unwillingness from citizens to use the devices due to the understandable fear of such young technology backfiring and harming them. To remedy this, the government should give transparent explanations of how they conducted trials and the results to assure the people. Moreover, a reward program offering cash prizes as incentives or advertisements that utilizes popular celebrities or influencers to showcase the devices in a positive light should be able to sway the people over time.

If we triumph, the inventions would not only benefit China economically, but would also build China a new reputation as an environmentally-friendly country focused on sustainability and the future of our planet with advanced technology. This will both aid China in regaining some of its soft power in the eyes of the people, and give us a boost within international relations when facing politicians who would seek to trade knowledge and technology that might further our development.

To conclude, China has a strong position to harness human energy by building upon current technology to invent more efficient and better models, and we should fully take advantage of this position to launch ourselves into the hall of fame of the innovation field.

Chinese Invention (Paper)

Hong Kong Adventist Academy, Chan, Maska – 13

Throughout history, humans have used paper as the medium of communication. The invention of paper has significantly shaped the human race, from carvings to digital documents.

Paper is a common material that many in the modern world use to transfer information. Before paper, people carved and painted pictures or symbols on bark, caves or clay tablets. These were the ways ancient civilizations used to transfer information and preserve legends. As history progressed, the paper eventually evolved into what we know today, but not many know its creator, Ts'ai Lun.

The creator of modern paper, Ts'ai Lun worked at the imperial court and was trying to find an alternative to bamboo and silk, their preferred way of marking down information at the time. Bamboo and silk were expensive and not readily available, which meant that only the rich could afford books. This motivated Ts'ai Lun to find a cheaper, more accessible alternative to bamboo and silk. He then discovered mixing bark, hemp and rags with water and fermenting it. It would produce a substance that could be flattened into paper. With the creation of paper, more people could access books as it was a cheaper writing material. The invention of paper led China's intellectual culture to grow and develop by giving the people a better alternative to bamboo and silk.

After Ts'ai Lun invented paper, it was only used as a wrapper or padding. It was soon after they started using paper in China's third century. Paper sheets were used as toilet paper throughout the sixth century, and they sewed paper bags to preserve the tea flavor. It was the Song dynasty that then started issuing paper currency.

The invention of paper is so great that there were only a few changes over nineteen hundred years. Has it ever been thought that we have been using an invention that is over nineteen hundred years old? Alas, recording information about things has existed since the dawn of time. As humans, we have been marking down information for years, the oldest marking being about seventy-three hundred years ago, with the paper introduced nineteen hundred years ago. With the invention of the internet, you can write as much as your hard drive can store. Who knows what will be the invention that will help humankind preserve information for years to come?

Cuju: The Ancient Chinese Game of Soccer

Hong Kong Adventist Academy, Ho, Yue Dung – 14

Soccer is a popular sport that people all around the world enjoy. But did you know its origins can be traced back to ancient China? The Chinese name for this game was Cuju. It was a game that brought people together, kept them fit, and taught them some important values.

Way back during the Han Dynasty, which was a long time ago, from 206 BCE to 220 CE, people would play Cuju. It was such an interesting game! They would use their feet to kick a ball made of animal bladders or leather into a net or between two poles. Unlike the soccer we know today, there were not any strict rules about how many players could be on the field or how big the field should be. It was a flexible and adaptable game!

The goal of Cuju was not just to score points but also to show off some mad skills and techniques. Players had to be super good at controlling the ball, which tested their abilities. Whenever they had Cuju matches, it was a big deal. They would have fancy ceremonies and throw parties to go along with the game. It was such a festive and exciting time!

But Cuju was not just a fun game to play—it had some deep cultural meaning too. It taught people culturally important values, like being respectful, loyal, and always trying to improve themselves. Officials and government workers would often play Cuju to build friendships and make connections. Even the emperors and high-ranking officials would get in on the action, using Cuju to show off their strength and skills. If they won against a rival court or a foreign delegation it filled them with pride. It was like saying, "Hey, look how awesome China is!"

Even though Cuju kind of faded away over time, its influence can still be seen in the soccer we enjoy today. The basic principles of Cuju, like kicking the ball with accuracy and working together as a team, are still super important in modern soccer. Cuju's legacy lives on in the hearts of soccer fans all around the world.

In recent years, China has been trying to bring back the spirit of Cuju.

They want to revive this ancient game and make it a national sport again. Schools and universities are even teaching Cuju as part of physical education so that its traditions are not forgotten. They have also organized international Cuju tournaments to get more people excited about this traditional game.

The revival of Cuju is not just about celebrating Chinese history; it is also about preserving ancient traditions and showing how sports can bring people together, no matter where they are from. As Cuju becomes more popular again, it serves as a reminder of the strong spirit of the Chinese people and their commitment to their history.

Just remember, as you enjoy the game of soccer today, do not forget about the ancient art of Cuju and all the cultural significance it holds. It is amazing how a game from such a long time ago can still have such an impact today!

The Invention Of Compass, The Door To The New World

Immaculate Heart of Mary College, De Guzman, Ringor Lewis Jenson – 12

China's compass, a magnetic revelation born,
Guiding sailors' voyages, revealing the world's untold dawn.

Prior to the invention of the compass, ancient civilizations could only dream about their travel and exploration. The yearning to venture into uncharted territories and uncover new lands was deeply ingrained in the human spirit. However, without the guidance of a compass, traversing vast distances across the seas posed a formidable challenge.

It was extremely complicated for sailors, explorers and travelers in navigation. In the ancient world, the travelers could only rely solely on observing the Sun, the Moon or the moving of stars for navigation. Some of them even relied on the profound understanding of astronomy in order to attain the accurate calculations for their travels. In the past, without a proper device like a compass, people risked their lives for their unforeseeable travels.

However, it was when the glorious compass was invented, everything was changed. A crucial navigational device that made an enormous impact not only on maritime and land navigation, but affected global trade and travel for centuries as well. As you read through this essay, you and I will explore more of the invention and the origins of the compass, tracing its development from its early origins to its widespread use in the modern world.

In the 4th century BC, its first mention was in a book called 'Book of the Devil Valley Master', which mentioned a compass-like device. Its description describes it as "south-pointing fish" as the early form of the compass. This actively demonstrates that it was used for its usual purpose—jade hunters used it for navigational purposes; for them not to be lost. People then used lodestone to align with the Earth's magnetic field.

The invention of compass was very much indeed relied on the discovery of lodestone, a naturally occurring magnetic mineral, dates back further than its use in Ancient China. Though the exact timeline of its discovery is uncertain, as it likely predates recorded history. Regardless however, the Chinese in particular, were known to have discovered and utilized lodestone's magnetic properties during the Hans Dynasty which occurred in 206 BC to 220 AD. The development of the "sinan", also known as "south-pointing needle" started, a magnetic compass floating in water. This was a huge development created by the Chinese, as it improved the accuracy and its significance in navigation in general.

When the Islamic World knew about the compass by the 9th century, many Arab navigators and astronomers soon refined the compass's design and navigation techniques.

Then the development of the compass continued, and people made good use of the compass for fulfilling their ambitious dreams of exploration. The compass card and magnetic declination were introduced by Chinese navigator and cartographer, Zheng He, during his voyages in the early 15th century. His expeditions, which took place between the early to mid 14th century (between 1405 and 1433), brought Chinese maritime technology, including the compass, to various parts of the Islamic World including the Middle East and Africa.

The compass also played a crucial role in the West. In the Age of Discovery, it enabled explorers like Christopher Columbus and Vasco da Gama to undertake ambitious expeditions, discover unknown territories and establish global trade networks.

The impact of the compass on navigation cannot be overstated. Prior to its invention, sailors relied on celestial navigation and landmarks, making long-distance voyages challenging and uncertain. With the compass, mariners gained a reliable means of determining their direction, even in cloudy or foggy conditions. This facilitated the exploration of new trade routes, such as the Silk Road and the maritime routes across the Indian Ocean.

The compass also had a significant impact on military strategies and warfare. It allowed armies to navigate more effectively, plan maneuvers, and gain a tactical advantage over their adversaries. The use of compasses in warfare contributed to the rise and expansion of powerful empires throughout history.

Moreover, the compass sparked advancements in scientific understanding. Its magnetic properties fascinated scholars, leading to scientific investigations into magnetism and the development of theories on electromagnetism. This laid the foundation for subsequent discoveries and inventions in the field of physics.

The Chinese invention of the compass eventually spread to other parts of the world, particularly through trade routes and cultural exchanges. Its adoption and adaptation by different civilizations further propelled the global impact of this invention.

One of the further refinements was a compass needle mounted on a pivot by a well-recognized, Italian navigator who played a critical role for the compass to be invented—Flavio Gioia. Additionally, the compass card was divided into 360 degrees, providing increased accuracy in determining direction.

In the modern era, the compass has been evolved to meet the demands of aviation, marine navigation and land surveying. With the creation of modern technology, electronic compasses with sensors and digital technology. It has greater portability, precision and accuracy in modern compasses we use nowadays.

The invention of the compass by the ancient Chinese has had a profound and far-reaching impact on navigation and exploration throughout history. People may only credit Chinese for the compass invention, however, their great invention is still benefiting our modern world.

In recent years, the significant technological advancements in compass design has been assisting our world in a new way. Modern compasses now feature digital interfaces, integrating with global positioning systems (GPS) and other navigation technologies. These advancements have enhanced accuracy and convenience, making navigation more accessible to a wider range of users.

Furthermore, the development of miniaturized and highly sensitive compasses has opened up new possibilities in various fields. These compact compasses can be integrated into portable devices, such as smartwatches and fitness trackers, providing real-time directional information to users during outdoor activities and fitness routines.

In addition to personal navigation, the future of the compass lies in its potential for autonomous vehicles and robotics. Compasses equipped with advanced sensors and algorithms can aid in precise navigation and orientation for self-driving cars, drones, and robotic systems. This technology could revolutionize transportation and logistics, enabling safer and more efficient autonomous navigation.

For further exploration beyond Earth, the compass continues to play a crucial role in space exploration. Spacecraft and satellites utilize magnetometers, which are essentially compasses, to determine their orientation in relation to celestial bodies and magnetic fields. As space exploration advances, the compass will remain an essential tool for navigating and orienting spacecraft in the vastness of outer space.

Looking even further into the future, advancements in quantum technology may lead to the development of quantum compasses. These revolutionary devices would utilize quantum properties to provide ultra-precise and sensitive measurements of magnetic fields. Quantum compasses could have profound implications for scientific research, navigation, and even the development of quantum computers.

In summary, the Chinese invention of the compass revolutionized navigation, exploration, and trade, shaping the course of human history. It also plays a crucial role in human society and has increased navigation exponentially. Its impact extended beyond maritime endeavors, influencing military strategies, scientific understanding, and cultural exchanges. The compass remains an enduring symbol of human ingenuity and its ability to transform the world.

Lastly, the future of the compass, stemming from its ancient Chinese origins, is a promising one. Advancements in technology are enhancing its accuracy, miniaturizing its size, and expanding its applications across various domains. From personal navigation to autonomous vehicles, space exploration, and beyond, the compass continues to evolve, guiding humanity through uncharted territories and paving the way for new discoveries.

Unveiling Ancient Marvels

Immaculate Heart of Mary College, Hung, Tin Lam Emma – 13

China's ancient craft, paper's enlightening sway,
Gunpowder's fierce spark, alchemy's hidden display.
A vessel for knowledge, delicate fibers embraced,
Explosive force harnessed; warfare's legacy traced.

Many people may know that China is a country with a rich history which is marked by remarkable development both in the past and in the present.

China, a place famous for its history and incredible inventions, and has gifted the world with numerous inventions that have shaped human civilization. From revolutionary advancements in agriculture to groundbreaking discoveries in science and technology, ancient China stands as a beacon of creativity and ingenuity.

Among the most significant contributions of ancient China is the invention of paper. In the early 2nd century BC, during the Han Dynasty, a eunuch named Cai Lun revolutionized the world by introducing an innovative technique for papermaking.

Some people said Cai Lun was ordered by the emperor to modify the papermaking process but this was, unfortunately, not explicitly documented. However, there are a few plausible reasons that could have led to the emperor's directive.

Firstly, during the Eastern Han Dynasty, the demand for paper had been steadily increasing due to the growing bureaucracy and administrative needs of the centralized government. The existing methods of papermaking were likely unable to keep up with this rising demand, prompting the emperor to seek improvements in the process to ensure a more efficient and reliable supply of paper.

Secondly, the emperor might have recognized the limitations of the available paper and desired a higher quality product. The existing papermaking techniques using materials like silk, bark, and bamboo fibers produced heavier, coarser paper that may not have been suitable for all purposes. The emperor's order to modify papermaking could have been driven by a desire to create a lighter, smoother, and more versatile paper that would better serve the needs of the imperial court, scholars, and other users.

Moreover, the emperor might have seen the economic potential and significance of papermaking as an industry. By improving the papermaking process, the emperor could stimulate economic growth, create employment opportunities, and establish China as a leader in paper production.

While the precise motivations behind the emperor's order remain uncertain, it is evident that the modifications made by Cai Lun played a pivotal role in transforming papermaking into a more efficient, accessible, and influential practice that revolutionized communication, culture, and knowledge dissemination in ancient China and beyond.

Cai Lun, a eunuch during the Eastern Han Dynasty in China, played a crucial role in the modification and improvement of papermaking. His contributions revolutionized the art of paper production, making it more efficient and accessible.

During Cai Lun's time, papermaking was indeed not an easy job but rather a "heavy duty" which involved using materials like silk, bark, and bamboo fibers. The fact is all these techniques were time-consuming, expensive, and produced paper that was relatively heavy and coarse. To meet the needs of Chinese scholars and the Emperor's court, Cai Lun began experimenting with different materials and refining the processes.

No one would have imagined that Cai Lun could really make it but his perseverance and hard work helped him succeed. His breakthrough came when he introduced the use of mulberry bark and hemp rags as the primary raw materials. By crushing and boiling these fibers, Cai Lun was able to create a pulp that could be spread evenly on a flat surface, forming a thin, smooth sheet of paper. He further enhanced the quality by adding ingredients like tree bark, old fishing nets, and even remnants of hemp clothing.

In addition, Cai Lun's modifications not only made the papermaking process more efficient but also resulted in a lighter, more durable, and versatile product. The new paper quickly gained popularity throughout China. It became a vital medium for writing, painting, printing, and various other forms of artistic expression.

Cai Lun's innovation had a significant impact on the dissemination of knowledge, culture, and communication. The availability of affordable and high-quality paper facilitated the spread of literacy, the exchange of ideas, and the preservation of historical records. His legacy as the inventor of modern papermaking remains an enduring testament to his ingenuity and the profound influence of his advancements on human civilization.

The invention of paper transformed the landscape of human communication, enabling the dissemination of knowledge, the preservation of literature, and the flourishing of arts and science. This breakthrough facilitated the spread of ideas, the growth of bureaucracy, and the development of education systems, ultimately revolutionizing and improving human civilization.

Another remarkable invention that originated in ancient China is gunpowder. Developed during the Tang Dynasty in the 9th century, gunpowder was initially intended for medicinal purposes. However, its explosive properties were soon discovered and harnessed for military applications. A mixture of sulfur, charcoal, and saltpeter (potassium nitrate), gunpowder has provided the foundation for the creation of fireworks, flamethrowers, and eventually, firearms. The invention of gunpowder revolutionized warfare, shaping the dynamics of conflicts across the globe. It propelled the development of cannons, muskets, and other firearms, transforming the nature of warfare and leading to the rise of powerful empires. Beyond warfare, gunpowder also had a profound impact on other areas, including alchemy, agriculture, and the invention of fireworks, which became an integral part of cultural celebrations and entertainment.

Ancient China's contribution to the world of printing is exemplified by the invention of moveable type. While the concept of printing with carved wooden blocks had been practiced in China for centuries, the innovation of moveable type printing revolutionized the process. This breakthrough occurred during the Song Dynasty in the 11th century, with the invention attributed to Bi Sheng, a commoner from the village of Xiangyang. Moveable type involved creating individual characters or symbols on small clay or ceramic pieces, which could be rearranged and

reused for printing different texts. This method significantly expedited the printing process, allowing for the mass production of books, pamphlets, and other written materials. Moveable type printing played a pivotal role in disseminating knowledge, promoting literacy, and fostering cultural exchange in ancient China. Its impact on the world of publishing and the spread of information cannot be overstated, laying the groundwork for the printing revolution that followed in subsequent centuries.

One of ancient China's most enduring and important inventions is the compass. The invention of the compass dates back to the Han Dynasty in the 2nd century BC. Initially used as a divination tool to align with the principles of Feng Shui, the compass evolved into a practical navigational instrument. Consisting of a magnetized needle floating on a plate, the compass allowed sailors and explorers to determine their direction accurately, even in the vast expanses of the open sea. This groundbreaking invention revolutionized maritime exploration, enabling the Chinese to embark on ambitious voyages of discovery during the Tang Dynasty. The compass not only facilitated trade and navigation but also played a vital role in the development of cartography, influencing the accurate mapping of lands and the creation of navigational charts. The impact of the compass on global exploration and trade cannot be overstated, as it opened new horizons for human civilization.

Ancient China's mastery of porcelain making represents an exquisite art form that has captivated the world for centuries. The invention of porcelain is attributed to the Tang Dynasty, although earlier forms of ceramic art existed. The secret lay in the use of kaolin clay, which possessed exceptional properties when fired at high temperatures. Chinese artisans developed unparalleled expertise in manipulating kaolin and crafting delicate, translucent vessels adorned with intricate designs. Porcelain, with its beauty, durability, and versatility, quickly became highly sought after and influenced cultural exchange along the ancient Silk Road. The trade of porcelain enhanced international connections, fostering the exchange of ideas, aesthetics, and technology. Even today, Chinese porcelain remains a symbol of exquisite craftsmanship and cultural heritage.

The ancient inventions of China continue to leave an indelible mark on human civilization, showcasing the remarkable ingenuity and creativity of the ancient Chinese people. The invention of paper revolutionized communication and education, providing a medium for the exchange of ideas and the preservation of knowledge.

Gunpowder, originally intended for medicinal purposes, transformed warfare and had far-reaching implications for science and entertainment. Moveable type printing revolutionized the dissemination of information, paving the way for the printing revolution that followed. The compass opened new horizons for exploration and trade, while porcelain exemplified the beauty and mastery of Chinese craftsmanship.

These inventions not only shaped ancient Chinese society but also had a profound impact on the development of global civilization. As we marvel at the tales of China's ancient marvels, we are reminded of the enduring legacy of human innovation and the transformative power of ideas.

The Chinese way – innovative way of transaction

Immaculate Heart of Mary College, Luk, Pui Ka Scarlett – 13

Nowadays, our lives are inseparable from money, but have you ever thought about how it was invented? The invention of paper money in ancient China is a remarkable milestone in the history of currency. This essay explores the origins, development, and significance of paper money in ancient China, as well as its latest developments with high-tech support, and the implications for the economy and culture of China.

It is interesting to know that the first object used as currency in ancient China was seashells. It then evolved to knife-shaped, spade-shaped, and ring-shaped coins, until the widespread usage of round bronze coins with a square hole in the center around 2,000 years ago. The roots of paper money can be traced back to the Tang Dynasty (618–907 AD) in ancient China. Initially, the Chinese government issued promissory notes known as "jiaozi" to be used as a medium of exchange. These notes were backed by the government's promise to redeem them for coins or other valuable commodities. The introduction of paper money aimed to address the inconvenience of carrying heavy coins and facilitate long-distance trade.

The Song Dynasty (960–1279 AD) witnessed significant advancements in paper money. The government initiated the production of promissory notes, known as "jiaozi" or "exchange certificates," which were redeemable for goods or services. These notes were issued by regional governments and private merchants, leading to a proliferation of different currencies across the country. During this period, the central government established a system of paper money backed by copper coins. Merchants could deposit copper coins, and the government's backing of paper money ensured its stability and widespread acceptance.

The introduction of paper money revolutionized the Chinese economy in several ways. Firstly, it facilitated trade and commerce by providing a convenient and lightweight medium of exchange. Carrying large quantities of coins became unnecessary, reducing the risks associated with theft and transportation.

