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# PILOT LIGHT

# FUTURE

This year's academic journal comprises a collection of thought-provoking articles that delve into the various aspects of the word 'future'. It has been fascinating to see the ways in which our Lower School scholars have interpreted the theme. The interdisciplinary nature of the journal reflects the variety of perspectives on offer as to what lies ahead, from theories surrounding synthetic biology and AI in education to Greek prophecies and Taylor Swift. I hope you enjoy reading this collection of articles as much as I have, as they truly showcase the multifaceted nature of the theme, as well as the individual passions of each scholar.



**AADYA, UPPER SIXTH**  
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## Do Engineered Languages Have the Potential to Shape our Future?

ADA, YEAR 10

Language is fundamental to our species, allowing us to communicate our thoughts and emotions. While natural language has evolved over time, adapting to our changing needs and culture, constructed languages (conlangs) are intentionally crafted to serve a specific purpose. They are usually divided into three categories: auxlangs (auxiliary languages - to enable communication between speakers who do not share a common language); engelangs (engineered languages - to test linguistic hypotheses); and fictional languages, e.g., Tolkien's Sindarin. Online communities have made conlangs more accessible and popular; as a result, certain languages with a significant following have been created, though their success is yet to be determined. Currently, experiments are being carried out with children growing up native in engelangs and auxlangs, enabling us to analyse whether conlangs can shape our future.

The most widely spoken constructed language is Esperanto - an auxlang created in 1887 by Polish oculist Ludovic Zamenhof - with an estimated 1-2 million speakers worldwide. Auxlangs' artificially constructed simple grammar enables accessibility, making them easy to learn, and creating the potential to enhance global communication by overcoming language barriers, e.g., in international diplomacy and trade. Additionally, auxlangs promote linguistic inclusivity - they are neutral and non-national. However, in order to have a widespread impact, populations of native speakers must grow to develop and change the language naturally. A 2001 study by Dr Bergen showed that this is already occurring,

as native speakers of Esperanto have caused the grammar to diverge (modification of the accusative case, phonological reduction, etc.), which means that dialects are likely to appear in the future and Esperanto will begin to behave like a natural language.

There are countless examples of engelangs, such as Laádan, a gynocentric engelang constructed in 1982, which was ultimately declared a failed experiment by its creator, Suzette Elgin, after not gaining sufficient popularity. In contrast, Canadian linguist Sonja Lang's 'Toki Pona' has, so far, been the most successful engelang. Invented in 2001, the 120-to-137-word language is intended to encourage speakers to find joy in simplicity. Lang was struggling with depression and was inspired by Taoist philosophy, which revolves around maintaining a balanced, harmonious life that finds contentment in the present. Similarly, Toki Pona intends to simplify complex, negative thoughts into clear, positive ones.

Most engelangs, including Toki Pona, are also designed to test the Sapir-Whorf hypothesis, which is known in its strong form as linguistic determinism, and linguistic relativism in its weak form. Although linguistic determinism - the concept that language determines how people perceive the world - has largely been discredited by linguistic studies, some evidence remains for linguistic relativism, which posits that language may slightly influence our worldview. Some natural languages provide evidence supporting the latter; for example, the Aboriginal Australian Guugu Ymithirr requires knowledge of cardinal directions, enabling speakers to be aware of them constantly, unlike most English speakers, who would need a compass. However, there is a scarcity of studies on linguistic relativism, which is additionally difficult to prove due to the complexities of language and thought, and the difficulty in controlling influencing factors such as culture and environment. If the hypothesis is proven,

Toki Pona would induce positive thinking in its speakers. Unfortunately, despite some children recently having been brought up as native speakers, the language is still relatively new and results are difficult to ascertain. In the future, linguistic relativity may be proven, meaning engelangs will truly alter our perceptions.

In conclusion, experiments are ongoing on how constructed languages shape our perceptions of the world, and conlangs will continue to be created - from positive minimalist engelangs like Toki Pona to fictional languages to auxlangs which facilitate communication between people of different backgrounds. In the future it is likely that more engelangs will be created with varying purposes - hopefully with more success. Fictional languages are also likely to continue, as they add depth and plausibility to their fantasy or sci-fi worlds.

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## The Car of the Future



### ALICE, YEAR 7

Artificial intelligence. As we progress into the future, AI is becoming a bigger and bigger part of our lives, some of the more obvious examples being Alexa, Siri and ChatGPT.

AI is used for many different things, such as writing songs and books, painting, and other things. The example I'm going to focus on, though, is self-driving cars.

Recently, the government has looked at self-driving cars. They were mentioned in a recent review written by Sir Patrick Vallance, Chief Scientific Officer, who stated that the government has made good progress towards making automated vehicles viable with a company called Midlands Future Mobility. Midlands Future Mobility is working towards creating one of the largest, most advanced centres, with over 300km of roads, for testing autonomous vehicles. Their test facilities will include lots of different roads, junctions, and traffic tests. Mark Harper, Transport Secretary, also said that driverless cars may be legal by 2026.

Lots of people will argue that self-driving cars are a force for the better. They are efficient, potentially safer and free people up to do other things. They allow people to work while they travel and improve the overall experience. They also help people who can't drive: for example, they would be very beneficial to someone who has an illness that prevents them from driving. Instead, they can stay independent. Self-driving cars make getting around easier and more productive.

However, there are many disadvantages to self-driving cars. Around 68% of Americans say they are afraid of self-driving cars, according to Forbes. The closest thing in the UK at the moment to a legal self-driving car

is the Ford Mustang Mach-e, which lets you take your hands off the steering wheel but requires you to watch the road. If the whole point of a self-driving car is to let you do other things while you're driving, do these actually work? It also takes away the fun and the skill of driving a car! Learning to drive is a rite of passage and brings people together.

Ethics is another big part of this. There are many important questions to think about. Firstly, imagine there's an accident. Who is to blame? Is it the driver, or the programmers? The car? The new Automated Vehicles Bill, if passed, will give individual 'drivers' immunity from unfair blame if something goes wrong while a self-driving car is in control. Instead the company will be fined. Studies have found that people prefer the idea of a person being responsible to a machine. Companies like Tesla make the driver keep their hands on the steering wheel and be ready to take over at any time. What if the system had been hacked? Can we trust self-driving cars? Another problem is deciding who should programme it in the first place. People think the company, the government, philosophers or even ethics students should be involved. Who should be given that responsibility? There are many disagreements but one thing most people agree on is on preserving human lives above animals. If a car is programmed either to keep driving and kill a human or swerve and kill a cow, for instance, the opinion that the car should swerve is a common view. Unless we find a way to solve all these questions, will we be able to use autonomous vehicles?

All in all, I think that self-driving cars are a force for the better, if we use them properly. They are useful and can help in lots of different situations. They are an important part of the future as we advance with more and more technology.

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## What Does the Future Hold for the Periodic Table?



### ALICE, YEAR 10

The periodic table is a roadmap of elements that has guided chemists for over a century. The modern incarnation organises 118 elements by rows based on atomic number, with the columns based on the number of electrons in the outer shell, which usually is one of the determining factors in an element's chemical and physical characteristics. The discovery of four new superheavy synthetic elements on the periodic table in 2015, elements 113, 115, 117 and 118, filled in the previously empty spaces at the bottom of it. Efforts to create elements 119 and 120 are underway, but exactly how many more elements remain are one of chemistry's mysteries.

The physicist Richard Feynman used relativity to predict the end of the periodic table at element 137. To Feynman, 137 was a "magic number" and his calculations showed that electrons in elements beyond 137 would have to move faster than the speed of light to avoid crashing into the nucleus. This violates the rules of relativity. Therefore elements beyond 137 in this case cannot be created. More recent calculations have reversed that limit. Feynman treated the nucleus

as a single point. If you allow it to be a ball of particles, then the elements can keep going until about 173. Atoms beyond this limit may exist, but could only be capable of summoning electrons from empty space.

Relativity isn't the only problem stopping the periodic table from developing. As more protons are packed inside a nucleus, it becomes less stable because of the positively charged protons repelling each other. Uranium has an atomic number of 92 and is the last element stable enough to occur naturally on Earth. Every element beyond uranium has a nucleus that falls apart quickly, with their half-lives being just split seconds. Theory predicts that there will be a point at which our lab-made nuclei won't live long enough to form a proper atom. A radioactive nucleus that falls apart so quickly wouldn't have time to gather electrons around itself and make a new element to be put on the periodic table. Heavier, more unstable elements may exist elsewhere in the universe, like inside dense neutron stars, but scientists can study them here only by smashing together lighter atoms to make heavier ones and then sifting through the decay chain. This makes them difficult to create on Earth.

Scientists still predict that there may be points of stability further beyond the current periodic table, where superheavy elements have relatively long-lived nuclei. If scientists add extra neutrons to certain superheavy atoms, stability could be found in the nuclei through preventing the nuclei from deforming. Element 114, for instance, is expected to have a stable number of neutrons, at 184. Elements 120 and 126 have also been predicted to be more durable. However, the complicated nature of these calculations to predict the potential stability of heavy elements means they haven't yet been done. Even when a way is discovered to compute them, a new



territory of nuclear physics is entered, where even small changes in the inputs can have profound impacts on the expected results, making it hard to discover their stability.

In conclusion, each new element is getting harder to discover, not only because of the shorter-lived atoms that are harder to detect, but because making super heavy elements may require beams of atoms that are themselves radioactive. Perhaps with technology evolving, we may find new solutions, but today, it remains uncertain whether there will be further elements added to the periodic table.

