JOLIOT CURIOSITY

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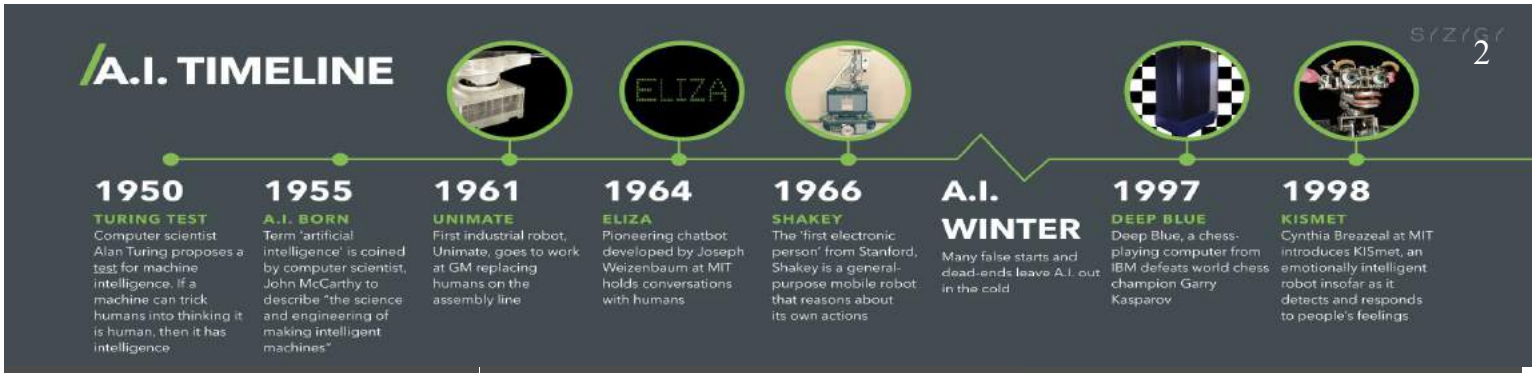


Artificial intelligence

Learn everything about artificial intelligence in one article

It is necessary to know that artificial intelligence did not appear in the blink of an eye in robots. First of all, for those who do not know it, artificial intelligence sets the concept that a machine is capable of being intelligent but also of having feelings or emotions. Artificial intelligence is not only used in robots.

In your house for example, it can range from a simple connected vacuum cleaner to a personal intelligent assistant as *Google Home*. But these technologies have their limits. For instance, everybody has already used a translator on the Internet and noticed that the system was unable to translate in context. It can only associate one word to another which causes many mistakes.

Source :https://digitalintelligencetoday.com/artificial-intelligence-timeline-infographic-from-eliza-to-tay-and-beyond/

IN 2050, HUMANOID ROBOTS WILL RULE THE WORLD

Source::http://yellowtube.org/wp-content/

Robots will take the control of the Earth in a few decades ! This is what some people or some celebrities think. They worry about the idea of living with humanoid robots, certainly because of movies they watched like *The Terminator*. Some celebrities have warned us as Stephen Hawking, Bill Gates or Elon Musk. When Stephen Hawking was asked about artificial intelligence he said "We are in danger of self-destruction". And he may be right! Indeed, if we keep developing artificial intelligence robots might one day surpass humans.

BREAKING NEWS

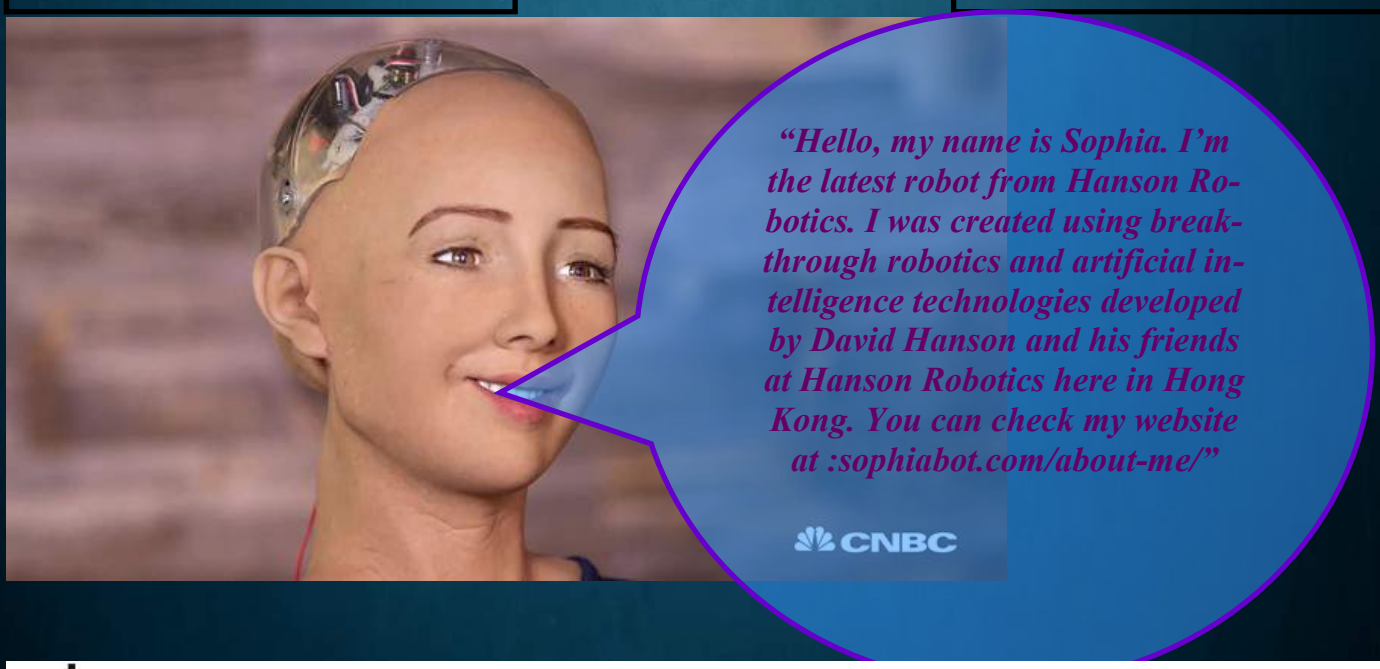
You certainly heard it on the news, in the United States a *Uber* car hit a woman. This car was driven by an artificial intelligence device which could be monitored by a man in case of emergency. Yet, the accident happened so quickly that neither the device nor the man could stop the car from hitting the woman. This event proves that A.I. is still dangerous and that we do not control this technology, yet.

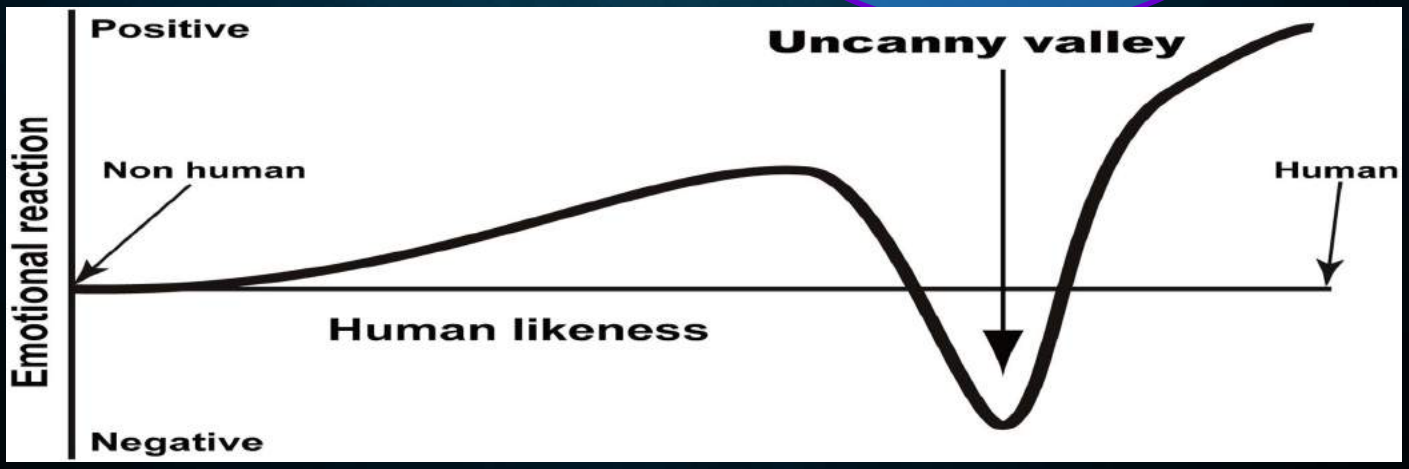
by *Ahmed.K*

Sophia is the name of a humanoid robot developed by Hanson Robotics, a company based in Hong Kong, activated on April 19th, 2015. It was designed to learn everything by getting used to the behavior of human beings. Sophia is able to answer questions and can be interviewed thanks to ELIZA a computer program, one of the first attempts to simulate a human conversation.

SOPHIA THE HUMANOID ROBOT HAS MORE RIGHTS THAN A SAUDI WOMAN.

In October 2017, the robot was given the Saudi nationality by King Salmane Ben Abdelaziz Al Saoud. It was the world's first android to get the citizenship of a country. Indeed, Sophia the humanoid robot has more rights than a Saudi woman and is the only one allowed to go without a veil in the country.





THE CURVE THAT TELLS YOU MORE ABOUT YOUR PHOBIA

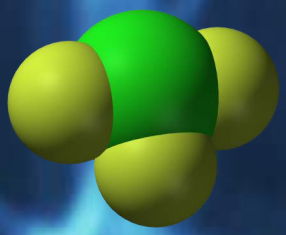
The uncanny valley is a theory which states that the more an android robot looks like a human being, the greatest feeling of strangeness it generates, showing its imperfections as monstrous from a human point of view. It is a scientific theory of the Japanese roboticist Masahiro Mori, published for the first time in 1970. This phenomenon can be represented by a graph where the y-axis represents familiarity (or sympathy) and the x-axis, the degree of anthropomorphism. Anthropomorphism is the fact of attributing human reactions to animals or robots.

by *Chahid..M*

DANGEROUS MOLECULES

In your opinion, what are the most dangerous or insane chemical substances in the World ? You are going to name: Cyanide, sulphuric acid, or sarin gas ? WRONG ! Scientists created in laboratory fascinating molecules which can kill a man or even totally destroy Humanity !