Paper money also allowed for the expansion of long-distance trade, enabling connections with other countries and facilitating cultural exchange. Previously, trade between regions was hindered by the scarcity and inconvenience of coins; with paper money, merchants could easily engage in transactions across vast territories, stimulating economic growth and regional integration. Moreover, the use of paper money fostered a sense of trust and stability in the Chinese economy. The government's backing of paper money ensured its value, and the widespread acceptance of this currency led to an increase in confidence among traders and consumers alike. Furthermore, the invention of paper money brought significant cultural implications. It symbolized China's advanced technological achievements and demonstrated the country's ability to innovate in various fields. The development of paper money also showcased China's economic prosperity and contributed to its reputation as a global economic power.

However, paper money has become the digital form of money in the recent decades. The future of digital money in China holds immense potential and is poised to revolutionize the country's financial landscape.

In recent years, technology has revolutionized financial transactions. Online payment methods such as "Alipay" and "WeChat Pay" have gained significant popularity, providing convenience and efficiency to consumers and businesses alike. However, as with any technological innovation, online payment systems come with their own set of advantages and disadvantages, such as security risks and limited acceptance and accessibility.

Both the government and business corporations have invested a significant amount of money and effort to advance technologies in order to provide smooth and safe transaction platforms that can be widely used. The well-developed monetary system, including electronic payment platforms, has influenced consumer behavior and greatly enhanced trading efficiency. Nowadays, consumers enjoy the benefits of online shopping, and business owners are no longer required to own or rent physical shops to sell their products. This transformation has successfully shifted people's lives towards digital trading environments. Additionally, the development of financial technologies (fintech) has imposed sophisticated security controls and greatly simplified the process of financial transactions.

Moreover, with the latest technological advancements, virtual currency has become increasingly popular. However, without mature technological support and regulations to control virtual currency, it has yet to be fully recognized by governments in many countries, including China.

One key development is the introduction of the digital currency electronic payment (DCEP), also known as the digital yuan. The digital yuan is a central bank digital currency (CBDC) that is backed by the People's Bank of China (PBOC). It aims to provide a secure and efficient means of conducting transactions, reducing reliance on traditional cash and improving financial inclusion.

With the adoption of the digital yuan, China is likely to witness a shift towards a cashless society. The digital currency can be easily transferred and used for transactions, eliminating the need for physical cash. This will lead to greater convenience for consumers and businesses, as well as improved transparency and traceability in financial transactions. Furthermore, the digital yuan has the potential to reshape China's economy by promoting financial innovation and inclusion. It can facilitate access to financial services for the unbanked population, enabling greater participation in the formal economy. Digital currency can also provide a platform for the development of new financial products and services, such as smart contracts and decentralized finance (DeFi) applications.

In addition, the digital yuan can strengthen China's position in the global economy. As the world's second-largest economy, China has the opportunity to leverage its digital currency to enhance cross-border transactions and promote international trade. The digital yuan can streamline payment processes, reduce transaction costs, and mitigate the risks associated with traditional currency exchanges.

However, the widespread adoption of digital money in China also raises concerns about data privacy and surveillance. The Chinese government's oversight of digital transactions could potentially infringe on individual privacy rights. Striking a balance between convenience, security, and privacy will be crucial for the successful implementation of the digital yuan.

In conclusion, the future of digital money in China holds immense potential for transforming the country's financial landscape. The introduction of the digital yuan and the shift towards a cashless society will bring about greater convenience, financial inclusion, and economic opportunities. However, addressing concerns related to privacy and surveillance will be vital for ensuring the successful adoption of digital money in China.

The future of digital money in China holds immense potential and is poised to revolutionize the country's financial landscape. China has already made significant strides in digital payment systems with the widespread adoption of mobile payment platforms like Alipay and WeChat Pay. However, the future holds even more exciting possibilities.

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In conclusion, the future of digital money in China holds immense potential for transforming the country's financial landscape. The introduction of the digital yuan and the shift towards a cashless society will bring about greater convenience, financial inclusion, and economic opportunities. However, addressing concerns related to privacy and surveillance will be vital for ensuring the successful adoption of digital money in China.

The well-developed digital payment platforms, as well as the invention of artificial intelligence, have enabled a cashless lifestyle for us. It is uncertain if people will still need paper money in the future, but we must maintain the integrity of our spending, whether we are using paper money or digital payment. It is also important for us to recognize the long historical development of paper money and the positive impacts it has brought to improve our lives as we should learn from the lessons in the ancient world so as to appreciate the past glory and better the future generations with modified technology in the future.

New Tales of China's Inventions

Immaculate Heart of Mary College, Tang, Nok Yi – 14

Nowadays, many schools have a policy called 'BYOD' (Bring Your Own Device), which means students bring their iPads or laptops to school and use electronic devices to replace physical books. Although we mostly use electronic devices instead of paper nowadays, paper is still a necessary part of our daily lives. Exam papers, notebooks, storybooks, music scores, and even certificates require paper for writing or printing. This highlights the importance of paper. However, despite using it every day, do we really know much about paper? Keep reading my article to find out more information about it!

Some people may have claimed that papyrus, a plant-based writing sheet, was the earliest form of paper. However, this is incorrect. The first documented paper-making process was actually in China during the Eastern Han period by a person named Cai Lun. Today, Cai Lun is credited with inventing paper. The earliest surviving paper fragment was found in Fangmatan, Gansu province, and was likely a part of a map. Paper is created by combining milled plant and textile fibers. Cai Lun's innovation involved using mulberry and other bast fibers, along with fishing nets, old rags, and hemp waste, to reduce the cost of paper production. This plant-purée conglomerate, produced by pulp mills and paper mills, was used for writing, drawing, and making money.

In ancient times, people used to write on bamboo or pieces of silk called "chih." However, silk was expensive and bamboo was heavy and inconvenient to carry. As a result, Cai Lun came up with the idea of making paper from tree bark, hemp remnants, cloth rags, and fishing nets. He invented paper, which was initially known as the "paper of Marquis Tshai." The production process involved pounding and stirring rags in water, collecting the matted fibers on a mat. During the Tang dynasty, another type of paper called rattan paper emerged, but it declined due to the specific growing areas required, slow growth, and long regeneration cycle. Other well-known types of bark paper, such as Chengxi Tang Paper, were also produced during the Five Dynasties and Ten Kingdoms period.

The invention of paper gradually spread throughout the world. In the 8th century, Chinese papermaking reached the Islamic world, replacing papyrus. In the 11th century, papermaking was introduced to Europe, replacing animal-skin-based parchment and wooden panels. In Spain, papermaking was further refined with the use of waterwheels in paper mills. In the 19th century, wood-based papers were invented.

As the invention of paper progressed, people continued to improve and develop new papermaking techniques. This was driven by the recognition of paper's importance in communication. In the past, when telephones and electronic devices didn't exist, people relied on paper to write letters and report news about society. Paper was the primary means of communication. Paper was also crucial for deaf-mute individuals, as there was no technology available to help them communicate with others. Although devices were introduced in the 15th century, they were expensive and not accessible to everyone.

Even today, ordinary people cannot afford the price of such devices. This highlights the ongoing importance of paper. Whether it's printing exam papers, drawing, taking notes, printing books, or producing musical scores, we still rely on paper. As you can see, paper continues to be used by us, both in the past and the present.

However, we often hear calls to use less paper. There are activities and discussions focused on saving our Earth, considering the rapid increase in air temperature due to global warming. Using excessive amounts of paper contributes to global warming. To address this, people have turned to electronic devices such as iPads, mobile phones, and laptops to replace paper. This allows us to reduce paper usage and offers greater convenience. We can now communicate with our friends and family anytime and anywhere. It also reduces the time it takes to receive a letter, allowing us to stay updated on societal events. Furthermore, we no longer need to buy newspapers, resulting in cost savings.

Thanks to the development of electronic devices, we can now do most things online, including submitting homework, making purchases, chatting with friends and family, attending lessons, and making new friends. However, have you ever heard of a service called "online tomb sweeping"? This service, provided by the government, allows us to perform tomb sweeping rituals online. You might wonder why the government would launch such a service. As you know, people traditionally burn paper offerings for their ancestors during tomb sweeping rituals, which can be difficult to clean and may be perceived as wasteful. Therefore, the government introduced this policy to enable people to continue the tradition of tomb sweeping while also being more environmentally friendly. Additionally, it helps preserve the cultural significance of tomb sweeping.

Currently, there are many alternatives to paper. However, paper remains the most important to us. We should take pride in its invention. Paper and the Earth are precious gifts given to us by our ancestors. No matter how many inventions come along, the invention of paper still stands as one of our greatest achievements. Therefore, it is our responsibility to protect the Earth so that future generations can understand the significance of paper's invention.

Looking ahead, the future of paper as an invention holds both challenges and opportunities. On one hand, the digital age continues to advance, and we are witnessing a shift towards paperless communication and documentation. With the increasing ubiquity and convenience of electronic devices, there is a growing emphasis on reducing paper consumption to minimize environmental impact and promote sustainability. This trend is likely to persist, with more organizations and individuals opting for digital alternatives such as e-books, e-documents, and online platforms for communication and collaboration.

Furthermore, advancements in technology may lead to the development of innovative paper products that are more sustainable and ecologically friendly. Researchers are exploring alternative sources of fibers for papermaking, such as agricultural waste or fast-growing plants, to reduce the reliance on conventional wood pulp. Additionally, there is ongoing research and development in the field of recyclable and biodegradable papers that can help minimize waste and contribute to a circular economy.

In conclusion, while the digital age has brought about substantial changes in how we communicate and document information, paper still holds its place in our society. The future of paper will likely involve a balance between digital alternatives and the continued utilization of paper for specific purposes. As technology evolves, we can expect to witness advancements in sustainable papermaking practices and the emergence of new, environmentally friendly paper products. Ultimately, the future of paper will be shaped by our collective efforts to embrace digital innovation while also recognizing the unique value that paper brings to our lives.

The Gifts, the Inventions

Inmaculate Heart of Mary College, Ying, Cheuk Kiu Cheryl – 14

Times have gone by, capturing precious moments. Across the passage of time, history has bequeathed humankind countless gifts, guiding global progress toward brighter horizons. China, as the top origin of Patent Cooperation Treaty (PCT) filings with 70,015 in 2022, according to the World Intellectual Property Organization (WIPO), has achieved remarkable innovation in the past, including the four great inventions. Through pioneering the renowned four great inventions, our ancestors exhibited an ingenuity that yet inspires. Seized by wonder, I embarked on study to answer queries lingering in the mind. Papermaking and gunpowder, pioneered in the ancient China, remain seminal gifts for today's world.

To trace paper's first steps, we journey to the second century BC. At this time, Baqiao paper – believed the earliest developed within ancient China. Though people first thought that the soft and flaky from hemp and ramie fiber was the main source for paper making, yet time revealed its primacy mistaken. In later decades, the truth emerged: An earlier sheet, part likely of a map, excavated at Fangmatan in Gansu province, proven to date from Han Dynasty's first imperial era, 179–141 BC. This sole surviving fragment stands as testimony to paper's deeper roots in those fertile soils whence China's wisdom and wonders have long sprung.

When considering the individual most renowned for their role in paper's chronicles within China and beyond, I am sure no one would deny Cai Lun made the greatest impact. As the pioneer credited for advancing papermaking techniques through ingenuity and toil, Cai Lun helped establish the material as a widely-used medium for sharing knowledge across communities. His innovations laid the foundations for paper to spread widely as a means of spreading literacy. Cai Lun's place as a leader in this field is firmly cemented in historical records, ensuring remembrance of his pivotal contributions for generations to come.

Cai Lun, a man who once served within the emperor's inner chambers, was chosen in 89 CE to hold high rank during the years of harvest and prosperity under Han sovereign Hedi's guiding hand. Many may know that Cai Lun made extraordinary contributions to improving the papermaking technology of his time. Before then, people wrote on bones or bamboo, heavy, bulky, and inconvenient to transport or write on. A type of paper called "bo" made from silk then appeared as ancient Chinese were inspired by silk reeling. But production was very expensive as material supply could not meet demand. Fortunately, this situation changed through Cai Lun. In his pursuit of technological innovation, he wisely employed cost-effective materials such as bark, rags, hemp heads, and fish nets to create paper, resulting in a significant reduction in the overall expenses associated with the papermaking process which benefitted us all.

Furthermore, enhanced papermaking brought many benefits across various fields. In culture, after the Han Dynasty, paper's presence vastly advanced book copying and cultural dissemination. In literature, paper played a crucial role in early Chinese written culture, and a strong reading culture seems to have developed quickly after its introduction, according to Timothy Hugh Barrett, now Professor of East Asian History at the School of Oriental and African Studies, London. Hence, individual collections of literary works increased in following centuries.

For gunpowder, let's begin in the Eastern Han Dynasty, when Wei Boyang, "the father of alchemy," mentioned a substance with properties similar to gunpowder. In *Cantong qi*, a Taoist text on the subject of alchemy written by him, he described a mixture of three powders that would flutter vigorously. It records a chemical combination

experiment of sulphur and mercury. Henceforth, during the Six Dynasties period, The "Thirty-six Water Methods" listed 32 prescriptions containing saltpeter. Furthermore, the Taoist philosopher Ge Hong outlined gunpowder's ingredients in his remaining works, Baopuzi ("The Master Who Embraces Simplicity"). In the "Inner Chapters" (neipian) of Taoism, he also noted experiments using heated saltpeter, pine resin, and charcoal among other carbon materials to create gold but instead brought out a purple powder and arsenic vapors. Later, in 492, Taoist alchemists stated saltpeter as one of gunpowder's most vital elements. This shows ancients' perseverance exploring the unknown.

Thereafter, in the Tang Dynasty, Taishang Shengzhu Jindan Mijue, a book from Qing Xu, an alchemist, cited the "Fu Huo Alum Method", mixing saltpeter, sulphur, and carbon-containing Aristolochia to make primitive gunpowder. A similar case appeared in Zhenyuan miaodao yaolie by Zheng Siyuan around 50 years later, saying "Some have heated together sulphur, realgar, and saltpeter with honey; flames result, so their hands and faces, or even the whole house are burnt.". This proved people in the mid-9th century already knew mixing those ingredients' aftereffects. Moreover, alchemists then called this mixture "Huo yao" (fire medicines), attempting to make awareness it was a side effect of elixir quests.

In the future, we can reflect on the enduring legacy of Chinese papermaking and gunpowder inventions and find inspiration for our own innovative, sustainable, and efficient advancements. In the realm of papermaking, we can consider how we can contribute to improving the eco-friendly, versatile, and cost-effective nature of the process. By exploring alternative raw materials, such as agricultural waste or recycled fibers, we can reduce our reliance on traditional sources like trees and make a positive impact on the environment. Additionally, we can embrace technological advancements and automation to streamline production methods, making papermaking more efficient and environmentally friendly.

Moreover, in the digital age, while digital platforms have gained prominence, we can recognize the enduring demand for high-quality, sustainable, and innovative paper products in various industries. By conducting research and development, we can contribute to the creation of eco-friendly papers that meet the changing needs of modern society. Innovations in paper coatings, finishes, and recycling technologies can further enhance the versatility and sustainability of paper as a medium.

In the realm of gunpowder inventions, humans should be more aware of using such a great invention with safety, precision, and efficiency. We must carefully consider the ethical implications and responsibilities associated with these powerful, potentially life-altering inventions. By conducting responsible research into new propellant materials and formulations, we can contribute to improving the performance of firearms and explosive devices while prioritizing safety. Additionally, we can explore the potential of additive manufacturing (3D printing) and nanotechnology to develop innovative and groundbreaking gunpowder-related products. However, we must always keep in mind the importance of responsible usage and the need for regulations surrounding firearms and explosives.

With good intentions and awareness, the great inventions will continue to shine in human history, helping us develop our world in advanced technology as well as peaceful relationships.

Paper

Kellett Senior School, Chen, Andre – 13

Paper, a simple yet revolutionary invention, holds profound significance in Chinese history. From its invention during the Eastern Han Dynasty to its widespread use in the modern world, paper has shaped human communication and knowledge dissemination. This essay explores the historical origins of paper, its cultural significance, and its enduring impact on society.

Papermaking was pioneered by Cai Lun during the Eastern Han Dynasty in China. Before this invention, people had to write on bamboo and wooden slips, alternatives such as writing on silk and cloth, which were too expensive for widespread use. Attempting to resolve this problem, Cai Lun boiled bamboo, hemp waste, old rags, fishnets and tree barks to create a pulp, which was then beaten and mixed with water. The pulp was then pressed and dried, resulting in the creation of paper. The invention of paper revolutionized the way people recorded information and communicated. It was more lightweight, accessible, and durable compared to the materials previously used.

The cultural significance of the paper could not be overstated. It became an essential medium for painting, literature and calligraphy. The smooth texture and absorbent nature of the paper allowed the ink to flow gracefully, capturing the essence of the artist's brush strokes. The art of calligraphy flourished, as paper provided a canvas for artistic expression and creativity. Paper also played a pivotal role in the preservation and dissemination of Chinese culture and traditions, serving as a vessel for ancient texts, poems, and physiological teachings.

With the advent of paper, communication and knowledge dissemination underwent a transformative shift. Paper allowed for the mass production of books, making information more accessible to a wider audience. The spread of papermaking techniques to other parts of the world enabled the exchange of ideas and facilitated cross-cultural learning. Furthermore, the invention of moveable printing during the Tang Dynasty, combining paper and printing, paved the way for the efficient reproduction of texts, revolutionizing education and scholarship.

Despite the digital age, the paper continues to hold significance in various fields of modern life. It remains an integral part of traditional arts and crafts such as origami and paper-cutting. Paper is also widely used in industries such as packaging, stationary, and art supplies. Moreover, the tangibility and tactile experience of paper continues to resonate with people, as it provides a sense of connection to history and tradition.

Paper stands as a testament to the ingenuity of ancient Chinese inventors. Its historical origins, cultural significance, and impact on communication and knowledge dissemination shaped the world we live in today. From calligraphy and literature to the mass production of books, paper has left an indelible mark on human civilization. As we navigate through the digital era, let us not forget the enduring legacy of this remarkable Chinese invention.

Cuju

Kellett Senior School, Ryo, Desmidt – 13

Did you know that around 3.5 billion people watch football and about 250 million people play the sport around the world? People think that because football is such a big sport in Europe that it must originate from there, but it actually came from the other side of the world, China. Football was first invented in the Han Dynasty, and this sport was originally called Cuju which directly translates to “kick ball”. This sport was created as entertainment for the wealthy and royalty and matches would be played in the royal palace. Cuju was also played to keep military officers healthy and physically ready at all times; the sport trained them to be very athletic and have good hand-eye coordination so they were better fit for battle. Since Cuju trained the athleticism and skills of soldiers, it became an important part of military education.

Cuju's popularity extended beyond China, spreading to neighbouring regions and influencing the development of similar ball games throughout Asia like *kemari* and *chuk-guk* from Japan and Korea, respectively. People who played Cuju would have to dedicate two to three hours of their time as it sometimes took this long for a team to win a match. Cuju has always been played on a rectangular field, but originally, the goal post was positioned in the middle of the field. It later evolved with two goalposts situated at each end of the field, similar to today's game. In the first version of the game of Cuju, a team scored a point whenever the ball went through the goal. The other team had the opportunity to score as well but not if they dropped the ball on the floor. The players showcased their agility, skill, and teamwork, and various techniques to score. Unfortunately, Cuju ended up collapsing as a game during the Ming Dynasty when the Hongwu Emperor, the first Ming ruler, banned Cuju because he thought that it was a distraction from work and military training. The 2,000 year old sport was neglected and started to fade away.

However, there is documentation of indigenous people playing a form of football. References of the sport's influence come from European explorers. For example, in 1586, European explorer John Davis went ashore in Greenland to introduce a form of football to the indigenous people. Later records show that the Inuits had a game played on ice called Aqsagtuk which was basically football on ice. Other accounts of football in indigenous cultures have been found in Virginia, U.S.A and Victoria, Australia. Football made its way around the world with help from explorers who spread the love of the game to everyone they met.