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#### Periodic table of the elements

group 1*	2											13	14	15	16	17	18		
1	2											3	4	5	6	7	8	9	10
1	H											B	C	N	O	F	Ne		
2	3	4											5	6	7	8	9	10	
	Li	Be											Al	Si	P	S	Cl	Ar	
3	11	12											13	14	15	16	17	18	
	Na	Mg											Al	Si	P	S	Cl	Ar	
4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
5	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	
	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
6	55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	
	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
7	87	88	89	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	
	Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og	
lanthanoid series 6	58	59	60	61	62	63	64	65	66	67	68	69	70	71					
	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu					
actinoid series 7	90	91	92	93	94	95	96	97	98	99	100	101	102	103					
	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr					

\*Numbering system adopted by the International Union of Pure and Applied Chemistry (IUPAC). © Encyclopædia Britannica, Inc.

## The Future of Cyborgs

### AMELIE, YEAR 8

Before we look at everything humans could become, we need to define what we mean by a 'cyborg'. It's short for 'cybernetic organism', which is anything that combines natural and artificial components. Like all technology, cyborgs can exist as anything from basic things (like wooden limbs used in Ancient Egypt) to complicated machines (like brain implants or human exoskeletons). Cyborgs mainly exist as a way to enhance people's physical or cognitive abilities. One day, it could be possible to replace entire human organs or even create a fully synthetic being.

*“Cyborgs mainly exist as a way to enhance people's physical or cognitive abilities.”*

*Using Cyborgs for Physical Enhancement*  
Cyborgs in medicine are mostly about replicating and replacing broken parts of our bodies with machines. They started off as wooden limbs and, as technology improved, became increasingly better at looking and acting like the part they replaced. Thanks to 3D printing, prosthetics can now be tailored to individual needs and are more affordable than ever before, helping more people live more fulfilling lives. Nowadays, we have even created exoskeletons for ourselves! These are a lot like Iron Man's suit - they are wearable and help us become stronger. They can also be used to help paralysed people move.

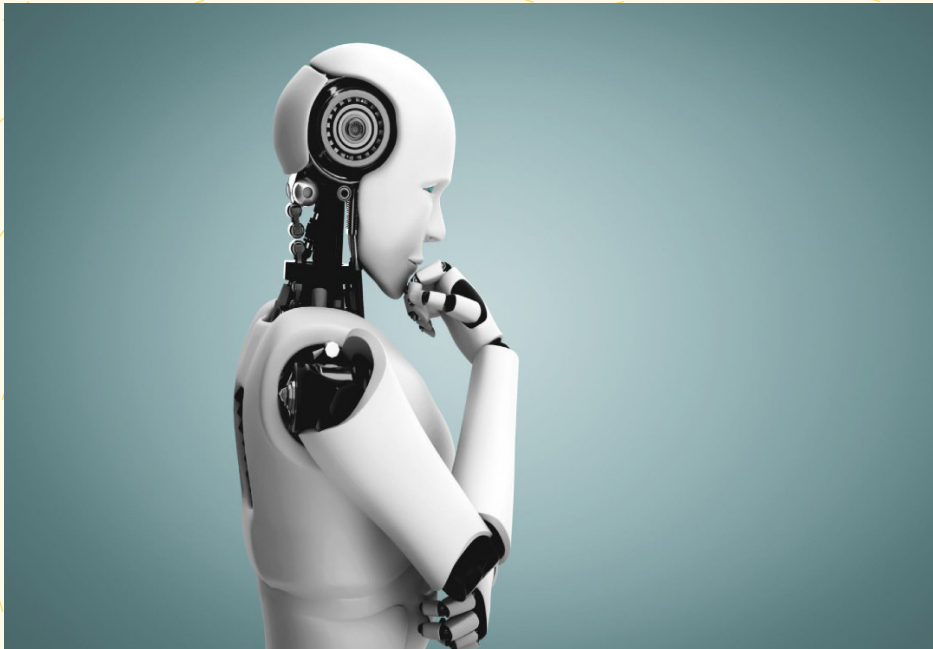
#### Brain-Computer Interfaces (BCIs)

BCIs are small machines implanted in the brain. They're used to register brain activity. So far, they have only been used in clinical trials on people with neurological disorders, such as paralysis or Parkinson's disease. The first successful demonstration of a BCI was in 1988, and it involved a paralysed man using brain signals to move a computer cursor across the screen. A more recent example is Musk's Neuralink. A device the size of a coin is surgically implanted in the skull with ultra-thin wires going into the brain. The first product would allow people to control their phones by "just thinking", says Musk. In addition, Neuralink is developing BCIs that could help restore brain signals. Planting the chip in the part of the brain that controls motor function would also

enable people to overcome neurological diseases, the company claims. But, in the long term, these devices have infinite possibilities. They could be developed to give us access to any part of the internet just by thought. We could literally have instant access to everything humans know. BCIs could make us as smart as computers.

#### The Ethics of Cyborgs

Cyborgs could significantly help people's cognitive and physical abilities and, in some cases, our quality of life, but there are many issues that stand in our way. The main problem with most technology is that someone controls it. Cyborgs (especially BCIs) bring up the question of privacy. If the machine can read your mind, does that mean the company can too? If it controls your neurons, can it control what you're thinking and doing? Can all of this be



hacked into? There are so many potential dangers. But before all that, we have the dilemma of cyborgs themselves. Where do we draw the line between human and robot? Will integrating technology into our bodies fundamentally change who we are as humans? This technology could also create inequality and discrimination. Those who can afford the latest technology could become a new class of “superhumans” who have access to abilities and knowledge which others don’t. As we move forward with this technology, we will have to find answers to all of these questions and more.

With all the advancements we have already made and the plans we have in place to make more, it’s clear that cyborgs are becoming a reality. If we can’t beat the robots, we might as well join them.

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## Own Future versus Our Future



### AMELIE, YEAR 7

One future. One road. One way to go. But is there? Two people could have different ambitions, goals and mindsets about how they want their future to go. Someone could grow up and become an author but someone else could grow up and become a mathematician. For this argument’s sake, let’s call these two people A and B.

A’s ambition is to become an author, and B’s is to become a mathematician, so you could say these two people should have completely different lives and timelines. However, if on Earth a catastrophic event happens, for example a black hole consumes the Earth, this event is on both A and B’s future timeline. Effectively, this now means the word ‘future’ has two major opposite meanings. One is that it refers to everyone on Earth’s fate and one is that it refers to everyone on Earth’s individual fate. The Oxford English Dictionary’s definition of ‘the future’ is ‘time regarded as still to come’. These two meanings are not so different, as they both include what is going to happen next. They are the same, except one is plural and one is singular.

If you were to ask someone which world they live in, they would say the world on Planet Earth. However, everyone has their own world, in a way, in which friends and family exist as well, each also within their own world. In some way, Planet Earth is made up of infinite worlds that co-exist to make one. The quote from Dr Seuss, ‘to the world, you may just be one person, but to one person you may be the world’ emphasises that the planet we share collectively thinks of one person as an individual. However, the elements of an individual’s world can be composed of one person, whilst our collective world is composed of many people. In the Swedish book *Mitt Bland Sjärnor* (Among

the Stars) by Lotta Olsson, she presents the idea that everyone lives in their own bubble or world and could be oblivious to another person’s world, yet they share the same physical planet and are heading towards the same hour, day, and future. An example it gives is the North and South Pole. Penguins living on the South Pole likely have no knowledge of the polar bears at the North Pole, but they share the common fact that they are both on Earth and heading towards their future on Earth, as well.

This suggests that, no matter what, we are all always in some way affected by each other in positive and negative ways, and, if we are affected by each other, this could mean the future has more than one route and that choices are made by us, not an external line or force that has our future mapped out. In her book *The Bell Jar*, Sylvia Plath uses the analogy of a fig tree to explain that she sees her life as having many different options and, although she wants all of them, she can only pick one fig (the metaphor used for a path) to carry on with for her future.

In conclusion, we all have our own lives. Our own ambitions. Our own achievements, family and bubbles. But we all come together in some way to create a future for the whole world and ourselves. After all, the future doesn’t just happen: it’s determined by our choices.

Or is it?

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## The Oracle of Delphi: How the Greeks Saw the Future

ANNA, YEAR 9

Located on the slopes of Mt. Parnassus in Greece, above the Corinthian Gulf, the Temple of Apollo (god of the sun and prophecy) at Delphi previously held one of the Greek sibyls: the Oracle of Delphi. From around the 8th century BC, the high priestess at the temple at Delphi was charged with delivering Apollo's prophecies and became known as the Pythia, or the Oracle of Delphi.

The Greeks viewed the role of prophetess as a sacred one, so there were very specific requirements that had to be met by candidates. The Oracle had to be a woman over 50, who lived apart from her husband, dressed in a maiden's clothes, came from a respectable family, and already worked at the temple. A woman who met the requirements would be watched for a day by a representative of the city's governing council to decide if she was suitable for the role. If she was endorsed, the current Pythia would then offer her Apollo's blessing and reveal the secrets of the Oracle to her by the sacred hearth. This meant she was now an oracle in training, and once the current Pythia died, she would take over the role.

Visitors to the Oracle – who came from as far as Afghanistan to receive advice – had to adhere to strict rules. Travellers were encouraged to bring two offerings for the oracle to choose between, as well as an obligatory sacrificial honey-cake called a pelanos. Travellers had to come at very specific dates; the Pythia was only open for consultation on the seventh day of the month for just nine months of the year. Even when the Oracle was open, Apollo was not always prepared to bestow prophecies. The priestesses would

drip cold, pure water on a goat, and if it shivered, then he was ready to speak. If not, the travellers would be sent away.