Chlorine Trifluoride



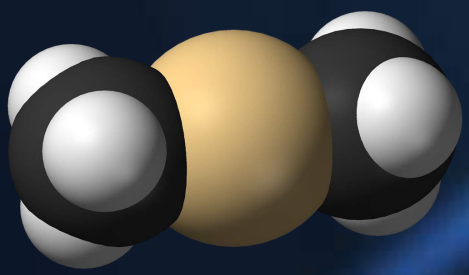
In a secret Nazi bunker, a full tank broke and let out a large quantity of Chlorine Trifluoride. The concrete burned to over **2,400 C°**, and even after the concrete was consumed, the fire burned also 1 meter deep in the ground before it stopped! The Nazis wanted to use it as flame thrower, but quickly realized that it was too dangerous. Moreover, it has a super oxidizing power (ability to burn), it allows the combustion of things that are normally impossible to burn. It can burn rock, metal, bricks and even burned things. **YES! It can burn ashes.**

Today, only some rocket companies like NASA use it to upgrade their propulsion systems. Imagine for a second that Chlorine Trifluoride falls into the wrong hands, the consequences could be catastrophic...

DIMETHYLCADMIUM

Erich Krause created it in 1917, and died at the age of 37 due to his own chemical experiments! He shared his discoveries about Dimethylcadmium with other scientists just before his death and it is really incredible to see how dangerous it is .

Dimethylcadmium has the particularity to be the most toxic poison in the world! It appears like a colorless oily liquid and is very volatile, even if you breathe it from a distance, you are infected. And only a few micrograms can put you in danger, and if you do not die immediately, it gives you cancer, to make sure that you die in the end. And in addition to being hyper toxic, it is impossible to get rid of. If you wash it, it explodes, if you rub it, it burns and if you leave it alone, it decomposes and explodes anyway!



Fortunately the difficulties to synthesize and manipulate it make it impossible to use it as a chemical weapon. However, it has a modern use, and only one: It helps synthesize some nanocrystals.

Yeah, imagine what would happen if bad people were able to use those weapons.

by *Badredine R.*
Nicolas D.

Polonium 210

If you saw the news in 2006, you surely heard about this high-powered radioactive poison. It caused an agent of the Russian secret service, Alexander Litvinenko's death.

Alexander, an opponent of Poutine, lived in England and worked over there for secret service. While he was in a sushi restaurant, he drank tea. When he left, he felt violent pains and understood immediately that he had been poisoned. He washed his stomach with two liters of water, but in vain. He was then taken to the hospital in a critical situation.

He lost his hair in only one week, stopped to eat during 18 days and finally died 23 days later, on November 23.

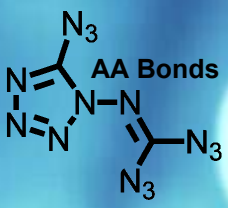
The autopsy was qualified one of the most dangerous in the world, because his dead body was very toxic. Polonium is 250,000 times more toxic than cyanide. The lethal dose for a human is 0.2 nanograms only!

And for you, future political opponent, this will happen after you drink your *Special Tea*: asthenia, lethargic state, dysfunction of the hepatic system, renal system and so on. Basically you're dead, write your testament, buy some flowers and put your feet in hot water.

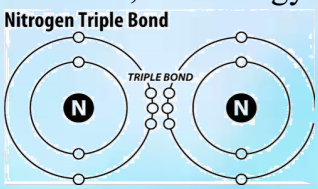
This atom was discovered by Marie Curie in 1898, but to produce a sufficient amount, you need A NUCLEAR REACTOR. So it really requires a lot of determination.

Recently, on Mars 4th, a 33 years old Russian girl called Youlia Skripal was poisoned with her father with Polonium 210. She is currently being cured and she is getting better. Her father was a Russian former spy and he is in a stable but critical condition.

Azidoazide Azide



A team of German chemists created the AA (Azidoazide Azide) in 2010 with the US army to develop more energy compound. This explosive is so instable that it can explode in all circumstances. It is the craziest chemical product in the world. Usually, two nitrogen atoms form a triple bond which makes it very stable, but the AA molecule, which contains 14 atoms of nitrogen has no triple bond. And because of that, the energy wants to break free and causes a thermal reaction known as explosion.



Scientists said that the sensitiveness of AA is beyond their measurement abilities, even the smallest possible quantities in shock & friction-tests led to explosive decomposition. They put one in a case without shock, light, movement and sound and it managed to explode… I think that you noticed it, but it is impossible to use AA anyway.

Thioacetone

Switzerland, Fribourg, the scientists who were working on the Thioacetone spilled a flask in the lab. The odor spread almost instantly. It caused vomiting, fainting, diarrhea among the people in the city… It was impossible to avoid it. And we are talking about a lab located half a mile off town. Dogs, which have a powerful sense of smell, where able to smell it from 35 km!

70 years later, scientists tried to recreate Thioacetone. One of them told that, after experimenting on it, he had been sprayed of lavatories deodorant by the owner of the restaurant where he was. Well… You know what? Give me a cup of Polonium 210 instead.

YOU ARE MORE BACTERIAL THAN HUMAN

IN YOUR BODY, THERE ARE TEN BACTERIA FOR ONE HUMAN CELL

A few surprising figures

- Some bacteria have a 250 million year lifespan. Bacteria do not have a pre-established lifespan because they do not grow old. They use a process called mitosis. They separate to create two identical cells. That is why bacteria cells do not really die.
- The lifespan of human cells can range from one day, such as Neutrophils (one type of white blood cells), to one life as the lens cells, that are part of the eye.
- In the body, for each human cell, we have ten bacteria.
- That represents approximately 100,000 billion bacteria, which weigh about 1 to 2 kilograms.
- The first form of life on Earth was a bacteria, call *LUCA (Last Universal Common Ancestor)*. It appeared about 3.8 billion years ago.

GMO bacteria can save the lives of 668.8 million people

Around the world, 668.8 million people suffer from diabetes. Diabetes is a consequence of the fact that the pancreas does not produce enough insulin to regulate the concentration of sugar in the blood. So to live correctly these people need insulin injections.

Insulin is important to keep a steady blood glucose level because it controls the storage and the release of glucose in different organs (liver, muscles…).

Low insulin level causes the release of glucose which induces an increase in the level of glucose in the blood . The body signs of this high level of glucose are thirst, urination, hunger and in the worst cases a blurred vision.

On the contrary a high level of insulin reduces glucose production by telling the liver to stock glucose as glycogen. If you have not enough glucose in the blood it can also cause some problems like hypoglycemia responsible for headaches, and unconsciousness in the worst scenario.

To create insulin, scientists use a technique named transgenesis. It consists in taking in the human DNA the gene which produces insulin and in putting it in the bacteria's DNA. After that, the bacteria *Escherichia coli* (yes, it is its sweet name) produces human insulin that scientists extract to create shots for diabetics. Diabetics have to use the shots several times a day.

by *Boury Erick* and *Pade Jules*

Some bacteria play a "double game"

Most *E.coli* are completely harmless and survive happily in the human digestive system. So all humans have them in their bodies.

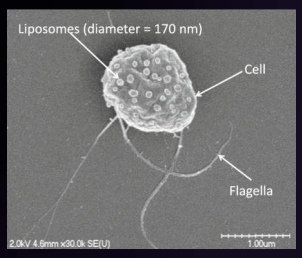
However, some kinds of *E.coli* can cause serious illnesses and most commonly lead to severe food poisoning as well as meningitis and infections. A high level of resistance to antibiotics has been found across several *E.coli*.

So yes, *E. coli* can save your life by producing insulin, but it can also kill you.

How oceanic bacteria help in the cancer treatment ?

Hello my name is *Magnetococcus marinus* and my nickname is MC-1. In the wild, I live in the ocean. I steer myself to the ocean floor and for that I follow the natural magnetic field of Earth and search the place with a low concentration of dioxygen. I am only 1µm big, but I am very fast: I can swim 300µm/s. That is the equivalent of a 1.8m man who swims at 1,900 Km/h !!

Do you think I can fight cancer and save all the 600,920 people who die every year from that ? The answer is yes .



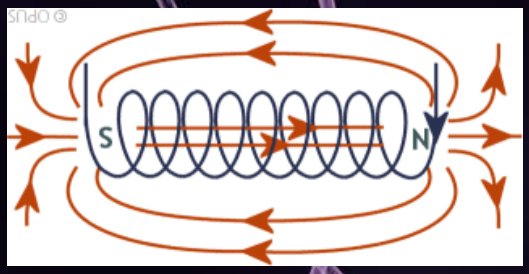
Tumor cells consume more dioxygen than healthy cells. So once I am getting close to the cancerous zone, I will move toward the zone where the lowest concentration of dioxygen is, so I will be close to the specific cancer cells and bring the drugs directly to them.

For now, I don't know when I will be able to help humans but I've already been proved efficient against mice and rats cancers.

https://www.researchgate.net/figure/Field-emission-scanning-electron-microscopy-image-of-one-MC-1-MTB-with-approximately-

A cancer treatment uses harsh drugs and kills other human cells as well as the cancerous cells. That is why chemotherapy is very harmful for the body.

Mahmood Mohammadi found a solution: Me! He put approximately 70 little bags on me that contains treatment against tumors. I can be controlled to target cancer cells. In the first step he guided me towards the cancer cells thanks to a magnetic field created by a solenoid, a copper coil that creates a linear magnetic field stronger than the natural magnetic field of the Earth.

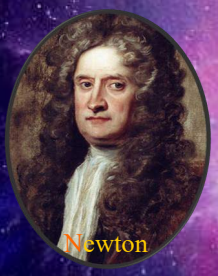


by *Boury Erick* and *Pade Jules*

Space propulsion:
How to go higher ?

On March 24th, 2018, Mike Hughes, a 61-year-old American, took off from California in his homemade rocket. He wanted to prove to the world that the Earth was flat. But he failed. He only reached a 550-metre altitude before using his parachute. He did not go high enough because his propulsion was not powerful enough. However, he was not discouraged and he said that he would try again. To help him, we modestly offer this article.


Mike Hughes in his rocket in California


Newton

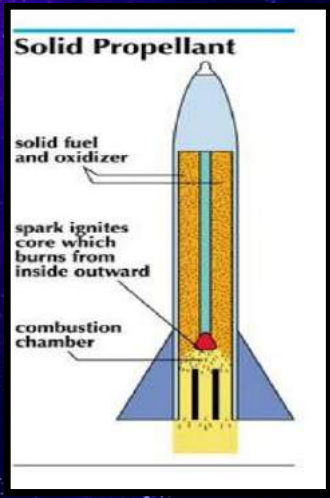
Reminder: The third Newton's law is used to propel all rockets. This law states that: "For every action, there is an equal and opposite reaction ". That is to say that the molecules ejected by the rocket engine (action), which are the flames that we can see under the rocket, create a force which propels the rocket (reaction).

