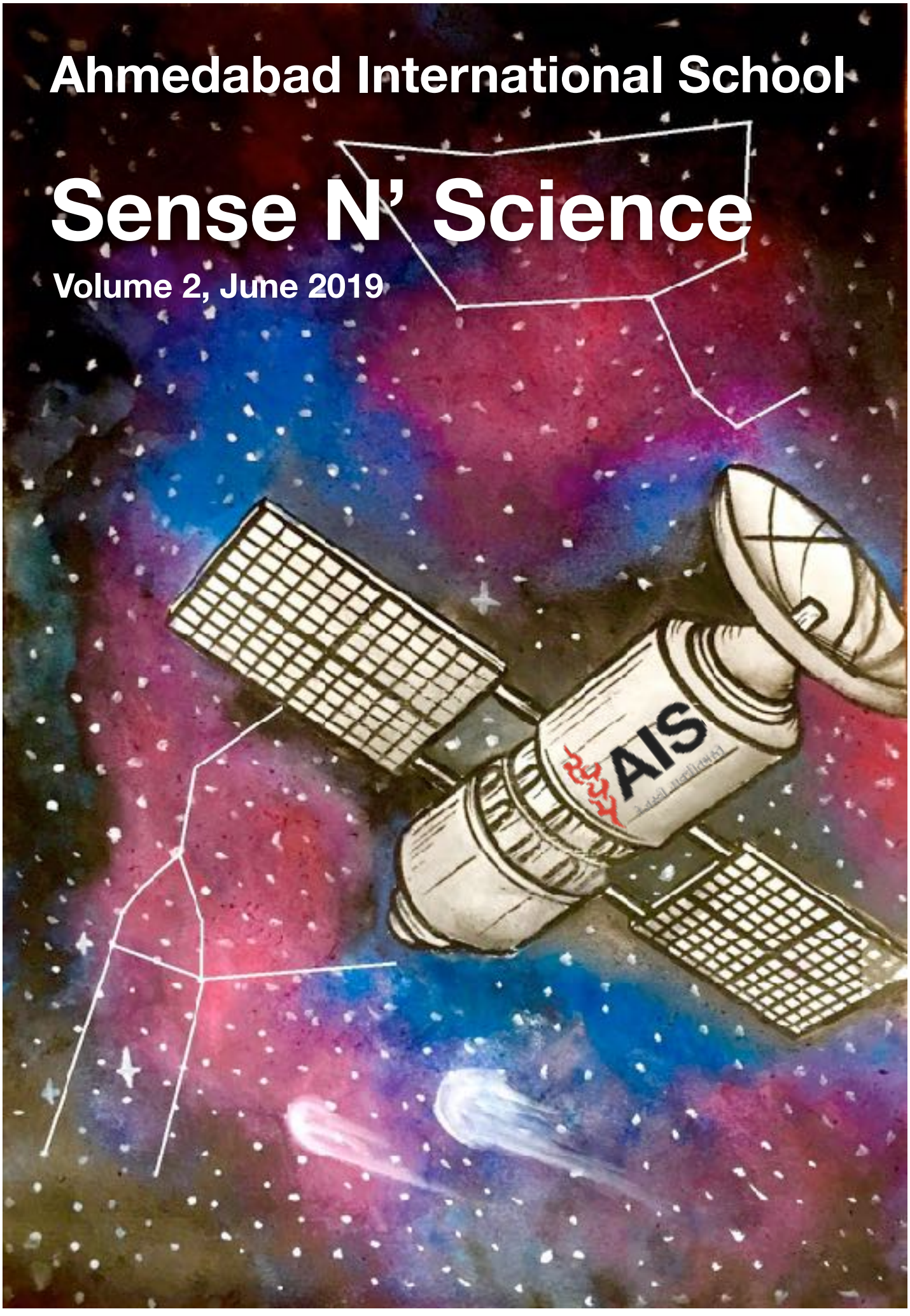
Ahmedabad International School

Sense N' Science

Volume 2, June 2019



Contents

The Big Bang

It gives us immense joy and delight to introduce you all to "Sense N' Science" - the science magazine of Ahmedabad International School in its second edition. Here, we plan to unfold some breath-taking mysteries of science.

In the words of Eileen Kennedy Moore, an American psychologist: "Potential is not an end point but a capacity to grow and learn." Our young writers are gifted with immense potential and have enthusiastically tried to bring to their readers: interesting information on some fascinating topics which have for long been an area of exploration. This magazine is a sincere effort to nurture their creativity and curiosity.

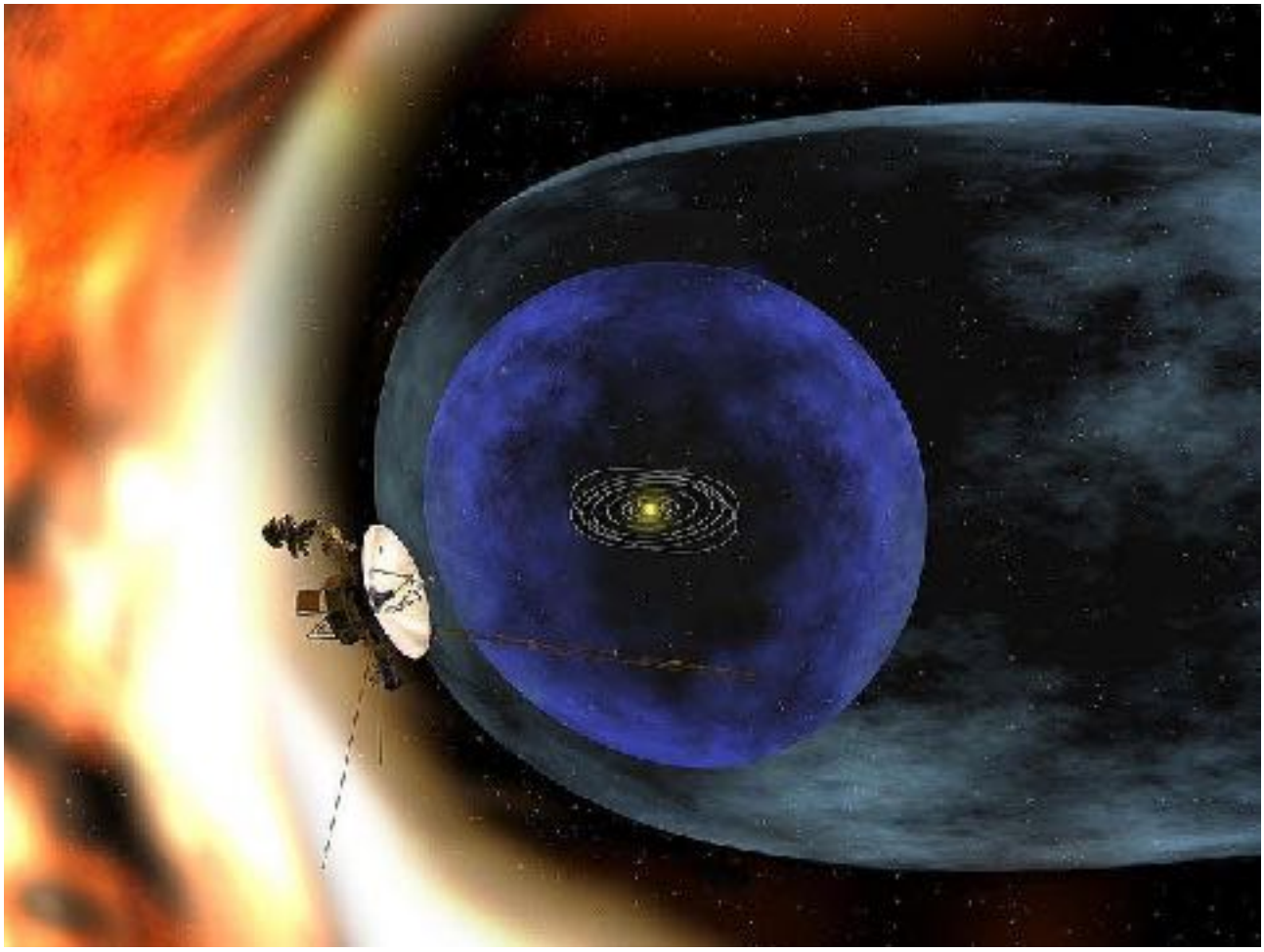
We are thankful to the respected Head of School for entrusting us with the responsibility of this magazine. We would also like to thank all the teachers for their valuable suggestions and the students who contributed for helping us bring to our readers this magazine in its present form.