According to the historian Strabo, the Oracle of Delphi itself lay in “a cavern hollowed down in the depths” of the hillside, underneath the great Temple of Apollo. After bathing in the Castalian spring and drinking from the sacred spring Cassotis, she would descend to her oracular cave. Whilst the other priestesses burned laurel (Apollo's sacred symbol), the Pythia would sit upon a tripod above fissures in the ground and breathe in the vapours and natural gases that rose through the cracks. Scientists now theorise that she likely came under the influence of ethylene – a sweet-smelling gas that, in light doses, can produce feelings of euphoria. After inhaling these fumes, she would enter a trance-like state and begin delivering Apollo's prophecies.

The political significance of these prophecies was undeniable. The Oracle was consulted on both private matters and affairs of state; rulers would consult her before founding new colonies or starting wars, and even went to war over her. However, the Oracle did not take sides in any conflict and remained open for all those who wished to visit. She had a large amount of autonomy, due to Delphi's sacred nature, and could even speak unwanted truths to the powerful. Her power can be seen in her calm composure in response to Alexander the Great dragging her out of her cavern by the hair and demanding a prophecy in 336BC, after he was originally turned away. She simply told him: “Boy, you are invincible.”

However, despite the Oracle's political importance, it was shut down in around AD 394, after a decree from the Roman emperor Theodosius I in a bid to end pagan cults. Yet over 1600 years later, the Pythia's story lives on – between 535 and 615 of the Delphi prophecies are known to have survived since classical times, and over half are classified as accurate. The sacred nature and political

influence of the Oracle of Delphi highlights the Ancient Greeks' belief in the power of the gods, and their ability to reveal the future.

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## The Future of Taylor Swift and the Music Industry

CHARLOTTE, YEAR 8

Taylor Swift is currently the second most streamed artist on Spotify, as well as being one of the current biggest celebrities in the world. She is currently at, what some people say, is her peak - so what is in store for her in the future?

Taylor Swift started to write music professionally, releasing her debut album in 2006, when she was 15. Since then, she has released 9 more albums and has also re-recorded some so that she was able to have the rights to them. She has also been on six tours and is currently on her international Eras tour, which ends in December, in which she is revisiting all of

her previous albums in a three-and-a-half-hour concert. After she is finished, she will probably re-record the last two albums.

Some people think that she will be taking a break or stopping after as she has achieved a lot, but most people would disagree. A lot of people think that that she will continue doing what she was doing before the Eras tour and release an album every two years and go on tour for it. Taylor is also currently dating the Kansas City Chiefs' tight end Travis Kelce. As she is now thirty-four, she may want to settle down and have a family. This doesn't necessarily mean that she would stop with her music career, however, as she has a net worth of \$1.1 billion and Travis Kelce has a net worth of \$50 million, so she would be fine if she stopped everything right now.

If she did stop completely then who would take over from her? As I mentioned earlier, she is the second most streamed artist on Spotify, with the first being The Weeknd. However, although they are both pop artists, they have different styles of music and different audiences. Someone better to compare her to would be Olivia Rodrigo, who is 21 and writes songs in a similar style. Olivia has 59.4 million monthly listeners, making her 26th in the world, but she is far from her peak.

People's music tastes have changed a lot over decades and even centuries, so who knows if the modern pop music we listen to today will have the same effect on people ten years from now? Some people in the past who changed the direction of music were classical composers such as Beethoven, who changed the way people thought about symphonies and made his a lot longer. In the early 1950s, Chuck Berry and Little Richard invented rock and roll, which changed what people listened to. This was carried on by Elvis Presley, who was a worldwide sensation and helped revolutionise rock and roll. Our music tastes as humans have changed so much and, in a decade, maybe people will listen to more EDM and electronic music.



For the time being, though, it seems like Taylor Swift is here to stay, and with her army of 'Swifties', she is able to have a lot of power. If she wanted to, she could completely copy another artist's song and her fans would still back her up. Whilst she and her fans are still young, she has a big career ahead of her and a lot of people who are willing to watch it happen.



## Is our Future Synthetic Biology?

▼  
COCO, YEAR 9

Synthetic biology is the field of science that involves engineering and designing biological organisms, components and systems that do not exist in nature, and redesigning existing ones to have useful purposes.

While the field of synthetic biology is only beginning to emerge, some would say it could change the future of the planet for the better. It is already beginning to have a major impact on a number of aspects of society, such as the agriculture and medical industries, as well as the environment and energy sources.

One of the best uses of SynBio at the moment is for environmental remediation – to reverse the damage of harmful fuels and waste products on the Earth. Engineered microorganisms are being used to degrade pollutants such as heavy metals, hydrocarbons and industrial chemicals. These microorganisms have had their metabolic pathways edited by synthetic biology to enhance their degrading abilities and help to clear oil spills and contaminated soil. At the rate that we are harming our environment, the use of synthetic biology for remediation could be crucial.

Meanwhile, SynBio could also stop the waste problem from worsening by diverting products away from fossil fuels. The fashion industry, for example, constitutes 10% of the world's carbon footprint, but this could be reduced drastically if clothes were made from sustainably sourced materials. Recently, it has been discovered that adipic acid, used in making nylon, can be extracted by genetically re-wired bacteria from a substance called guaiacol, which is found in the plant polymer lignin. An abundance of lignin is wasted every year from paper mills and agriculture that could be used for this purpose.

Many initiatives are being carried out across the globe, with people developing sustainable alternatives for materials such as rubber, acrylic and even meat. This is a significant step in moving towards a future with zero waste.

Synthetic biology also has great potential in healthcare; it has allowed the development of personalised medicine, where a person's genetic makeup is considered when prescribing treatment. With the revolutionised genetic testing and diagnostics provided by synthetic biology, scientists are predicting more accurately both the main and side effects a drug would have on an

*“One of the best uses of SynBio at the moment is for environmental remediation – to reverse the damage of harmful fuels and waste products on the Earth.”*

individual, as well as how likely an individual is to have a disease. This allows them to customise disease-prevention strategies and shift the focus on healthcare from reacting to what is happening in the body to preventing it from happening in the first place. Currently, any prescription drug on the market will only work for about half the population due to genetic differences, so this is sorely needed.

Furthermore, SynBio is helping the invention of new drugs in medicine. It has been used to manipulate yeast to develop Januvia (sitagliptin), a drug used to treat type 2 diabetes. It has also made possible gene therapies like Kymriah, which is made from the patient's own white blood cells and treats acute lymphoblastic leukemia. Kymriah works by isolating the patient's T cells (a type of white blood cell) and inserting a new gene into them which programmes them to find and kill cancer cells.

When developments such as these have been made possible by synthetic biology - things that we could only have dreamed of two decades ago - you may wonder why this new and potent technology is not being utilised more. It could be that questions have been raised about how safe these engineered organisms are for existing ecosystems, leading to many people voicing the need for regulations to tackle their potential misuse.

At this rate, SynBio is expected to generate \$28.8 billion in global revenue by 2026, so, with the right ethical guidelines and support from the public, it is set to become a prominent part of our future.

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## Futurism: Embracing and Shaping Tomorrow

DARIA, YEAR 9

Petrol, hybrid, electric. Tesla, Fiat, Kia. Today, you can choose from 1000 different car models, but it wasn't always like this. Street vehicles have existed since around 1768, but it wasn't until 1886, when German mechanic Karl Benz invented the first gas-powered 'car', that quick, accessible travel became a reality for those with financial privilege.

Italian poet Filippo Marinetti was one of those people, amazed by how these simple cars gave people the power to go from one place to another in a matter of minutes. On one of his long drives in 1908, upon crashing his car with some cyclists, Marinetti experienced a life-changing and pivotal moment. Bicycles were slow, manual and reminiscent of the past. His car was fast, automated and modern. Marinetti viewed that the past had gotten in the way of his path and had almost killed him. He consequently made a promise to himself that he would never let the past get in his way again.

He wrote the Manifesto of Futurism, glorifying the speed and violence that came with the new wave of technology after the Industrial Revolution and rejecting the oppressive past of tradition. Marinetti joined with other artists, creating a movement that reached beyond just literature and poetry: futurism.

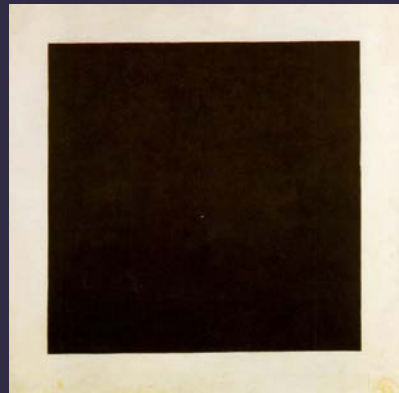
Futurism, characterised by cubism and neo-impressionism, sought to depict the vitality and dynamism of the contemporary world. The Futurists aimed to replace what they saw as outdated, conventional ideas with an exuberant celebration of the machine age.

Artists such as Gerardo Dottori often depicted technological inventions and urban landscapes with planes, cars and trains to represent their perception of future innovations. They

glorified speed, violence and the working class, believing this would help advance change in society. The movement quickly gained followers, spreading to many media, such as sculpture, architecture and theatre.

The futurism movement in Italy inspired many other art movements and artists. Three years after the Manifesto of Futurism, artists in Russia, such as Lentulov, Goncharova and Larionov, adopted Italian Futurism into Russian Futurism, which is considered as a separate movement.

Kazimir Malevich, a key figure in this movement, proclaimed that 'Futurists want to free themselves from [...] the orderliness of the world'. For most of us, painting a black square could take a minute, but for Malevich, it took two years, as there are two more pictures hidden underneath Malevich's Black Square: a Cubo-Futurist composition, and a Proto-Suprematist composition whose colours can be visible through the cracks. He wanted to create a new world of geometric shapes and forms. It was at this time that Malevich formed the idea that art develops similarly to science and technology, consecutively progressing from system to system and appropriating future discoveries.