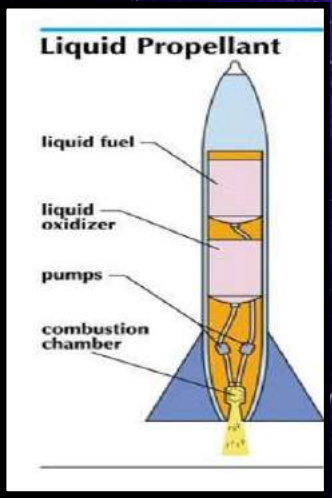
Chemical propulsion


Ariane rocket

Nowadays chemical propulsion is the only way to bring objects into space. The first scientist to imagine the concept of this method was the Russian Konstantin Tsiolkovski, the father of modern astronautics, at the beginning of the XXth century. There are two types of chemical propulsion which are solid and liquid propellant propulsion. The propellant is in fact the fuel of rockets.

The **solid propellant** propulsion is the simplest technique to use but not the most efficient. The Chinese have used it for their fireworks for 1,000 years. It consists to mix the two chemical components needed for the reaction, the oxidant and the fuel, in the same tank. The oxidant is generally oxygen. They are inert until a flame burns the mixture. The solid propellant propulsion is called explosive because it ejects great quantities of exhaust gas in a short time. The quantities of gas depend on the nozzle shape and the hot gas can reach 2,000°C. As it cannot be stopped and start again, it is used as booster on the sides of the rocket and not as principal propulsion way.





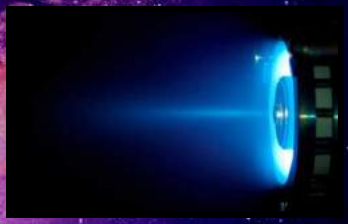
The **liquid propellant** propulsion is the most efficient chemical propulsion. In others words, it uses less fuel for an equal thrust. The fuel and the oxidizer are stocked in separate tanks. They are propelled, under pressure by turbo pumps, in the combustion chamber where they burn and create exhaust gas which propel the rocket.

Liquid-propellant propulsion is the most efficient one.

For example the rocket engine of the space shuttle can propel 4 tons of propellant per second in the combustion chamber. It represents a thrust of 213 tons per engine (as heavy as 30 elephants). So you can imagine the incredible power of this gear. As engineers can control it, its thrust and the orientation of the nozzle, it is used as the main propulsion means.


A rocket nozzle

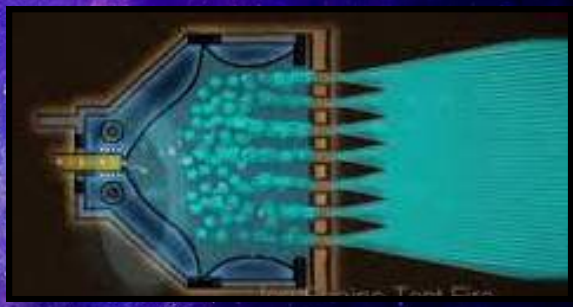
Electric propulsion



Electric propulsion is the most thrifty propulsion means because it ejects little quantities of gas between 4 and 80 km/s, with a very low push (if you put your hand 20 centimeters away from your mouth and breathe out slowly, you have an insight of the power of the electric propulsion). Consequently to have an acceptable thrust the system should work during a long time (weeks or months). By contrast, chemical propulsion ejects great quantities of gas at 0.3km/s but it generates a very important push. Therefore electric propulsion is used only in space and chemical propulsion is used during the take-off.

The main difference is that for electric propulsion the gas molecules (Argon or Xenon) are accelerated with electricity while in chemical propulsion the molecules are accelerated by burning. There are two main techniques for electric propulsion (some spacecrafts use several techniques).

The first one, the electro-thermal way is based on the fact that a hot gas takes up more place than when it is cold. By warming the gas, it takes more space and has to get out which creates the push. To warm it we use either an electric resistor (as in an oven) or an electric arc. Electric arcs use twice less fuel than electric resistors.



The second one, the electromagnetic way is based on the fact that same electrical charges repulse oppositely. Positive ions are created by the projection of electrons on the gas. These positive ions are accelerated by a cathode (positive pole) in the nozzle.

But all of those methods need a lot of electricity to use their full potential. Today, in space we have just solar panels to create electricity and it is not sufficient.

To finish we hope that this article will help our dear “Mad Mike” to go faster and higher!

Travelling with a nuclear reactor in your rocket

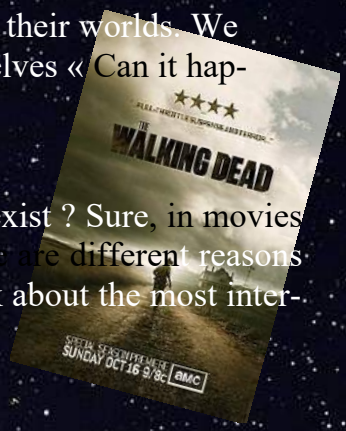
During the Cold War, American scientists developed an engine using nuclear power. The concept is quite simple, it works as nuclear power stations splitting atoms of uranium in a nuclear reactor. (Un)fortunately it has never been used and the reason is very simple: it is highly risky. Can you picture yourself, travelling through space with a nuclear reactor around 50m away from you!? Ouch! Dangerous and a little bit daring, isn’t it?

So, you can understand that for 50 years, this technique has never been used on any rocket.

by Nathanaël and Maël

Reel Life V

When we watch movies and TV shows, we are used to being attracted by their worlds. We can be so submerged by their extraordinary ideas that we finally ask ourselves « Can it happen in real life and not only on the reel ? »



Can a world full of zombies called « walkers » like in *The Walking Dead* exist ? Sure, in movies it is fun but in real life it is another story sounding as crazy as impossible. There are different reasons why we can confirm that zombies can exist but today let's talk about the most interesting one.

A BRAIN PARASITE !!!

It is a microbe called ***Toxoplasma gondii*** that causes toxoplasmosis. Only cats have an intestinal phase of this infection.
The microbe of toxoplasmosis is mostly transmitted by cats to humans and other animals. Basically the most interesting fact is the effect of toxoplasmosis on rats. The place of reproduction of this parasite is in the intestine of cats. They have an asexual reproduction forming multiple merozoites (cells that are the result of an asexual reproduction). These then enter new cells and form gametocytes (germinal cell from the process that produces ova and spermatozoa). Fertilization of a **macrogametocyte** (female) by a **microgametocyte** (male) forms the zygote which develops into an oocyst (egg). This egg bursts the intestinal cell and is passed in the cat's feces. So after the reproduction, microbes reject their eggs in our pretty cat's excrement. When the rat eats the contaminated feces, the ingested parasite migrates to the rat's brain and takes control of the part of the brain which creates the fear of cats among rats. So without fear they will go in front of the cat to finally be eaten by it. In a word, the parasite takes control of the rat's brain to program it to be eaten by cats.

We, Humans, can also be affected by ***Toxoplasma gondii*** by eating some undercooked sheep, pork or beef meat or by drinking unpasteurized milk which contains the germ.

Don't forget that we are not that much different from rats, for example we are accustomed to using them for some medical experiments. So it means that the germ can also affect us one day. If rats can lose every control of themselves and their conscience because of ***Toxoplasma gondii***, this parasite can evolve to produce the same effects on humans in order to transform them into ZOMBIES.

So, you'd better be careful during your next barbecue!

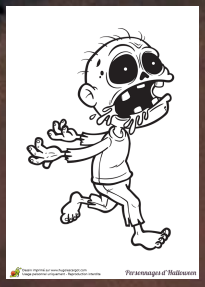
S Real Life

The series has been a world-famous phenomenon. The pitch: It takes place in the 80s, scientists carry out secret experiments on children to turn them into weapons to surpass the Russians and to spy on their plans and strategies, using a parallel dimension. During one of these experiments, *Eleven* acquired telekinesis powers, the capacity to move objects or herself just using her mind. Because of her power she accidentally travelled to another dimension which opened a portal between our world and the Upside Down, a world similar to ours but darker and populated with monsters called « Demogorgon ». Let's see if we can also have telekinesis power ?

Are you lazy ? Do you think that you can take any object you want from where you are without moving like in «Stranger Things »?

To move an object, physics explains that we need a direct material contact with the object, called an action contact like that of a human hand for example. In the absence of material contact, we can use distance action like gravitation or magnetic or electric fields. Thanks to an experiment, we will understand the influence of a direct material contact action. Let's take the situation of a mineral water bottle of 1,5kg on a table and subject to the Earth gravity, we can convert this weight in Newton: 14.715N. When we raise the bottle one meter above the table, the force exerted on the bottle is about 14.715J (approximately 3.52 calories). When we drop this bottle from this height, it will fall and its kinetic energy has an impact on the table.
After that one-meter fall that kinetic energy is 14.715J.

Our spirit is generated by the neurochemistry of the human brain. There is no separation between the spirit and the body, they form a whole. The mass of the brain represents 2% of the mass of the whole human body but the brain exploits 20% of the biochemical energy of the body. The biochemical power (the driving force) of the brain is too weak to lift or move objects. Up to now, no scientific experiment has proved the reality of telekinesis powers.



By Sandra Deepika Lauryne

YEAH A HORROR MOVIE CAN REALLY AFFECT YOU!

« A blood-curdling movie» is not just an expression. Scientists established an effect on blood circulation when watching a horror movie. A horror movie really has the ability to thicken your blood.
A medical test began with 24 healthy people under 30, working at the medical center of Leiden university, Netherlands. They let 12 people watch a French movie entitled « *A year in Champagne* » and the rest, a horror movie called « *Insidious* ».

The researchers took blood samples from all participants 15 minutes before watching and after to compare the level of factor VIII, a protein that promotes blood clotting. Blood clots are lifesaving when they stop bleeding. A blood clot forms in an attempt to repair some damage to a blood vessel. It is a gel-like mass that is formed to help stop bleeding. When blood clots form the wrong way inside an artery or a vein, they can cause serious problems (This can lead to strokes, heart attacks, and even paralysis).

The results were really surprising. The rate of factor VIII had increased in 57% of participants after watching « *Insidious* ». On the contrary only in 14% of those who had watched « *A year in Champagne* ».
The level of factor VIII had decreased in 86% of people who watched the documentary. One of the scientists said : « When you are really scared, all your nerves are in state of hyper excitability ». The experience of fear shows that our body is preparing to lose blood to protect itself.

The reaction to what we see on the screen is not limited to the brain but extends through the body. This happens because the brain sends an alarm signal activating the anatomic nervous system by increasing the production of cortisol and adrenaline, two neurotransmitters that cause some physiological changes.