Organised football began in England in the 1850s, and the first football club called Sheffield United was born. A few years later, the Football Association (F.A) was set up in 1863. The F.A organised matches for players within England, but as the sport grew in popularity, the players wanted to be challenged by playing teams outside their country. The first international match set-up by the F.A was played between Scotland and England, although the players from Scotland were London-based Scottish players. This match was held at Hamilton Crescent in Glasgow, Scotland with around 4,000 people watching this exciting game which ended in a nil-nil draw. There were several of these kinds of matches organised by the F.A before more global matches were demanded. Back then, players had to travel long distances to get to the host country's field via vehicles or railway. It was quite the journey and dedication.

The Fédération Internationale De Football Association (FIFA) was established on May 21, 1904 by Belgium, Denmark, France, Germany, the Netherlands, Spain, Sweden and Switzerland to continue to spread the love of football worldwide. The matches fostered friendly relations between these countries and the game of football was changed forever. The first World Cup was held in 1930 in Uruguay and the host-country, Uruguay ended up winning and becoming the first World Cup champions. The World Cup is held every four years, and the last one in

2022 was hosted by Qatar and was won by the Argentinian team. Since FIFA was established, there have been many players that have been responsible for popularising the sport internationally such as Diego Maradona, Pelé, David Beckham, Ronaldo Nazário, Ronaldinho Gaúcho, Cristiano Ronaldo, and Lionel Messi. Some people say that they are some of the greatest players of all time. FIFA generated approximately US\$5.8 billion in 2022. Worldwide, football generates the most money with US\$50 billion.

Cuju, the ancient football game of China, holds a very special place in sporting history. Its original rules and roots, and its cultural significance have left an incredible impression on the development of sports. Cuju's influence can be seen in the evolution of football and its lasting impact on sporting traditions worldwide. The principles of footwork, teamwork, and goal scoring that were originally from Cuju laid the principles for the modern game we know and love today. The game has developed and evolved through centuries, and rules have been changed to challenge the players more over time. China's invention of the first version of football, Cuju, sparked interest, encouraged fitness, inspired billions of people around the world to play, spectate, and connect other fans around the world via online games and in person at the stadium, sports bars, schools, and homes. It is one of China's most significant inventions ever created.

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The Great Inventions that Shaped the Modern World

Korean International School, Chai, Max Thomas – 14

Many people may have famously heard the Four Great Inventions of the ancient Chinese civilisation, which includes papermaking, printing, gunpowder, and compass, but most do not know that there are many more inventions that has shaped the course of human history and civilisation. The major innovations and creativity that we see from modern China stretches back to a massive, rich history. From the development and advancements in communication to innovative discoveries in science and technology, Chinese inventors have left a massive mark in the modern world, and have had a profound impact to our daily lives and the development of our society as a whole.

Papermaking, which is the first in the list of the Four Great Inventions, started in ancient China during the Han Dynasty in 105 A.D. The process was created by a Chinese court official, Ts'ai Lun, who used rags as the raw material. This method was first a secret but it eventually reached central Asia, the Islamic world and Europe through trade and cultural exchanges. However, this process later on was replaced by using other plant materials including bark, bamboo, and hemp. This Chinese invention of papermaking has revolutionized numerous developments in administration, literature, education, and communication. This had played a major role in the recording and sharing of ideas, and later to the advancement of civilizations throughout the world. Even though this activity is largely becoming replaced by technology during the modern times, paper still continues to be a foundational aspect in our daily lives. In addition to this, students who are interested in many things related to paper can study a PhD in Pulp and Paper-making Engineering in a university in Nanjing!

Another important famous invention from China is printing, which is another invention in the list of the Four Great Inventions. This invention was yet another crucial moment. Invented around the 8th century A.D. during the Tang Dynasty, it involved a revolutionary technique of re-arranging and reusing individual characters, rather than the previous method, which is carving out entire blocks for each page. The impact of this invention was that this innovation made preparations for the modern printing process that we know today, which meant that books could be produced faster, cheaper, and placed in larger quantities. Larger amounts of books meant more knowledge spreading and passing through the minds of people all over the place.

When it comes to mathematical calculations, the abacus, was an important invention. This invention is outside of the Four Great Inventions, but has created a significant positive impact in the fields of mathematics. Which emerged in China approximately 2,500 years ago, it was a simple yet ingenious tool of mathematics and calculating that would greatly transform mathematical calculations. The Chinese abacus, or "Suan-p'an", consisting of rows of beads or stones on rods, provided a practical and efficient method for performing calculations and arithmetic operations. Due to its design allowing for quick manipulation and accurate calculations, the abacus was a very useful tool in fields such as commerce. The practice of using this Chinese abacus was called "Zhusuan", "zhu" meaning bead, and "suan" meaning to count, and it is widely recognized as the China's fifth great invention as of recent times. By moving the beads, one can add, subtract, multiply or divide, calculate powers and roots, and even solve further degree equations. Because of fast calculations, convenience and powerful capabilities, the abacus has been called "the world's oldest computer". It was shown from historical records that Zhusuan spread throughout several countries in Asia, including South Korea, Japan, and Southeast Asia during the 16th century. Today, Zhusuan is widely used all over the world, and the invention of the abacus laid the foundation for the future developments in computing technology and the advancements of knowledge and problem solving in mathematics.

Another significant Chinese invention is porcelain. Porcelain is made by heating clay to high temperatures, and it is valued for its permanence, thinness and beauty. Originating in the Eastern Han Dynasty nearly 2,000 years ago, Chinese porcelain was highly prized around the globe, contributing to trade and cultural exchange. The invention has also greatly influenced global dining and tea-drinking customs. Porcelain has quickly become fresh and in demand, both for its functionality and aesthetic appeal, and its influence spread across the globe, shaping the world of pottery and fine art.

In conclusion, these ancient Chinese innovations and inventions have not only transformed technological and mathematical developments but have also shaped the course of human history. The significant impacts of the Chinese innovations extends beyond the fields of science and technology, but influenced economics, culture, and society on a massive, global scale. The legacy of the profound and remarkable inventions is evidence to the ingenuity and creativity of this civilization as a whole, continuing to inspire us and many parts of the world today.

The Tragic History of Gunpowder

Korean International School, Lau, Magnus – 12

Introduction

In China during the first millennium (years 1–1000), people are trying to make an elixir which extends people's lifespan. They accidentally invented gunpowder, also known as black powder, a low explosive which is then used in warfare later.

The powder is composed of three chemicals: potassium nitrate, sulphur and charcoal (carbon). The Chinese alchemist Wei Boyang described three powders which are the ingredients of gunpowder, since gunpowder is the only explosive known to humans that consists of three chemicals, they can fly and dance but he did not name these powders.

The early use of gunpowder

The story begins in ancient China. Early gunpowder is only flammable, but not explosive because they lack a certain chemical, potassium nitrate. Also known as saltpetre, It was harvested by boiling manure. During those days, gunpowder only contains 50 percent of potassium nitrate, which is too low to make it blow enemies up. But remember, gunpowder is flammable so it can still be made into devices that set the enemy on fire. So people developed incendiary, or in other words, fire-starting devices. The first of them are fire arrows. The (possibly) first use of fire arrows dates back to the year 904 in Southern Wu during the siege of Yuzhang.

Fire arrows then became a weapon that you don't have to shoot with a bow and uses gunpowder as a propellant—rockets. The chinese name for this weapon is 火箭, which literally means “fire arrows”. This new variant of the older fire arrow was invented in the year 969 by two generals named Yue Yifang and Feng Jisheng according to the Song Shi. Then it was shown to the emperor in the year 970 and Jisheng was rewarded.

Later on, Gunpowder is also introduced to the Chinese navy. In 1229 decreed that all warships must have a trebuchet (which is also first used in China) for lobbing bombs (which the explosive is gunpowder) but the earlier weapons are still used. When in 1159, a fleet of Song warships were caught in a Jin fleet. Gunpowder arrows were shot in every direction and set enemy ships on fire. But that's not all. The Song armed forces took another victory in 1161 for launching bombs at a Jin Transport fleet and drowning the crew into the rushing Yangtze river. And during the Jin siege of Xiangyang, Song's gunpowder weapons did destroy Jin trebuchets and manage to deter the advancing army.

Then came something truly revolutionary: the hand cannon. This is considered as the ancestors of modern firearms but they are defined as “true guns” because they don't have any projectiles. That's the bullet or the cannonball or the shell. Afterwards shrapnel were added and they were blasted out, but still only referred as “co-viatives”.

The spread and development of gunpowder

The Mongol empire is the second largest empire after the British empire and in history the Mongols did have a great influence on the evolution of gunpowder. Their wars helped with the development of the military in east asia. When the Mongols invaded Japan, the Japanese created a scroll. And in the scroll there is a painting depicting a bomb.

Descriptions of the Mongol invasion also mentioned a cannon that blasts out two to three thousand bullets. It is believed that it is the Mongols which introduced gunpowder to the west. But this is just one theory on how gunpowder ends up in Europe. Another popular theory is that gunpowder made its way to the west through the silk road. During the 13th century, gunpowder reached Europe and the “true gun” was invented. The Europeans discovered that by wetting gunpowder and forcing the paste through a sieve they can make uniform and fine particles that were more powerful per unit of weight. The Europeans call this corned gunpowder. During the late 14th century, cannons were widespread among armies in Europe and the trebuchet, a siege weapon which originated in China (as mentioned earlier), is losing its place in the battlefield.

Meanwhile, back in Asia, cannons were also used in wars in Southeast Asia. Huge quantities of gunpowder was found in the Khmer empire (nowadays Cambodia, Laos and Thailand and Burma) and by the end of the century, such firearms were also used in Vietnam. The Mongols brought the invention to Indonesia in the form of cannon. That's 炮 if you're Chinese. The use of handgonne or hand cannon is recorded in Java in 1413, the knowledge of making “true firearms” came later. It was brought by Muslim traders from west Asia, probably mostly Arabs but the year of introduction remains a mystery.

Then, there came the Portuguese and they defeated the Malacca Sultanate (which is now modern day Malacca state of Malaysia and northwest Sumatra). Their influence helped create a new type of firearm, the istinggar.

In Korea, an early rocket artillery was developed and it was called the Hwacha (화차 in Korean or 火車 in Hanja). The weapon was used in defence of the Korean peninsula against the Japanese invasion in the 1590s. It was a rocket-propelled arrow fitted together on a cart and it can fire more than 100 rows at once.

But weaponry is not the only use of gunpowder. Back in China where gunpowder was invented, it was used for hydraulic engineering.

Blasting by gunpowder is one of the techniques that improved the Grand Canal at the waterway it crosses with the Yellow River and in France, gunpowder helped with the construction of Canal du Midi.

During the 15th to the 16th century, three superpowers arose in west Asia. That is the Ottoman empire, which is modern day Turkey some part of the Saudi Arabia, the Balkans and the northeast part of Africa. The Safavid empire, modern day Iran and Mughal empire, which is modern day India. They have such a strong military and they conquered neighbouring cities with their rifles and cannons (both weapons use gunpowder and this is the reason why the term “ Gunpowder empires” came in). These superpowers reached their peaks between the 16th and 17th century. But these superpowers gradually collapsed due to several reasons such as they lacked in military technology. The spread of gunpowder to other armies left them outdated. Also, the governments inability to run the country properly caused civil wars that weakened their military.

Gunpowder was also applied to mining which helps blast rocks into smaller pieces. The earliest record of gunpowder used in mining was in Hungary. This technique was introduced to Britain in 1638 by the Germans.

Gunpowder was used in railway construction for example, the 12.9 kilometre-long Mont Cenis tunnel in Europe took 13 years to complete starting in 1857. Even with the magical and trusty gunpowder the progress was still painfully slow, at 25 centimetres a day until the jackhammer was invented and speeds up the work.

The use of gunpowder during the American civil war

During the American civil war, in which the Union States were fighting against the Confederates, British India was the main source of potassium nitrate for gunpowder for the Unions. During the Trent Affair, in which the Unions captured two Confederate envoys from a British ship, the supply was threatened.

The decline of gunpowder

A disadvantage of gunpowder is that once burned, it will create a lot of smoke and fog up the battlefield. So in 1889, the British army replaced gunpowder with another low explosive called Cordite as propellant in the military. During the Great war, another explosive was used as military propellant, nitrocellulose. It looks a bit like cotton and was used in firearms and artillery. Cordite was used in the Second world war and the gunpowder, or black powder, which was used in countless wars in the mediaeval ages, was slowly replaced by other explosives that are better and produce less smoke, such as smokeless powder.

Conclusion

In search of elixir for extending lifespan humans created something else. Humans then find the dark side of gunpowder and use it for weapons of war.

Humans gradually improved their inventions but they eventually found it handy killing each other. During the Second world war, Germany developed the world's first long range ballistic missile and more than a thousand of them struck London. And a few years later, scientist created the nuclear bomb and were dropped on Hiroshima and Nagasaki and resulting approximately 200,000 dead. But a few thousand years ago, there's no such thing. It's the world's first rockets and simple explosive devices which contribute to ballistic missiles and thermonuclear bombs, but an invention does have other uses other than blowing people up. Gunpowder is used in beautiful and dazzling fireworks. The harmless and fun that lights up the sky at new year. Though almost no modern weapons use gunpowder as an explosive or propellant, It's true that gunpowder has many enteraniting and non-harmful purposes, but the ancient chinese invention had changed our history and our conflicts. It is true that an accidental discovery can influence millions of lives for centuries.

Innovation and Influence

Maryknoll Convent School (Secondary Section), Wong, Yui Gi Gigi – 12

China, our home, has a long and impactful history of vast inventions that have greatly influenced the whole world. Besides the four great inventions – paper making, printing, gunpowder and the compass, ancient Chinese inventors have contributed to numerous and remarkable creations. For example, Yi Xing a Buddhist monk in 725 A.D. has invented the world's first mechanical clock which was powered by dripping water on a wheel that made one revolution in 24 hours. From ancient times till this present day more and more groundbreaking inventions from China have emerged in recent years which showcased the country's continued legacy and technological advancements.

With the development of high-speed rail technology, China has completely transformed the transportation industry. China has constructed and operated an extensive high-speed rail network that connects the nation's main cities and regions in recent years. China's high-speed rail network is well known for its effectiveness, dependability, and

swiftness. It has not only revolutionized domestic travel, but it has also encouraged other nations to fund comparable infrastructure initiatives.

With climate change still approaching, China has become a global leader in the technology related to renewable energy. The nation has made significant increases in solar panels and wind power. They have been exported to countries across the globe, helping to expand solar energy capacity worldwide leading to a substantial increase in clean energy production. China's renewable energy innovations have not only aided in combating climate change but have also sparked new job opportunities and economic expansion. Additionally, Chinese businesses are now outstanding players in the international renewable energy market, exporting their technologies and expertise to other countries.

As high technology keeps developing, E-commerce and mobile payment systems have grown rapidly in China, driven by businesses like Alibaba. These platforms have transformed the way individuals shop and do financial transactions. Chinese consumers may now buy goods and services with a few touches on their mobile devices because to the increasing usage of smartphones. In addition to revolutionizing the retail sector, this innovation has given entrepreneurs and small companies new chances to prosper in the online market.

In the areas of robotics and artificial intelligence (AI), China has achieved impressive progress. In terms of creating AI technologies, including facial recognition, natural language processing, and autonomous vehicles, Chinese researchers and businesses are leading the way. The nation's aspiration to lead the world in AI has stimulated innovation and drawn people from across the globe. China has made significant strides in robotics, resulting in the creation of advanced humanoid robots and automation systems that are transforming sectors including manufacturing and healthcare.

China has a long history of invention, and it has made outstanding contributions to many different sectors in the current century. China's latest innovations demonstrate the nation's dedication to innovation and its influence on worldwide technical breakthroughs, ranging from high-speed rail and e-commerce to renewable energy and aluminum. These fresh innovation stories from China are evidence of the country's inventiveness and its power to influence the future.

Unearthing China's Hidden Gems of Inventions

Marymount Secondary School, Ip, Agnes Nga Chi – 13

From culinary delicacies to groundbreaking advancements in technology and infrastructure, China has a rich history of creativity, innovation, and originality. The Four Great Inventions of China are rather well-known, but there is more and it makes for a rich tapestry of imagination and ingenuity that transcends time. Chinese creations stand as a testament to the nation's resourceful and delicate civilisations. Join me today on an enthralling journey as we unravel the lesser-known stories of Chinese inventions, past, present, and future, which have shaped our modern lives.

Unbeknownst to most, nail polish, a staple of beauty routines today, finds its origins in ancient China. Dating back over 500 years, it was a symbol of status. Red, black, and yellow were very popular colours as they symbolised prosperity, affluence, and status. The technique later travelled across India, Africa, and the Middle East, where they continued to inspire in their new forms of nail polish. Fast forward to the present, nail polish has evolved into a global industry, inspiring countless brands, trends, and techniques. Evolving from a symbol of status to a form

of self-expression, the development of nail polish owes its origins to the nail adornment that began in ancient China and spread across the world.

Another Chinese invention that most might not know about is the mechanical clock of the Song Dynasty, which revolutionised timekeeping. The first clocks were driven by water mechanisms, introducing the idea of accurate time measurement. Soon, its precision influenced the development of contemporary technologies in the growth of timekeeping devices worldwide. Today, the mechanisms of these ancient Chinese inventions continue to shape timekeeping in an expansive array of industries, helping people across the globe connect through time. The synchronisation of time across various devices and networks is an essential aspect of modern technology, and its roots are indebted to the Chinese invention of the mechanical clock.

The origins of flamethrowers can be traced back to ancient China. The early form of it was known as the 'Fire Lance' around the 10th–12th century. It utilised a bamboo tube filled with gunpowder and ignited projectiles, projecting flames toward enemy forces. Today, flamethrowers have found applications in different aspects of our daily lives, for example, in weed control. By directing it towards unwanted vegetation, farmers can remove weeds without using any chemicals. Therefore, this minimises the environmental impact. This technology can also be applied in entertainment. In events such as circus shows or performances, they add a visual element and create dramatic effects, captivating adults and children alike.

Football, the most popular sport on the planet, actually originates from ancient China. While the ancient Chinese version, cuju, is a bit different from the modern one we know today, its influence can be seen in a vast array of aspects. Its roots were set in the early Han Dynasty and served as a recreational activity, as well as military training. The ancient Chinese football game laid the foundation for modern football and has driven sports technology to advance, popularising it throughout the world. Now, it has spread even further to the most secluded countries in the world with variations of it ranging from Australian football to rugby, showing its dominance in the sports society.

Chinese history is rich with remarkable inventors who excelled in creativity, and two have made significant contributions to their respective fields. Empress Leizu, known as the Silk Empress, discovered the secret of silk production. She observed how silkworms spun their cocoons, realised that their silk could be woven into fine fabric, then experimented with different techniques to refine the silk production process and even developed methods to raise silkworms in controlled environments. Her invention not only revolutionised the textile industry but also brought immense wealth to China since it was traded along the Silk Road which connects the East and West. The silk fabrics have captivated the world and spread Chinese culture and craftsmanship far and wide. Even today, the legacy of the Empress continues as China remains one of the largest producers of silk, and Chinese silk is still admired for its quality and beauty.

Another great Chinese inventor was a skilled architect and engineer, Lu Ban, who was named the Father of Chinese Carpentry. He created tools through his innovative designs and construction techniques and revolutionised the field of carpentry and construction. One of his notable creations was the Lu Ban lock. This wooden lock was a mechanical puzzle designed to secure doors and chests. The lock consists of multiple interlocking pieces, which can only be disassembled in a specific sequence. His work serves as a practical way of securing value and has become a source of intellectual challenge and entertainment. The lock's popularity spread throughout China and beyond, even the Rubik's Cube shares a similar rotating layer and interdependent movements.

The legacy of Lu Ban and Empress Leizu can still be seen in ancient temples, palaces, and traditional homes that continue to stand as testaments to their skills and vision, demonstrating the problem-solving abilities and adaptability of Chinese inventors. The inventions not only transformed their respective fields but also had far-reaching impacts on Chinese society and the world.