Futurists stated that everything was now art and that what wasn't art yesterday could become art today.

In 1913, after a New York Art Fair named the Armory Show, Futurism was introduced to the United States. This led to the rise of American Modernism and movements such as Precisionism, which is regarded as the first modern American art movement.

Vorticism, a movement often viewed as the British equivalent of Futurism, took inspiration from both Cubism and Futurism, despite the founders' hatred for the Futurists.

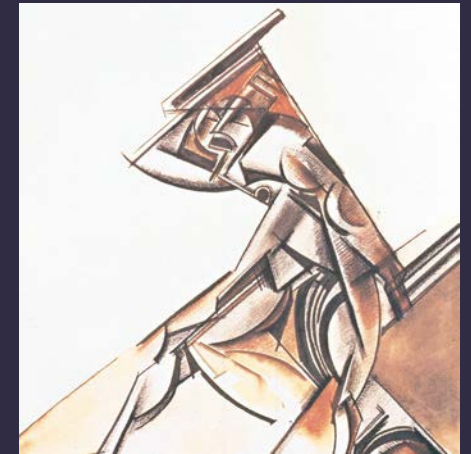
However, following World War I, many were against advancing the modern age and developing new technologies that had contributed to the brutal war.

Traditional approaches were re-introduced, the phenomenon coined as the return to order. Futurists endeavoured to change the trajectory of the future through their art, stopping abruptly once the danger of accelerating the development of technology and pursuing advancement was re-considered. Life was changing rapidly, but not consciousness: people still revered the past, dreamed of a 'beautiful era', believed that the laws of beauty were eternal and immutable, and saw divine

revelation in creativity. Everyone wants to know what lies ahead, so perhaps the best way to predict it is to create it.

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## Mutations



DIYA, YEAR 7

Most people think mutations are bad things that have made people different. But what actually is a mutation? Mutations are tiny changes or flaws in the genetic code that runs in DNA. They are caused by errors in DNA replication or from mutagens (chemicals and radiation). They are classed into three different categories: point mutations, chromosomal mutations and copy number variations. Some mutations include: Angelman syndrome, Canavan disease, colour blindness, cri-du-chat syndrome and Down syndrome. This article will help you reach a decision on whether mutations are good or bad and how they will affect us in the future. I will be talking about apolipoprotein A-I Milano, Sickle-cell anaemia, oncogenes and antibiotic resistance.

from our liver. The mutation does this more efficiently, reducing the risk of cardiovascular disease and heart disease. These are among the many beneficial mutations.

Although certain mutations are beneficial to humans, there are also what is known as 'harmful mutations'. An example of this is a point mutation of a proto-oncogene, which mutates to become an oncogene. This means that the cell will activate when it is not necessary, growing out of control, which increases the risk of cancer. Another example is a chromosomal mutation that causes antibiotic resistance. Bacteria can develop defensive mechanisms to prevent antibiotics reaching them. Some bacteria have created biochemical 'pumps' that remove the antibiotic before it reaches the recipient, while others have developed enzymes to stop the antibiotic from working. These are just two examples of the many harmful mutations out there.

*“In the future, malaria may not pose any threat at all, as sickle cell anaemia is becoming more common.”*

Some mutations can actually help save lives. Take sickle cell anaemia (discovered in 1910), for example. This mutation is where red blood cells have changed shape to sickles, or crescents, instead of the bi-concave shape they are supposed to be. This affects the haemoglobin. This can actually be good, as the people who have it are not as affected by malaria, compared to people without sickle cell anaemia. The people with this mutation are also less likely to get bacteraemia. Another example of a good mutation is Apolipoprotein A-I Milano, discovered in 1980, in particular townships in Italy. Apolipoproteins help clear cholesterol from our blood, moving it to and

In the past, malaria has had devastating consequences and more than 627,000 lives have been lost due to it. When sickle cell anaemia was discovered in 1910 by Dr. James Herrick, there was finally a chance to eradicate the disease. Now, one in 79 babies carry sickle cell anaemia. In the future, malaria may not pose any threat at all, as sickle cell anaemia is becoming more common.

A mutation that is causing concern for the future is antibiotic resistance. When the first antibiotic (Salvarsan) was invented in 1910, it was renowned worldwide. Since then, hundreds of different antibiotics are

used daily. Some may say that antibiotics are the greatest invention of mankind. They have increased the average human lifespan by 23 years. Then, after the invention of penicillin in 1928, the first antibiotic resistance mutation was discovered and was found to inactivate penicillin. In 2023, it was estimated that 58,224 people in England are living with antibiotic resistance. In the future, this could decrease the number of people on Earth, as one of the most crucial medicines is ineffective against the antibiotic resistant bacteria with which so many people are living.

In conclusion, there are many different types of mutations, bad and good. Some have influenced our society more than others. Scientists are working to find cures to many of the harmful mutations inflicting pain on the world. They are also finding certain mutations that cure many different diseases. In the future, mutations will play a big role in the world's healthcare and lifespan, determining the future of medicines and treatments.

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# ANTIBIOTIC RESISTANCE



## The Future of Fusion Power

ELIANA, YEAR 10

Fusion power is the future. It is a form of energy generation that uses the reaction of two nuclei fusing together to form a larger nucleus, releasing enormous quantities of energy. Although it is currently not feasible on a commercial and energy efficient scale, scientists hope to make major breakthroughs within the decade, after ITER, the largest tokamak ever built, becomes operational. If we somehow succeeded in harnessing fusion power, could this radically improve the world as we know it?

Fusion power, when compared to our current energy generating methods, would provide virtually unlimited energy. While it may not be evident at first glance, many global issues could be solved with unlimited energy supplies. Major issues such as water shortages, famine, and climate change could, to some extent, be prevented if we had abundant energy. Even some global issues considered more complicated, like overpopulation or poverty, would be improved with unlimited energy.

Water shortages are undoubtedly a global issue. The problem the world faces with water is not a shortage, as such, but instead a distribution and filtration issue. Currently, only 3 percent of the Earth's water is freshwater, and water is unevenly distributed between countries, leaving some with abundant water and some in drought. Redistributing water through pipelines and filtration requires plenty of energy; with fusion-generated energy, filtration factories could be developed, and pipelines could be built to distribute this water to all countries in need. Additionally, with access to more energy, we could produce more freshwater from seawater, a

process known as desalination. Currently, this is a highly energy-intensive process, so it is not accessible to developing countries with a lack of potable water.

Similarly, we could solve famine with unlimited energy. A big problem in agriculture is a lack of space to grow crops and raise farm animals. Some countries, such as Singapore, are almost entirely dependent on imports for food and farmed goods. With abundant energy, however, those countries could become less dependent on imports. They could build vertical farms; building costs would decrease with fusion power, as machines could be powered all day long, and they could begin to develop artificial methods of growing food (plants and meat). This food could, like water, be distributed across the globe, with transport made cheaper and more sustainable by an abundance of energy.

Unlimited energy through fusion would also remove the demand on fossil fuels as an energy source. Burning fossil fuels adds up to more than 75 percent of global greenhouse emissions. This contributes to climate change and the enhanced greenhouse effect. If we stopped burning fossil fuels, and instead used fusion-generated energy to power vehicles, devices, machines and more, then we could minimise the impact of the climate crisis on our environment.

Tackling something like overpopulation may seem more difficult, but with the amount of energy fusion would provide, humans could more feasibly inhabit areas of the earth with harsh climates, such as deserts like the Sahara and the Arctic that are currently barely populated by humans at all. If we were able to develop portable and safe nuclear fusion reactors, we might even be able to undertake space missions and set up base on other celestial bodies.

Finally, I will address the issue of poverty, a global issue which is dependent on energy availability. For example, the cost-of-living crisis in the UK has caused poverty rates to rise dramatically, pushing thousands more people in the UK to seek help from charities for financial and practical support. With unlimited energy, however, fuel, food and housing would be significantly cheaper. Fuel would be abundant, food could be produced and transported cheaply, and houses could be built by automated machines powered by our fusion energy. This all goes to show that fusion power could reduce the impact of many major problems in the world cheaply and sustainably. Unfortunately, at the moment, this is all theoretical. However, if we do succeed in realising nuclear fusion reactors, we would have to take care to prevent a widening of social divides, which could occur if the extremely rich hold a monopoly on fusion generators. In addition, while energy can fix many tangible problems, as explained, it is less helpful in preventing more abstract issues, such as prejudice, hate speech, a loss of culture and tradition, and so much more.

In conclusion, fusion energy is the future, but we must take care to ensure that this energy is harnessed for the greater good.

# UNLIMITED ENERGY



## The Ethics of Space Mining



GRACE, YEAR 10

Space mining is closer than we may think. The demand for precious metals, such as copper, neodymium and yttrium, is only on the rise (Nornickel, 2023), and the falling stocks of these metals on Earth might be Big Tech's next problem to solve. Resource-rich asteroids might well be an attractive solution to the insatiable demand for technology, thus, some companies may be able to start within the next few years (Forbes, 2023). The resource exploitation of space has, on occasion, been compared to pulling resources from the ocean – if the ocean needed investors, advanced technology and about \$10 million. Clearly, the ethics here are slightly questionable.

Asteroid mining has one major advantage: it lessens the burden on Earth's ecosystems when it comes to mining for finite resources. It certainly alleviates the need to destroy large areas of land, such as rainforests to mine for copper. However, to some, this might present itself as a workaround to avoid genuinely sustainable solutions, which would change the business model. Space mining might seem like a convenient solution to the depleting amounts of resources on Earth, but with a finite number of valuable asteroids within economical distances from Earth, the practice would become obsolete and unsustainable. Currently, only 12 have been identified, according to estimates (Planetary Resources, Martin Elvis, 2014). After the initial numbers of asteroids have been mined, companies would have to rely on passing bodies to produce resources, likely increasing the demand for mining on Earth again.