- **Heart rate increases :** Based on the experiment above we know that horror movies increase the heart rate by 14 beats per minute with a significant rise of blood pressure. Researchers also found an increase of white blood cells and higher concentration of hematocrit (the percentage of red blood cells in blood. It is normally 40% for men and 31% for women), because the purpose of red blood cells is to transfer oxygen from the lungs to body tissues. The increases of heart rate and of hematocrit prepare the body to defend itself against an intruder (to run or fight).
- **Sweating :** Skin conductance is one of the indicators of emotions. For example in our group of experiment, if *Jean-Pierre* is more emphatic he will tend to sweat more while watching this movie.
- **Muscles contraction :** Once the primitive brain has detected a threat and given the alarm signal, it is difficult to stop it. Especially when horror scenes are succeeding one another with a chilling soundtrack. So this movie generates a reaction known as « alarm reaction » which is like a response of the mind and the body to sudden and unexpected stimuli and leads to contractions of arms and legs muscles. That's why while watching horror movies, we always feel tense.

by *Sandra Deepika Lauryne*

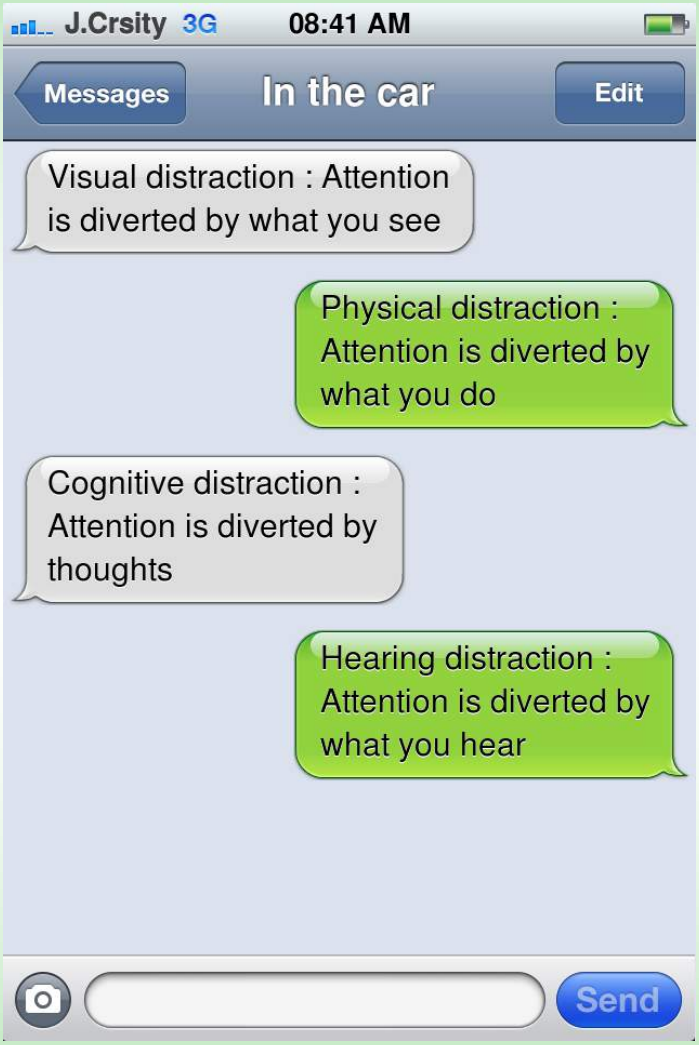
Tech' about it...

IS YOUR SMART PHONE KILLING YOU ?

The dangers of phone driving and more...

Is your smartphone killing you ?

Probably more than your little brothers or your children, your smartphone can drive you crazy!



Seen on YouTube!

There are several selective attention tests which prove that you cannot be focused on your phone and on the road at the same time !

ACCORDING TO THE ONTARIO PROVINCIAL POLICE THERE ARE MORE DEATHS ON THE ROAD DUE TO SMARTPHONES THAN BECAUSE OF ALCOHOL AND SPEED COMBINED.

YOU ARE 23 TIMES MORE LIKELY TO HAVE AN ACCIDENT IF YOU ARE TEXTING WHILE DRIVING.

30% OF DRIVERS AND TWITTER USERS REVEALED THAT THEY TWEET "ALL THE TIME" WHILE DRIVING.

1.6 MILLION CRASHES EACH YEAR DUE TO CELLPHONES *

TEEN DRIVERS ARE 4x MORE LIKELY THAN ADULTS TO GET INTO CAR CRASHES WHEN TALKING OR TEXTING ON A CELL PHONE.

USING A PHONE WHILE DRIVING IS THE 4th CAUSE OF DEATH ON THE ROAD

*In the USA according to the NCS

Blue light effects

Children are more likely to be affected by the blue light of smartphones than adults.

One month ago, a mother in a city near Paris, discovered her little boy in a shocking state ! Aged of 6 years old, the kid had spent all night on his tablet playing videogames. The young mum found her son sitting on his bed, with **bloodshot eyes** and carrying his iPad. Imagine how shocked she was. The boy had become addicted. Then, he was spending too much time on screens, which made him unable to sleep correctly. Most of us lose a lot of time every day using their smartphones. Recently, the blue light produced by screens has been studied. A lot of phone apps claim that they can stop blue light emissions and the latest phones have built-in settings which can limit the exposition to blue light (most of them just limit the brightness of the screen and others really filter the light and ban the blue one).

But the main question is : What does blue light really do?

According to the ***Harvard Health Letter***, the extra illumination affects our biological clocks. Circadian rhythms (the mechanisms that our bodies use to tell us if it is day or night for example) rely partly on light. Blue wavelengths are naturally present during the day, and our bodies associate them with sunlight.
When our body receives blue light, it reacts by boosting our reaction time, span attention and mood. Indeed, it is really useful during the day, but less during the night. Blue light also stops the melatonin production, a hormone which controls the sleep cycle (read more on page 19). It actually disrupts sleep.

There might even be a tenuous link between blue light exposure and certain types of **cancer**. However, the ***Harvard Health Letter*** stated that they still had to further their researches on this subject.
While you have an Internet connection you can stay connected 24/7, right ? You enjoy being informed at all times ? Okay, read a newspaper! Checking the news on your phone before sleeping is not a good habit to take ! It is unhealthy and the screen light keeps you awake.
The problem starts with the fact that 71% of people sleep either holding their smartphone, having it in bed or on their nightstand, for example when they use it as an alarm clock.
But when your phone is that close to you, the temptation to check social media, sites, work emails, and/or the new headlines is often too strong to resist at any hour of the day (or the night!). When you are in your bed, it should be a relaxing moment, but you can be energized by interacting with others or stressed out by something that you read. That can explain why people who are looking at their phones, are at higher risk of insomnia. Therefore, your brain feels stimulated. This is fine if you are looking at your smartphone screen at noon, but if you are looking at the screen at midnight, your brain is going to get confused and think that the sun is out, making it even tougher to fall asleep.

You don’t need any blue light you are already our cutest sun ray :)

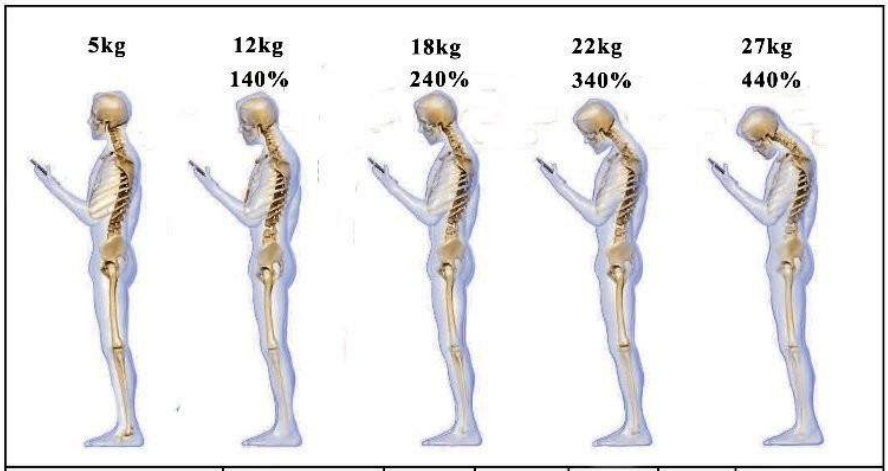
Is your smartphone killing you ?

Damages to the spine and neck

You all have already heard your mother telling you "Straighten up! You will become hunchbacked !" when you are using your phone. Well, mine does ! So, by force of repetition, I made some researches which proved me that it is not completely true ! Actually, it has a bad effect, but not the one which makes you hunchbacked.

Have you already heard about the "Text neck"?

When you keep your head down for too long consulting your mobile, your head is overloading, your neck is blocked and it causes an hyper extension of the spine. The weight of your head is then multiplied by 5 !
You can have pains, contractures, headaches, torticollis and then musculoskeletal disorders (MSDs) !



Position	Neutral	15 °	30°	45 °	60 °	90°
Force to Cervical Spine	5kg	12kg	18kg	22kg	27kg	Not Measurable

Of course, it can be treated by thermotherapy or balneotherapy, with massages or thanks to postural physiotherapy or specific stretches.

To avoid pains you can reduce the number of messages you send, make some movements of your neck, change your posture, and of course stop spending too much time on your phone (we'll never repeat it enough).
Do you know what is happening to your spine when you are not standing correctly?
Imagine that you are using your phone from 2 to 4 hours a day. So, to be able to look at your phone, you tilt your head and also move your shoulders into a rounded position. Extra weight on the structure of the neck, on the upper spine and also on the back can be caused by this excess strain which can lead to **spinal degeneration that may require surgery.**
Indeed, the strain on the spine has bad effects which act like a cascade on the back's muscles. Pain is gravitating to the shoulders, down the arms, and to the fingers because trouble at the top of the spine often spreads down to the other vertebrae, like a chain.
According to Kenneth K. Hansraj, the Chief of Spine Surgery at New York Spine Surgery and Rehabilitation Medicine, if your spine is in a proper alignment, spinal stress diminishes. The correct posture is not only good for your spine's health, but also for your overall health and mood. Other researchers have discovered that standing straight elevates or decreases the levels of hormones that affect the mood. In brief, standing upright makes you more confident ! :)

Is your smartphone killing you ?

Dopamine, the E-Drug

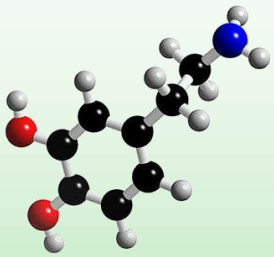
We are constantly attracted by our smartphones. Screens in general are playful, interactive, attractive, colorful, almost alive …

And the spell they put on us is purely scientific, even neurological.

The mechanisms of addiction are very curious reactions to our environment. Drugs and narcotics cause addictions. But smartphones and social networks are not left behind!

An American addictologist states that the children exposed to smartphones have the same clinical symptoms as drug addicts: impulsivity, aggressiveness and a withdrawal syndrome if you try to deprive them from their device.