- Meenu Gupta and Rachpal Kaur Nirmale

Astronomy

Is There Such a Thing as Planet Sound?

By Naisha Desai, Grade 9 GB



Can a planet make a sound? It's an interesting question that gives us an insight into the nature of sound waves. In a sense, planets do emit radiations which can be used to make sounds we can hear. So how does that work?

"In space, no one can hear you scream." For any sounds to be heard while someone is "in" space, molecules have to be present to vibrate and transmit sound to the ears of people in space. On our planet, air molecules serve this purpose. In space, however there are few if any molecules to deliver sound waves.

This doesn't mean that there aren't any vibrations moving through space, it only means that there are no molecules to pick them up. However, these emissions can be used to create "false" sounds (that is, not the real "sound" a planet or other object might make).

As one example, people have captured emissions given off when charged particles from the sun encounter our planet's magnetic field. These emissions are at really high frequencies that our ears can't perceive but they can be slowed down enough to allow us to hear them. They sound eerie and weird, but those whistlers and cracks and pops and hums are just some of the many "songs" of earth. Or, to be more specific, of earth's magnetic field.

In the 1990s, NASA explored the idea that emissions from other planets could be captured and processed so people could hear them. The resulting "music" is a collection of eerie, spooky sounds.

So are we really hearing a planet? Not exactly. The planets don't sing pretty music when spaceships fly by. But, they do give off emissions that Voyager, Galileo and other probes can sample, gather, and transmit back to Earth.

The music gets created as the scientists process the data to make it so that we can hear it. However, each planet does have its own unique "song". That's because each one has different frequencies that are emitted (due to different amounts of charged particles flying around and because of the various magnetic field strengths in our solar system). Every planet's surroundings will be different and so will its sound be.
The creation of "planetary sound" started when the Voyager 2 spacecraft swept past Jupiter, Saturn and Uranus from 1979-89. The probe picked up electromagnetic disturbances and charged particle fluxes, not actual sound.

Charged particles (either bouncing off the planets from the Sun or produced by the planets themselves) travel in the space, usually kept in check by the planets' magnetospheres. Also, radio waves (again either reflected waves or produced by processes on the planets themselves) get trapped by the immense strength of a planet's magnetic field.

The electromagnetic waves and charged particles were measured by the probe and the data from those measurements were then sent back to Earth for analysis.

Galaxies Battle to Give Birth to Stars: Galactic Cannibalism

By Sara Shah, Grade 9 GB

Galactic Cannibalism by Andromeda

We have heard a lot about black holes and white holes and what galaxies are. But, have you heard about how galaxies fight?

Not much was heard and known about this till until January 2003, when two curious and now prestigious astronomers: Puragra GuhaThakurta of UCSC (University of California at Santa Cruz) and David Reitzel of

UCLA (University of California, Los Angeles) presented some new findings to the American Astronomical Society.

They indicated that large spiral galaxies were growing by gobbling up smaller satellite galaxies. Their evidence was a faint trail of stars in the nearby galaxy called Andromeda. They named this phenomena as Galactic Cannibalism.

Galactic Cannibalism is the collision of two galaxies and the subsequent absorption of parts of one into the other. The closest galaxy to us, Andromeda, is over 2.5 million light years away. But in many corners of the universe, galaxies are much more tightly packed in. All galaxies move. With many massive moving bodies swirling around, it's only a matter of time before they collide and "eat" each other.

When galaxies collide, their individual gravitational forces reach out and pull the other in. You can picture a massive "gravity arm" reaching out and grabbing a chunk of another galaxy. Except this is a two way event. However, the larger galaxy (the one with the greater gravitational pull) almost always wins the fight and causes more destruction to the smaller galaxy.

Galactic cannibalism doesn't just distort galaxies, it also gives birth to new stars. A major component of galaxies are clouds. When galactic clouds collide, stars are born.

We can look at our own solar system, the Milky Way, to get an example of this. The Milky Way is comprised of two parts: a disk and a halo. Most of the stars in the disk are relatively young and were likely formed in the Milky Way itself. The stars in the halo, on the other hand, are much older, more ancient stars. Most scientists believe that these ancient halo stars were formed in neighbouring systems or galaxies but were sucked into the Milky Way due to its larger gravitational pull.

Understanding galactic cannibalism helps to answer questions about our own solar system as well, particularly about whether our solar system is ordinary or unique. By understanding that, we could gain more insight into the possibility of another planet like Earth.

We must eagerly await more information while scientists research why and how this phenomena occurs.

What are Red Supergiants?

By Janmay Panchal, Grade 9 GB

Red Supergiant

Red Supergiants are stars with a supergiant luminosity class (Yerkes class I) of spectral type K or M. Stars of this type are among the biggest stars known in terms of sheer bulk, although they are not the most massive or luminous. Red supergiant stars are stars that have exhausted their supply of hydrogen at their cores. As a result, their outer layers expand hugely as they evolve off the main sequence. The temperatures of red supergiants range from 3,500K to 4,500K. The life of red supergiants ranges from 3 million years to 100 million years. Betelgeuse and Antares are the brightest and best

Where is the Centre of the Universe?