Nowadays, we use technology to do everyday things. From transport to education, it has transcended our lives. Notable inventions from the past have contributed to the development of technology over the past few years.

For one, the innovation and experimentation behind nail polish reflect early human creativity and problem-solving skills. These skills are fundamental to the development of AI, as it involves complex problem-solving and creative thinking. The process of inventing flamethrowers can be seen as a distant ancestor to the principles of engineering and technology innovation that underpin AI development with its creative and strategic ways. Therefore, the past is within us even if we do not carefully see it.

I believe that education and the environment are the two areas that hold promise for future development, two that have yet to overextend throughout our time. Currently, in the education industry, AI advancements enable personalised learning experiences by analysing vast amounts of data. By tailoring the learning experience, virtual reality and augmented reality technologies can create immersive and interactive learning environments, enhancing engagement and knowledge retention. Moreover, AI-powered tutoring systems can provide customised feedback and adaptive learning paths, fostering student progress and achievement.

In the environmental sector, there have been breakthroughs in addressing sustainability challenges. AI-powered systems can examine complex environmental data, helping to monitor and manage ecosystems, predict natural disasters, and optimise resource allocation. Machine learning algorithms can assist in the development of renewable energy solutions, improving energy efficiency and reducing carbon footprints. It can develop smart systems for water management, monitoring air quality, and waste reduction, leading to more sustainable practices. With these new and modern inventions, China will be able to rapidly rise in the technology industry and influence foreign countries with them. They can give both convenience and efficiency to people across the world, and create a path for the next generation of inventors. However, these future inventions also come with challenges that need to be addressed.

Of course, with new inventions come new problems. It is vital to safeguard data and ensure compliance with privacy regulations to protect the rights and well-being of them. We also need to strike a balance between AI and human interaction as it is essential to maintain the role of teachers as mentors. Furthermore, we need to ensure that the calculations used in environmental research are free from biases. To avoid unintended consequences and ensure responsible environmental protection, we need to balance the benefits of AI-driven solutions with human judgement and ethical considerations.

Overall, China's history is marked by a rich tapestry of creativity and originality. From the iconic four great inventions to the lesser-known everyday items, they have shaped and influenced various aspects of our modern lives. These innovations have transformed our lives, and have greatly impacted the world for the better. The inventions have dominated the global industry, inspiring young minds around the globe, and further contributing to China's flourishing empire.

Looking towards the future, the fields of education and environment hold significant promise for Chinese inventors. Advancements in technology, particularly in artificial intelligence can focus on enhancing overall academic achievement, sustainable solutions, and environmental conservation. Nevertheless, we need to address the challenges and potential issues that come with these future inventions.

As China continues to innovate and push the boundaries of technological advancement, it is important to foster and cultivate a culture of responsible innovation. By embracing critical thinking and considering the broader implications of new inventions, China can continue to shape the world in transformative ways. The legacy of Chinese inventors, both the past and present, stands as a testament to our nation's remarkable resourcefulness, ingenuity, and enduring impact on a global scale.

New Tales of China's Inventions

Marymount Secondary School, See, Yu Yeng Seana – 12

China, the country I call home, is a global leader in various fields. Many of the world's inventions were invented by the Chinese, old and new, ancient and modern. With its long history as one of the world's oldest nations, China holds a lot of significance in the modern world.

Since the old days, China has been continuously developing and researching new technology for the benefit of mankind. Now is no different; China still has the same creativity as it had in the past and will continue to develop groundbreaking technology for the sake of the present and future.

Among the many fields of technological research that China is engaged in is weather modification, which can influence the weather, and is something the world pays attention to with climate change looming over us. China is one of the global leaders in this technology; how does the creativity of the Chinese play a role in this technology?

The effectiveness of weather modification is currently a topic of discussion among scientists, but the technology continues to develop and improve every single day. Weather modification, also called cloud seeding, has been practiced since long ago with the belief that it might just be able to stop natural disasters. However, China's pursuit has not ended with cloud seeding, it continues to explore more and more opportunities for the modification of weather.

Although two researchers from the US were the ones who created cloud seeding, the Chinese government was very eager about this development and have wholeheartedly supported it. China often did weather modification tests with the hope to one day balance out the territories in drought and those that have floods, showing the country's enthusiasm for the modification of weather. As China is a country that has the most potential in this field, some researchers and scientists speculate how far China might go.

Since China has a wide territory with different geography, China experiences various extreme weather like floods and droughts. This encourages China to investigate and research more about weather modification technology to balance the weather and decrease the chances of harm done by the weather.

Furthermore, China is a nation for whom agriculture is a major industry. People believe that weather modification technology could influence the weather, which could lead to fewer crops dying from unpredictable weather. Also, with controlled weather, China would be able to control the sunlight and water crops would be getting, countering the problem of unstable weather.

Even though weather modification is great, there are some concerns about the environmental impact of this technology on the environment. Some researchers contemplate whether the usage of this technology would put a strain on the environment. Since we are forcefully changing the world's weather, many are worried about what kind of effect it will bring.

Besides environmental concerns, some are also worried about ethical issues. For example, who should have access to this technology, and how should it be governed? Also, whether we humans would abuse or become over-reliant on this technology. But I am sure that along with the collaboration of society and various stakeholders, China would be sure to find a way.

With the technology's continued advance, the supernatural power of controlling the weather might not just be a pipe dream. In the future, we humans may have the ability to understand the functions of the atmosphere and its associated weather patterns, and along with technology that improves over time, we may be able to predict and manage extreme weather like typhoons, droughts, floods, etc. Even though we are not sure about the impacts of weather modification, this problem will surely be solved in the not-so-distant future.

Will weather modification add a new page to the history books? That is a story that only time will tell.

New Tales of China's Inventions

Marymount Secondary School, Suen, Hayley – 12

In our daily life, we always use a simple but essential object at least once a day: paper. We use it to draw pictures on, write letters on, or even fold paper aeroplanes with. But, have you ever heard about the history of paper?

Before the invention of paper, ancient Chinese people often used bamboo, wooden slips and silk for writing. However, bamboo and wooden slips were heavy, and silk was very expensive. These early materials certainly got the job done, but the people were constantly trying to find something better. Therefore, in the Eastern Han Dynasty (AD 105), the eunuch Cai Lun created the first type of paper through experimentation.

Cai Lun experimented with various materials such as tree skin, hemp heads, old cloth and fishing nets. He wanted to create a mash that could be formed into thin sheets for writing. With the power of perseverance, Cai Lun successfully developed a mixture that dries into a light and sturdy material. This mixture was called "Caihou paper" as it was named after Cai Lun, and it revolutionised the way Chinese society functioned. China had become number one in papermaking with the introduction of Caihou paper, and knowledge was able to spread more easily and widely.

But how did Caihou paper spread around the world? Well, after the invention of Caihou Paper, paper spread universally through trading and cultural exchanges with the help of trading networks such as the silk road. These trading networks made paper accessible to a wider population and enabled the exchange of goods and ideas between different regions. As papermaking techniques improved, people in Asia and beyond adopted Cai Lun's techniques to develop new types of paper based on their local needs. For example, in Japan, traditional washi paper was made from the fibres of the bark of the mulberry trees, which is a medium-sized tree that grows berries. While in India, handmade paper, also known as "kagaz"(which appeared in about the 3rd to 7th centuries), was made from materials such as cotton cloth or jute fibres. Each culture added its own techniques to papermaking, resulting in a wide variety of paper types available worldwide.

Paper gradually replaced other writing materials as it was affordable and easy to use. Its light weight made it easy to transport and its adaptability allowed for various applications, including writing, printing, drawing and packaging. The invention of paper was an important milestone in human history as it changed the way information was recorded, transmitted and preserved.

Cai Lun, the accidental inventor of paper, left a lasting legacy on human civilization. His willingness to experiment and think outside the box led to the development of one of history's most influential technologies. Paper became the foundation for advances in education, art, science, and all aspects of modern life. Cai Lun's invention not only changed Chinese society, but it also had a major impact on cultures around the world.

In conclusion, paper was first produced in the Han dynasty and later spread throughout the world through trading. The invention of paper by Cai Lun serves as a reminder that innovation can come from everyday problem solving and experimentation. As for the next big invention, who knows—maybe the next great invention is waiting to be discovered by everyday problem solvers who are willing to think outside the box. Maybe it will be you! Do you think you can create amazing inventions like Cai Lun? Use your own potential and leave a lasting impact on the world through discovery and innovation!

From Chopsticks to Rockets: The Incredible Inventions of Chinese People

Pui Kiu College, Liu, Junxiang Benjamin – 13

Ancient Chinese inventors have bombarded us with ahead-of-time inventions all the time, with groundbreaking inventions often coming out of poor, unnoticed inventors inventing things that are top of their time. Their innovations continue to inspire generations of young Chinese inventors whose creations are not only determining the whereabouts of Chinese society, but also extraordinarily impacting on the development of the modern world.

When Chinese civilization first began, they had little technological knowledge they could use to help them improve their lives. However, some clever brains are not comfortable with such little they could do at the moment, and came up with some incredible inventions. They used the power of nature, along with some pioneering thoughts of their own, to solve everyday problems like not enough farming efficiency. They have revolutionized their lives from time to time, slowly pushing up living standards to what we see today.

Their irrigation systems could water crops without needing farmers to carry heavy buckets from rivers or lakes. Scarecrows prevent unwelcome guests from eating farmers' produce. These inventions all changed the way people earned their livings. People could have time to carry out more tasks that they enjoy doing, not only limited to farming all day. The invention of paper, for instance, allowed people to get educated without having to afford expensive books made of bamboo, which itself was a huge advancement from turtle shells. These inventions just keep changing people's lives, in all different aspects.

One of the most significant contributions of ancient Chinese people was the invention of gunpowder. Originally invented as a medicine, gunpowder is a perfect example of how Chinese innovation changed the world. At first, gunpowder was not used as a weapon to kill one another, but rather ignited to celebrate festivals. But when foreigners bring this magical powder back home, they worked on this Chinese invention and created weapons that were exceptionally useful in battles.

These pioneering inventor's legacy continue to be a sign to young Chinese people about what their ancestors could do. They are well-aware of their country's achievements in the past, and do not disappoint their ancestors at all. The modern world is ever-changing, and China, as a leading country, is adapting to these changes in their unique way and changing even more! From what was a colony of western powers, China has risen in its own fashion. From nuclear weapons to aerospace technology, whatever you name, China has it, or is working towards it.

Home to a population of over 1.4 billion people, China has a market size that simply no other place can get. With this, the possibilities are unlimited. From cheap takeaway delivery to fine-dining in one of the world's tallest buildings, the diverse economy of the nation is a perfect place for- you guessed it- inventions!

Transforming tiny villages into bustling cities, China is home to world-leading technologies. Chinese companies like Tencent and Huawei are constantly pushing the boundaries of humans. We are producing microchips for mobile phones. We are sending dozens of people to space. We are operating our own home-built aircraft. All these things are solid proof to what we could achieve, and there is no need to leash your imagination at all.

We also care for the environment. Being the largest producer of electric cars, China is taking responsibility for the negative effects its industry has on the environment and is working tirelessly to change that. Shared bikes are visible everywhere on the streets in China, and there are more trees than ever before being planted near roads everywhere.

From 5000 years ago to now, Chinese people have continuously shined in their very own way, changing the course of history. Our positive impacts cannot be ignored, and we are ready to change those that are not. China was, is, and will always be, an ideal location for everyone to create.

Papermaking

Singapore International Hong Kong, Mak, Chun Ho – 15

Paper. A valuable essence of human life. Without it, trivial pieces of homework cannot be completed. Without it, architectural designs for the greatest structures we all know and love would never be completed. Without it, the most significant, life-or-death deciding treaties would never have been written down as part of humanity's history. Without it, our lives would be so much more challenging. Let us head back to where it all began, from the start of the beginning of such a wondrous creation...

Fifty AD, Guiyang Commandery, now present day Leiyang County. A baby, fresh from his mother's womb, lay wailing on the bed. His parents picked him up tenderly, not knowing what kind of future awaited him. One that revolutionised the world, one that completely changed the direction of mankind...

Born into a poverty-stricken family, the man known as Cai Lun came into the world during a period of strife, rebellion and warfare during the Han dynasty. Not fortunate enough to have sufficient resources provided by his low-class, poverty-stricken family, it was believed his early life was as rural and plain as it could be. Despite his relatively unknown and humble beginnings, the young Cai, against all odds, still managed to secure a humble job overlooking the iron mines of the past. With some sleight of hand, the crafty Cai obtained the position of an eunuch, one who overlooks the Imperial Harem containing the multiple empresses, consorts and concubines of the Emperor by 82AD; he developed a great interest in production and craft of items due to his additional role of *Shangfang Ling*, where he manufactures imperial musical instruments and equipment for the military. He continued living an unbothered life, despite the rebellions and coup d'etats occurring. As the years progressed, his craftsmanship soon became one of the most renowned and as high-class as it could get, setting the stage for a greater leap in his innovation.

Almost three decades later at 105AD, Cai was working at the imperial palace, Cai himself openly announced to the general public that he had developed a then more modern, state-of-the-art constitution of paper structures, alongside the addition of creating a new papercrafting procedure. Prior to Cai's new inventions, classical China most prominently utilised the tough, rigid structures of bamboo and wood pieces as a means to write lengthy and concise text respectively. Contrastingly, Cai himself had chosen to undergo a different approach, with an usage of mulberries, bast fibres, tree bark and more mixtures of unorthodox materials, even including waste! This new material, now known as paper, soon underwent drastic changes through Cai's constant experimentation from his desire to produce a better alternative to bamboo. Some thought that he had manually tested out the possible environmentally-available substances, some thought he had simply asked imperial craftsmen to help him. However, with the blessing and support of the Emperor, Cai eventually settled on his pulp technique, where he boils and heats all the materials together until they form a soft, shapeless chunk of rags; hammering the pulp with a wood hammer and finally using wooden sieves in order to create the material, now known as "Cai Hou Paper". Such a piece of paper carries several benefits. Not only is it lightweight and hence easy to carry round, but also utilises many raw materials. It was a great alternative to cloth and silk, which were extremely expensive back in the day. There were also multiple tales that illustrate Cai's reason and motivation for doing so: his hometown, where its people tended to utilise the mulberry trees. Another would be that he was motivated by how paper wasps make their own nests.

With such a groundbreaking, astounding and incredible formation, the Emperor gladly recognised Cai as a phenom and as popular as it could get. During Cai's final decade after his discovery of the paper, Emperor An had taken the place of Emperor Deng, and he immediately ordered Cai to head to the Ministry of Justice due to Cai's part in Emperor An's grandmother's death. As what Cai feared was a shameful and disgraceful death from the Emperor, he

took his own using poison in the year 121 AD, leaving no children behind, hence ending the life of what was one of the pioneers and founding fathers of both paper and its development.

Over several centuries, Cai's method of pulping rags has been the norm, up until the 19th century, where two bright minds started to make use of wood pulping and grounding in papermaking. Their names were Charles Fenerty and Friedrich Gottlob Fenerty, a Canadian and German respectively. Keller had invented a wood-cut machine, while Fenerty learnt how to manually pulp and bleach the wood into white, in order to create an authentic look for the paper. Slowly but surely, the era of newsprint, which consists mainly of wood pulping, had arrived, leading into the modern era.

The renowned Cai Lun, the masterful artisan who could craft anything, from weapons to rags. But his greatest treasure was his paper, which resulted in the worldwide increase of paper use and production. If he'd seen the impact his uninteresting and bland imperial eunuch life had on the world, he would have been satisfied. While this gift that he gave the world will be remembered through all of time.

China: Cradle of Invention

Singapore International Hong Kong, Ye, Zikai – 13

From the early stirrings of technology, the first mechanical clock developed from water wheels, to the man who made alcohol from fermented rice and honey, Chinese inventors have left their indelible mark on history with their revolutionary creations and genius. China has always been a cradle for innovation itself, nurturing the inventions that shaped our present and past. Why is China so prevalent and powerful in their creations? Let us explore the numerous remarkable inventions of ancient China and speculate on where China will take us in the future.

China can be credited for inventing modern time itself, pioneering the creation of clocks. Before China's Yi Xing developed the first mechanical clock based on calculations and mechanics, sundials and hourglasses were commonly used. However, they are quite ineffective since they take a long time to set up, while hourglasses often require constant management.

Our story starts with Yi Xing, a Buddhist monk, in 725 A.D. The Tang court, which was in power then, appointed him in charge of the sector investigating astrology combined with geodetic surveys, or astrology. In his life, he had a number of impressive achievements, such as calculating the number of positions in a go-chess game, which bolstered his popularity and fame. He drew inspiration from many famed individuals, such as Zhang Heng, who was the first to apply hydraulic pressure power, such as a waterwheel in mechanical engineering. Another source of his ideas was Li Lan, a Daoist local who was an expert on water mechanisms, creating balances for weighing water, and combined with the followers of Ma Jun, who employed waterwheels, it provided the perfect environment for his revolutionary invention.

The mechanical clockwork, first invented by Yi Xing, whose invention was described as a "Water-driven Spherical Clock," was operated by explicitly calculating the amount of dripping water it takes to complete one full rotation on a wheel for 24 hours, then precisely applying the calculations to create the first mechanical clock. The clock features intricate and delicate systems of overlapping gears and mechanisms regulating the water flow to drive the clock's movement. Yi Xing's clock not only demonstrated the Chinese's deep understanding of celestial mechanics but also built the foundation for future advancements in timekeeping through a mechanical manner, influencing other inventors such as Su Song, who developed a more sophisticated version of this clock, known as the Cosmic Empire 1092, which was astoundingly developed 200 years before the first mechanical clock in Europe. Although he has long passed, his legacy continues to inspire clockworkers and the field of timekeeping to this day.

Our next invention relates to something we still have not fully understood, which is the numerous natural disasters that plague our earth. Although we may not fully comprehend how they form and impact us, observation and prevention measures date back to the Han Dynasty, when the first earthquake detection measure was invented by Zhang Heng, another prominent inventor, astronomer, mathematician, engineer, and geographer at the time.

His most renowned invention was the earthquake detector, which was said to be able to detect the direction of earthquakes from even hundreds of miles away. Zhang's ingenious device, known as a seismoscope, consisted of a large bronze vessel adorned by eight dragons, who caught a small bronze ball in their mouth, and made up the primary compass directions, and eight large toads standing ready to catch the balls. This system may seem questionable and unconventional at first; however, by hanging the bronze ball on a loose stick, in the event of an earthquake, the stick would topple, causing the ball to fall into one of the toads with an ominous clang, alerting everyone around it to the potential danger.

In 138 AD, the bronze ball dropped menacingly in the imperial palace, received by the toads in the direction of Luoyong, the capital city at the time. Imperial officials were doubtful, questioning the legitimacy of the mechanism. In a twist of events, a Luoyong messenger arrived a few days afterward, confirming that there was an earthquake that did ravage the city around the time Zhang's seismoscope had set off.

Scientists are still fascinated by the simplicity yet effectiveness of Zhang's invention. In 2005, a group of scientists decided to recreate his prodigious seismoscope and used it to detect simulated earthquakes based on four real life earthquakes that happened close to China, near Vietnam. Miraculously, this phenomenal invention was not only able to detect it, but the data was accurate with those based on modern seismoscopes. This experiment proves that Zhang Heng's innovation was amazingly refined, remarkable, and ahead of its time.

Alcohol, known to some as liquid courage or even referred to as intoxication, has been and always will be a staple of both Chinese and Western culture. Although many assume alcohol to have a Western origin, recent discoveries in 2013 have discovered 9000-year-old pottery found in the Henan province had the presence of alcohol, almost 1000 years earlier than the earliest documented Arabian-produced alcohol, who were widely believed to be the first brewers of this golden beverage.

In China, alcohol is named "Jiu" and is traditionally made through the brewing and careful fermentation of a diversity of ingredients such as rice, fruits, and honey. This drink was not only used by officials and common folk alike to relax in social gatherings but was also a standard treatment used in medical remedies and methods in religious rituals.