In fact, using your smartphone increases the level of dopamine in your nervous system. Dopamine? The hormone of pleasure. It is the key hormone to understand our addiction. It is what keeps pushing you back to your cell phone, and it feeds a brain reward circuit, the same one that motivates you to do things that are essential to our survival, like eating or reproducing. (Also the reward system is activated by anything that cause us pleasure, like eating chocolate … ;)Thanks to the MRI technology, scientists did an interesting experiment.



So ? Are you ready to break the screen and join those who live ?

To read: Glow Kids: How Screen Addiction Is Hijacking Our Kids - and How to Break the Trance by Nicholas Kardaras 09/08/16 St. Martin's Press

Indeed they discovered that showing teens their own photos with a lot of “Likes” (on Facebook, Instagram and so on…), was turning on their reward circuit and the part of the brain that is activated is the same as the one affected in addictions to drugs or alcohol .

If « screenagers » are immersed in their smartphones, or if we are constantly scrolling our Facebook or Twitter thread, it is simply because the screens give us this "shoot" of dopamine: seeing a like has an impact on our brain !

A "reward circuit" perfectly integrated by the giants of the digital revolution.

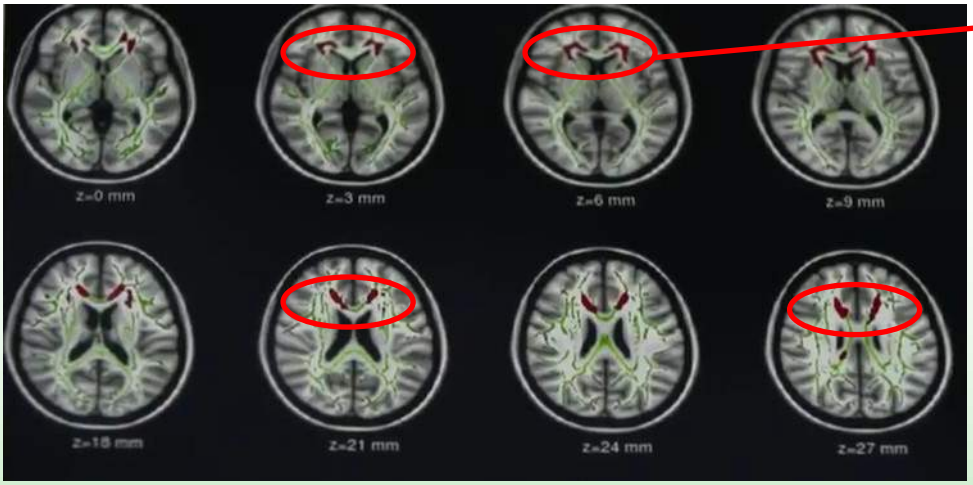
Chamath Palihapitiya, a former Facebook executive alerted us about the social networks: **"My kids are not allowed to use this shit!"**

This addictive effect explains why Dr. Peter Whybrow, director of the neuroscience program at the University of California Los Angeles, calls the screens "electronic cocaine" and why Chinese researchers talk about "digital heroin".

Brain: GONE WRONG!!!

Do smartphones change our brains ?

Absolutely, there are a dozen brain imaging experiments that show that the frontal cortex is shrinking if you spend too much time in front of screens.
For 5 years, studies have multiplied, increasingly precise, indicating the impact of digital machines on the brain.
The most visual study was realized by Chinese scientists. The circulation of brain fluids is altered among young Internet addicts.



The reduced areas of the brain are reported in red on the image :
In these areas, neuronal communication is very strongly slowed down.
Such defects in brain connections may lead to symptoms of autism or bipolar disorder.
A person who has a reduced frontal lobe and less grey matter becomes more impulsive, is more prone to addiction, does not make good decisions and his abilities to logical combos are altered.
The frontal lobe is indeed "the brain of thought ".
It is the brain area which sometimes makes us think that what we do is wrong and that spending too much time on the screens is bad. *"That's enough, you should stop, you ruin your life !"* But sometimes this brain of reason is weakened by our practices.
Routine is the worst enemy of the brain and spending hours on our news feed does not make things move and causes nothing exciting.
In fact, children's brains need to relearn to be bored to gain creativity. Moreover virtual contact is not really « funny » for our brain.

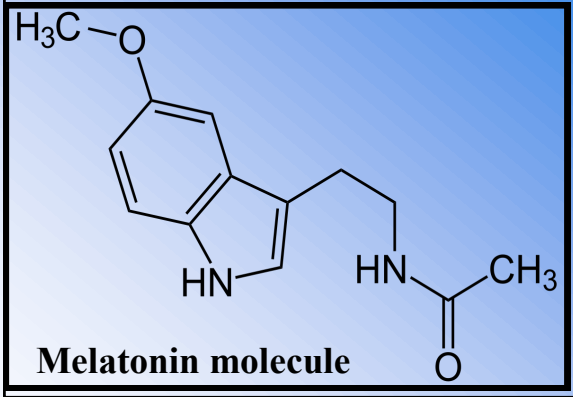
You should try juggling with a knife or at least try to wield it with agility! It's a good exercise for our little neurons.

by *Mohamed B.F. & Yléana R.*

WHAT ARE THE EFFECTS OF SMARTPHONES ON OUR SLEEP?

Scientists often wonder about the possible side-effects of our favorite electronic devices on our sleep, and if we, teenagers, don't, well… we should! If you are not too tired, read our article to understand why.

Having sleep is crucial for us, teenagers. It is essential to our growth, our health and our social life. We actually need more sleep than children and adults, but we unfortunately get less than ever. At night most adults produce melatonin (see definition below) at 10 p.m. But when we finally go to sleep at 1a.m., this delay in melatonin production is never made up for. Due to our screen addiction, we stay up late, we often play computer games or watch television. This stimulates the brain and exposes us to blue light which could cause a poor release of melatonin. What's more, the hormonal upheaval of puberty could be pushing the melatonin release back, in which case we are being kept awake by our bodies and we simply cannot help our peculiar sleeping behavior.



Melatonin molecule

Melatonin is a hormone in the body that produces changes in skin color and is involved in controlling biorhythms such as our sleep.

Teenagers need 8 to 10 hours of sleep a night. In the United States, some schools have delayed the beginning of their classes to give their teenagers extra time. One school has noticed a significant improvement in the academic performance of its students.

by MYRIAM

Black holes, or how our planet might get destroyed ??

Far from the idea of our planet getting swallowed by a gigantic void, we should first explain what causes that phenomenon called "*Black holes*".

Black holes have always drawn our attention because they are strange and mysterious.

We have seen them in many fiction movies or series but we never really understood that phenomenon.

So we decided to investigate on them and then deliver to you, our precious readers, an explanatory article about *Black holes.*

We hope you will appreciate the content of our work .

What is a black hole ?

Black holes are stellar objects that are super massive and so dense that even light cannot escape from their attraction. Due to that, they are not visible for humans, which means that if you get into the hole, you will not realize it. *Black holes* are formed as a result of a huge amount of mass being concentrated in a incredibly small area. For instance, *black holes* may be created after a supernova (which is the death of a star or the state of a star at its end). The core of the dying star is entirely collapsing.

As for today, we can assume that *black holes* are composed of two different parts. The biggest part is called the "*Event Horizon*" and there is in the centre a place called *singularity*.

Event horizon

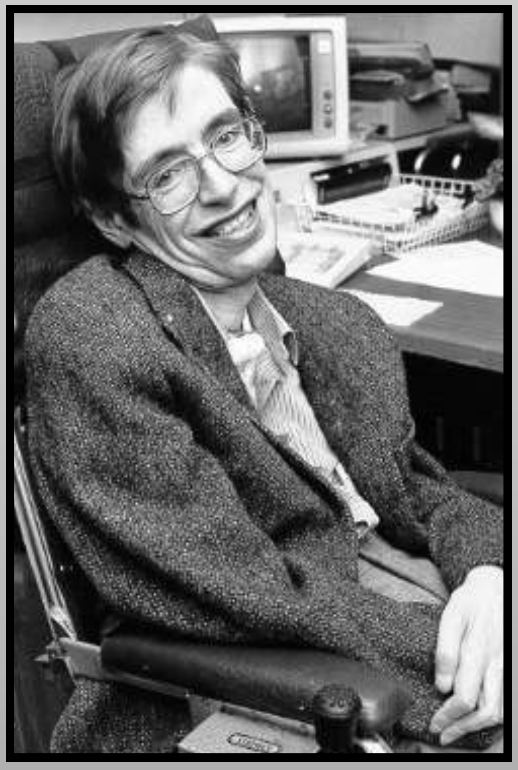
It is the boundary defining the *black hole*. Nothing can escape from its attraction once it has gone beyond, since the necessary speed would be at least equal to light or even more to pull out. Scientists say that if you found yourself by misfortune in this event horizon, your perception of time would accelerate and you would be able to see the final explosion of the Earth.

Singularity

A gravitational singularity is a location in space-time where the laws of physics as we know them cease to operate. If an object came near this place, it would stretch out as it would be deformed by the gravitational attraction.

by *Jean-Pascal. L*

A tribute to the famous physicist Stephen Hawking



Hawking at the NASA's center (1974)

I think you all know, or you have just known him after his death, the notorious Stephen Hawking (1942-2018).

Stephen Hawking was a British theoretical physicist, a cosmologist and an author. He was also a professor at the University of Cambridge, precisely a mathematics teacher during 29 years.

When we speak about Hawking, we immediately think of his disease named the amyotrophic lateral sclerosis (ALS), **a neurodegenerative disease** that causes the death of lot of neurons controlling muscles. This disease affects, unfortunately, his whole body. He was diagnosed at the age of 21. The doctor told him that he had only a few years to live, but he resisted and lived for **50 years longer** than what was expected.

During his life, he published **three books**. These books represent the research of his entire life. In '*The Universe in a Nutshell'* and '*A Briefer History of Time'* he explains how the universe works and all his theories. In his last book entitled *'The Grand Design'* which was published in 2010, he claims that God could not have created the universe and thanks to all his researches he concludes that **the Big Bang** was the real cause of the creation of the universe.

He appeared in many famous **series or cartoons** but you probably did not notice him. You can see him in "*The Simpsons*", in 5 episodes of "*The Big Bang Theory*" and many others. A few days after his death, "*The Simpsons*" paid him **a tribute** by putting an image of him at the end of an episode and with a little text : "In loving memory of Stephen Hawking"

(« The Simpsons » S:16 E:466)

He was invited to a lot of **TV shows**, and he loved making people laugh. Although his disease deprived him of speech, he cracked a lot of jokes on TV. He could do jokes about anything, not only about science.