By Amoli Patel, Grade 9 GB

Looking up at a clear night sky, you see stars in every direction. It almost feels as if you're at the centre of the cosmos. But are you? And if not, **where is the centre of the universe?**

The universe began as a singularity (an infinitely tiny point with infinite density) that started expanding at the moment of the Big Bang. However, the Big Bang wasn't a normal explosion starting from a single point in space. Rather, space itself was expanding, with everything in the universe moving away from everything else. Today we observe a universe that appears fairly isotropic; that is to say, it looks basically the same in every direction.

Throughout history, humans have wrongly thought that we were at or near the centre of the universe, whether that centre was the Earth, the sun or even the Milky Way. But no matter how special we humans think we are, the universe has so far, shown otherwise.

One way to think about this is to imagine a two-dimensional ant that lives on the surface of a perfectly spherical balloon. From the ant's point of view, everywhere on the surface looks

Carl Sagan as a kid

the same. There is no centre on the sphere's surface, nor is there an edge.
If you inflate the balloon, the ant will see its two-dimensional universe expand. Draw dots on the surface, and they will move away from one another, just like the galaxies in our real universe do.

For the ant in this two-dimensional universe, any third dimension that extends perpendicular to the balloon's surface – like traveling into the centre of the balloon – has no physical meaning.

"It knows it can go forward and backward. It can go left and right," said Barbara Ryden, an astrophysicist at the Ohio State University. "But it has no concept of up and down."
Limited by how far light has travelled since the Big Bang, cosmologists' observations offer only a finite glimpse of the cosmos, but the entire universe could be infinite.

"**If the universe is infinite, there is no centre!**" Ryden, an astrophysicist at The Ohio State University told Live Science. That the universe has no centre and, by extension, no edge, is consistent with the cosmological principle, the idea that no place in the universe is special. Observations of how galaxy clusters are distributed and the cosmic microwave background reveal a cosmos that, when you zoom out far enough, does indeed look the same everywhere.

What Am I?

By Sara Shah, Grade 9 GB

1. I'm bright but I'm not clever
   I burn but I'm not a bonfire
   I sound like I'm a celebrity but I'm not famous
   I twinkle but I'm not an eye
   I can be seen at night but I'm not the moon

2. I can be looked through but I'm not a window
   I have your eye pressed to me but I'm not a door peephole
   I'm often placed on a tripod but I'm not a camera
   I help you see things that are far away but I'm not a pair of binoculars
   I'm often pointed at the sky but I'm not a satellite dish

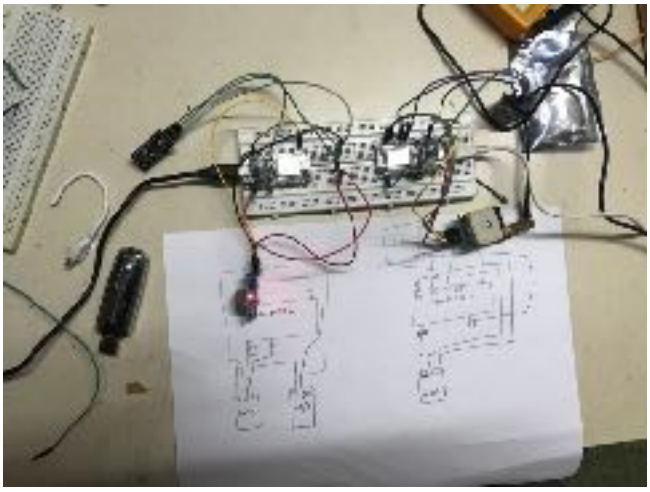
3. I'm spherical but I'm not a soccer ball
   I can be full even though I haven't eaten anything
   I have craters but I'm not a volcano
   I have a dark side but I'm not Darth Vader
   I can be seen at night but I'm not a star
   I affect tides but I'm not the wind

4. I provide light but I'm not a candle
I'm hot but I'm not a bonfire
I have rays but I'm not an aquarium
I'm a star but I'm not a celebrity
I rise in the morning but I'm not someone getting out of bed

Answer Key:
1. Star
2. Telescope
3. Moon
4. Sun

Invention of the Month

The Joy Bot

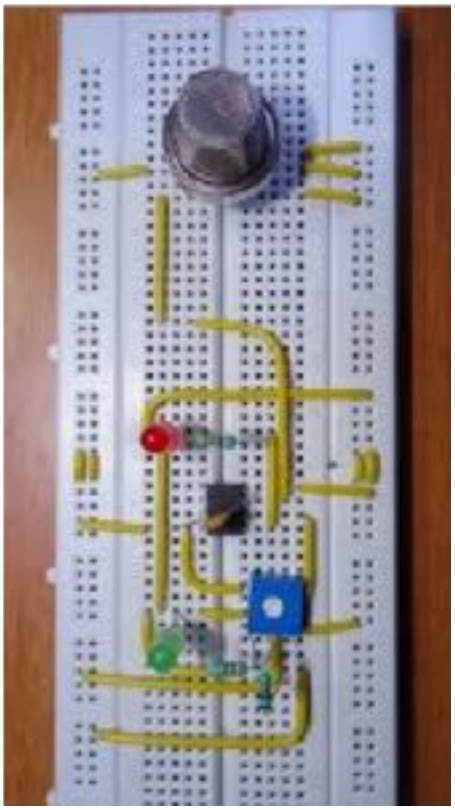


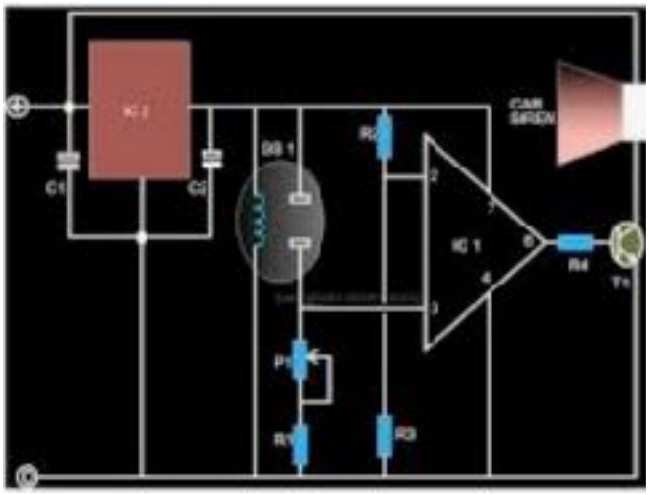
By Rachit Agarwal, Grade 11 Science

The Joy Bot is a combination of various sensors. There are gas sensors which give readings when they sense the presence of toxic gases such as sulphurous, nitrogenous, and carbon oxides. It also has a temperature sensor which will detect the temperature of the exhaust and the gases which are being released. It has GPS which adds to the device.