It might also be worthwhile to consider the colonialist implications of space mining. There is certainly an ethical debate over whether the expansion and exploitation of

resources in the solar system has the same implications as historical colonialism, even if there are no known life forms that could be possibly affected. However, in the event that life were to be found, there would almost certainly be further debate about the extent to which those on Earth have the right to disrupt the environment of other planets. Given our track record on Earth with preserving the environment against the interests of capitalism, it is vital to consider the long-term environmental impacts of resource extraction on planetary bodies.

Legally, one treaty with no enforceable policies determines the current attitudes to space mining. The Outer Space Treaty (US, 1967) dictates that the acquisition of resources must be for the benefit of all humankind, an ambiguous term. However, it may be safe to say that a practice that likely increases inequalities on Earth does not fall into this category. Space mining, for starters, requires a huge amount of startup capital, with even the least expensive operations requiring at least \$10 million to start (Forbes, 2023). The high risk involved means that this cannot be achieved by poorer countries, especially those with greater resources on Earth. An influx of new resources from outer space – some optimists value individual asteroids to be worth up to \$50bn each (Harvard, MIT, 2023) – could have unforeseen consequences on the global economy, as those in resource-rich countries find the price of their products falling. After resources on Earth are used up, resource-depleted nations will have nothing, while richer nations accumulate more wealth to invest in asteroid mining. Therefore, the exploitation of space may increase wealth disparities, as those who make the most from it tend to be the ones with greater wealth in the first place. Even worse, space mining could exacerbate global conflict. Recent treaties from Luxembourg and the US (Commercial Launch Competitive Act, 2015) determine that companies that obtain resources in

space have full rights to them. Absolutely no policies cover what might happen if two different companies lay claim to the same asteroid. OST says that nations cannot actually own a celestial body, but a company probably can, according to current guidelines. Might a monopoly develop? Or worse, a resource war thinly disguised as corporate competition?

Admittedly, this is a long list of what-ifs. Space mining truly does have the potential to be profitable, both economically and to society, but it cannot realistically go ahead without tighter regulations. The ethical problems with space mining cannot be ignored in favour of economic gains to a small percentage of rich countries, and right now, the question is not only whether we should make advances into space, but how we can do it in way that benefits all.

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# RESOURCE-RICH ASTEROIDS

## What does the Future Hold for Women in Iran?

HONOR, YEAR 7

A few years ago, I was lucky enough to visit Iran. I loved Tehran, and travelled around the country, visiting some beautiful cities, including Isfahan. Just a few months after returning, a young woman called Mahsa Amini was arrested and beaten to death in Tehran for refusing to cover her hair with a hijab. Her death in police custody sparked protests in Iran and countries all over the world. In Iran, women bravely cut their hair and refused to wear hijabs in protest, and her death seemed to show the mood in Iran was changing, that Iranian women were no longer going to accept the lives that are forced onto them by the Revolutionary Guard.... that they might begin to enjoy more freedoms,

time of the Shah, you could easily mistake Tehran for a European city: young people dressed in jeans and short skirts, and no hijabs. But lots of Iranians supported the Ayatollah, as they thought that the Shah was corrupt, living in grand palaces whilst his own people were struggling. The Ayatollah's arrest made him a hero, and even though he was forced to leave the country, support for him grew. By the late 1970s, the Shah had become incredibly unpopular; there were riots, strikes, and massive protests. Then, in January 1979, the Shah's government collapsed, and it was his turn to flee. He and his family left the country, and Ayatollah Khomeini returned to Iran as leader. Strict Islamic laws were introduced across the country, including the mandate for women and girls over 12 to wear conservative clothing and the hijab. Life became much harder and more restricted for Iranians, especially for women. These laws are still in force today and the Revolutionary Guard strictly enforces them.

*“Strict Islamic laws were introduced across the country, including the mandate for women and girls over 12 to wear conservative clothing and the hijab.”*

ones that we take for granted. But eighteen months on, has anything changed? Is the future for Iranian women and girls brighter than before, or are they facing even tougher times?

To understand why life is difficult in Iran today, it's important to understand its history. In the late 1960s, the most important religious leader in Iran, Ayatollah Khomeini, was arrested by the Shah's security service for openly criticising the Shah. The Ayatollah thought that the Shah wasn't Islamic enough, and life under the Shah's rule was too free. If you look at photographs of Iranians from the

Foreign tourists are rare in Iran, so everywhere my family and I went, we were treated with curiosity. Many of the young people we met were also keen to practise their English. We wanted to be respectful, so my mum, sister, and I wore hijabs, long sleeves and trousers whenever we were outside. The country was mixed: some dressed very conservatively, whilst others were relaxed, in jeans and hoodies. Some have access to social media, so even though it's quite restricted, they know what life is like outside of Iran and what freedoms they are missing. When we visited touristy places like bridges, mosques, or palaces, there



were teenagers on skateboards wearing hoodies rather than hijabs. They would talk about wanting to travel and visit places like London. But foreign travel is impossible at the moment, as it is forbidden.

Because of its support for terrorist activities, Iran is sanctioned, so it's impossible to buy anything made anywhere in Iran. They had brands I recognised, like Coca Cola, Nutella, and Magnum, but they were fake Iranian copies. We found lots of designer copies, such as Chanel clothing misspelt as 'Channel'. Daily life for most Iranians is very difficult and even more so if you are female. Today, despite the death of Mahsa Amini and the wave of protests that followed, life for Iranian women is hard. Some women and girls are brave, still refusing to wear hijabs, but they risk being sent to prison, tortured, or even sentenced to death. It's difficult to know what the future holds for women in Iran, but there is so much this beautiful country (and its people) could offer the world, if only given the chance.

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## The Future of AI in Education

IRIS, YEAR 8

The use of AI has increased greatly over the last couple of years, but what about the future of AI in education? A recent survey of more than 2,600 college students and faculty in the US found that 49% of college students had used AI writing tools, compared to 22% of faculty. This highlights that teachers and students are out of sync when it comes to using AI. To find out the likely prospects of the use of AI in this field, we must look at several factors, such as how it can help advance, as well as hinder, education; how we can set boundaries concerning the use of AI; how to integrate it into the classroom and, of course, how it affects the role of educators.

AI can collect and analyse data on student performance, which enables informed improvements to the curriculum. AI has the potential to transform learning, but there are a few challenges to using it in the classroom. AI models can include biased data, sometimes containing entirely false information, and their responses may be limited by their programming and data input. Therefore, in the future, AI experts expect it to be developed further in order to enhance the learning experience for students and take full advantage of information that users may not have access to otherwise, such as the current ChatGPT practice questions and explanations. Also, they should incorporate less biased data by collecting information and having software developers from a more diverse group of people, to avoid perpetuating biases in society. According to

responsibly. “You have to stop thinking that you can teach exactly the way you used to teach when the basic medium has changed,” said Professor Houman Harouni, arguing that educators must help the next generation develop ways of navigating this new reality.

In conclusion, there are many advantages to the use of AI in Education, and as long as it continues to be developed and refined to avoid misleading data, it will be increasingly beneficial. Additionally, once more teachers are educated on the potential uses of AI, it will become more widely used and more events like the hackathon will ensure that schools and universities are making the most use out of the new resources. Education has helped young people to develop relevant skills in the past, and AI will be an inevitable part of our education in the future.

*“Education has helped young people to develop relevant skills in the past, and AI will be an inevitable part of our education in the future.”*

The debate recently surrounding the advantages and disadvantages of using AI in the classroom has led to events such as the organisation of a ‘hackathon’ by the UK government for teachers and school leaders. The ‘hackathon’ was a two-day event that tested the potential of AI in different classroom situations; the aim of this was to come up with solutions that use AI to tackle real-life issues like workload and assist teachers with their duties. One of the advantages of this human-centric AI, which prioritises enhancing human capabilities, is that it could be used to assist with administrative work, in addition to supporting personalised learning for students and young people. Furthermore,

a study done by these AI experts, there is a real chance that such human-level AI will be developed within the coming decades.

Since the launch of ChatGPT in November 2022, schools all around the world have had to update their policies concerning the use of this tool. Public schools in New York and some of the best universities in France, England and Japan decided to ban the software to avoid plagiarism, while other schools have embraced it. Top US universities, such as Harvard and Princeton, have encouraged students to experiment with AI, with the former advising that educators should use AI, particularly ChatGPT, alongside the students, and teach them how to use it

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TRANSFORM  
LEARNING



## The Future of Transport



JESSICA, YEAR 7

The future is a concept that people have always been intrigued by. When someone says 'future,' most people think of a distant future full of flying cars, glowing skyscrapers, and talking humanoid robots. But that isn't all the future is. The near future is looking very interesting for transport in the fields of both tourism and cargo transportation.

In the last few years, the COVID-19 pandemic has led to an increasing number of people working from home. Currently, 10% of full-time employees work from home, and 30% alternate between home and their workplace. This trend could result in a decrease in public transport usage and fewer people owning cars. However, travel and tourism are likely to remain just as popular, and if anything, become more popular.

In recent years, holidaymakers have been desiring more exciting and exotic holidays. An emerging branch of tourism is space tourism. The company SpaceX has been taking people to the ISS; a recent NASA flight in 2022 took three wealthy businessmen to the ISS for just over a week's stay. However, similar to when aeroplanes first became available to the general public, these flights are not yet accessible to everyone, as each flight costs around \$55 million per passenger. In the future, however, they could become accessible to more people.