Stephen Hawking was a really smart man, he fought his disease during all his life, he helped us understand the universe and he achieved many great things in both his personal and professional lives.

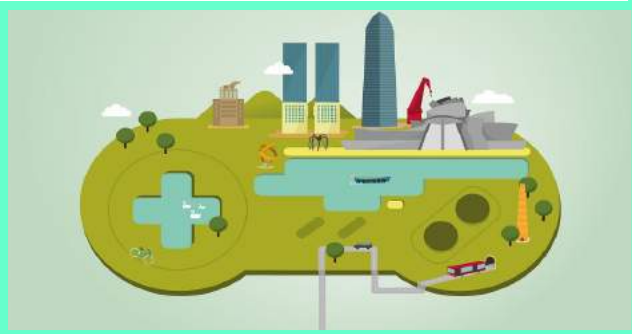
Rest In Peace Stephen Hawking.

by *Awsim.B.*

What is a "Serious Game"?

A serious game is a game designed for a **primary purpose** other than pure entertainment. The adjective "**serious**" generally qualifies video games used by industries such as **defense**, **education**, **scientific exploration, health care**, **emergency management**, **urban planning**, **engineering** and **politics**. But of course you can also play serious games at home or even on your smart phone.

Flight simulations and medical simulations are examples of serious games which add **fun and competition** to the video game.



Serious Games also aim **to raise awareness**, **to learn** or **to convey an advertising message** or to **train mentally** or **physically.**

What is it for ?

Virtual reality has been part of our daily lives for a long time. In addition, **the serious games market** is growing exponentially in its two main sectors: **education and business**.

It can also be used in the military field to simulate a **concrete situation** such as a hostage situation.

Serious Games are also used with patients to help them **regain their brain functions** after a stroke or an accident.

Basic rehabilitation programs to regain brain functions are for the most part often intensive and repetitive training: it is therefore a matter of doing the same thing over and over again, often and for long periods of time.

It works but it is not always fast and can quickly be **boring.** Many patients do not always respect their programs because of this limit. But if the program is done using more fun or interesting activities such as video games, people can better enjoy their work sessions and therefore **improve their recovery.**

Thus the main goal of Serious Games is to target the deficient parts of the brain. For example, a trauma to the **cerebellum** can lead to a **loss of coordination** between the different limbs. Video games will thus easily make it possible to target the affected part and to restore it in **a playful way**. However, although the brain can heal itself and patients can regain certain capacities such as walking or driving, it cannot fully **regenerate these cells** due to the fact that some brain tissues are too damaged. The patient must therefore compensate for this by **training the parts of the brain that are still functional,** notably through the use of video games that force patients to make certain parts of their brains work and repeat more and more precisely the actions they could not do anymore.

by *Jean and Kévin*

Serious games are used in the army to train soldiers

As we can see on this image soldiers are virtually training for war .
This is a good way to train without any risk and with a reduced staff which permits to focus on everyone at the same time and find the soldiers' flaws more easily.

This method can have negative aspects. For instance, soldiers can forget the difference between virtual reality and reality. They often forget that in virtual games they can never really die but in reality they can lose their lives at any moment. They may not feel at war and suffer from an adrenaline deficiency which may put their lives at risk. Adrenaline is a neurotransmitter and a hormone which is secreted in response to stress or physical activity and induces an increased heart rate. It responds to the body's need for energy, for example to react fast in case of a danger.

This method is also very good as a training practice because the soldiers are not under stress. This means they can take more time to analyze their actions.

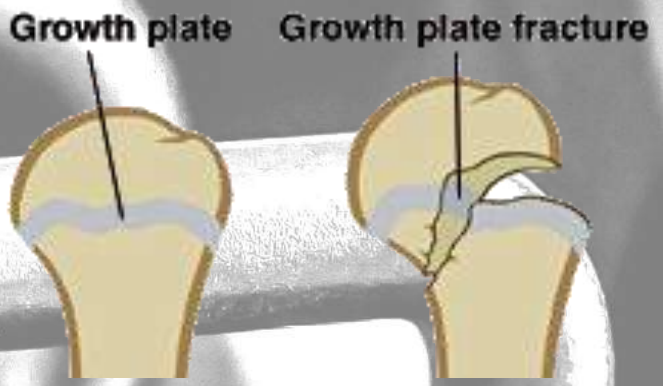
by *Jean and Kévin*

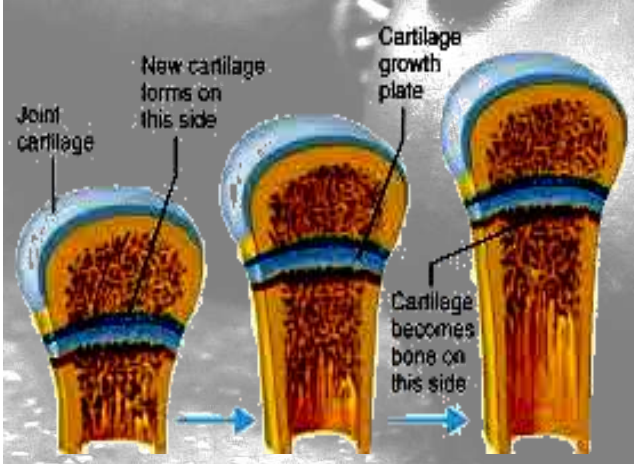
YOUR GROWTH...

Do you want to know how your growth works and how injuries can stop it or slow it down, read on! And keep reading our second page to know which bodybuilding exercises can be dangerous if they are not done correctly. Then, you will be able to set up a fitness program which is adapted to your age and health.

A few scientists and doctors say that the practice of bodybuilding can slow down or stop growth. This theory originates in the fact that some body-builders and gymnasts are small. Some studies prove that this affirmation is partially true.

Among children, long bones have a very different structure from that of adults. Adults' bones are composed of two parts: the diaphysis (the long part in the middle of the bone) and the epiphysis (the rounded end on both sides of a long bone). Children and adolescents' bones have a third element located between the epiphysis and the diaphysis known as the metaphysis, also called growth cartilage. This part of the bone permanently produces new cells called chondrocytes, which ossify later to become part of the long bone. The metaphysis is entirely ossified between 19 and 21 years old, depending on individuals. Complete ossification means that the cartilage becomes part of the bone and only a thin layer remains at the boundary between the metaphysis and the epiphysis, this is the line of the epiphysis.





The potential injuries of the metaphysis are precisely the reason why some doctors advise against violent efforts for children and adolescents. The only reason why scientists, practitioners and coaches advise teenagers to do resistance training is the risk of damaging the growth cartilage. The metaphysis can be damaged during training. If such accidents are rare, they do exist. Of course, all accidents that cause fractures can lead to metaphysis injuries. 15% of metaphyseal injuries result in deformities in the damaged bone. In others cases the bone will not be formed properly and the bone will be more or less curved. In other words, someone who is injured in the metaphysis may end up with one arm (or leg) shorter than the other. Note that some metaphyses are much more important than others in terms of growth. The most active ones are around the knee. That's why serious knee injuries must be avoided at all costs during childhood and adolescence.

by *Rafaël* and *Nicolas*

...AND BODYBUILDING

If you are a great teen sportsman you should practise body-weight exercises, exercises that only use your body weight. These exercises are completely safe for your young body because they involve several muscles simultaneously so the pressure which the weight of your body puts on your bones is divided. Nevertheless, you should not train your body before the age of 15 because your bones are still fragile. However, please do not over-train or you might lose your hair as *Saitama* (Private joke, read *One Punch Man* for more information). Do not forget to have some rest between sessions. Remember that it is in the period of rest that your muscles develop by regenerating.

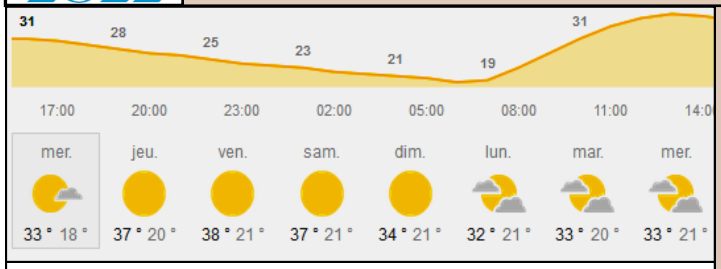
With the body-building program shown on the left you are going to develop your body and to get an athletic shape. You are going to train three days a week with a minimum of one day of rest. You have the choice between taking industrial food supplements which can be dangerous for your hearth or stay natural with less progress. We advise you to eat enough proteins but not to many because it can be bad for your health. If you have some doubts about the way to do the exercises, ask professionals for more security. **After a few months of training the exercises will be too easy so add repetitions or reduce the time of rest between the sets.**

ENJOY YOUR TRAINING !

by *Rafaël* and *Nicolas*

SOCCER WORLD CUP

Focus on the effects of temperature on the body



Today, on the 21st November 2022, the sun is shining in Doha, the capital city. The temperature is approximately 19°C this morning and it will reach 29°C in the afternoon.

Of course, this is fiction. We are not sure of this at all, but on this day the opening match of the world cup 2022 will take place and we worry about the football players' health because **temperature changes** between inside stadiums and outside can have devastating effects on the body.

Sudden changes from hot to cold can harm health

Here is part of the interview of Doctor Shah from a Dubai's hospital to the Emirate paper *The National*:

"*What are the effects of sudden temperature changes between outdoors and Dubai's hospitals?*

"A sudden change in temperature dries your skin, the mucous membrane and the eyes. We see patients who say they went to the malls or to their offices where it was extremely cold. They suffer from eye infections, respiratory infections and muscle spasms which are caused by these temperature changes. The recommended temperature should be between 23°C and 25°C to ensure a healthy life."

Then Dr. Tarek Abdul Hadi Azeem declared that temperature changes can exacerbate coronary **heart, vascular heart, vascular cerebral and peripheral vascular diseases,** [arteries and veins], because the body is submitted to lots of efforts.

High temperatures have a dangerous effect on the body

One of the main problems is heat. During a football match with the high activity of the body, temperatures can easily reach dangerous values, around 40°C. But the outside temperature is more important because at 40-41°C, heat exhaustion is likely - and above 41°C, the body starts to shut down. Chemical processes start to be affected, body cells deteriorate and there is **a risk of multiple organ failures.**

The body cannot even sweat at this point because blood flow to the skin stops, making it feel cold and clammy. Heatstroke - which can occur at any temperature over 40°C - requires professional medical help and, if not treated immediately, **chances of survival can be slim**. Hopefully Qatar promised to put air-conditioning in each stadium to avoid these potential problems.