All these features are connected using a wifi device. It connects the device to the mobile phone of the user. All the readings from the sensors are taken from the wifi device and it sends them to the data server from where the data is transferred to the mobile and the website login.

The mobile app shows the user all the readings and makes it easy for the user to figure out how much he is harming nature. Apart from this the app also shows the areas which are highly toxic at that point. The user gets merit points for avoiding those areas and can avail those them in parking areas.

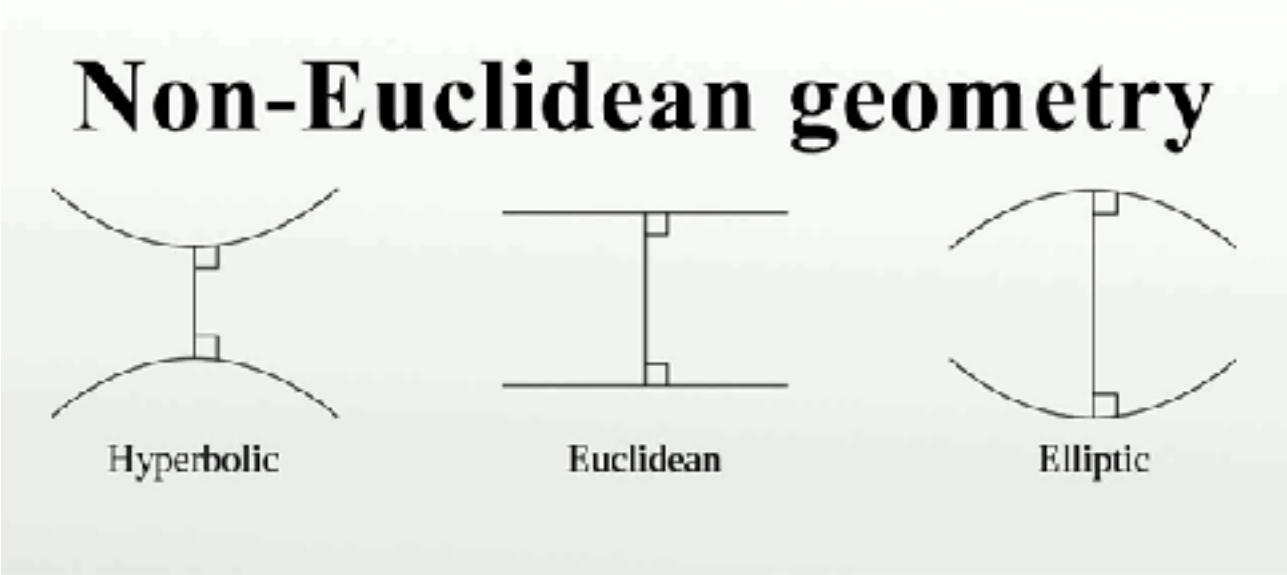




The Magic of Numbers

Going Above and Beyond: Euclidean and Non-Euclidean Geometries

By Anay Arora, Grade 9B IGCSE



What is geometry?
Geometry is the realm of math in which we talk about things like points, lines, angles, triangles, circles, squares and other shapes, as well as the properties and relationships between the properties of all these things.

What is Euclidean geometry?
The type of geometry we typically learn about in schoołand the type of geometry we usually think of when we think of "geometry"is known as Euclidean geometry.

Why such a proper name?
Euclidean geometry gets its name from the ancient Greek mathematician Euclid who wrote a book called 'The Elements' over 2,000 years ago in which he outlined, derived, and summarised the geometric properties of objects that exist in a flat two-dimensional plane. This is why Euclidean geometry is also known as "plane geometry". In plane geometry, the interior angles of triangles add up to 180 degrees, two parallel lines never cross, and the shortest distance between two points is always a straight line.

What is Non-Euclidean geometry?
It turns out that not everything lives in a two-dimensional flat world and therefore not everything is bound by the laws of plane Euclidean geometry. For example: you, me, and all of humanity live on the surface of the Earth which isn't flat. It is, in fact, an approximately spherical object. Which means that the rules of plane geometry do not regulate our lives.

Imagine you start at Earth's north pole and walk south until you reach the equator. You then walk directly east until you travel 1/4 of the way around the planet. Finally, you turn back north and return to the North Pole. If you think about it, you will realise that the path you have traveled is a triangle on the spherical surface of the Earth. And the crazy thing is that all three angles of this "triangle" are right angles so its interior angles add up to 90 x 3 = 270 degrees.

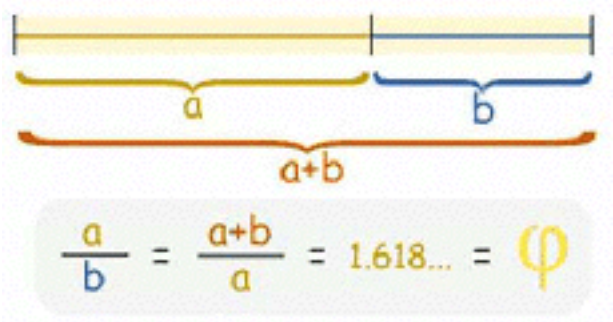
Here's another crazy thing: the pair of lines representing the two sides of the triangle marking the north-south legs of your journey are "parallel" to each otherin the sense that they both run in the north-south direction. But they intersect at the North Pole! And the South Pole! So even though they're going in the same direction, they're not parallel like the never-crossing parallel lines of plane geometry.

What Is the Golden Ratio?

By Aryan Singh, Grade 9A IGCSE

The golden ratio… Sounds beautiful in itself doesn't it? Well, you would be correct to assume it is. This phenomenon can be witnessed in nature and is often used to argue that math is the language of the universe.

So, **what is the golden ratio?**
Well, it would be better to show you an example. Euclid said that if you wanted to understand it on a basic level, first draw a line segment and divide it into 2 segments A and B. That's it. If you see in the picture below, the ratio of the shorter side to the longer side is the same as that of the entire line to the longer side. If we calculate it, the value becomes 1.618.