During social gatherings, offering alcohol symbolizes shared hospitality and camaraderie, while its consumption is linked to celebrations, such as banquets, festivals, or weddings. In prayers or offerings to the spirits or higher powers, alcohol was presented as a libation, a drink as an offering to deities. Offering alcohol was a means of respect, often seeking blessings or favors from the gods in return. In addition, some doctors even use alcohol for its therapeutic abilities or used to dull pain and cure specific ailments.

By building upon the legacy of these honored Chinese inventors, modern society currently stands on the cusp of infinite possibilities, teetering between a crossroad of ideas and exciting prospects. With the rapid rise of technology and artificial intelligence, improving and further revolutionizing existing yet simple inventions, such as the mechanical clock by Yi Xing, is a real possibility for future inventors.

One possibility is implementing artificial intelligence and machine learning into a simple mechanism such as the clock, by allowing the clock to learn your sleep patterns, time, and quality of sleep, allowing the machine to learn from your habits to provide personalized suggestions on optimized sleeping times to maximize productivity and rest. While many trivialize the importance of healthy sleep, it supports a healthy brain and functions to maintain physical health. Designing this device that teaches and promotes a healthier lifestyle helps create a favorable environment for growth and mental development.

Another potential idea for upgrading Zhang Heng's seismic detector is to link it to nationwide security alarms, and when a sizable seismic activity is detected, indicating an earthquake, automatic signals are sent to cities and densely populated areas where damage would be the greatest, such as large buildings. For most earthquakes, deaths and injuries related to building collapse and giving citizens invaluable minutes to escape and evacuate could mean life and death.

China's focus on communication and social media communication is evident with recent inventions such as WeChat, allowing families to transcend geographical boundaries and connect in tough times. COVID-19, the recent virus that rampaged the global stage and caused lockdowns all around the world, separated many families from one

another, young teenagers from their parents, and families from their elders stranded overseas with no support. China's ingenuity saved many from succumbing to loneliness from lack of support and attention, rescuing those overwhelmed by feelings of isolation and forsakenness.

The inventiveness of ancient China and their continued contribution to modern society today have left their ineradicable mark on human history forever. From clocks, seismoscopes, and alcohol to revolutionizing communication and the potential implementation of artificial intelligence, their inventions have undoubtedly shaped the course of human progress.

As we stand on the shoulders of ancient Chinese inventors, let us continue to foster an environment of growth and progress, nurturing an environment of creativity and curiosity. Inspiring future generations and pushing the boundaries of possibility, China is one of the critical factors that usher us into a new era of innovation and progress.

Modern Inventions Of China

St. Joseph's College, Choi, Aidan Manhon – 14

Technology is one of the most important industries in the modern world. It has been crucial to the development of humankind. Without the machinery sprung from it, I doubt humans would be able to achieve even a tiny fraction of the accomplishments that we are achieving now.

A mere one and a half decades ago, China was but a rookie in the technology industry, and the size of China's digital economy in proportion to its gross domestic product (GDP) was only about 16.0% in 2005. But the digital technology sector has proliferated subsequently, growing to 37.1% in 2020, which is 2.3 times the amount in 2005, and it still has not stopped growing even until now.

These developments have been shown through different incidents throughout the 2010s and the 2020s until now, such as the emergence of different reputable mobile phone brands from Mainland China. These phone brands have become household names in the past few years. Eight out of the top ten mobile phone brands in 2023 are Chinese companies. Xiaomi, one of said phone brands, even being the top selling phone brand in countries such as Kyrgyzstan, Greece and Palestine.

Although China dominates the mobile phone market, phones were not invented by the Chinese. Instead, they were invented by Americans. What the Chinese did invent though, were creative ways to use a phone and use it more creatively in daily life. One excellent example would be the new digital payments gaining traction in the past decade. This kind of payment method relies on apps such as Alipay and WeChat Pay. Unlike the western world, rather than using cash and "traditional" credit cards and banks, they use their phones to pay for their daily purchases. Instead of taking out their card and swiping it, which requires one to bring their credit card everywhere with them, they use an app on their phone to display a quick-response (QR) code or a barcode to the cashier, and the cashier uses a scanner to scan it. This has multiple benefits. One of them being the risk of people forgetting to bring their money or their credit card to where they make their purchase. People are going to bring their mobile phone out anyways, so there is no reason why payment methods should not be built into mobile phones. Another reason why this payment method reigns superior to others is that it uses a powerful security system which fends your money off from thieves and hackers. Traditional credit cards have the chance of getting pick-pocketed, and all of the credit card information is on the card itself, allowing criminals to use your card with ease. Alipay, on the other hand, uses their Intelligent ALPHA Risk Management system. It uses artificial intelligence to identify the risks and uses intelligent risk assessment adjustment to analyse every transaction in real-time and block any suspicious transactions.

Despite Alipay hugely benefiting the lives of citizens in China or possibly even worldwide, it is not quite as life changing as the house 3D printing technology that was invented in China a decade ago.

Although there are plenty of excess houses in China, there is an estimated 1.6 billion people worldwide lacking adequate housing and that may rise to 3 billion people in the year 2030. In addition, due to inflation, housing prices will only continue to rise in the future, leading to less people being able to afford houses.

This problem needs a solution as soon as possible. Fortunately, a Chinese 3D printing architecture company, Winsun, has developed a 3D printing method that can be used to print small cabins, houses or even apartment buildings. They do this by using nozzles to dispense a mixture of quick-drying cement mixed with a special hardening agent, which is flexible, self-insulating and earthquake-resistant, in a pattern to make a building, like how a baker bakes a cake. They were the first in the world to achieve this phenomenal accomplishment which is a huge advancement in housing.

In a project in 2014, Winsun successfully 3D printed 10 houses, which are 2,152 square feet each, all in the span of 24 hours. Not only can they be printed very quickly, but these houses' construction costs are also only 30,000 RMB (32,972 HKD) each. In addition, these houses are predicted to last at least 100 years and they are as durable as a

house made from concrete blocks. In 2015, they 3D printed a five-story, 11,840-square-foot apartment building in Suzhou, China, which is near Shanghai, where the company is based.

These construction methods are able to save 60% of the materials normally needed to construct a home and can reduce the time needed for construction to just 30% of the time usually needed to build a typical residential building of the same size. As a result, this type of construction is also friendlier to the environment as the material used reduces the need for quarrying for materials, which cuts down noise, air and water pollution in the areas of the quarries. It also reduces the risk of accidents happening to construction workers as it scales the number of construction workers needed down to less than 10 per building.

Recently, this company has also expanded into Japan, bringing 3D-printed technology into other Asian countries. Other companies in Europe, Africa and the Americas also followed suit afterwards. Through this, the fuse might have just been lit for the future of construction around the world, and this may be the solution to the global housing crisis.

There are much more modern inventions of China that are worthy of naming, such as their social media formats, smart glasses, internet cars, et cetera. These inventions are destined to make a huge impact in the future, not only in China, but globally. With the rapid development of technology in China, it is likely that China will become the leading country in the technology sector in the near future. So let's stop looking down on China as a minor contributor to the field of technology, but instead as a strong player and a superpower in the world.

New Tales of China's Inventions

*St. Margaret's Coeducational English Secondary and Primary School,
Chan, Lok Hay Hayden – 12*

In ancient China, there are many tales of impressive weaponry, knocking down walls like butter and tearing through ranks of soldiers and horses like they aren't even there. But there is one so great, sharp as an obsidian blade yet tough as steel, that has been hidden away and removed from history, as to mask it from human eyes, for it was believed it could ruin the entirety of Asia if it landed in the wrong hands. But today, we delve in what caused this horrific personification of war to be created, and how it was made.

The Kingdom of Song was having a difficult time facing off against the old kingdom of Tang, it having built up its empire for nearly 250 years, and amassed an army consisting of nearly 1,000,00 troops, including cannons, siege weapons, conscripts and allied forces. The current Song king, Song Taizhu, was nearing a headache when one of his commanders came rushing in, yelling about some new "innovation". "Sir, sir, you are going to want to see this, one of our inventors has been screaming all morning about a new siege weapon he'd manage to come up with! It's Ling Fung! He's done it!" The emperor hung his head low, sighing out: "Oh not that buffoon again, the last time he "created the most powerful weapon below the heavens" burnt down the barracks, it took THREE months to rebuild! Oh fine I will go have a look at it."

The emperor trudged along the path next to the general, until they reached the armoury, where Ling Fung was almost running around in circles because of his excitement. "ME LORD, EMPEROR, I HAVE MADE DEATH ITSELF, GAZE UPON THE GREATEST WEAPON I HAVE EVER CREATED" he exclaimed. There sat a weird metal rectangle, with what seems to be two smaller rectangles attached to it, with one of them being curved to look like a handle with grooves carved into it. There seemed to be a tube on one end of the rectangle, almost like the barrel of a cannon, only much smaller. One final detail the emperor noticed was a very small handle on the side of the "weapon", attached to a secondary piece inside the bigger chamber, which could slide along a shaft cut out of the main piece. "What is this, amalgamation of iron, it just looks like you banged a lot of metal together", the emperor questioned, confused and unimpressed. "Well then you CLEARLY don't see the bigger picture here, let me show you."

The engineer picked up the weird contraption and push one end against his shoulder, with the tube pointed towards a target some 20 to 30 metres away. He pulled back the small handle and let go, with it slamming back forward and making a small *click*. He then pulled a small trigger next to the bigger handle and all the emperor could notice was the insanely loud *BANG* that went off and the flash of light in front of the tube. A small metal casing fell out of the weapon and landed on the floor. Looking further forward, the small target was all but disintegrated, and Ling Fung had a mad smile on his face, turning towards the emperor: "WELL? HOW'S THAT FOR A WEAPON SIRE?" The emperor's jaw was on the floor, and he could only mutter out "make..more."

And that is the tale of how a weapon several centuries ahead of its time was born, but just as quickly hidden, and served as an ancient example of the modern automatic rifle.

New Tales of China's Inventions

St. Margaret's Coeducational English Secondary and Primary School,

Chan, Maris Sum Yuen – 12

We all know some famous inventions of China, such as gunpowder, the papermaking technique, and the compass, but did you know China has also invented all sorts of other useful things?

China has actually invented one of the lightest flying objects known to man— the kite. This artificial bird was invented by 2 scholars, Mozi and Lu Ban, in the 5th century BC. During that time, there were a lot of wars in China, and the kite was used for military purposes. The kite, usually made of light wood and cloth, made a great ancient measurement tool, casually breezing over all sorts of difficult terrain, allowing the Chinese to easily measure distances and wind. They were also used as a form of communication, similar to smoke signals. Nowadays, kites are not used in the military and are merely a form of entertainment, instead made of cheap plastic and easily affordable. Who would've guessed a kite would be so useful in the past?

Talking about flying objects, we move on to China's second not-very-known invention— the rocket. While there were rocket-like objects used in the past, the first true rocket was invented by the Chinese. While we are still not sure about the exact date of the first use of the rocket, the first recorded date of a use of the rocket was in 1232. The Chinese used rockets, which were a tube with gunpowder strapped onto a stick, as a weapon to battle the Mongols, who were at war with them at the time. When launched, the stick would guide the tube, and the burning of gunpowder would act as fuel, allowing it to steadily fly to its target and explode. Eventually the Mongols would develop their own rocket, and the technology would spread and be developed until the rockets that we know today.

Besides the heavily militarised rockets and the breezy, light kite, the Chinese have also invented one of the most useful items in the world— paper currency. The first use of paper bills was technically used in the Tang Dynasty, but it wasn't an actual currency yet. Instead, it was used as a sort of receipt, where someone hands their very heavy copper coins to a trusted person and receives a paper slip, recording their deposited money. In the Song Dynasty, some Sichuan people invented the jiaozi— the first ever paper currency in the world. At first, it was used alongside copper coins, but later it completely replaced coins as the primary currency in China. Paper money, given how convenient it was, quickly spread across the world and is now a common currency to use, along with lighter coins.

China has invented all sorts of revolutionary items, from weaponized gunpowder to convenient money to paper. To this day, the Chinese continue to innovate and develop new and creative inventions to improve all sorts of aspects of life. A new, never-seen invention may be just around the corner.

New Tales of China's Inventions

*St. Margaret's Coeducational English Secondary and Primary School,
Chiu, Man To Isabelle – 12*

With a history spanning several millennia, China is an old civilisation that has given rise to innumerable inventions that have influenced the development of human civilisation. Among these incredible achievements, the creation of paper is a noteworthy accomplishment that completely changed how knowledge was recorded, shared, and kept. This essay examines the intriguing history of paper's invention in China, its significant influence on various facets of human existence, and its persistent legacy that still shapes our world today.

The Eastern Han Dynasty in ancient China is when paper first appeared on the scene. Compared to past writing materials like animal bones, silk, and bamboo strips, which were challenging, costly, and scarce, this fantastic invention marked a dramatic shift. The development of paper, which offered an accessible and adaptable medium for writing and communication, was a significant turning point in human history.

China produced its first paper by processing the fibres from plants, including bamboo, hemp, and mulberry. After being soaked, beaten, and combined with water, these fibres were made into a pulp that was uniformly and thinly applied to a level surface. The pulp was carefully dried, pressed, and smoothed until it became a thin, pliable sheet of paper. Over time, the process was improved, creating premium paper shipped to other countries and in great demand.

The advent of paper significantly impacted the development of human communication and the spread of information. Writing supplies were scarce and frequently only available to the wealthy or privileged groups before it was invented. Conversely, paper was quickly produced, lightweight, and reasonably priced, making it available to a larger audience. Due to its accessibility, knowledge became more widely available, facilitating the dissemination of literacy and the preservation of ideas across social classes.

Paper's widespread availability encouraged the creation of books, which allowed for the previously unheard-of level of knowledge preservation and accumulation. As educational institutions and libraries expanded, written language became a potent medium for disseminating knowledge about history, culture, and ideas. The development of paper had a significant role in the preservation and diffusion of the rich literary tradition of China, which includes a wide range of works in poetry, philosophy, scientific treatises, and historical chronicles.

The development of paper had an impact on knowledge and communication, but it also spurred progress in several other areas. Printing was one of these fields. The Tang Dynasty saw the invention of woodblock printing, which was made possible by the advancement of paper. Using this method, wooden blocks were carved with characters or images, inked, and pressed onto paper. The mass production of books was revolutionised by woodblock printing, which also reduced the cost of manufacture.

The diffusion of knowledge was significantly expedited during the Song Dynasty with the invention of movable type printing. The ability to cast individual characters in clay or metal made it possible to assemble and rearrange text efficiently. This technological advance in printing created the groundwork for the Gutenberg printing press, which was developed centuries later in Europe and sparked the Renaissance and the fast dissemination of information known as the Age of Enlightenment.

The Chinese were not the only people to invent paper. Papermaking knowledge travelled great distances via trade routes like the Silk Road, eventually arriving in the Middle East, Central Asia, and Europe. Remarkably, the Arab world was essential in transferring paper making skills to the West. Paper became widely used as a writing material after paper mills were built in places like Samarkand and Baghdad.

It is impossible to overestimate the influence of paper on world culture. It made it easier for old books to be preserved, for cultures to share ideas, and for scientific, technological, and creative disciplines to advance. It fueled the Enlightenment, the Renaissance, and the contemporary information era. The idea of a "paperless society" still exists in the digital age of electronic media dominance because of the Chinese invention of paper and its lasting significance.

The Chinese civilization's inventiveness and inventive spirit are demonstrated by the invention of paper. It revolutionised the methods of documenting, sharing, and preserving knowledge, democratising information access and propelling human civilisation forward. The paper has come a long way from its modest beginnings in ancient China to its widespread use as a symbol of human development and a reminder of the significant contributions that can result from the pursuit of knowledge and invention.

New Tales of China's Inventions

St. Margaret's Coeducational English Secondary and Primary School, Chow, Hiu Long – 13

China, a land steeped in ancient traditions and rich history, has long been regarded as a cradle of innovation. From the invention of paper to the creation of gunpowder, China's contributions have shaped the world as we know it. Now, a new wave of discoveries is shedding light on untold tales of ingenuity from this remarkable civilization.

Archaeologists and historians are unearthing hidden treasures, revealing the vast scope of China's inventions. Among these remarkable finds is an ancient scroll that tells the tale of a time-traveling compass—a device rumored to have the power to transport its bearer to any point in China's history. This extraordinary artifact offers a glimpse into the ingenuity and brilliance of Chinese inventors.

As we journey through time with the time-traveling compass, we witness the construction of the Great Wall, a testament to human perseverance and engineering prowess. We stand beside ancient astronomers as they chart the stars and make astounding celestial discoveries. We marvel at the intricacy of porcelain-making and the artistry of calligraphy, each stroke a testament to the mastery of ancient craftsmen.

China's inventions extend beyond its borders, influencing cultures around the globe. The advent of paper revolutionized communication, enabling the spread of knowledge and ideas. The discovery of gunpowder transformed warfare and propelled technological advancements. The creation of silk, a luxurious fabric coveted throughout history, traversed continents, and became a symbol of Chinese craftsmanship.

Yet, the true treasure lies not only in the past but in the present. China continues to forge ahead with cutting-edge innovations, blending tradition with modernity. From technological breakthroughs in artificial intelligence and renewable energy to advancements in space exploration, China's inventors are shaping the future.

As we celebrate the remarkable legacy of China's inventions, it is essential to recognize the importance of preserving and honoring this cultural heritage. Museums dedicated to showcasing these treasures serve as a bridge between the past and the present, inspiring generations to come.

China's Legacy of Inventions

St. Margaret's Coeducational English Secondary and Primary School, Deng, Zhoulan – 12

Papermaking is an ancient technology invented more than two thousand years ago. It is one of China's four great inventions and its origin can be traced back to ancient China. Over time, papermaking has been used in many aspects and plays an important role.

Before the advent of paper, ancient people carved and wrote characters on oracle bones and bamboo slips, or cast them on bronze objects. During the Qin and Han Dynasties, official correspondence, private letters, and classics were all written on bamboo slips and silk. Bamboo slips are made of bamboo and wood, so it is very heavy. Although silk is light, it is expensive. For these reasons, people are very hard to use them.

Cai Lun's idea of improving papermaking from the emperor's review memorial. At that time, the memorials reviewed by the emperor were all written on "slips". Bundles of bamboo slips were pulled by eunuchs on carts, and several people carried them and placed them in front of the emperor's desk, where they were piled up into a hill. The emperor spent every day reading and reviewing the papers on the desk, which made his back hurt from exhaustion. Cai Lun followed the emperor all day long, he saw the situation and felt anxious, so he wanted to create a new writing material. During his tenure, Cai Lun often went to the suburbs of Luoyang to collect production materials. He summarized the experience of using hemp fiber to make paper since the Western Han Dynasty.

After repeating experiments, he created a paper based on bark, hemp heads, rags, old fishing nets and other plant fibers. As raw materials for papermaking, the quality of paper has been greatly improved. This kind of paper raw material is cheap, easy to find and easy to promote. Since then, the use of paper has become more and more common. Paper gradually replaced bamboo slips and became a widely used writing material.

Papermaking technology was introduced to Japan in the seventh century and to European countries in the eighth century. It increases the spread of writing, promoted cultural exchanges, and improved production efficiency. At the same time, it promoted the production and development of literature.

The invention and spread of the papermaking have a big effect on science and culture. It's also very important to the development of society.

Chinese Innovators of the Past: Pioneers of Ingenuity and Innovation

St. Margaret's Coeducational English Secondary and Primary School, Fiaz, Abia – 13

Introduction

China's history is teeming with a wealth of inventions and discoveries that have played a significant role in shaping human civilization. From ancient times to the modern era, Chinese inventors have made remarkable contributions across a wide range of fields, spanning technology, engineering, medicine, and astronomy.

Ancient Chinese Inventions

Ancient China witnessed the emergence of numerous inventions that revolutionised various aspects of human life. Among these, the invention of paper stands out as a monumental achievement credited to Cai Lun during the Eastern Han Dynasty (25–220 AD). Paper revolutionised communication and education by offering a more efficient alternative to writing on bamboo strips or silk, thus paving the way for the widespread dissemination of knowledge.