We also worry about hydration because athletes will lose a lot of water during matches. There is no solution to this apart drinking a lot of water and rehydrating liquids before, during, and of course after the games. Maybe the FIFA will set up breaks to let athletes drink water like during the Africa football cup when they let the players have a little more time to drink to avoid any problem. Water loss can vary from 2 to 4 liters per hour under the sun. Fortunately, matches last 90 min.

by *Jalil.B.*

The hell of runners

You are running quietly and an excruciating pain occurs in your stomach! F…! I'm having a side stitch! Do you recognize yourself in this situation?
Everybody has already had one, whether it is during a physical effort or not !
How can you avoid these abdominal pains ? How can you stop these pains during a physical effort ? This article is for you !

A side stitch causes pain **during a physical effort.** It classically manifests as an aching, stabbing, or sharp stomach pain, just below your ribs. It is usually only on one side, and occasionally will be accompanied by pain at the tip of your shoulder on the same side. The most common cause is induced by **a spasm in the diaphragm** (the muscle that runs right across the bottom of your rib cage). Some scientists believe this could happen thanks to a **shortage in blood supply** mainly in the liver and sometimes in the heart.

Here are 6 solutions to avoid Side Stitches :

1- Eat a lightweight breakfast, low in fibers and fat. **2–** Eat your breakfast 2-3 hours before the effort. Have a small power snack right before the race. **3–** Five or ten minutes a day working your oblique abdominal muscles out can reduce the probability to have a side stitch. **4–** A side stitch is a signal that your body is overwhelmed, so you must start slowly and accelerate step by step. **5–** To avoid side stitches, a good warm-up is required because this allows to prepare the muscles but also the respiratory system. **6-** If you want, you can also use your hand to press on the pain to help the side stitch disappear.

by *Nicolas.D.*

FEEL BETTER IN YOUR BODY !

Feeling good in your body is the secret to a better life. It is based on a balanced nutrition and on healthy eating which are two key-factors that help us stay healthy and be active.

Have you ever heard about the great actress Lucy Hale who suffered from anorexia in her adolescence ? “I never really talked about that but at the time I could spend days without eating. Or maybe I took a fruit and then I went to the gym for 3 hours.”, she confessed to *Cosmopolitan Magazine*.

People suffering from anorexia nervosa, a nervous disease, will have an obsessive fear of gaining weight and have an unrealistic perception of their body image. They limit the quantity of food they consume and view themselves as overweight, even when they are clearly underweight.

Anorexia can have damaging health effects, like osteoporosis, which is a disease that changes the bone structure. It is a disease that weakens the bones, promotes broken bone settlements which means that in case of mild shocks we can have limb fractures and bone pain. Osteoporosis is reversible if it occurs during adolescence and irreversible in adulthood. Anorexia can also cause brain damage, multi-organ failure, heart difficulties and infertility.

https://www.pinterest.fr/pin/530087818617364569/

And what about Nicole Scherzinger, the former singer who was bulimic, she confided to *Cosmopolitan Magazine* : “I guess it was like it was my addiction […] I never took any drugs, but we can consider that this thing that I was doing to myself was an addiction.”

This eating disorder is characterized by repeated binge eating followed by behaviors that compensate for the overeating, such as forced vomiting, excessive exercise, or extreme use of laxatives or diuretics.

The people who suffer from bulimia may fear weight gain and feel severely unhappy with their body size and shape.

Bulimia can have harmful effects, such as gastrointestinal problems, severe dehydration, the loss or lack of ingestion of water and fluids in the body can lead to kidney failure, heart difficulties resulting from an electrolyte imbalance, an electrolyte disorder is an imbalance of ionized salts (bicarbonate, calcium, chloride, magnesium, phosphate, potassium and sodium) in the blood, and even heart attack and death.

NO POISON ON YOUR PLATE !

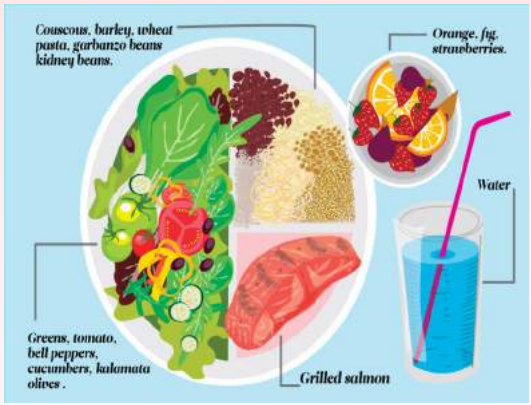
An unhealthy diet is a diet that does not provide the right nutrients to the body for it to be healthy. A good diet consists of a healthy alimentation, it consists of food selected wisely from a variety of foods, grain products, fruits and vegetables.

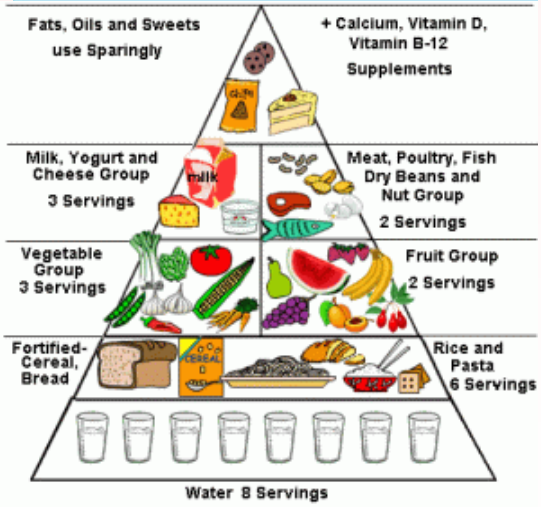
We often think that dieting is not eating or eating very little, yet, this is not a balanced diet but malnutrition. We can think that it is safe for health which is false because malnutrition and risky diets are two important factors of mortality.

A lot of teenagers feel bad about their bodies so they decide to starve themselves which is a terrible idea. Indeed depriving oneself of eating or overeating can provoke overweight or obesity, tooth decay, high blood pressure, high cholesterol, heart disease stroke, type-2 diabetes, osteoporosis, some cancers, depression and eating disorders like bulimia and anorexia.

There are a lot of diets that are beneficial to health such as diets that avoid sugar because excessive consumption of sugars promotes the formation of caries, overweight, obesity and the onset of type 2 diabetes or cardiovascular diseases.

There is also the gluten-free diet, which minimizes the consumption of processed products. This makes it possible to avoid all those unnecessary and unsuspected calories. This is a first way to explain a possible weight loss through a gluten-free diet.



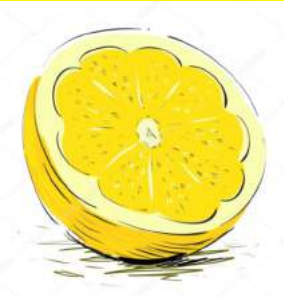


FOOD PYRAMID : *The basis of this pyramid shows what food groups are the best for your body, contrary to the top where unhealthy food is shown. Avoid it in your alimentation as much as you can.*

If you do not like your body, nobody will do it for you !

By *Lina H.*
Yasmine E.
Waraka D.

Lemon, a magical fruit for the skin



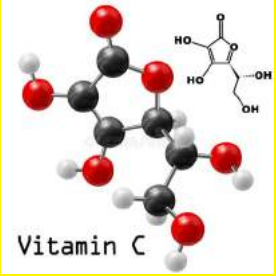
What kind of fruit is it?

Lemon is a citrus whose juice has a pH of 2.5 (the measurement of acidity). Its juice is acid but not enough to be dangerous, it can be applied safely on the skin. Actually, it helps your skin to become smooth, soft and glowing. It also provides vitamin B, as well as minerals and trace elements: iron, calcium, potassium, phosphorus, magnesium, copper and also antioxidants. Lemon is rich in ascorbic acid (Vitamin C) which, brought to the skin, is an astringent that dries the acne and, consequently, helps to reduce pimples and blackheads. In the evening, before going to bed, on a clean skin, we apply a cotton soaked with lemon juice on zones that need to be treated.

What is vitamin C?

Lemons are rich in vitamin C, which fight against the negative effects of free radicals. Free radicals are chemical species that can be created from pollution, dust or cigarette smoke, for example. Skin damage caused by free radicals may appear in different forms. They range from changes in skin color (brown spots and broken blood vessels) to weakened skin that looks loose and saggy as a result of damaged elastic fibers. Free radicals can also break down the skin's collagen and create wrinkles.

Vitamin C, known as L-ascorbic acid, is a water soluble vitamin and powerful antioxidant. This molecule slows down or prevents the oxidation of other chemical substances in contact with them. It helps the body form and maintain connective tissues, including bones, blood vessels, and skin.



Formula: $C_6H_8O_6$

Beauty Recipe: Body scrub

Ingredients:

- ¼ cup of brown sugar
- 1 tablespoon of honey
- ½ lemon juice
- ½ cup olive oil

Method: Mix all the ingredients together. Scrub your body for 5-10 minutes. Then apply a moisturizer. Repeat this process once or twice a week to achieve clear and soft skin.

by *Kelly.M* and *Pauline.D*

Aloe Vera, a plant with miraculous virtues

Aloe Vera? What is it? Aloe Vera is a succulent plant without stem. In its green parts a clear pulp that looks like frost is collected. It is often used directly as a gel for the beauty and health of the skin. Anti-burns, moisturizing, healing, the beauty benefits of Aloe Vera are well known all across the world. The anti-inflammatory, antiseptic and healing properties of Aloe Vera make it an effective remedy for mild burns (sunburns for example). Aloe Vera is also rich in vitamin A which is one of the dominant vitamins in the plant. It makes the skin cleaner, and toner.

The composition of Aloe Vera

Aloe Vera is rich in vitamins C and E and beta carotene (a powerful antioxidant, precursor of vitamin A) which give it its nourishing and anti-ageing qualities. It can moisturize the skin without making it greasy. Rich in minerals (calcium, potassium, iron, magnesium, zinc ...) and vitamin E, Aloe Vera is particularly beneficial to feed and develop healthy hair and skin. It contributes to hydration. The high concentration in antioxidants helps to look after wounds, scars and sunburns. Studies prove that its remarkable anti-ageing properties also reduce wrinkles and fine wrinkles.

The campesterol, a phytosterol, plants carbohydrates, found in the plant of Aloe Vera is an anti-inflammatory substance which is going to act on the skin and to reduce inflammations and pains. Inflammation is the reaction of the body to a lesion, an irritation or an infection, like pimples. The inflammation is generally translated by red patches, swelling, pain and heat.

Get rid of your acne marks!

Aloe Vera is especially a good remedy against acne because the antibacterial properties of Aloe Vera gel are very effective in treating acne and reducing the redness caused by it. It prevents bacteria from infecting acne wounds and accelerates the process of healing. Its antifungal properties are useful in treating inflammation on the skin. Blackheads are the first manifestation of acne. They are caused by an excessive production of sebum by the sebaceous glands located in the hair follicles, where the hairs are produced.