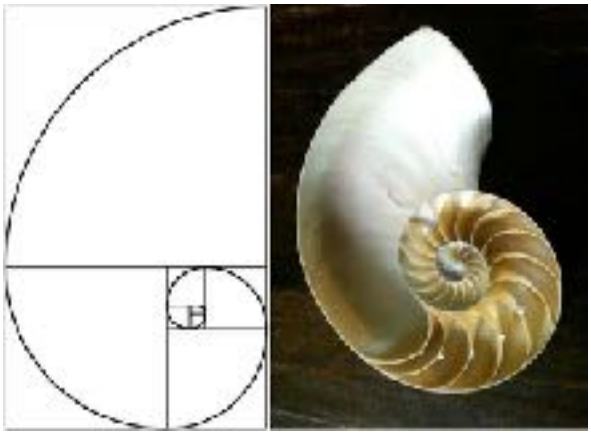
The Golden Ratio

Another interesting concept related to this is the Fibonacci sequence. Now, I am sure you all know about the Fibonacci sequence where the next number is the sum of the preceding numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55… The interesting bit is that if you divide any number by the preceding number, you will get an approximation of the golden ratio. So, 2/1 = 2. Not far off. But if you divide 55 by 34, you will get 1.618 which is the golden ratio.

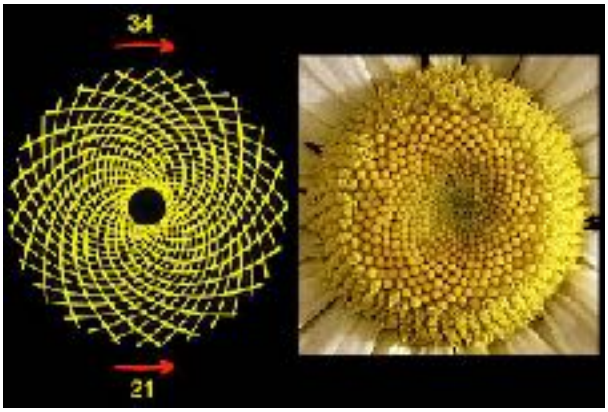
Now, how can you apply this? Here comes the golden rectangle. The picture below shows how it is formed. The numbers chosen are the numbers of the Fibonacci sequence.

Here are some examples of the golden ratio in nature:

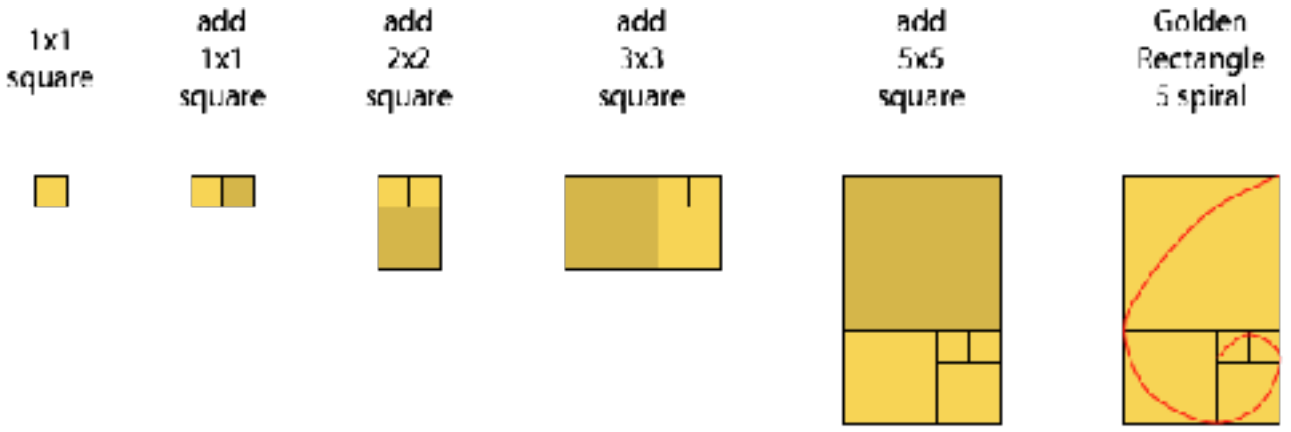
Shells

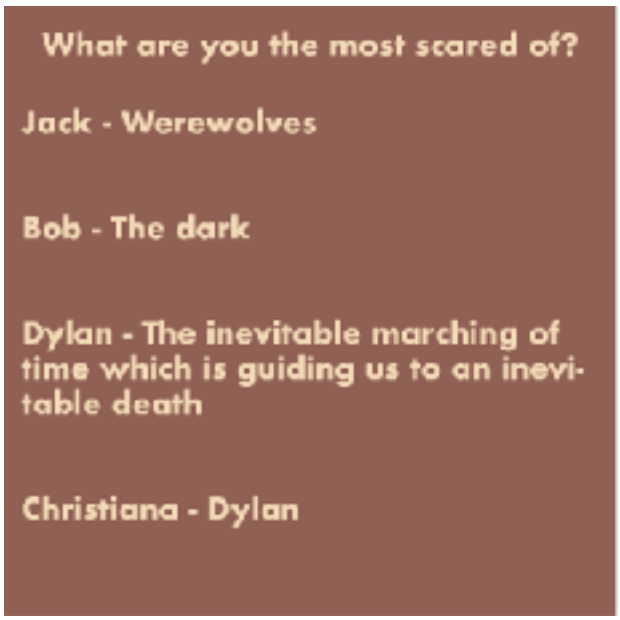


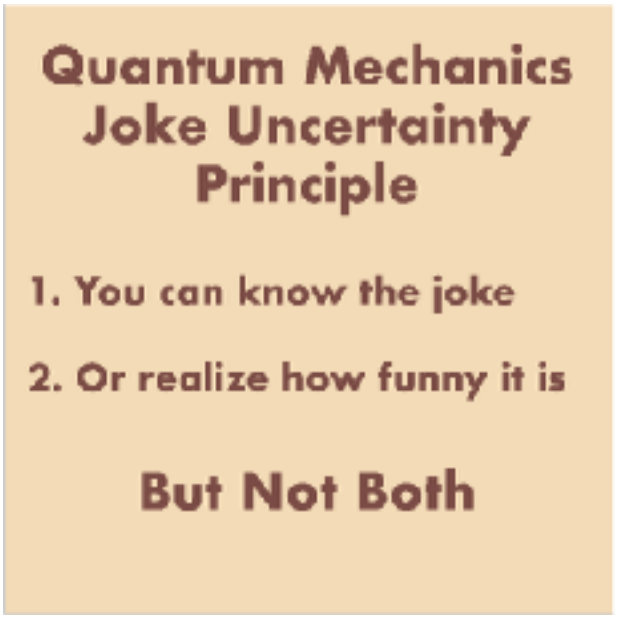
Seeds in a flower:
34 (a number in the Fibonacci sequence) is travelling in one direction and 21(another number in the Fibonacci sequence) is travelling in the other direction which gives us this satisfying spiral.