On the note of travel relating more to tourism than commutes, a recent concept of high-speed travel has been evolving over the past few years. High-speed planes are a distinct possibility, and have, of course, been tried before. However, there is the major problem with the breaking of the sound barrier, which was one of the major factors in Concorde's failure. With future technology, this problem could be solved. There is also the possibility of a high-speed train. The bullet trains in China are an example of this, but the idea of a 'hyperloop' train that could run

underground in low-pressure tunnels is a theory that is being developed.

Another type of transport that is currently developing is cargo transportation, particularly for emergency deliveries. In war zones, earthquake zones, and areas around volcanoes, it is often difficult to get things in by road, air, and countries without a coastline can't receive sea deliveries. For example, in the United States of America last year, there were multiple floods, tropical cyclones and tornado outbreaks. In Japan, there are 111 active volcanoes, and these could get worse due to climate change.

A solution that has been developing for this over the last few years is automated drones. These can deliver safely and efficiently. However, there is a sizeable problem. Most can only travel short distances, so any deliveries have to be within range of a delivery hub. In the future, creating drones that can travel longer distances could save a lot of lives. Currently, there is also quite a lot of mistrust around drones, and particularly those with cameras, as some people think they invade privacy. Companies will have to work hard to overcome this barrier if they are to be successful.

To conclude, I think the future of transport is set to be very exciting. Of course, I have only covered a few future possibilities. There are so many scientific breakthroughs happening all the time, with technological advancements occurring seemingly every day, and transport is always developing. The transport of the future could have many added benefits: saving lives; more efficient energy use; and more efficient delivery and transport. This will be important because, as the population grows, more efficient delivery systems will be needed, and with climate change, travel may become more difficult.

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# HIGH-SPEED TRAVEL HAS BEEN EVOLVING



## Looking Forward, Looking Back

JULIA, YEAR 9

Every passing year brings the opportunity for individuals to create resolutions for the time ahead; the start of the year is a period of reflection on past goals and the creation of new ones. Ultimately, we are provided with a chance to reshape our futures into the futures that we desire. The word 'future' derives from the Latin word 'futurus', meaning the time that will come after the present, but the word 'future' is not only a measurement of time: it defines your life, however you choose to shape it.

The New Year is advertised in magazines as 'a fresh start' and an opportunity 'to start over', and while these forms of marketing have made New Year's resolutions such a concrete start to the year, they are by no means a new tradition.

New Year's Resolutions first emerged in around 2000 BC, when the Babylonians celebrated a twelve-day New Year's festival called 'Akitu', signifying the first day of spring, when they would start the farming season by planting crops. It was also a sign of a clean slate being drawn, as they promised to pay their debts ahead of the new year. While most Western civilisations tend to celebrate the new year on January 1st, this thought of starting a new year with good intentions is not new, and the thought of paying off one's debts at around this time coincides with our tax year ending and beginning in early spring.

It was only with the Ancient Romans changing the calendar from the Gregorian to the Julian calendar in 46 BC that the time of the new year shifted from the start of spring to the date that we use now: January 1st. The month of January was named after the two-

faced God Janus, who looks forward to new beginnings, and backwards for reflection and resolutions. Carrying forward the Babylonian tradition, the Romans would make sacrifices to Janus at this time and made promises of good behaviour in the year ahead.

The use of the phrase 'New Year's Resolutions' was only first recorded in 1817 in a Boston newspaper, but while New Year's resolutions were mostly religious or spiritual around this time, like promising to have more restraint in the face of earthly pleasures or to have a stronger moral character, now, they are generally about perceived self-improvement, such as common resolutions to exercise more or stay organised.

But ultimately, our core resolutions are not that different from the original resolutions that the Babylonians made. They often professed that they would pay off debt, be less gluttonous, and return borrowed farm equipment; similarly, some of the most common resolutions that people make in the twenty-first century are also to pay off debt, eat more healthily, and save more money. Interestingly, resolutions from both time periods are centred around food and wealth.

While many people partake in New Year's resolutions, often with family members or friends supporting them and professing to follow through with these resolutions alongside them, most people quit before they have had a chance fully to make a start on their new goals. In fact, so many people quit within two weeks that the second Friday in January is dubbed 'quitters' day', as it is the day that New Year's resolutions often crumble.

Though made in good faith with every intention to uphold them, most New Year's resolutions can't seem to last longer than a few weeks, or, at most, a month. The only resolutions that really seem to last are those that are made not because society defines

them as 'good resolutions', but because the person making them genuinely believes in the resolution as something that they specifically need to do. How else can resolutions withstand the uncertainty of the future?



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## The Future of the Past



### KAYA, YEAR 7

People have always been preoccupied with the future. It is a blank canvas that holds our deepest fears and aspirations. The way we view the future tells us a lot about how we perceive the past, either trying to make the future mirror the past or prevent the past from ever happening again. Throughout history, artists have been drawn to ideas of the future.

In the early twentieth century, Italian poet Filippo Marinetti became inspired by new technology and industrialisation. This gave him an immense belief in the future, and he strongly believed that artwork from the past was worthless and out of touch with modern society. Therefore, he founded the Futurist movement to capture the speed and essence of the modern world.

The Futurist art movement wanted to abolish the art of the past, seeing it as outdated and repetitive. Marinetti said, "[w]e rebel against the supine admiration of old canvases, old statues and old objects and against the enthusiasm for all that is worm-eaten, dirty and corroded by time". Despising past artwork, Marinetti himself explains that the past stands in the way of promising and exciting developments, and the progress and speed of the future.

Although mainly an Italian art movement, Futurism soon spread to countries like Russia and Britain, encouraging more and more artists, authors and musicians to embrace the thrilling ideas of the future. The Futurists developed new ways of creating movement and speed, often depicting cars, trains and other high-paced vehicles, symbolising the artists' expectations of the world ahead. Some of the best-known artists from this movement were Umberto Boccioni, Giacomo Balla, Carlo Carrà and Gino Severini.

An iconic example of Futurist painting is *Dynamism of a Car* by Luigi Russolo, painted in 1913. In this painting, Russolo captures the speed and motion of the car in such a way that the car's shape vanishes.



Instead of focusing on the car's shape, Russolo wanted to show the sound waves surrounding the car, using distorted lines to create a visual effect similar to the Doppler effect. This shows how he viewed the future of transportation as bringing change, beauty and excitement. As Marinetti described the car, "[w]e affirm that the world's magnificence has been enriched by a new beauty: the beauty of speed. A racing car whose hood is adorned with great pipes, like serpents of explosive breaths – a roaring car that seems to ride on grapeshot – is more beautiful than the *Victory of Samothrace* [an ancient Greek sculpture]."

However, one of the most famous Futurist sculptures, *Unique Forms of Continuity in Space* by Umberto Boccioni, is inspired by the very same *Victory of Samothrace* sculpture. The piece depicts a human in motion, and, like the Greek sculpture, Boccioni's is armless and faceless. But while the Greek sculpture is static, *Unique Forms of Continuity in Space* consists of shapes, showing the essence of future aspirations and the dynamics of movement.

Today, 100 years after the Futurist art movement, it is interesting to see how the views of the future have changed dramatically. Futurists were so excited about the future of technology that they overlooked the destructive potential of these modern machines. The very same things that the Futurists admired and looked forward to, like fast cars and mass production, are now seen as jeopardising our future by contributing to climate change. A century from now, someone might look at our present day ideas of the future and find them completely different from their own reality.



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## The Future of Human Evolution

KIKI, YEAR 7

In the past, humans evolved to survive. However, now there is no need; we have vaccinations for most of the deadliest illnesses, and animals that were once our predators are now our prey because now humans are at the top of the food chain. But even though there was a more desperate need to evolve before, that doesn't mean that we aren't still evolving. Researchers and scientists suggest that natural selection is still happening around the world.

Here are a few examples of natural selection. In sub-Saharan Africa, two hundred million people (mostly children) catch malaria every year, killing close to half a million of them in total. It has been discovered that some people have developed a genetic variant that mostly protects them from the disease and has started being passed down through generations. Another example of natural selection is that in higher mountain regions, such as in the Andes or Tibet, some people who live there are starting to develop a higher lung capacity and smaller blood vessels so that they are better suited to the high altitude.

Some scientists say that in order to see how we will evolve in the future, we have to look to the past and see how we have previously evolved. If that is true, then it is likely that we will grow taller and live longer; we'll have smaller brains; we'll become less aggressive and kinder, whilst also being less interesting. However, statistics show that the world is in fact becoming more depressed. A growing population can cause growing tension and conflicts, if there is a need to compete for resources. Even today, there are more than 100 conflicts happening around the world.

Another factor that could help humans to continue to evolve is the rapidly growing

population. In the past, growing populations forced natural selection to occur, as many people started to move to larger towns or cities. This meant that when mass epidemics happened, such as the Black Death or the Spanish Flu, they spread quickly, killing millions. This is also when something called microevolution happens. During a large epidemic, a few people start to develop a special genetic variant sometimes called an allele. It will increase that person's likelihood of living longer and being able to pass it down to their children and so on. This is another example of natural selection, as the virus or disease will continue to kill off the rest of the people who didn't inherit the allele, therefore creating a new generation that is more likely to survive that disease.

In 2050, studies show that 75% of the human population will be living in urban areas and mega-cities. This could lead to small evolutionary changes. For example, our feet could become more padded, so we are able to walk on harder surfaces such as concrete, which will become a lot more common in the future, when more people will start to live in cities and will be walking on pavements and roads frequently. Our average speaking volume will increase if there are more people around, so that we can hear each other better, and some believe that our thumbs will become bigger, as the need to type on phones or computers continues with the growing demand for technology.