Beauty tips

Apply the gel directly on the spot. The neck, chin, face, back, chest may be affected. Massage gently, being careful not to squeeze the pimples to prevent their proliferation and limit the appearance of scars. Repeat the operation several times a day until the spots disappear.

Are Fake News really true ?

A virus created to kill humans...

Are you able to recognize fake facts ?

An ancient debate is re-surfacing...

The end of skepticism about climate change

Tick the true or false boxes according to your choice. The answers to these questions are at the bottom of the page. You will also find explanations on the next two pages.

1– Can HIV be transmitted non-sexually ?	**True**	**False**
2- Is the Earth really round ?	**True**	**False**
3- Is it Galileo who proved that the Earth is round?	**True**	**False**
4– Was HIV created in a laboratory ?	**True**	**False**

1. **True (explanations on page 33), 2. True (explanations on page 34), 3.False (explanation on page 34), 4.False (explanations on page 33)**

by *Aya* and *Roxana*

The origins of a human-killing virus…

HIV (Human Immunodeficiency Virus) is a virus that attacks the human immune system, which is the body's natural defense against illnesses. The virus destroys a type of white blood cells in the immune system called T-helper cells and makes copies of itself inside these cells.

How is it transmitted ?

In most cases, HIV is a sexually transmitted virus. It occurs through the transfer or contact of pre-ejaculate, semen, and vaginal fluids.

The non-sexual transmission of this virus can occur from an infected mother to her baby through milk or through blood contacts.

HIV's origins

There are some different ideas that have been put forward to explain how HIV emerged. The two best known are: "The government did it" in order to control black people and homosexuals, or "It was really people who had sex with monkeys!"

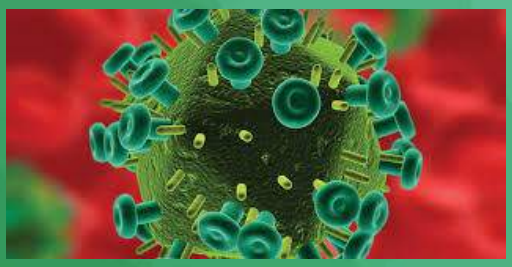
There are two types of HIV, there is HIV-1 and HIV-2. HIV-2 has its origins in Mangabeys in West Africa, which is a species of monkeys. HIV-1 is a more complicated virus because it is divided into different groups (M, N, O and P). M and N are attributed to infected chimpanzees while O and P were found in gorillas.

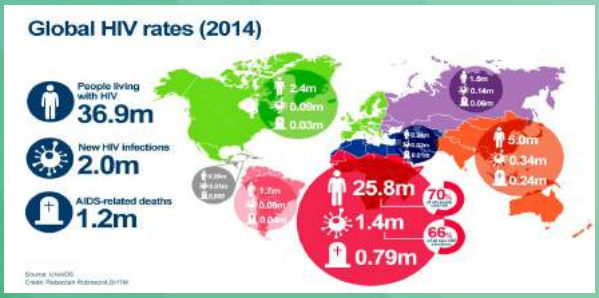
HIV's spreading

Some of the first documented cases of HIV were in the late 1950s. It was impossible for scientists to have the knowledge and technology to create such viruses at that time.

In 2014, 36.9 million people lived with HIV and 1.2 million died of AIDS (Acquired Immuno-Deficiency Syndrom). The cause of it is that people did not have the means to protect themselves and they did not know by which ways they could catch these viruses.

We can therefore deduce that, based on the origins of both types of HIV and the lack of knowledge and technology at the time of the virus' onset, it is impossible that it was created in laboratory.





A very old debate resurfaced, "Is the Earth round or flat?"

"Is the Earth round or flat?" That is the question. If you thought that this debate was closed, well, you are wrong !

The Earth's shadow on the Moon

As Galileo and many others showed a long time ago, the Earth is round. Despite the different evidence that it is not flat, like the photos taken from space, some people still think that it is. These people ask themselves the questions « Why do we only see one side of the Moon? » and « Why is the horizon flat? » .

To answer these questions and to convince some of them of the sphericity of the Earth, here are some explanations:

The Greek philosopher Aristotle has studied the spherical nature of our planet thoroughly. He found that during lunar eclipses, the shadow on the Moon has a round surface. This shadow is that of the Earth, this is the best clue to prove that the Earth has a spherical shape.

When we are on Earth we see the horizon as a straight line, that is why some people think that the Earth is flat.

The reason for this is that we cannot see beyond a distance of five kilometers but the higher we go the more we can see that the horizon is slightly curved. We can see this on this picture taken from a plane.

After many theories, the demonstration of the Earth's sphericity was achieved by Ferdinand Magellan and Juan Sebastian Elcano's expeditions around the world (circumnavigation) between 1519 and 1522. So we can conclude that the flat Earth's theory is wrong.

ARE SCIENCE LESSONS THE SAME IN THE DIVISIONS S, L, ES, STMG, ST2S ?

A few weeks ago, we launched a survey to know how sciences are taught in different divisions at Joliot-Curie. Thanks to the students who answered our questions, we can learn more about science classes at Joliot.
After an analysis which was very interesting, we made statistics. On 58 people interviewed, we had 21 students in S, 26 in ES, 4 in L and STMG and 3 in ST2S. They have, on average, 30 hours of lessons a week, but they do not have the same amount of science classes.

On average a S student (Premiere or Terminale) has 17 hours of science. An ES student has 5 hours. The division L is special because there are only 2 hours in math in Premiere but it does not mean that L students are not interested in sciences because two of them said that they were very interested in them.

As far as the value is concerned, opinions are divided. Indeed, 41% answered that sciences have high or moderate value.
More than half of the participants find sciences interesting. Finally, 53% think that learning about science brings moderate chances of success.

We dealt with the influence of sciences on orientation choices: 38% think that sciences influenced them a lot when it came to choosing their division, 26% think that they influenced them moderately, 35% think that they did not influence them at all.
To the question "Do sciences require investment, logic and hard work?" a high number of participants answered "Moderately" (41%).

JOLIOT'S SOLAR SYSTEM

Since the end of the winter holidays, the 2nd15 has presented an exhibition on the solar system near the CDI.

Creation of models

Indeed, they worked during one term to create a panel and a model of stellar objects of the solar system.

Distances from the Sun, diameters of the objects, chemical compositions, rings, satellites… The celestial bodies do not have any secret for them anymore. After having gathered all the required information, each group created a panel and a model of their stellar object, with materials such as cardboard, paint, plaster, newsprint and paper glue. We asked students how they lived this adventure. Here are some of their answers: "It was an original idea". "This is an activity that we do not often do at school". "The topic was interesting". "It was a long and hard project, especially for the conception of models and the installation in the corridor".

First Day of the exhibition

To conclude, it was a good project, the majority of the students would be ready to do it again but the degradations were very disappointing.

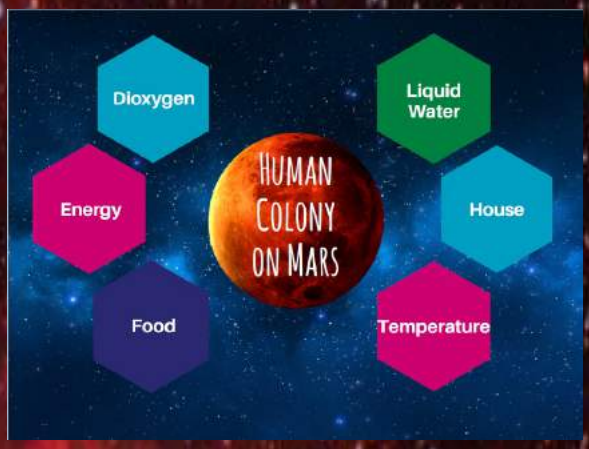
Five days later

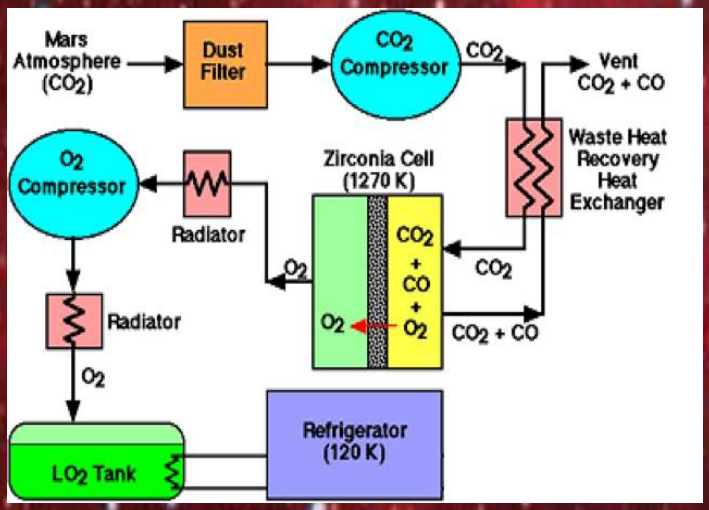
"Stolen planets? Are you kidding ??!!"
" -Did you hear ? We lost four planets !!
-And NASA said nothing!!"
Indeed, only three days after the installation of the exhibition, the 14th of February, four planets were stolen.

by Amandine & Nawel

LIVING ON MARS, IMPOSSIBLE ?

Many humans want to go to the red planet and live on it. The students of 2nd15 had to design a colony for two hundred people who would live on Mars. Indeed, they had to respect many constraints, listed on the mind-map on the right, which was not an easy task. The creators of the colony *Atlas*: Mohamed, Maël, Nawel, Amandine, and of the colony *Osiris*: Badredine, Sandra, Deepika, Nicolas, have taken up the challenge.





We will sum up their solutions to tame Mars. First, we need to breathe so oxygen is vital. Both colonies resort to the technique of the electrolysis of water, which consists in decomposing water in hydrogen and oxygen with a continuous current and the recycling of CO_2, which consists in separating CO_2 to have O_2 thanks to cold plasma.

When we can breathe, we need to eat and drink. Both teams chose to built greenhouses to grow crops and make a poultry farm.

Once solutions to the essential constraints were found, we nevertheless could not spend the rest of our lives without a home and they created beautiful shelters. *Osiris* is a sort of heaven on Mars with a living room, bedrooms and a giant greenhouse to provide for the colony. On the other side, *Atlas* is composed of an underground shelter to avoid solar radiations (see right).

The last constraint was the temperature, because Mars's average temperature is -63°C. To make up for that, students chose the simplest solution: electric radiators. Nevertheless, they need energy which will be produced thanks to solar panels, *Kilopower* (a nuclear reactor) or by an antimatter engine.

A competition was organized and each group presented their project, *Atlas* won and *Osiris*, despite their good ideas, came second.

by Amandine & Nawel