Another remarkable invention was gunpowder, originally formulated by Chinese alchemists around the 9th century. Initially intended for medicinal purposes, the explosive properties of gunpowder were soon recognized and utilised for military applications, leading to the development of fireworks and, subsequently, firearms. This invention had profound consequences, transforming warfare and shaping the course of human history.

The Compass, invented during the Han Dynasty (206 BC–220 AD), was a navigational instrument that revolutionized maritime travel. By providing a reliable method for determining direction, it enabled Chinese sailors to embark on long-distance voyages with greater accuracy, opening up new trade routes and fostering cultural exchange between China and other civilizations.

Technological Advancements

Chinese inventors throughout history have also made significant contributions to technology and engineering. One of the most notable achievements was the invention of movable type printing, attributed to Bi Sheng during the Northern Song Dynasty (960–1127 AD). This innovative printing technique allowed for the mass production of books, facilitating the spread of knowledge on an unprecedented scale and revolutionising the world of publishing.

The invention of the mechanical clock during the Tang Dynasty (618–907 AD) is another noteworthy contribution. These clocks, powered by water or weights, marked a significant advancement in timekeeping, enabling precise measurement of time and improving productivity in various fields.

Chinese inventors also excelled in the realm of agricultural technology. The invention of the seed drill during the Han Dynasty revolutionised farming practices, allowing for more efficient planting and increased crop yields. Other agricultural innovations, such as the iron plough and the water wheel, further improved productivity and laid the foundation for sustainable agricultural practices.

Medical and Scientific Contributions

Chinese inventors and scholars made remarkable strides in the field of medicine, developing innovative treatments and diagnostic techniques. Zhang Zhongjing, a renowned physician during the Eastern Han Dynasty, authored the influential medical treatise "Shang Han Lun," which provided groundbreaking insights into the diagnosis and treatment of various diseases.

Acupuncture, an ancient therapeutic practice dating back over 2,000 years, stands as another significant Chinese invention. This technique involves the insertion of thin needles into specific points on the body to alleviate pain and promote healing. Today, acupuncture is practised and recognized worldwide as an effective alternative medical treatment.

Chinese astronomers also made noteworthy contributions to the understanding of the cosmos. Shen Kuo, a polymath during the Song Dynasty (960–1279 AD), conducted extensive research on astronomy, geography, and natural sciences. His groundbreaking work, "Dream Pool Essays," contained detailed observations and theories on celestial phenomena, laying the groundwork for future advancements in astronomy.

Conclusion

The Chinese inventors of the past have left an indelible imprint on the world through their groundbreaking innovations and discoveries. Their inventions, ranging from paper and gunpowder to compasses and movable type printing, have had far-reaching consequences, transforming various fields and shaping human civilization. These inventors' contributions in technology, medicine, and astronomy exemplify the spirit of innovation and ingenuity that has been an integral part of China's rich history. Their legacy serves as a testament to the enduring impact of Chinese inventors and their invaluable contributions to the progress of humanity.

Wok – A Chinese Invention

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Go into any Chinese kitchen, whether it be a commercial restaurant or a home, there will always be a certain instrument of cooking sitting upon the stove. Especially in Cantonese or Yue cuisine, this, of course, is the wok. The wok is so essential to Chinese cooking, I'm willing to go as far as to say that the wok is the pinnacle of Chinese cooking. One has to merely be in the vicinity of one in action to understand my view point: blazing orange-red flames burst forth and heat a shallow simmering pool of oil, the delectable food inside the wok gets tossed and turned like a roller-coaster, and deep, flavorful, mouth-watering aromatics fill the hectic kitchen.

The wok is most famous for being essential in any stir-fried dish but can be used in a massive variety of methods which include but not limited to: boiling, braising, pan frying, roasting, searing and steaming.

The wok is one of the staples of Chinese cooking and is deep and round in shape with it most commonly being made of cast iron or carbon steel, though there are different types.

The Chinese wok originated during the Han Dynasty, where it was crafted using raw iron. Skilled Chinese blacksmiths would forge the deep, round cooking vessels at a dangerously high heat of 1600°C, then painstakingly hammer and polish their creations by hand. Despite the 2000-year time gap between the Han dynasty and present day, the process of wok making remains relatively unchanged.

Woks are made of a sheet metal which is cut depending on the desired size and then hammered up to 5000 times to shape. While gently hammered again and again, the iron gets lighter but tougher with higher density. In this way, light and durable woks are produced. Additionally, the surface of a wok that has been hammered is uneven, which allows oil to spread well and prevents food from burning easily. After the manufacturing, it must undergo a seasoning process before it can be used. This ensures that the coating is non-stick and heats evenly during cooking. The wok is first washed in warm, soapy water, then dried thoroughly. Next, every single inch of the wok must be burned over high heat to release the impurities found in the metal. After that, the wok is cooled and a layer of oil is poured in. The oil, which prevents moisture and rust from forming during the cooking process, is then heated until a glossy protective patina is formed. And finally, you're left with a gorgeous fully-seasoned wok.

When you talk to a seasoned chef about woks, another Cantonese phrase will almost always be thrown around and is near synonymous with the wok itself. This phrase is “Wok Hei” and quite literally means “breath of the wok”. This refers to the extremely distinct charred taste and smokey flavor coming from the dish that the wok is cooking. The traditional way to infuse your food with “wok hei” is to cook in a seasoned wok over a high flame whilst being stirred and tossed quickly. In any kind of cooking the sooner you lock in moisture to a protein or a vegetable, the more you enhance its total nutritional value and flavors, which is why chefs use an enormous amount of heat, which can exceed 700 Degrees Celsius, when cooking with a wok. The unique shape of the wok is imperative for cooking food evenly no matter the temperature. The design of the walls of the wok can be broken down into three areas, which are the conduction zone, condensation zone and the convection zone. The conduction zone is the hottest since it is right on the flame and is the best for searing. In the condensation zone the temperature drops significantly, the food is still cooking its just up off the surface. Because of the lower temperature where you're ‘resting’ the food, it won't over-caramelize. And finally, the convection zone, is where food flies freely and finishes off when it's there.

The four great inventions of China are paper, printing, gunpowder and the compass. However, I firmly believe that the Wok should be the fifth as it is one of the cornerstones of Chinese cooking and improves the depth of flavor, plus the quality of life of chefs and their dishes all around the world. Bon Appetit!

New Tales of China's Inventions

St. Margaret's Coeducational English Secondary and Primary School, Lau, Chun Hei – 13

Paper is one of the four great inventions of China. It is a thin sheet of material produced by mechanically or chemically processing cellulose fibers derived from wood, rags, grasses, or other vegetable sources in water, draining the water through a fine mesh leaving the fiber evenly distributed on the surface, followed by pressing and drying. Paper was originally made in single sheets by hand. However, almost all papers are now made on large machines.

Paper is a versatile material with many uses, including printing the tips for this Christmas holiday homework, wrapping Christmas gifts and decorating the venue of Christmas party. Paper is so useful in our daily lives, but do you know how it was invented? Let me tell you!

Paper is an invention that was created in China. The papermaking process was developed around 105 CE by a eunuch in Han dynasty – Cai Lun. Before the invention of paper, people wrote on clay tablets, papyrus, parchment or vellum. Cuneiform characters were placed on wet clay tablets with a stylus made from a reed. The clay and reeds were not expensive. They were easy and quick to make, and easy to dry under hot climate, but clay was not available everywhere. On the other hand, paper could be made from many materials including rags and clay tablets break, so it was more convenient to make paper.

To make paper, Cai mixed mulberry bark, hemp and rags with water, mashed it into pulp, pressed out the liquid and hung the thin mat to dry in the sun.

During the 8th century, about 300 years after Cai developed the papermaking process, this 'secret' traveled to the region that is now known as the Middle East. Yet, it took another 500 years for this skill to enter Europe. One of the first paper mills was built in Spain, and soon, paper was being made at mills all across Europe. Then, as paper became easier to make, it was used for printing important books, bibles and legal documents.

To conclude, although paper can be made easily nowadays and it is convenient for us to use paper, we should thank Cai Lun for his amazing invention and protect the environment by reducing the use of paper.

New Tales of China's Inventions

St. Margaret's Coeducational English Secondary and Primary School, Lee, Bernessa – 12

In Ancient China, many great inventions were made. There were four inventions known as the “The Four Great Inventions of Ancient China”. The Four Great Inventions are inventions from ancient China that are celebrated in Chinese culture for their historical significance and as symbols of ancient China's advanced science and technology. Paper making, printing, gunpowder and the compass were the four items. Let's talk about each item's origin as it gets more interesting. Learning more about our homelands inventions can also enhance our knowledge of Ancient China. These great inventions greatly promoted the development of China's economy, politics, and culture.

First invention, compass. It is known by the public that China may have been the first civilisation to develop a magnetic compass. After it was invented, compass was used for divination and geomancy for centuries. With the help of a compass, ancient people can prevent getting lost in the middle of the ocean or newly discovered land. In Ancient China, as there was a lack of communication with other countries, it was difficult to know that they even existed. The invention of the compass made it possible to determine a heading when the sky was overcast or foggy, and when landmarks were not in sight. This enabled mariners to navigate safely far from land, increasing sea trade, and contributing to the Age of Discovery. In Ancient China, the compass was first used to worship, fortune-telling and geomancy—the art of aligning buildings. In the late 11th to early 12th century, Chinese sailors adopted the compass for astronomical and terrestrial navigation, heralding a new era in the history of navigation.

In addition, a compass includes north, east, south, west, with the north point being red in colour. For knowledge, Shen Kuo, a Han Chinese scientist and public official of the Song Dynasty, made the first known explicit reference to the magnetic compass—needle and the concept of true North.

The birth of paper took place under the Chinese Han Dynasty in AD 105. Ts'ai Lun, a court official, invented a papermaking process which primarily used rags (textile waste) as the raw material with which to make paper. The second great invention of China, papermaking, is a complex process in which paper is produced from pulp, water, filler, and chemicals. In around 100 BC, ancient Chinese people invented paper from hemp, then moved on to using tree bark, bamboo, and other plant fibers to create paper. The invention of paper is a symbol of advanced science and technology in ancient China. Throughout history, it's played a crucial role in the development of writing, printing, education, science, art and culture.

To continue, papermaking can let people have education, for example, let people write on papers to remember things. In ancient China, papermaking can also be used in imperial court for business trading with other countries or informing the emperor about news happening to different places. Example, if there are floods in the Yellow River Plain, officials can write on the paper and send it to the imperative court so that the emperor can be informed about the situation and send out troops or officials to help with the situation there.

The third item, gunpowder. Gunpowder was invented during the late Tang Dynasty (9th century) by Chinese alchemists searching for an elixir of immortality. The original purpose of gunpowder was used to make fireworks for festivals and major events. It was later utilised as an explosive substance in cannons, fire-arrows, and other military weapons. Since there were many battles in ancient China, the demand for gunpowder was relatively high.

Furthermore, with the help of gunpowder, the military power of China has greatly increased. Gunpowder was used to protect one's own country from others during war and to dominate other places for their territories. It was a favourable invention for the ancient Chinese people.

Lastly, the last object from “The Four Great Inventions of Ancient China” was printing. The oldest known printed text originated in China during the first millennium A.D. Printing originated in China, evolving from ink rubbing made on paper or cloth from texts on stone tablets, used during the sixth century. It was invented in China about 700 A.D., making China the country with the longest history of printing in the world. Craftsmen had developed a way to

mass produce books by carving words and pictures into wooden blocks, inking them, then pressing paper onto the blocks.

In addition, the printing press has sparked the “printing revolution”, the popularity of woodblock printing onto paper in China has spread widely across the globe. The knowledge of woodblock printing from China was brought to Italy and many other parts of Europe. Printing has helped ancient Chinese in many different ways. You only have to carve out the word once and put ink on it to print out words rather than writing the same word over and over again. Example, the word “the” is very common and it would take a lot of time to write out the same word, therefore, Chinese craftsmen have invented printing so you only have to soak it with ink and you can get the word on paper without writing it out. Fun fact, the Diamond Sutra, a Buddhist book from Dunhuang, China from around 868A.D. during the Tang Dynasty, is said to be the oldest known printed book!

With all these great inventions invented by China, it has greatly influenced not only Chinese, but the whole world. It has made people's lives easier and more convenient. Nowadays, the inventions have been greatly improved and it has shown how China's invention made a significant impact to the world. We should appreciate every invention made and the effort from ancient Chinese people since they helped us to develop into a better future and have better living.

New Tales of China's Inventions

*St. Margaret's Coeducational English Secondary and Primary School,
Mok, Chun Ting – 12*

Everyone may be familiar with Luban. But do you know why he is so famous? Today we are going to describe LuBan this person.

LuBan was a famous craftsman in the late Spring and Autumn Period, and was honored by later generations as the master craftsman of China. It is said that Lu Ban was born in the Gongshu clan, a large family in the Lu State. Because he was from the Lu State, he was called Lu Ban or Lu Ban. Later, the name Lu Ban became the most widely circulated and became a common name. Lu Ban was born in about 507 BC (the thirteenth year of King Jing of Zhou Dynasty). 40 years later, he lived in seclusion in Lishan (southeast of today's Jinan City, also known as Qianfo Mountain).

Legend has it that the saw was invented by Lu Ban. In fact, archaeologists have found that humans living in China were processing and using toothed stone sickles and clam sickles as early as the Neolithic Age. These were the prototypes of saws. Hundreds of years before Lu Ban was born, in the Zhou Dynasty, people were already using copper saws, and the word "saw" had already appeared.

The following is one of the widely circulated legends about Lu Ban's invention of the saw. The author is unknown. Some people in modern times use this legend to believe that Lu Ban was a pioneer in the application of "bionics"

According to legend, Lu Ban accepted the task of building a huge palace. A lot of wood was needed, so Lu Ban asked his apprentices to go up the mountain and cut down trees. The apprentices used axes to chop, which was inefficient. The craftsmen worked hard every day from dawn to dusk, but could not cut down many trees, which delayed the progress of the project again and again. Seeing that the project deadline was getting closer and closer, Lu Ban was very anxious. To this end, he decided to go up the mountain to personally inspect the situation of felling trees. While going up the mountain, he accidentally grabbed a handful of a kind of weed growing on the mountain and his hand was scratched. Lu Ban felt very strange. Why could a piece of soft grass cut his hand? So he picked off a leaf and observed it carefully. He found that there were many small teeth on both sides of the leaf. When he touched it gently with his hand, these small teeth were very sharp. Lu Ban realized that it was these small teeth that scratched his hand. Later, Lu Ban saw a large locust eating leaves on a grass. The two large fangs were very sharp. They opened and closed and quickly ate a large piece. This also aroused Lu Ban's curiosity. He caught A locust carefully observes the structure of the locust's mouth and finds that the two large teeth of the locust are also arranged with many small teeth. The locust relies on these small teeth to bite off grass blades. Because of these two things, Luban was greatly inspired and fell into deep thinking. He wondered, if it were made into a jagged felling tool, would it be equally sharp? So he used a large moso bamboo to make a piece of bamboo with many small saw teeth, and then tried sawing a small tree. The result was good. The bark was torn in just a few strokes. After a few more pulls, a groove was drawn on the small tree trunk. , Luban was very happy. However, because the bamboo pieces are relatively soft and have poor strength, they cannot be used for a long time. After pulling for a while, the small saw teeth may break or become blunt, so the bamboo pieces need to be replaced. This affects the speed of felling trees, and using too many bamboo chips is also a big waste. It seems that bamboo slices are not suitable as a material for making saw teeth. A material with higher strength and hardness should be found to replace it. At this time, Luban thought of iron slices. So they immediately went down the mountain, asked the blacksmiths to make iron sheets with small saw teeth, and then went to the mountain to try sawing trees. Lu Ban and his apprentice each pulled one end and pulled it up on a tree. As they went back and forth, they cut the tree in a short time. It was fast and labor-saving. This is how the saw was invented. Apart from saw. Lu Ban also invented a lot of invention. For example, umbrella, ink fountain, curved ruler etc.

After we talk about the invention that Lu Ban invented. Let's talk about how people commemorate Lu Ban. Every year on the 13th day of the sixth lunar month is the "Master Lu Ban's Birthday". Many carpenters in the Chinese community, especially Hong Kong and Macao, celebrate this festival. In Taiwan, the seventh day of the fifth lunar month is often celebrated as the Christmas Day of Qiao Shengxianshi. The China Carpentry Trade Union attaches great importance to this festival. When they congratulate the master on his birthday every year, they have a traditional activity of giving out "Master Rice", which is to cook white rice in a big iron wok on the master's birthday, plus some vermicelli, dried shrimps, black beans, etc. It is said that children who eat "Master's rice" will not only be as smart as Lu Ban, but also grow up quickly, become healthy and smart. In addition, on the day of "Master Lu Ban's Birthday", a group of artists will be invited to come back to sing eight tones, or a puppet show will be invited to perform.

Hong Kong celebrates the birthday of Master Lu Ban, which is a major event in the construction and real estate industry. Real estate developers, contractors and even small bosses all treat guests to this day to express their condolences to the staff of all parties. All those related to the construction industry do not need to be invited, they are all guests. among the list. People even created the China Luban Award to encourage construction companies to strengthen management, ensure project quality, strive for first-class projects, and promote the general improvement of China's project quality level. Currently, this marks the highest honor for project quality in China's construction industry.

The Art of Craftsmanship

St. Margaret's Coeducational English Secondary and Primary School, Mok, Garren Shin – 12

A long, long time ago, in a small unnamed town in China, there lived a boy named Cheung Wei, he grew up watching his father create inventions. Inventions that made the townsfolk thing Cheung Wei's father, Cheing Tao was insane. The townsfolk began to complain to the mayor to have Cheung Tao exiled. However, the mayor couldn't really do anything because Cheung Tao wasn't harming others, he was just annoying townsfolk and tricking them into buying his terrible inventions.

As Cheung Wei grew up, the words of this father's inventions had spread all across the kingdom, eventually reaching the ear of the king. Luckily, the king was kind enough to try out Cheung Tao's inventions. Cheung Wei didn't know the full story, but he did know that the invention was bad enough for his father to never return home. Cheung Wei's mother Dou Mei begged the king desperately on what had befallen on her husband, but the king never said a word and ordered his men to kick her out.

Years later, Cheung Wei had become a respectable inventor unlike his father. His inventions helped the townsfolk, like his organic water purifier and automatic harvest machine. He enjoyed the praise and wanted to make more inventions but one thing changed his life forever. His mother, Dou Mei had fallen ill to a deadly disease known as D3A7H. She had went to see all the doctors in China but they all said the same thing, 'You are not long for this world. Only a miracle can save you.' Cheung Wei got angry with the doctors, he was angry that they didn't even try to save his mother's life. He glanced over at Dou Mei, who was on her deathbed. He went over and said 'It's okay, mother. I'm going to make that miracle happen, I promise.' He hired a nurse to take care of his mother while he was away. As he was walking away from the village, the mayor said to him 'You know there's no coming back from this, right? Once you step foot out of this village, who knows how long you're going to spend chasing a miracle? Years? Decades? A lifetime? It would cost you dearly.' 'I don't care how long it takes, I know what I'm doing and I know the price I'm going to pay. But I have to do this. I have to save my mother. She's all I have left.' Cheung Wei replied.

So off Cheung Wei, with only a backpack filled with a week's worth of food and drink, notes and blueprints of his inventions. Within three weeks, Cheung Wei had met many people who helped him find a cure for D3A7H. But they all came up with nothing. No one could help him, Cheung Wei felt hopeless. A few weeks later, he found himself on a hot, dry desert. He had been travelling on the desert for nine days now. His rations were all gone, and his steed who was gifted to him by one of Cheung Wei's friends was dead. As Cheung Wei walked across the desert with the sun blazing down on him, he only thought about one thing. 'I'm so hungry, thirsty and tired. What about mother, though? I don't even know if she's still here, I don't know what's happening to her. I'm so scared for her.' Eventually, Cheung Wei passed out from the heat and exhaustion.