Many scientists argue about if or when the human race will become extinct. Some say never; some say in one billion years; and a few believe that we could become extinct in 250 million years. This could be because of a giant asteroid strike, a nuclear war or Earth could heat up too much from the climate crisis and become uninhabitable. There are so many ways in which the human race is continuing to evolve – sometimes we force ourselves to evolve, even if it isn't on purpose.



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# NATURAL SELECTION



## The Future of Delivery Drones

LILIA, YEAR 10

Could you imagine a robot delivering your weekly shopping to your doorstep? Maybe a drone lifting your package to your rooftop like a modern Santa Claus? Perhaps not, but this could become a new reality in the near future. Replacing vehicle-operated delivery systems with unmanned drone delivery systems is estimated to cut between 40% and 70% of delivery costs, so many companies have already started testing out these systems. Patents in drone technology have been filed from as early as 2005, and the advancement of this technology has continuously evolved throughout the years. In 2022, almost 875,000 drone deliveries were made worldwide, which was about an 80% increase on the previous year. This jump shows that the drone industry is gaining traction worldwide and has the potential to continue growing and expanding. Drones so far have mostly been used to deliver healthcare items such as medicine to more



remote locations, especially in North Africa, South-East Asia and the Pacific islands. Some of the commonly delivered products are food, stock for restaurants and shops, medical items and, more recently, e-commerce orders.

Using drones for such deliveries can benefit rural regions, with faster delivery times and better access to certain supplies, which may otherwise be hard to obtain due to a lack of well-maintained roads or even infrastructure problems caused by natural disasters. Another positive of drone deliveries is that they can be more environmentally friendly than other conventional delivery methods, as they release fewer greenhouse gases. The average delivery vehicle emits 4.6 metric tonnes of greenhouse gases each year. In comparison, drones are electric and automated; therefore, few greenhouse gases are emitted. This also means that there would be fewer vehicles on the road, which would also reduce the risk of road accidents and cut congestion, especially in busy towns or cities. Drone delivery can also be useful for delivering to harsh terrains, such as jungles, deserts, mountains and others. In general, drones could be used for more advancements in geospatial mapping to provide a better understanding of more rural or suburban areas that are otherwise difficult to access without harming or negatively impacting those places.

On the other hand, there are still some issues left to work out with drone delivery.

For example, drones are less well suited to urban areas, where there is less drop-off and landing space and many high-rise buildings, which are difficult for the drone to navigate around. Also, as the landscape changes more frequently, as buildings are constantly created, changed and modified, the drone mapping would have to be frequently updated to ensure that no crashes would occur. In addition, many people are concerned about privacy, as the drones will have to fly over people's property and could be recording their surroundings.

There are also some potential issues with the weather, such as rain or wind, as this may disrupt the drone. As there is no current drone infrastructure, the initial set up cost is high, as setting up charging points and drop-off or pick-up stations and building all of the drones can be costly, but once the infrastructure is set up, drones have been more cost effective than delivery vehicles.

In conclusion, delivery drones offer a practical solution that provides fast deliveries of supplies to mostly rural and suburban areas. They can provide vital necessities to communities which otherwise couldn't have accessed them. Although there are still issues with legislation and privacy, as more drones come into use, more governments will start to create laws regarding privacy and safety protocols. This means that, over time, they could become more commonplace, especially outside of cities or towns, once the proper legislation is introduced.

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ENVIRONMENTALLY FRIENDLY



## Exploring Tomorrow: The Future of Transportation

MAIA, YEAR 10

Transportation plays a vital role in our daily lives, connecting people and the distribution of goods across the globe. Looking ahead, significant changes are expected in transportation, driven by technological advancements and environmental concerns. In this essay, key trends will be explored, as well as considerations for shaping the future of transportation.

One major trend in transportation's future is the rise of electric vehicles (EVs). EVs offer an environmentally cleaner alternative to traditional petrol and diesel vehicles, reducing harmful emissions and reliance on fossil fuels. With ongoing improvements in battery technology and charging infrastructure, EVs are becoming more accessible and affordable, paving the way for a greener future of transportation.

Another exciting development is the advent of autonomous vehicles (AVs). AVs have the potential to revolutionise transportation by improving safety, reducing congestion, and increasing mobility for individuals who are unable to drive. However, challenges remain, including regulatory hurdles, ethical considerations, and questions about job displacement in industries reliant on human drivers.

Emerging technologies such as artificial intelligence (AI) and the Internet of Things (IoT) are also set to transform transportation. AI-powered algorithms can optimise traffic flow and route planning, while IoT sensors can monitor infrastructure conditions and provide real-time data to improve safety and efficiency. These technologies have the potential to create smarter, more responsive transportation systems tailored to the needs of users.

Moreover, urbanisation and changing mobility patterns are reshaping transportation in cities. As urban populations grow, there is increasing demand for sustainable transportation solutions to alleviate congestion and reduce pollution. Public transit, cycling, and walking are gaining prominence as cities promote healthier, more environmentally friendly modes of transportation.

In almost every respect, environmental sustainability is a key consideration in the future of transportation. Climate change and air pollution pose urgent challenges that require bold action to reduce emissions from transportation. Transitioning to electric and alternative fuel vehicles, investing in renewable energy, and promoting eco-friendly transportation options are critical steps towards a more sustainable future.

At the same time, realising the full potential of these innovations will require collaboration and investment from governments, industry, and society. Infrastructure development, regulatory frameworks, and public acceptance are essential for the successful implementation of future transportation technologies. Additionally, efforts must be made to ensure that the benefits of these advancements are accessible to all, particularly the more disadvantaged communities.

In conclusion, the future of transportation holds great promise for improving mobility, reducing environmental impacts, and enhancing people's quality of life. By embracing innovation, sustainability, and inclusivity, transportation systems that are safer, more efficient, and more equitable can be created, ensuring a brighter future for generations to come.

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## What do the Ancient Greeks Teach us about Predicting the Future

MARINA, YEAR 9

I was at a Chinese restaurant last night and of course I had to have the classic fortune cookie. But instead of a cheesy, meaningless fortune like 'bloom where you are planted', when I cracked open the shell of my cookie, the note I saw said, 'you will meet death in a car'. I mean, who was this cookie to tell me how I was going to die? "A fortune cookie won't dictate my future," I said. Just to be safe though, I opted to take the tube home rather than a taxi.

In a world where predictions are made constantly (in casinos, the weather forecast, in order to gamble, etc.), it's evident that we are troubled by the uncertainty life holds. Psychologists believe our need to know the future links to a desire for control over certain events in our life and, in particular, our survival, relating it to evolution. With the earliest prophecies on record dating back to the 8th century BCE, many people (myself included) believe predicting the future is part of human nature. But what are the risks of doing so?

The Ancient Greeks believed in the Moirai, or three Fates: sisters Clotho, who spins the thread of life; Lachesis, who assigns each person's destiny; and Atropos, who carries the scissors to cut the thread of life at its end. The myth suggests that the gods and the oracles could predict a person's fate before or after birth, but no one, not even the gods, could intervene in that person's fate. Oracles were regarded as portals through which the gods spoke directly to people and were consulted by the Greeks when facing an important decision (be it business-related or personal). Any incongruities between the

oracles' prophecies and real-life events were usually understood to be misinterpretations of the prophecies rather than the oracle's error. We might find a link between modern-day fortune-tellers' prophecies and those of the oracles in that they were worded ambiguously, in order to cover all contingencies, so it's likely the oracles were mainly reassuring people that they weren't completely responsible for their own actions.

The stories of Oedipus and Achilles in The Iliad spring to mind when thinking of prophecies in mythology. One tried to escape his fate, yet unwittingly fulfilled the prophecy, and the other eventually accepted his fate, after struggling with it for the majority of his life. The obvious moral of both myths is that no one can control their fate, but could the more significant moral be that knowing the future (or what is believed to be the future) ultimately leads to one's downfall? If we believe something good will happen in our lives, we might be reckless and place an immoderate amount of trust in that prediction. On the other hand, if we think we are doomed, we may try to avoid the seemingly terrible fate or surrender entirely to it and become unable to enjoy the rest of our life.

We want to know the future or pretend to know it for the same reason conspiracy theories rose to popularity during the pandemic: to regain control and deal with the unknown situations we find frightening. But sometimes knowledge of the future can be even more frightening. The Ancient Greeks teach us that predicting the future can be extremely harmful, especially when a prediction is interpreted too literally. So maybe the engine won't even be turned on when I meet death in that car.

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## Could we Stop Ourselves from Aging in the Future?

PJ, YEAR 10

Contemplating the prevention of aging, it is natural to gravitate towards the idea of immortality. It is a fascinating concept and actually hard to wrap your head around, due to the implications of possible overpopulation or the philosophical consequences of a meaningless life as a result of an immortal one. However, considering the extremely early stage this research is currently in, this concept might be a long shot, anyway. However, the idea of giving people more healthy years might not be completely out of reach.

First of all, it is important to address a key question: how do we age? To start small (literally), the aging of cells is when cells eventually lose the ability to keep dividing. Every time a cell divides, the end of the chromosomes it contains becomes shortened. These end caps are called telomeres, and, once they shorten beyond a certain point, the cell cannot divide anymore. As a result of this, the cell enters a state called senescence. Although there is nothing immediately detrimental about a senescent cell, over time, our bodies stop disposing of them quickly enough, leading neighbouring cells to become senescent, too. This can result to chronic inflammation, leading to the brain not working as effectively and processing information slower. Subsequently,

the body begins to deteriorate, and we become more susceptible to disease. And after that? Well, we die (to put it bluntly). Another way for cells to deteriorate is the gradual decline of the cell's mitochondria.

There is a 'disposable soma theory' to explain why we and our cells age that theorises that the body has a limited amount of energy that will eventually run out and we spend most of this energy prioritising reproductive functions. Overall, it states that the body (the soma) is disposable, and the gene line continues.