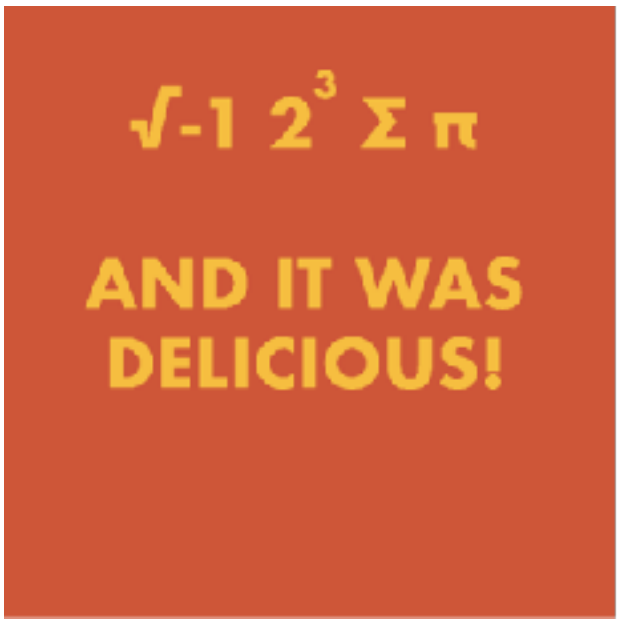


Spiral Galaxies


1x1 square
add 1x1 square
add 2x2 square
add 3x3 square
add 5x5 square
Golden Rectangle
& spiral


What are you the most scared of?
Jack - Werewolves
Bob - The dark
Dylan - The inevitable marching of time which is guiding us to an inevitable death
Christiana - Dylan


Quantum Mechanics Joke Uncertainty Principle
1. You can know the joke
2. Or realize how funny it is
But Not Both


√-1 2³ Σ π
AND IT WAS DELICIOUS!


Ingredients
Carbon
Holmium
Cobalt
Lanthanum
Tellurium
CHoCoLaTe

The Maths Behind the Leaning Tower of Pisa

By Khushi Patel, Grade 9A IGCSE

The Leaning Tower of Pisa may be the world's greatest spot for a tourist photo, but there's a lot more to this centuries-old icon than lighthearted images of your friends and family "holding up" the tower. Here's everything you need to know about Italy's most beloved architectural accident.

Tower of Pisa is located in Pisa, Italy and was closed to the public more than a decade ago, when officials feared it was beginning to lean so much that it might topple over. Work to stop the towers increasing tilt has taken far longer than planned, but officials expect it to be open to tourists soon. When work began, the tower leaned 6 degrees, or 13 feet, off the perpendicular on its south side. By removing a small amount of soil, the tower has settled better and now leans about 16 inches less - nearly the tilt it had 300 years ago.

The tower was 184.5 feet tall to start with when it stood upright. When construction resumed in 1272, the additional developments did not exactly help the tower's posture. The stacking of additional stories atop the existing three jostled the building's centre of gravity, causing a reversal in the direction of its tilt. As the tower accrued its fourth, fifth, sixth, and seventh stories, the once northward-leaning structure began to tip further and further south.
The Leaning Tower of Pisa in Italy has slowly started defying its name, losing 4 centimetres of its tilt over the past 17 years.
The Leaning Tower of Pisa

The movement, roughly 1.5 inches, comes after extensive consolidation work done between 1993 and 2001, which was required to reverse its slump and keep the tower upright. It would be fascinating to inquire why the tower is leaning but hasn't fallen.

The Leaning Tower of Pisa

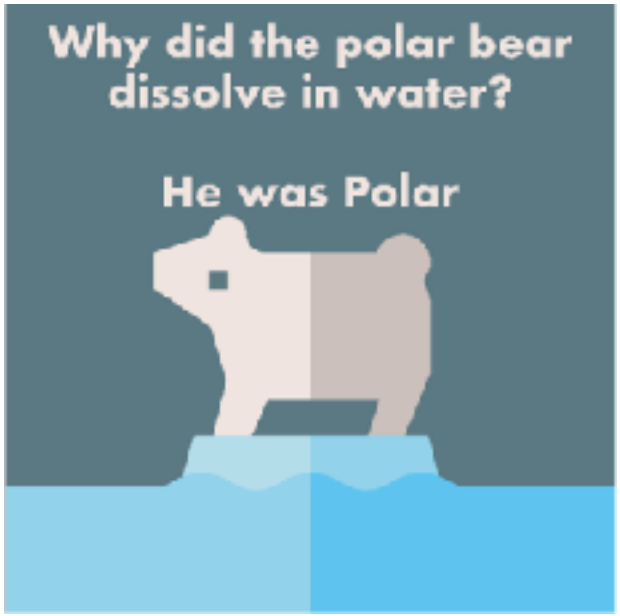

Electricity Detective . . .
SHERLOCK
OHMS!


My favourite frequency
is 50,000 Hz
You probably haven't
heard of it before


BIOLOGY
Where
Multiplication = Division


FERROUS
Fe
Fe
Fe
Fe
Fe
Fe
Fe
WHEEL


Why divide sin by tan?
Just cos


Why did the polar bear
dissolve in water?
He was Polar

The Hunt for the Largest Prime

By Kush Agarwal, Grade 9A IGCSE

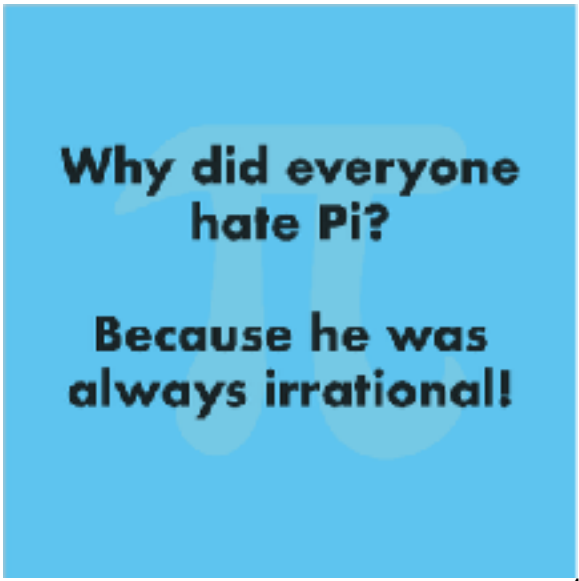
"Why was 6 afraid of 7? Because 7 is a prime, and primes are intimidating"
Prime numbers, a weird concept which we came across in lower grades, has a surprising and startling implication in our lives. Scientists today, are on a quest to find the largest prime. The longest one discovered is more than a few million digits long. But why are we doing this?

Let us say, that you want to buy a book - *The Elegant Universe* by Brian Greene. To do so, you log into your Amazon account, search for the book, and enter your details. You get an OTP as you want to pay with your debit card, and within a few days, you would be flipping through pages of literary heaven. In this entire process, prime numbers, played a crucial role at two instances. First, when you logged into your Amazon account and when you paid for the book. So, how do these numbers play a crucial role?