When he awoke, he found himself under a tent, with a fresh set of clothes and food and drink next to him. He also found a man looking at his blueprints and notes. 'Who are you? Where am I? Why are you looking through my backpack?' Cheung Wei asked. 'Ask questions later. Freshen up and talk to me.' The man replied. After Cheung Wei ate and changed into some fresh clothes, he got a better look at the man's face. 'Wait, I know you. You're Lau Wong, the 'Miracle Doctor'!' exclaimed Cheung Wei. 'Yes, I'm the 'Miracle Doctor'.' replied Lau Wong. 'It's a pleasure to meet you, sir. I'm sorry to ask you of this, but I need your help.' Luckily, Lau Wong agreed to help Cheung Wei out, eventually discovering a cure for D3A7H, known as L1V3. After creating the cure, Cheung Wei rushed home to his mother.

'Mother!' exclaimed Cheung Wei. 'I did it! I have found a cure for the disease!' Cheung Wei injected the serum into his mother, praying to himself that it would work. Within minutes, color began to rush back to her face, and her energy seems to have come back to her body. Soon enough, word of L1V3 reached the ear of the king. Eventually, the king's men found Cheung Wei and said 'The king demands your immediate arrival, failure to comply will result in severe punishment.' Without a second thought, Cheung Wei followed the men's orders and brought along L1V3.

When Cheung Wei arrived at the palace, he saw the king waiting outside for his arrival, frantically walking around. Looking at the king, Cheung Wei's blood boiled and his heart filled with hatred. He hated the king for not telling him nor his mother what happened to Cheung Tao. The king invited Cheung Wei into a bedroom, and in the bed laid a beautiful woman, Cheung Wei recognized her immediately, she was Rei Lai, the queen, the wife of the king. 'Please can you help her?' asked the king. 'I'm sorry, I can't help you.' Replied Cheung Wei. All of a sudden, the king got on his knees and begged 'I'm sorry, I truly am, I'm sorry to what I did to your father. My wife, she has the same disease as your mother, D3A7H. When I heard about your father, I heard that invented a cure for D3A7H, my wife had started to show symptoms of D3A7H and no doctor could help her. That's when your father came along and brought the 'cure'. After she took it, her condition worsened and she is in a coma because of it. Blinded by rage, I ordered my men to execute your father. After I realized what I had done, I was too ashamed to face your mother, that's why I never revealed what happened to Cheung Tao. I know I don't deserve your help, but please help me save my wife, she had nothing to do with any of this.' Cheung Wei looked at the desperate king and looked at his wife. He was obviously very angry, but knew if he let his emotions get the better of him, he would harm others like the king. Suppressing his anger and hatred, he took out L1V3 and put it in the queen's mouth. Moments later, the queen awakened from her decade-long slumber. The king, with tears in his eyes, thanked Cheung Wei endlessly. On his way out, a soldier gave him a piece of paper, he read it and realized it was a certificate of ownership of a high-end property that the king owns.

As Cheung Wei and his mother walked into their new home amazed at how big it is, Cheung Wei told his mother what happened to his father and they decided that it was best for them to move on, letting go their anger and hatred in the past to make room for the future and the many fantastic inventions Cheung Wei would on to invent.

Development History of Kites

St. Margaret's Coeducational English Secondary and Primary School, Su, Qing JoJo – 12

Nowadays, when you walk on the traditional Chinese streets, you can always see the kites showing in the showcases. The shapes of kites are different but lovely, such as butterfly, swallow, phoenix and so on. They are also colourful, with a mixture of different colours and meanings. More interesting, according to their shapes and colours, you can tell which province in China each kite is made from. You will be attracted by such an interesting thing. So, you can't help but wonder how much history and culture in China are involved in the development of kites?

As early as the Spring and Autumn Period and the Warring States Period, a man called Mozi made the first kite with wood. But it broke after only one day's use. Then a man called Luban improved the materials of kite. He used bamboo not wood to make the kites. In the Sui and Tang Dynasties, the materials of kite were more advanced when the kites were made of paper.

In the past, the kite was considered as a tool for message sending and military detection. The most presentative example is that the Emperor Wu of Liang was trapped in the city by rebels. Facing the critical moment, a minister tied the plea for help on the kite and let it fly away in order to get support. Although the emperor failed to be rescued, this case shows that people use kite to send messages to others in the past. Also, during the period of the War of Chu-Han, a general named Hanxin, who was famous for The Battle to destroy Zhao, used the kite to measure the distance of the tunnel below the palace.

In the 13th century, an Italian merchant named Marco Polo came to and brought Italian culture to China. After he went back to Italy, he brought Chinese culture to his country, including the culture of the kite. As a result of which, the culture of the kite became popular in Western world.

Nowadays, the meaning of kite changes a lot. Flying kite becomes an activity for leisure and entertainment, instead of a tool to communicate. During Qingming Festival, children and adults usually fly kites on the lawn to celebrate the revival in all unions with the advent of spring. In addition, there are kites everywhere on traditional Chinese streets and you can even see some old men are making the kites! Moreover, doctors believe that flying kite can cure whiplash. So, many people like to flying kites for health. In Chinese culture, there are many poetries and stories writing about kites, some praised the consummate skills of making kites, where others recorded the scene of children flying kites.

There are many inventions in China. However, I think the most interesting invention is the kite. It combines a long and colourful history and is still loved and appreciated by the people until now.

The Great Inventions of China

*St. Margaret's Coeducational English Secondary and Primary School,
Yue, Tsz Ching Janice – 11*

Speaking of Chinese inventions, what invention first comes to your mind?

This question often makes people feel bored. Because it is so meaningless, just like what I say very often, "There is no wonder in the world". To be explicit, I think it is more appropriate to say: "Nothing more interesting can be found nowadays!"

But how about in the past? Sometimes things that you think are boring and nowhere to be found are very valuable in the eyes of the others. Namely, Chinese culture and are what countless people dream of and devote to. To me, speaking of ancient Chinese inventions, the greatest inventions are gunpowder, papermaking and movable type printing among the four great inventions.

Let's talk about gunpowder first. Some people might disagree the use of gunpowder in wars, but the truth is, it is functional in many aspects in the society. In ancient times, emperors hoped to live forever, so they ordered Taoist priests to refine sulfur, saltpeter, cinnabar and mercury, and then boil them on the fire. During the Western Han Dynasty, a young Taoist priest forgot to watch the medicine in the alchemy furnace and fell asleep. While he was dreaming, he only heard a loud "boom" and the alchemy furnace exploded. He shouted, "Something happened to gunpowder!" From then on, the word gunpowder came into use. People noticed the huge explosive power of gunpowder and finally developed the world's earliest explosives. From then on, explosives were used to open mountains and build roads, or in military warfare. Since the advent of explosives, it has brought benefits to mankind, but also brought disasters to mankind. Of course, this is not the fault of the inventor of dynamite or the dynamite itself, but the responsibility of those in charge of the dynamite.

The second is papermaking. This invention makes our lives better, and we also use paper products in our daily lives. From ancient China to the Western Han Dynasty, people wrote on sheepskin or cloth. This was very expensive, so the poor had to use bamboo slips to write, but bamboo slips were very bulky. During the Eastern Han Dynasty, in order to invent a cheap and simple writing instrument, Cai Lun, a minister of the Central Committee, visited many craftsmen and ordinary people, and after many experiments, he finally made the world's first paper using tree bark and fishing nets. The invention of papermaking brought about a revolution in writing, making it possible for poor people to write and read, and making books widely circulated.

Finally, there is movable type printing, which is like using a seal to print a pattern on paper.

Bi Sheng, a native of the Northern Song Dynasty, worked as an apprentice in a printing studio since he was a child. He saw the master carving characters on the entire board. Just because one character was broken, the entire board could not be used. He thought that it was a waste of manpower and material resources. So Bi Sheng carved a word on each small wooden block, and then put them together for printing. He discovered that wooden movable type easily swelled when exposed to water, so he later switched to using clay-fired movable type for printing. Bi Sheng's invention speeded up printing and saved labor. His invention was 400 years earlier than European metal movable type printing.

I think Chinese inventions are really great, because they cannot change our previous lives, but they also allow us to use these improvements to achieve a better quality of life in modern times.

AngelEyes – The Wings of Perception for the Blind to Take Flight

St. Paul's Co-educational College, Seto, Ching Grace – 16

China's contributions to human civilization are as diverse as they are significant. From ancient times to the modern era, Chinese inventors have pioneered groundbreaking technologies that have revolutionized various aspects of life. The Four Great Inventions of Ancient China are classic examples of her consistent innovations, yet new tales of China's inventions have been entering the scene following the rise of technology. Beyond the familiar, commonplace narratives, the Chinese together orchestrate inventions of imagination and brilliance, creating momentous feats of human ingenuity.

According to the World Health Organization, approximately 253 million people worldwide have visual impairments, with 36 million of them classified as blind. Conventional pleasures of life that the average person is entitled to, from reading a book to watching television, come across as unattainable to the blind. Undoubtedly, success stories remain, such as Helen Keller writing up to 14 books, but such exceptional cases are but a needle in a haystack. Blindness permanently scars an individual's quality of life, independence, and access to opportunities – be it education or employment. Fortunately, AngelEyes recognises this long-standing issue and addresses it.

AngelEyes is an extraordinary wearable technology that has emerged as a new thread sewn into the tapestry of China's inventions – a pair of smart glasses designed to assist blind individuals in navigating and perceiving the world around them. Developed by Next VPU, a pioneering software development company based in China, AngelEyes utilizes artificial intelligence (AI) and sensors similar to those used in autonomous cars to provide a range of functionalities.

Contrary to popular belief, this gadget that assists the blind is not a pair of glasses. In terms of the “Wearable Version”, it is rather a device attached to the temple of glasses. It is identifiable by its rectangular shape, with a touch bar in the center and a camera at one end. The power button and charging jack are located at the side of the device for wearers to easily locate by touch. For the “Desktop Version”, the device is shaped in a conical frustum with an camera extension at the top to scan items placed in front of it. The power key as well as USB inlets align at one side of the frustum, again for ease of access. Despite a slight divergence in their specifications, the two AngelEyes Versions share the same remarkable features.

One of them is its ability to detect objects, enabling blind users to navigate their surroundings more safely and independently. By leveraging AI and sensor technologies, the smart glasses can identify and alert the wearer to potential hazards in their path. Thus, AngelEyes provides a platform for the visually impaired to freely travel, uninterrupted by obstacles. In addition to object detection, AngelEyes also incorporates other functionalities to enhance the blind user's experience. It can recognize different banknotes, enabling individuals to independently identify and handle money. The glasses also assist with text reading, allowing users to access written information, such as signs, menus, or documents, through optical character recognition (OCR) technology. OCR begins with capturing an image of the text to be recognized, using a scanner or a specialized OCR device. Once the image is secured, OCR software performs preprocessing steps to enhance the image quality and optimize it for character recognition, involving operations like noise reduction, skew correction, and normalization of the image with OCR algorithms. Post-processing steps are then applied to improve the accuracy of the recognized text, including dictionary look-up, language modeling, and context analysis to refine the results and enhance the overall accuracy of the recognized text. Moreover, AngelEyes is equipped with the capability to recognize colors, enabling users to differentiate between various hues. This feature can enhance their perception of the environment and aid in distinguishing objects or elements based on color cues. The glasses can also detect different levels of light intensity, providing valuable information about the brightness of the surroundings.

Ultimately, one of the most impressive aspects of AngelEyes is the compactness and portability of the technology. Founder Feng Xin Peng has managed to fit a powerful AI system into a mere 45-gram pair of glasses, alongside the necessary sensors and processing capabilities. This maximizes the convenience and subsequent satisfaction derived

from putting AngelEyes into use. The achievement is notably commendable, considering that similar technology would have been deemed impossible to fit into such a miniscule form factor just a few years ago.

The development of AngelEyes represents a significant advancement in the application of AI and wearable technology to improve the lives of blind individuals. By providing unprecedented functionalities, the smart glasses embody an international breakthrough in human intelligence, offering greater independence and access to information for the visually impaired.

Over the past years, China has made numerous efforts to elevate the quality of the life of the blind. Students from the Kunming University of Science and Technology, for example, invented the helmet Eye See to detect obstacles within three meters using a laser radar, while professors from Zhejiang University developed a pair of glasses to collect information about the wearer's surroundings, converting it into audio signals. The aforesaid inventions are undoubtedly great leaps in human technology, yet pose inconveniences to users in real-life contexts and interactions, not to mention the robotic mechanics attracting unwanted attention from passers-by. Thus, the preceding inventions, though impressive by themselves, pale in comparison to AngelEyes. They set the stage for AngelEyes to ameliorate and, even, completely eradicate the concerns of the blind.

Though possessing numberless perks, AngelEyes still bears room for improvement. To further refine and enhance AngelEyes, connectivity and accessibility should be emphasized: the smart glasses can be connected to other devices or networks, enabling seamless access to digital content, applications, and services. For instance, this connectivity can facilitate the integration of screen readers, navigation apps, voice assistants and other assistive technologies, providing a more comprehensive and holistic support system personalized for individuals with visual impairments.

AngelEyes serves as a testament to China's commitment to technological innovation, pushing boundaries, and finding creative solutions to address societal challenges. Bold and groundbreaking, it exemplifies how advances in AI, miniaturization, and sensor technologies can be harnessed to create revolutionary inventions that positively impact people's lives.

A Seed of the Future

St. Paul's Secondary School, Lau, Tsz Yi Stella – 12

In a world where human desire and inventive thought are the primary means of weaving time together, an enigmatic force known as Fibre Optics is at work. It is more than just a tool; Sir Charles Kao Kuen's inventive genius gave rise to a conscious being. It is a real-life illustration of human ingenuity as well as the limitless potential of the human mind and the unbroken power of perseverance.

The story of Fibre Optics history is not merely a history; rather, it is a tale that encompasses time and the tremendous history of human ingenuity. It began at a pivotal moment: the illustrious Nobel Lecture delivered by Sir Charles Kao on December 8, 2009. In the hallways, Kao's words transformed into an insightful hymn which honoured the brilliance of technological progress while resonating with the sounds of contemplation.

However, the roots of Fibre Optics can be found far further back in the fertile ground of Professor Kao's inquisitive mind. In 1966, he posed two key questions, setting off a global scientific inquiry into previously unheard-of technological domains: "Is the Ruby laser a suitable source for optical communication?" along "What material possesses sufficiently high transparency at such wavelengths?" These inquiries served as catalysts for the birth and growth of Fibre Optics, much like seeds planted in innovation that has the power to totally change the communication landscape.

Kao's questions sparked a strong wave of resolve and interest that spread across the scientific research channels. As they responded to Kao's provocations, the labs were bustling with activity. Extensive tests and theoretical discussions sought to reveal viable sources and materials with outstanding transparency. In pursuit of elusive solutions, scientists navigated a complex network of experiments. Their dedication extended beyond just studying science and took the form of an unwavering quest for technological progress, a resilient tapestry, and sleepless evenings filled with the excitement of discovery. In addition to looking for parts and laser sources, the mission was to establish a connection that would enable the transmission of human speech over hitherto unimaginable distances. The incessant efforts being made in laboratories around the world were driven by the goal of connecting people, communities, and worlds together.

Fibre Optics evolved gradually over several iterations, rather than appearing completely from nowhere. It came about as a result of extensive experimentation, constant recalibration, and trial and error. Every thread that was woven into this cutting-edge technology symbolised not just scientific discovery but also the tenacious pursuit of seemingly impossible goals and the resiliency of the human spirit. Nevertheless, a solid support system worked discreetly in the background amid the scientific intensity. Gwen May-Wan Kao was a silent force behind the scenes, but she was a tower of support and unwavering encouragement. Her unshakable faith in Sir Charles Kao's ideas and unsaid contributions laid the foundation for his ceaseless search for innovation.

The history of Fibre Optics is intricately linked to the everlasting innovation of Chinese people throughout history. It was a monument celebrating China's rich history of ground-breaking discoveries rather than just a single story about a person or a breakthrough. It highly regarded a range of modern and historical innovations weaved together to represent the country's constant commitment to innovation across time. It went beyond being a single incident or technical turning point, representing a long history of innovations that show how committed China has been to innovation throughout her history.

The historical journey of Optics goes beyond simple historical recall, echoing into the present and the future rather than simply existing as a light echo from the past. It is a captivating suspenseful composition that captures the unwavering creative force that entices individuals to explore new frontiers. This timeless tale stands as a testament to the creative capacity of the human intellect, showing that anything is possible if one has unwavering resolve, an insatiable curiosity, and an unrelenting drive for progress.

The epitome of innovation, Optics, muses over the convoluted path that led it to the universe of endless time. Optics weaves a path through the complex tapestry of its origins, illuminating the gleaming threads that result from the never-ending search for the perfect source and the ongoing development of materials. These memories bring us to a time when the discovery of light-guiding strands represented more than just a scientific finding; instead, it symbolised unwavering dedication and relentless pursuit of an endeavour.

This journey provides insight into the past as well as the future. In this reflection circumstance, Fibre Optics imparts consciousness to its existence in this reflection state. It sees itself as more than just a conduit; it wants to be an ethereal link that connects communities and continents, allowing voices and data to travel at speeds beyond the realm of the possible. It yearns to be the link that shrinks vast distances across the globe to fleeting moments, surpassing tangible barriers and uniting individuals on a global scale.

The tale of Fibre Optics and the understated yet vital part presented by Mrs. Gwen May– Wan Kao are perfectly interwoven in this radical story of invention. Her unwavering support and inconspicuous contributions were crucial in fostering Sir Charles Kao to pursue his ceaseless quest for novelty. Her silent support became an unseen but essential thread woven into the fabric of Fibre Optics' birth, highlighting the crucial support in the journey of trailblazing invention.

China's magnificent historical inventiveness melds smoothly with Fibre Optics, highlighting its contemporary technological marvels and enhancing its history of ancient inventions. Both historical innovations like the compass and paper, as well as today's incredible technological marvels like solar panels, WeChat, and TikTok, demonstrate China's unwavering devotion to innovation. The story of Fibre Optics' development gains layers of complexity and depth from this diverse terrain.

Fibre Optics' account of its development serves as a striking example of how technology is advancing, honouring Sir Charles Kao Kuen, the remarkable intellectual whose insight sparked a revolution. This narrative combines creativity, history, and the resolute nature of the human spirit to tell the tale of how this ground-breaking technology came to be. The way the plot unfolds is reminiscent of an old tapestry, with each thread cleverly woven together to form a timeless story. However, the story of Fibre Optics transcends time; echoing like a symphony, it echoes not only as a remnant of the past but also as a melody extending into the time to come. It democratises access to human knowledge and cultivates universal connectivity: marking a new era in history. It represents a sense of expectation and the unwavering core of ingenuity.

This story is an enduring tale that honours the boundless powers of the human mind and the unbridled heritage of wisdom. It is, above all, a monument to the never-ending pursuit of progress. The innovative and historically splendid story of Fibre Optics is a monument to human perseverance and the eternal potential of intelligence; this victorious seed is continually germinating and growing to an everlasting future.

Sustainable Inventions: From Paper to Recycled Cars

St. Stephen's Girls' College, Wong, Katelyn – 13

China created many inventions, and the most notable ones we all learnt about in primary school is, of course, the four great inventions – papermaking by Cai Lun, printing by Bi Sheng, the compass by Shen Kuo and gunpowder by Chinese alchemists. These inventions helped with the development of the world, and even to this day, we still use them, whether for a good or bad cause.

One of the most famous inventors is Cai Lun, a pioneer in paper making. Cai Lun was born during the Eastern Han Dynasty. Bamboo, wooden slips, shells or bones were used for writing or carving in ancient times. Some alternatives were silk and cloth, which were extremely expensive, so not everyone could afford it. As it wasn't convenient, Cai Lun decided to solve this problem by making paper himself. He boiled bamboo, old rags, tree bark and fishnet into sludge, and mixed the sludge with water after beating it. Then, he poured the mixture into wooden sieves, squeezing out the excess water. After drying the sludge, the dried residue called paper was ready to use.