However, scientists have been researching possible solutions to this. The UC San Diego research team has determined these two aging pathways by modifying aging circuits in yeast. They managed to control the aging of the yeast cells by manipulating the expression of two molecules that control which genes are active in the cell, which are also called transcriptional regulators. By creating a synthetic gene oscillator, they managed to generate sustained oscillations between the regulators, or in other words, the two different types of possible aging routes. By doing this, they managed to prevent the cells from following either of the two aging routes, and subsequently the lifespan of the cells increased. The Co-Director of the UC San Diego Biology Institute said of the project, 'Our work is a proof-of-concept, showing that, like mechanical engineers can fix and enhance our cars so that they can last longer, we can also use the same engineering approach to modify and enhance our cells to live longer'.

Not only can this be applied to the longevity of entire organisms, it can also help stop aging in cells affected by degenerative diseases. However, a problem arose, as, although the yeast cells were able to increase their lifespan successfully, researchers were not sure what the effect the manipulation of the regulators would be on different types of cells in different organisms, as it could be potentially dangerous. Although the

research programme is still in early stages so nothing can currently be determined, there is at least some possibility that age-related illnesses could be treated using this new and innovative research.

So maybe the title of this article is possibly slightly hyperbolic, as we might still be a long way off stopping the aging of an entire organism, I believe that this fascinating research still has the power to impact the medical world forever by treating degenerative and age-related diseases.

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# DISPOSABLE SOMA THEORY

## Future of Education



### ROSE, YEAR 8

In the relentless progression of modern day life, education stands as a cornerstone of society and a sign of evolution within society. As we look to the future, what do we think school and education will look like? Will our conventional classroom be adorned with the newest futuristic technology? These questions beckon us to delve into the course of the future of education, where opportunities lie to shape the minds of the generations to come.

The first main educational system that is likely to be very prominent in future school environments involves using AI to provide students with personalised support and guidance. The integration of AI has the potential to revolutionise learning systems and environments; AI's adaptability and personalised learning capabilities can cater for individual students' needs, allowing them to move at their own pace, and concepts that students may not understand can be reinforced without disrupting their classmates. In addition, AI can be used to complete tasks such as marking or grading, meaning educators can spend more time on the more creative and interactive aspects of teaching. Furthermore, AI-generated content used in virtual reality can create immersive experiences that bring abstract concepts to life and enhance students' engagement in lessons.

Our classrooms are likely to undergo a remarkable transformation, as new technology develops and finds ways to boost efficiency. One example of a past evolution of classroom technology is seeing blackboards and chalk transition into whiteboards and pens, and then into interactive whiteboards, which allow more dynamic and engaging teaching. There is a growing possibility that augmented reality, such as the new Apple

Vision Pros, will further transform the look of a classroom. I also believe that other technology could make the classroom and the classroom schedule more efficient, such as a scanner that recognises people who enter the classroom using facial recognition and fills out the data that would be filled out by a teacher during registration. This means that there would be no need for registration, allowing learning to start straight away when you get to school. There could also be a sensor that monitors a student's temperature as they walk into school to make sure no fevers or infections spread, like COVID-19 did.

In the future, there will be more people who have access to a good education during their lifetime. The widespread integration of online platforms and home learning tools will enable more people from across the globe to access educational resources easily. There is also an increasing availability to different affordable devices, which can empower individuals, even in remote areas, to learn from online content. Also, due to population increases, more schools will be built or existing schools will expand, as there will be more students in each year. Opposing this, many students are choosing to learn at home via online courses or websites, which means that schools may have fewer students. Altogether, this is likely to balance out and a similar amount of students will attend school.

With a global emphasis on the importance of education, the future holds promise for a more accessible and efficient learning landscape, driven by rapid technological advances. By embracing these changes, we can build a more inclusive and empowering education system that prepares individuals for the challenges and opportunities of life in the twenty-first century.

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## Can Humans Imagine the Future



### TILLY, YEAR 10

Imagining the future is something we are often asked to do, whether it be an introspective question of how you see yourself in five years, or an environmental campaign demanding consideration of our planet's future – but how accurately can we construct these images? Is it truly possible to imagine our world in 20 years time? The answer to that can only be answered by analysing how our minds generate images and ideas.

There is a quotation that reads, 'you can not imagine something out of nothing', provoking consideration of the boundaries of what humans can actually visualise in their minds. Just because we have the ability to create abstract devices in our minds does not mean that we have the capability to imagine something non-existent and new, as all images in our minds are simply combinations of elements of reality reorganised in a fanciful way. Our minds are very similar to a database, in the sense that when we come across a new, sensory experience – whether that be sight, smell, sound, taste, or touch – we record this information in our memory's database to be used later to conjure up something novel, essentially forging new from old. It is impossible for humans to imagine something using information that is not stored in their memory, much like a computer, unable to fetch a file that it has not been introduced to. Humans can reorganise this data in the most advanced way, demonstrated, for example, by our ability to associate concrete matter with abstract concepts through the interpretation of information from our databases. For instance, the concept of 'love' can evoke a wide array of images in one's head, from loved ones to inanimate matter, such as beautiful scenery, but the interpretation of

'love' varies from person to person, given that everyone is exposed to and is storing different information in their memories. Because of this ability, we have to merge different data from our memories to forge something new, enabling us to picture non-existent images purely from description. Dragons, although purely fictional, can be visualised by humans from a description as simple as 'a very large, flying, fire-breathing lizard with tough scales and wings, with vocalisations similar to a lion'. From reorganising and reinterpreting our mental databases' current information, we can visualise this creature by likening it to known, existing concepts, allowing us to turn the nonsensical into something we understand.

This process explains why humans cannot in fact imagine the future without it being based on the past. Returning to the question of imagining the world in 20 years with this in mind, it is clear that any 'new' ideas you previously had were not innovative, but instead a mere collating and reshaping of present and past experiences into something more abstract. This is exactly why humans are not able to picture the far future accurately; it is physically impossible to imagine something with any aspect that does not come from your database, and therefore any future created by our imagination will likely not come into fruition.

There are many examples of this occurring throughout history, one of the most notable of which can be traced back to the Victorian era, when people attempted to visualise the world after 2000. There was one depiction of a 'Correspondence Cinema', akin to our modern day 'FaceTime', but with some key differences between these images, most notably the vast amounts of brass machinery operated by a worker in order to project an image of the caller and to send and receive the sound. The Victorians were unable to conceptualise a portable mobile device that digitally displays an image and communicates using radio waves, since essential discoveries that would







## How Literature Portrays the Future

### ULA, YEAR 8

In literature, the future is often portrayed in a number of different ways, with myriad different possibilities. However, two of the main ways in which the future is depicted through literature are dystopian and utopian storylines, each of which gives a contrasting perspective on the future of society, governance, and humanity. A dystopia presents a vision of society where social, political and environmental conditions have significantly deteriorated, whereas a utopia often describes the idealised or 'perfect' society that prioritises justice, freedom and social harmony. Both of these sub-genres of literature can play a role in shaping a person's perception of the future and can be useful in encouraging development in a social aspect.

*“Utopian and dystopian literature offer differing opinions on the obstacles and potential that the human race may face in the future.”*

Utopian narratives serve as inspiration for social improvement, as they often reflect 'perfect' societies. This challenges people to consider other possibilities of how societies should be organised and provokes reflection on issues to do with current politics and governance. By imagining these idealistic utopian societies, many authors offer unique solutions to some of the contemporary concerns we face today. Yet, by presenting civilisations with such a static state of perfection, it leaves no room for any inevitable

change or conflict, making utopian ideals unrealistic and almost unobtainable.

One of the first utopian novels was Thomas More's Utopia, which began to popularise the genre. The book focused on a fictional island named Utopia, with its optimistic democratic principles, communal ownership and absence of private property, critiquing European society, which was entirely the opposite at the time. The principles of this somewhat perfect island inspired many to contemplate possible and alternate forms of governance and contributed to discussions of political philosophy, and of how they thought society should look in the future.

In contrast, dystopian societies often draw attention to issues regarding the environment, poverty, politics and many other contemporary issues by exaggerating them in what seems like a drastic and unrealistic way. This can be useful, as it may inspire people to confront real-life issues and advocate for

change in the future, once they realise the urgency of the problems that may become the pitfalls of the human race. However, dystopian novels' bleak and pessimistic outlook on the future can be disheartening, leaving readers feeling hopeless about the future that they may have to face.

A prime example of a well-known dystopian novel is Nineteen Eighty-Four by George Orwell. It presents the bleak vision of a future

society where individualism is discouraged, the citizens are oppressed and the Party, led by the omnipresent figure of Big Brother, controls every aspect of their lives. The citizens are also subjected to constant propaganda and are denied basic human rights. George Orwell wrote this book as a warning against the possibility of totalitarianism in the future, especially in the post-World War Two era, when there was a dramatic rise in censorship and propaganda. He was also concerned about the growing power that governments had over manipulating public opinion and how they used information to their advantage, with the image of Big Brother reflecting these political leaders. Nineteen Eighty-Four became a very popular and influential book, highlighting the importance of individual freedom.

In conclusion, utopian and dystopian literature offer differing opinions on the obstacles and potential that the human race may face in the future. By exploring these themes, we are warned about potential problems and informed with imaginative ways about how we might fix them, as well as becoming exposed and more open-minded to a number of possible outcomes for the future.

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G D S T

South Hampstead's Lower School Academic Scholars join the Pilot Light programme, contributing to the scholars' journal and symposia, and attending a cultural trip and dinner. Academic Scholarships are available on entry to Year 7 and the Sixth Form.

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