The short answer is, that they secure the data. The long answer however, is much more deep and profound in nature. It is something which is seemingly absurd but undoubtedly ingenious. When you log into your Amazon account by typing in your password, a whole slew of mathematical wonder unfolds. The password is converted into a string of numbers, and is then multiplied by a huge prime number twice. Once by the user, and once by the company. The resulting string of characters is stored in a database. When you try to log in next time, the password again goes through the multiplication process, or the "hashing" process. If the two "hashes" match, the user is granted access.

The advantage of using prime numbers is, that it is easy to multiply two prime numbers, but it is difficult to factorize a large number into two primes. For example, multiplying 11 and 13 is easy, but finding out which primes make up 143 is relatively difficult. Thus, even if hackers get knowledge of the "hash", they will have quite a hard time figuring out what it really means. The real prime numbers which are used, are however **much** larger. Reaching upto millions of digits, their products are a nightmare to factorize.

Credit and debit card transactions are also secured in a similar way. Lets say, you want to learn about Superstring Theory and its implications, and you bought the book mentioned earlier, you would probably pay using a debit or credit card. When you enter the your card details, and try to process a payment, a communication channel similar to the password channel is created between the online merchant and the bank, fortified by the prime numbers. Moreover, if it were not for prime numbers, we probably wouldn't have had bank accounts that are as safe and secure as they are today.



20 Fun Facts About Maths

By Trisha Saini, Grade 9A IGCSE

1. The word "hundred" comes from the old Norse term "hundrath" which actually means 120 and not 100.

2. In a room of 23 people there's a 50% chance that two people have the same birthday.

3. Most mathematical symbols weren't invented until the 16th century. Before that, equations were written in words.

4. "Forty" is the only number that is spelt with letters arranged in alphabetical order.

5. Conversely "one" is the only number that is spelt with letters arranged in descending order.

6. From 0 to 1000, the only number that has the letter 'a' in it is "one thousand".

7. "Four" is the only number in the English language that is spelt with the same number of letters as the number itself.

8. Every odd number has an 'e' in it.

9. The reason Americans call mathematics "math", is because they argue that "mathematics" functions as a singular noun so "math" should be singular too.

10. Markings on animal bones indicate that humans have been doing math since around 30,000BC.

11. "Eleven plus two" is an anagram of "twelve plus one" which is pretty fitting as the answer to both equations is 13.

12. Also, there are 13 letters in both "eleven plus two" and "twelve plus one".

13. Zero is not represented in roman numerals.

14. The word "mathematics" only appears in one Shakespearean play - *The Taming of the Shrew*.

15. -40 °C is equal to -40 °F.

16. In France, a pie chart is sometimes referred to as a "camembert".

17. The symbol for division (i.e. ÷) is called an obelus.

18. 2 and 5 are the only prime numbers that end with 2 or 5.

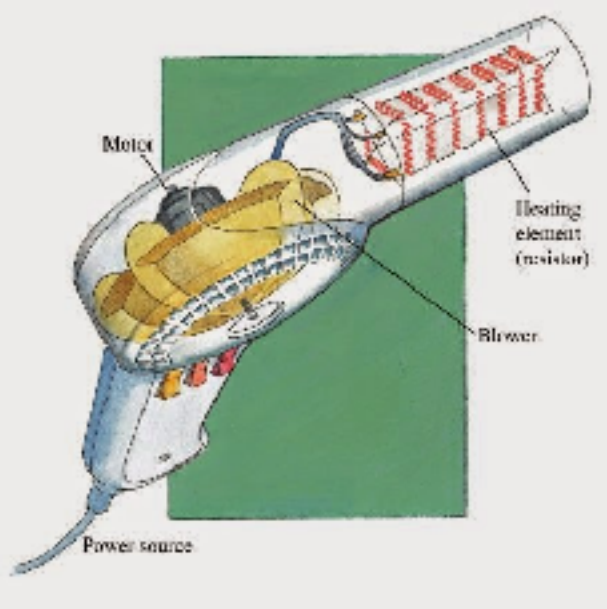
19. A 'jiffy' is an actual unit of time. It means 1/100th of a second.

20. If you shuffle a deck of cards properly, it's more than likely that the exact order of the cards you get has never been seen before in the whole history of the universe.

How Things Work

Hair Dryer

By Shreeya Patel, Grade 8C IGCSE



Even though hair dryers haven't been around for long, almost 70% of people in modern society today use hair dryers on a daily basis. A hair dryer or a blow dryer is an electromechanical device designed to blow normal or hot air over damp hair, in order to accelerate the evaporation of water particles and dry the hair. Invented around the end of the 19th century, the handheld, household hair dryer first appeared in 1920.

The hairdryer was created based on the principle of evaporation. Evaporation is controlled by relative humidity — the ratio of the amount of water the air holds to the amount it could hold. For example, if the relative humidity is 90%, that means that the air is holding 90% of its maximum capacity of water volume. When air is heated, its relative humidity decreases. It still has the same amount of water, but it can hold more. The lower the relative humidity, the more easily water evaporates. That's why hot air will dry your hair faster because the water in your hair will evaporate more quickly.

The two important components of a hair dryer are the electric fan and the heating element. The heating element is made out of nichrome wire, which is a resistor. A resistor resists the flow of electric energy, turning it into heat energy. The air then passes over nichrome wire coils that heat it, making it able to blow the hair dry with hot air.

The process of air blowing on the hair speeds up water evaporation. Applying power to the hair dryer allows the motor to start spinning the fan inside, and that is what draws the air in through small air holes on the side of the dryer. Other electric hair dryers work by blowing room temperature air in through the vents.

Air Conditioner

By Krish Patel, Grade 8C IGCSE

Air conditioners use refrigeration to chill indoor air, taking advantage of a remarkable physical law: when a liquid converts to a gas (in a process called phase conversion), it absorbs heat. Air conditioners exploit this feature of phase conversion by forcing special chemical compounds to evaporate and condense over and over again in a closed system of coils.

The compounds involved are refrigerants that have properties enabling them to change at relatively low temperatures. Air conditioners also contain fans that move warm interior air over these cold, refrigerant-filled coils. In fact, central air conditioners have a whole system of ducts designed to funnel air to and from these serpentine, air-chilling coils.

When hot air flows over the cold, low-pressure evaporator coils, the refrigerant inside absorbs heat as it changes from a liquid to a gaseous state. To keep cooling efficiently, the air conditioner has to convert the refrigerant gas back to a liquid again. To do that, a compressor puts the gas under high pressure, a process that creates unwanted heat. All the extra heat created by compressing the gas is then evacuated to the outdoors with the help of a second set of coils called condenser coils, and a second fan. As the gas cools, it changes back to a liquid, and the process starts all over again. Think of it as an endless, elegant cycle: liquid refrigerant, phase conversion to a gas/ heat absorption, compression and phase transition back to a liquid again.