In 105 AD, Cai Lun notified the emperor about his invention, and the emperor was quite impressed. Cai Lun was praised for his invention. This new invention was cheap, and the materials needed were easily accessible. The invention of paper helped with the development and the spreading of information throughout the world. Without this invention, generations might not have been able to pass on factual information or ancient traditions to modern times.

But with the rise of technology, electronic books are slowly replacing hard copies. Along with the changing times, artificial intelligence has recently become the newest trend and many countries strive to produce the latest AI inventions, hoping to improve the human lifestyle. China is the leader in artificial intelligence research and inventions. Not only that, they also invented self-driving cars which help improve accessibility for citizens, including people with disabilities. According to research by the World Health Organization, there were about 1.25 traffic deaths in 2013. Having self-driving cars will minimize traffic accidents, as they can prevent drunken drivers from causing car accidents.

Based on the invention of self-driving cars, I thought of an invention that would combine the newest technology with environmental protection. The invention I thought of is a self-driving recycled car. My invention can reduce gas emissions and slow down climate change, using the power of technology.

This car will be powered using electricity and solar power which will be provided by portable solar panels on the roof. The remaining solar power can be used for other purposes if some remains after powering the car. This will reduce gas emissions produced by cars. Not only that, the car won't be made entirely from its usual materials like new steel, but instead with recycled materials, micro-plastic waste and blended shells with bones collected from food waste. About 95% of vehicles are recycled every year. Think of how many cars there are! If we can use recycled car materials, it will reduce overcrowding landfills or junkyards with these large objects, and reduce over-producing different materials for cars, so it will minimize waste. Research stated that about 80% of a car is able to be recycled, so the suitable recycled materials can be mixed together to create a more environmentally-friendly car shell.

To address flat tyres, the car would be made using stronger materials. Old plastic bottles, flat tires, plastic utensils, recycled rubber and furniture would be combined to create tyres. Micro-plastic will also be added to create a tougher, more sustainable car tyre. Without all this waste, it would provide more space in the landfills and to protecting the nature.

The paint for the car will be made with a special substance called chlorophyll. Chlorophyll causes photosynthesis – making plants absorb carbon dioxide and release oxygen when encountering sunlight. By mixing chlorophyll with the usual vehicle paint, we will help increase the amount of oxygen and to reduce carbon dioxide. This can freshen the air quality in a polluted city. Chlorophyll paint can be mixed with different acrylics or pigmented colors and sprayed onto the car.

Finally, the car will incorporate technology of artificial intelligence. There will be a music system and GPS system built in. An AI assistant will also be added to the dashboard screen to provide suggestions for the route or popular holiday areas. There will also be two auto-pilot functions. One is the full self-driving mode, which enables the driver to sit back and relax while the AI takes over and drives the car. The other function is the semi self-driving mode. When AI camera sensors are set up around it, the car senses that an accident might happen, it will take over and avoid the hazard on the road.

This invention will benefit the future of citizens' safety and protect the environment, minimizing harm to the environment. As the power of technology improves every day, someday this invention might even become a reality. Who knows?

The key to inventing is creativity, curiosity, a desire to strive forward and improve. If the Chinese Taoist alchemists didn't have the curiosity to find the life-extending elixir, they wouldn't have discovered gunpowder! Without wanting to improve peoples' lives, Cai Lun would never have discovered paper making. If Bi Sheng didn't have the desire to improve the printing technology, we would still be using old stamps and carving letters into stone blocks.

All these Chinese inventors inspired us to let our imaginations run free, and to create something that will be useful and meaningful. During the brainstorming process, we can learn so much!

China: a Tapestry of Ingenuity

Victoria Shanghai Academy (Secondary), Van Olphen, Dani Pieter Mahmoud – 12

In the labyrinthine corridor of human history, one civilization illuminates as an iridescent beacon of innovation and development. You may wonder, what could this nation possibly be? This civilization is Ancient China. China is a land steeped in an existential understanding of wisdom, a resplendent tapestry of ingenuity.

Globally, it is acknowledged that Ancient China is home to some of the world's most rarely recognized and heavily validated inventions. The Four Great Inventions of Ancient China were papermaking, printing, gunpowder, and the compass. China therefore was a world leader in ancient technologies. From this evidence, I propose that Chinese inventions have had a gargantuan impact on innovation and creativity on our planet as a whole. Furthermore, China's modern-day ventures of pursuing advancement in technology and transportation continue to inspire and lead the way toward a future of revitalization. In this essay, I will explore how this spirit of ingenuity might continue in the future, demonstrating how seeds were planted in the ancient inventions that have now bloomed in our modern day.

The first great invention, papermaking held great potential to impact society. Paper is a daily essential for the average human, used by the entire world every single day. 10,000 sheets of office paper per year are used by the average American. (O'Mara) The story behind the ingenious idea of papermaking all started in 105 CE. Cai Lun made this by pressing and soaking plant fibres, then drying them in sheets on wooden frames. This was revolutionary for Chinese people since paper was significantly cheaper and more practical than other forms of writing. (Cartwright) This demonstrates how China is ingenious since it shows how China was able to solve the problem of cheap and efficient forms of writing. Therefore, we can see how China is capable of solving its problems and also creating revolutionary inventions. This contributed to the ingenuity of China as earlier means of paper were far less advanced such as parchment or papyrus. China's modes of writing have been further developed to the point where it reaches the digital sphere. A notable example of this is the famous communication company, WeChat. WeChat has a completely digitized means of communication with instant connection via texting with anyone across the globe? WeChat has taken over paper as a faster means of communication, with 1.3 billion people using the app. With WeChat, China is deemed to be a powerful and leading figure in the industry.

The second great invention, printing, was responsible for the spreading of literacy. UNESCO estimates that around 2.2 million books are now printed every year. Printing is one of the most used essential technologies of today. Woodblock printing was the earliest example of printing, which involved transferring images and text onto sheets of paper using carved blocks of wood. The first real printing technology was done by using waxed paper, ink impression, and reverse image. Printing is done by applying ink to block, laying paper, and pressing. This is significant as printing was responsible for spreading different types of literacy, leading to higher rates of literacy in ancient China compared to Europe. Literacy is still a major part of our modern-day society as this is taught in our education and working systems. In terms of ingenuity, printing didn't become significant in Europe until the invention of the printing press in 1436. The fact that Europe was less advanced in such technologies shows that China is an original and influential inventor. This ingenuity has proven itself, with the unprecedented technology of 3D printers that can print houses. A Chinese business has reportedly created ten full-sized, detached single-story houses in a single day using massive 3D printers, according to the BBC. ("China: Firm 3D Prints 10 Full-Sized Houses in a Day") With China's original invention of woodblock printing, and now 3D House printing, we can see that China is a consistent tapestry of ingenuity. There is a problem of housing in China due to its massive population; with this technology, it is being addressed and shows China's ability to overcome problems with its innovation.

The third great invention, gunpowder, was helpful in siege warfare. Gunpowder is used in a variety of different weapons, such as a fuel for guns, artillery, rockets, and fireworks; it can also be used as a blasting agent for explosives used in mining, quarrying, and the construction of pipelines, tunnels, and roads. The backstory of gunpowder is rather fascinating as it was accidental. Around 1000 A.D., Chinese Taoist alchemists mixed elemental sulfur, charcoal, and saltpeter to create a concoction that would grant humans immortality; this is how gunpowder was created. It was useful for China in blockade tactics, to fend off invaders and helped defend and protect borders. Without such gunpowder, China would not have its enormous military advantage. English soldiers did not use guns or gunpowder in warfare until the Battle of Crécy in 1346. Therefore, the significance of this invention is that it was a necessity for China's military advancement advantage. In the present, we can see how China continues to make life-altering technologies to eventually surpass other countries globally with their military forces, which has been actively demonstrated with AI being used to help battlefield performance. Modern warfare technologies have been shifted to the cyber domain. Chinese researchers plan to upgrade nuclear submarines with artificial intelligence, aiming to create a \$150-billion AI industry by 2030. AI applications include cyber and electronic warfare, drone targeting, and battlefield decision-making. Ancient prowess has been further developed.

The fourth great invention, the compass, was a form of direction-indicating tool, which is widely used in navigation, exploration, and other fields. Compasses are used today to help determine one's orientation, especially when traveling in unfamiliar locations. During the Han Dynasty, lodestone—a magnetic iron stone—was used to make the first compasses. By the middle of the eleventh century, under the Song dynasty, it was known as the "South Pointing Fish" and was utilised for land navigation. ("History of the Compass") It was an everyday tool for traders and explorers, therefore, it had a profound influence on trade, war, and cultural exchange during the Han and Song dynasties. With our modern-day society requiring more efficient means of travel, China has constructed the infamous High Speed Rail system with success. China has constructed the longest high-speed rail network in the world, spanning 124,000 km, or more than 22,000 km. It ran 2,595 high-speed trains by 2016, which made up 60% of all high-speed trains worldwide. (王亚梅) When thinking back to the great invention of the compass and comparing it to the modern-day invention of high-speed rail, we can see how China has always been an involved and dominating nation in navigation and direction. In the past, an average explorer would plan their journeys for years and dedicate their lifetime to it. However, with China's invention, it has truly simplified the process of travel. The modern-day traveler just needs to catch a train and in a few hours, you will arrive on a whole new continent. China has continuously advanced its technology, to the point where its high-speed rail accounts for 60% of the world's network of high-speed trains.

In conclusion, with so many life-changing technologies and inventions, I believe China has proven its solid legacy and can only continue its reputation for ingenuity. The above-mentioned four great inventions had different impacts on different aspects of evolution. However, with these four great inventions, how can we predict the bright future of China? With the great invention of papermaking, we can see how this basic form of communication is now inevitably transforming into different forms, with the introduction of Artificial Intelligence into our lives. China has introduced already a new restaurant in Shanghai where robots are the cooks and waiters. Humans can now communicate in a further sophisticated way with China being ahead of the AI curve. China's early experimentation with gunpowder is now also seen in its adaptation of modern warfare using AI. China has developed a new form of warfare known as intelligent warfare, where weapons are now strategized to avoid casualties. In terms of printing, China has shown how she had managed to use 3D printing to create houses and hospitals in a matter of days during the COVID-19 pandemic, saving many lives with this quick ability to adapt to situations and emergencies. Furthering China's invention of the compass, China is pushing ahead with its respected high-speed rail technology that can connect with many countries. China has shown its dominance, by expanding its network with the creation

of the new Silk Road and we can anticipate a lot of trade and economic growth for China and its partner countries. China has shown its ability to craft influential inventions from the beginning of time, innovating these inventions, and creating new ones along the way up to these present times. We shall see and be amazed by many more great things that future China has in store for us!

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Liang's Revelation With Ink: The Birth of Woodblock Printing

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In the ancient realm of China, amidst the bustling village residence, there lived a man whose brilliance surpassed that of his peers. This scholarly individual, known simply as Liang, possessed a profound love for books that bordered on obsession. His name echoed through the narrow streets of the village, whispered everywhere he went, for he was practically a legend among the locals.

On a particular day, Liang heard footsteps encroaching his front door. Shortly after, “Knock, Knock”, he figured that a visitor was here. Turns out it was Choi, the village chief with a task at hand for Liang to complete. He had to translate the Bible into Chinese with 500 copies. He tried to decline but there was no other choice. Liang was the only intellectual individual around. He was unable to decline with the knowledge in his hands and the anticipation of his friends boiling.

The next day, the sky was covered in an ominous cloak of grey, an imminent storm brewed in the distant horizon. The air hung heavy with anticipation, as if nature itself was aware of the storm raging within Liang's soul. The weather mirrored his inner turmoil, as he was deeply frustrated by the vigorously treacherous process of copying passages by hand from one piece of paper to another. As the rain drummed relentlessly against the roof tiles, Liang found himself confined within the walls of his comfy abode. The inkwell, filled with its pitch black liquid, stood as a catalyst representing his unyielding determination. Yet, with each painstaking stroke of his brush, his patience wavered, and his agitation grew.

In a fit of exasperation, Liang's hand forcefully slammed with the wooden surface of his work table, causing the inkwell to fly into the air and the ink to spill forth in a chaotic dance of droplets. As his eyes closely followed the ink's descent, a peculiar sight unfolded before him. The ink, like a silent serpent, slithered its way into the crevices of the woodblock, leaving behind an intricate trail of darkness. In that moment of revelation, Liang was simply in shock. His eyes widened as he beheld the marvel that lay before him. The ink, seeping into the wood's cracks, had birthed something extraordinary. Accurate and identical characters emerged from the once rough surface, as if the ink itself had gotten a mind of its own.

With a heart filled to the brim with excitement, Liang shared his discovery with his fellow scholar friends, who marvelled at the ingenuity of his accidental creation. He immediately travelled abroad to spread the word to others about his brilliant invention. He travelled to large cities such as Beijing, Shanghai and Hong Kong. Many of the presentations were successful with the scholars flabbergasted. They too, were bewildered by the ink's ability to create perfectly intricate characters onto the smooth sheet of canvas. The news of this miraculous invention spread like wildfire, igniting a craze among the villagers. Word of Liang's newfound technique reached the farthest corners of the town, sparking curiosity and wonder amongst the people. They flocked to witness this remarkable phenomenon, eager to witness the birth of a new era. Word of the village's cultural innovation reached the imperial court, capturing the attention of the Emperor himself. Impressed by the profound impact of woodblock printing, the Emperor bestowed upon Liang a prestigious title, recognizing his invaluable contribution to the realm's cultural heritage. He was also given the crucial task of translating many famous western books into Chinese, allowing for the literature we have now to be accessible to the ancient Chinese and us. Liang, who was propelled by a thirst for knowledge, embraced the opportunity to share his invention with the world and make his name known to the world.

The art of woodblock printing, as it came to be known, spread as quick as a flash of light throughout the land. Liang's humble village became the epicentre of this revolutionary technique, as artists and scholars all honoured Liang's craft. The written word, once limited to the realm of tiring copying, now flowed effortlessly from the hands of skilled craftsmen. As the ink-drenched woodblocks were pressed onto paper, the characters emerged with unparalleled clarity and precision. The collective wisdom and imagination of countless ancient Chinese minds were immortalised

in ink, capturing the essence of ancient China's rich culture and heritage. The printing press became a beacon of enlightenment, illuminating the minds of the masses and bridging the gap between the literate and the illiterate people in the country.

Liang, the brilliant pioneer whose frustration birthed a revolution, stood at the forefront of this transformative era. His legacy, which has been forever etched in the cloth of history, served as a symbol of the power of creativeness and the boundless potential of the human mind. In the realm of ancient China, amidst the stormy weather that mirrored Liang's rage inside his heart, a profound discovery emerged. Through a very accidental accident, the ink's dance with the woodblock birthed a revolution that forever changed the course of history. And thus, the art of woodblock printing was born, bringing with it, a new era of knowledge and enlightenment.

China's Great Leap in Nuclear Fusion Technology

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Since the Industrial Revolution, fossil fuels have been the main source of energy. As a result, global warming has proven to be one of, if not the most pressing issues present worldwide. Moreover, the constant growth of population has given rise to another dire problem – Global energy crisis, that is, constantly increasing electricity and gas prices across the globe. Now, you may ask: How do we solve these problems? Well, there is one technology that many leading countries are researching, with our home country China leading in research – Nuclear fusion energy, the holy grail of clean and renewable energy.

Before we talk about nuclear fusion, there are some things we first need to understand. Why are these problems so difficult to solve? Why not just build more burners, or use renewable energy? Well, it is not as simple as that...

Since the beginning of human civilisation, our energy consumption has been increasing exponentially. To tackle this, we have found exponentially increasing efficient methods to obtain energy. For example, the discovery of fire has led to an explosion of groundbreaking technologies for the time such as cooking. Another great breakthrough was the Industrial Revolution in the 19th century when we started burning coal and oil. The drawback of this was that these burners released extreme amounts of carbon dioxide, and the intensified greenhouse effect was not noticed until decades later. Is this really all we have for making energy? Well, we still have nuclear energy, which involves splitting heavy atoms, but the resource used, uranium, as well as the side products, are highly radioactive, which could cause cancer and mutations.

So, how is fusion energy so much more reliable than burning coal and nuclear energy, then? To answer this question, fusion energy is at least four times more efficient than nuclear energy while at the same time being completely safe to the environment. These will be explained in further detail later.

After all that, what even is nuclear fusion? Nuclear fusion involves the collision and merging, or fusing, of atoms. This is the very process that holds our host star, the Sun, together. In the core of the Sun, temperatures reaching 15 million degrees Celsius creates a hot plasma where hydrogen atoms can freely collide and fuse into helium, creating an outward pressure that pushes against gravity. This kind of energy is what we are currently researching for, in a sense putting the Sun on Earth to harness its energy.

With that said, China has been actively researching nuclear fusion, and unbelievably, our country is the leading country in terms of research, with multiple major breakthroughs in just a few years' time. So far, China has constructed a large network of fusion reactors across various locations in major provinces, such as the China Fusion Engineering Test Reactor, or CFETR and the EAST reactor in Hefei, Anhui, as well as the J-TEXT reactor at Wuhan. Recent breakthroughs in fusion technology have also appeared: the Huanliu-3 fusion reactor has 'realised high-confinement mode operation with a plasma current of one million amperes', according to the China National Nuclear Corporation, which marks an important milestone in China's fusion research, as well as in the global development of fusion energy.

This begs the question: Is nuclear fusion energy an extremely advanced technology only to be fully implemented in the distant future? Well, nuclear fusion on certain levels have already been fully understood by scientists, however these levels are either too insignificant or so effective it becomes dangerous.

On one extreme, we have the particle accelerator. It is capable of carrying out nuclear fusion, speeding up atoms to near the speed of light. However, more energy is used to support the reaction than the total usable energy output, making it only for research purposes.

On the other end of the spectrum, we have the hydrogen bomb. It is also capable of carrying out nuclear fusion, causing a chain reaction that releases so much energy in the process it destroys entire cities upon detonation. It is extremely uncontrollable, making it impossible to efficiently use the energy.

The balance of these two extremes will be the benchmark for nuclear fusion energy, where we could control the magnitude of energy output. We have already managed to release more energy than we put in, making a net power output. We just need to sustain the reaction for long enough, which is predicted to be possible by 2035.

Now, we will talk about the multiple benefits fusion energy will provide once implemented on a large scale. Firstly, and most importantly, it is a completely clean energy source, releasing no greenhouse gases at all while needing little to no radioactive materials. Fusion energy forms helium-4 after reaction. This is the most common and stable isotope of helium and is completely safe even when inhaled. It also poses no harm to the environment, as both marine and terrestrial wildlife are unharmed when in contact with helium-4, as well as not absorbing heat nearly as much as greenhouse gases such as carbon dioxide and methane. The reactants needed for nuclear fusion are also safe, being deuterium, a stable isotope of hydrogen, and helium-3, which is also stable. These factors will greatly alleviate, if not completely solve, the issue of intensifying greenhouse effect, and when paired with reforestation, we may even start to see a decrease in global carbon dioxide levels. The nature of fusion reactors also removes the possibility of a meltdown incident, as the reaction is difficult to sustain and only a small amount of fuel is used at a time. Therefore, there is no risk of a runaway chain reaction that could cause explosions, guaranteeing the safety of nearby civilians.

Secondly, fusion energy is easily renewable. The reactants, as mentioned, are deuterium and helium-3. Deuterium can be commonly found in sea water as what we call 'heavy water' and can be extracted through electrolysis. Helium-3 can be found in large reserves on the surface of the Moon, which can be extracted in the near future when space technology is more advanced. This removes the worry of running out of fuel to keep fusion reactors running.

Thirdly, fusion energy is extremely efficient and can generate an enormous amount of energy in a relatively short period of time. Research has shown that the energy output of a single kilogram of nuclear fusion fuel equates to burning 10,000 tonnes of fossil fuels. This will greatly boost the energy output potential of our civilization, allowing for more advanced inventions and discoveries, as well as the opportunity to advance greatly in space technology and exploration, potentially allowing us to quite literally reach for the stars in the future.

In conclusion, China has taken a great leap in the advancement and development of nuclear fusion technology, and if successful, will change the world forever, giving rise to a new era of human civilisation, with great inventions and a prosperous future ahead for us to unravel.