Viruses

What is a Computer Virus?

By Nivaan Choksi, Grade 8B IGCSE

A computer virus is a harmful software that is put in a computer to modify softwares and to harm the computer. It is mainly used by black hat hackers for offensive purposes. Hacking is an unethical activity and there are several reasons why hackers insert viruses into computers.

It may be for amusement or to exploit something or to send a political or personal message. Hacking can also cause economical damage. Every year online or offline virus scams worth billions of dollars are orchestrated which tear the economy apart. Computer viruses are also not easy remove once they have entered the computer. Millions of people on the internet get tricked to download softwares not trusted by the computer which insert a virus in the same.

Viruses may seem hard to deal with but there are several softwares made by companies like windows, anti malware etc to counter or prevent malware scams, trojan horses, spyware etc. These softwares have helped prevent a few viruses from entering the digital space if not many. As a citizen, viruses should be prevented from spreading by using tools like windows defender. These scams affect a lot of people and we should work to prevent them.

Viruses & Diseases

By Ariha Shah, Grade 8B IGCSE

A virus is an infective agent that typically consists of a nucleic acid molecule in a protein coat. It is too small to be seen by light microscopy and is able to multiply only within the living cells of a host. In biology, extinction is the termination of an organism or of a group of organisms, usually a species. The moment of extinction is generally considered to be the death of the individual of the species, although the capacity to breed and recover may have been lost before this point.

Viruses never go extinct, but many have been successfully eradicated. Two infectious diseases that have successfully been eradicated are smallpox and rinderpest. Smallpox is an extremely contagious and deadly virus for which there is no known cure. The last known case occurred in the United States in 1949.

Rinderpest - an acute, highly contagious viral disease of ruminant animals, primarily cattle - was once common in Africa, the Indian subcontinent, and the Middle East. Rinderpest was a devastating affliction of livestock and wildlife, and for centuries it was a major threat to food production

As of now there are four ongoing programs, targeting poliomyelitis, yaws, dracunculiasis, and malaria. Five more infectious diseases have been identified as of April 2008 as potentially eradicable with current technology. They are measles, mumps, rubella, lymphatic filariasis and cysticercosis.

Computer Viruses

By Yash Kheni, Grade 8A IGCSE

Zeus Virus

Zeus:
Zeus is a Trojan horse made to infect Windows computers so that it can perform various criminal tasks. The most common of these tasks are usually man-in-the-browser keylogging and form grabbing. The majority of computers infected with it were infected either through drive-by downloads or phishing scams.

First identified in 2009, it managed to compromise thousands of FTP accounts and computers from large multinational corporations and banks such as Amazon, Oracle, Bank of America, Cisco etc. Controllers of the Zeus botnet used it to steal the login credentials of social network, email, and banking accounts.

With 25% of the compromised computers in the US alone, it was estimated that more than 1 million computers were infected in the US. The entire operation was sophisticated, involving people from around the world to act as money mules to smuggle and transfer cash to the ringleaders in Eastern Europe. About $70 million were stolen and in possession of the ring. 100 people were arrested in connection of the operation. In late 2010, the creator of Zeus announced his retirement but many experts believe this to be false.

Mydoom:
Surfacing in 2004, Mydoom was a worm for Windows that became one of the fastest spreading email worm since ILOVEYOU. The author is unknown and it is believed that the creator was paid to create it since it contains the text message, "andy; I'm just doing my job, nothing personal, sorry,". It was named by McAfee employee Craig Schmugar, one of the people who had originally discovered it.

'mydom' was a line of text in the program's code (my domain) and sensing this was going to be big, added 'doom' into it. The worm spreads itself by appearing as an email transmission error and contains an attachment of itself. Once executed, it will send itself to email addresses that are in a user's address book and copies itself to any P2P program's folder to propagate itself through that network.

The payload itself is twofold: first it opens up a backdoor to allow remote access and second it launches a denial of service attack on the controversial SCO Group. It was believed that the worm was created to disrupt SCO due to conflict over ownership of some Linux code. It caused an estimate of $38.5 billion in damages and the worm is still active in some form today.

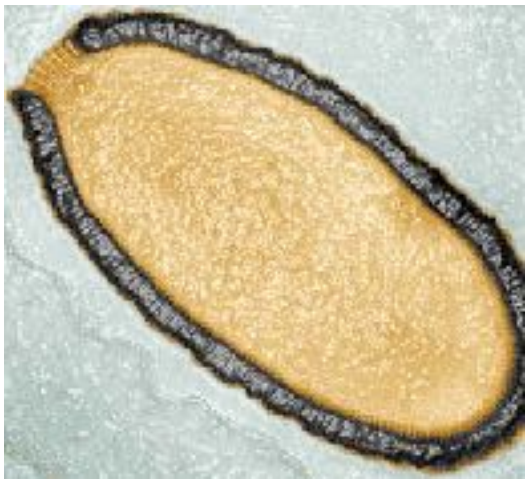
Mydoom Virus

The Mystery of Frozen Viruses

By Krishang Worah, Grade 8A IGCSE

Ice has started to melt due to global warming, and because of this a lot of previously extinct viruses have come back to life and now have the potential to bring great harm to the human race.

Pithovirus



Pithovirus

When an object is trapped beneath layers of frozen soil, the layers become the permafrost. Such permafrost in Siberia is melting and getting thawed as a result of global warming, giving life to dangerous viruses like the pithovirus. This virus was found approximately 100 feet below the permafrost and now has become infectious again after a span of 30,000 years.

French scientists say that although this virus does not affect humans and animals, it can unleash other dangerous viruses still lurking in the permafrost. It is 1.5 micrometers in length and attacks amoebas.

These viruses are frozen in the laboratory to preserve them for the future. If they have a lipid envelope - like flu or HIV for example - then they are a bit more fragile. But the viruses with an external protein shell - like foot and mouth and common cold viruses - survive better.

"But it's the freezing-thawing that poses the problems, because as the ice forms then melts there's a physical damaging effect. If they do survive this, then they need to find a host to infect and they need to find them pretty fast."

Anthrax

Anthrax is caused by the Bacillus Anthraces, which makes spores that can expose the person to this virus if the toxins are released in their body. This virus usually affects farm animals, but it is possible to get infected if their products are consumed or the person comes in contact with them. Although, anthrax is not contagious a few years back a young boy was killed due to anthrax and around 20 people were hospitalised. The cause of all this - a reindeer carcass exposed to anthrax about 75 years ago had thawed and released the virus into the water, food supply, and soil. It is rod-shaped and is around 1.2 micrometers in length. It can attack the skin, lungs and intestines. It can be cured, depending on its fatality.

Anthrax