

ELETRON

THE TECHNOLOGY MAGAZINE

CREATE YOUR FIRST
WEBSITE



Bluetooth vs WiFi

HOW A SPEAKER CREATES

SOUND



MODULAR
GADGETS



The Tech
Heroes

THE MYSTERY BEHIND
FAMOUS SCI-FI STORIES



Discover the World of
DiHubMT



WHERE ANIMALS AND
TECHNOLOGY MEET



How Digital Art
is created



THE CAR THAT CUTS
THROUGH AIR



How Artemis'll
Reached the
Moon

AI and Ethics
with Gizmo!

Win a
D1Milano
watch



ELETRON

Before you even see him,
you've already used his power.

The light in your room.
The screen of your phone.
The sound in your headphones.

All of it
depends on something
incredibly small...

An electron.



Now imagine that tiny particle brought to life.

Meet **ELETRON**...

a character inspired by one of the smallest building blocks of science and technology.

He may look like a hero but his powers are based on real science.

Because without electrons,
the modern world simply wouldn't work.

Think of an electron like a tiny energy messenger.

It moves from place to place, carrying power.

Now imagine millions... no, billions of these tiny messengers racing through wires every second.

That's electricity.

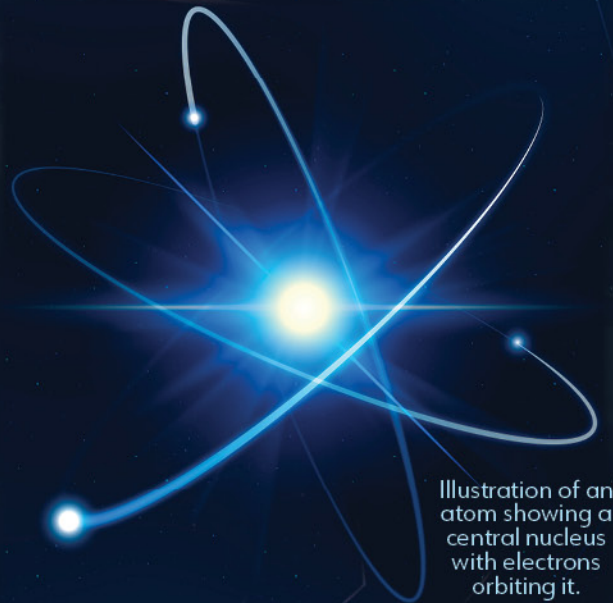


Illustration of an atom showing a central nucleus with electrons orbiting it.

ELETRON'S POWERS Based on Real Science

Elettron isn't just a fun character; everything about him connects to real behaviour of electrons:

SUPER SPEED

Just like real electrons, Elettron is always moving. In wires, electrons flow incredibly fast to carry energy.

ENERGY CARRIER

Elettron transports energy from one place to another just like electrons do in circuits.

CONNECTOR

Electrons help atoms bond together. Elettron represents connection, between ideas, systems and technology.

ORBIT MOTION

The orbits around his head represent how electrons exist around the nucleus of an atom.

ATOMIC SYMBOL ON CHEST

A direct link to science showing he comes from the structure of matter itself.

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Editorial Board

Trevor Sammut (Editor)

Robert Caruana (Co-editor)

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Publisher



Malta Digital Innovation Authority (MDIA)

Twenty20 Business Centre

Triq l-Intornjatur, Zone 3
Central Business District, Birkirkara

Tel: 2182 8800

Email: info@mdia.gov.mt

www.mdia.gov.mt

Translation and Proofreading



Centru tal-Ilsien Malti (ĊIM)

30, Triq it-Teżorerija

Valletta

Email: info.ilsienmalti@gov.mt

www.ilsienmalti.mt

Production, Design and Advertising

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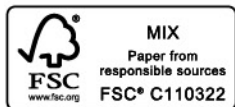
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In the Maltese version of this publication, some technical terms, key words and labels in diagrams are intentionally kept in English. Although Maltese equivalents may exist, the English terminology has been retained to support educational clarity, ease of research, and familiarity with international standards.

BOOST YOUR DIGITAL SKILLS WITH MDIA: YOUR PATHWAY TO THE FUTURE

What about you, future tech superheroes?! Have you ever dreamed of creating your own video game, building a robot, or developing a new mobile app? Well, guess what!

With the Malta Digital Innovation Authority (MDIA), those dreams can become a reality! MDIA offers exciting programmes to help children like you boost your digital skills and unlock your potential. Digital skills are the key to the future, and learning them today will help you shape tomorrow!

In today's world, technology is everywhere. From smartphones and video games to school projects and even the job market, digital skills are essential. By learning coding, understanding robotics, or working with Artificial Intelligence (AI), you are preparing yourselves for success in a world that relies more and more on technology every day. And the best part? You can start learning these amazing skills right now!

MDIA is here to support you through Skolasajf and bootcamps. These programmes give you the opportunity to explore fun topics like game development, 3D printing, robotics and AI. Imagine creating your own video game or an app that uses AI! Through these hands-on experiences you will be able to understand how technology works in real life.

Why is all this important?

Because digital skills are shaping the jobs of tomorrow. Every industry, from healthcare to entertainment, is using technology in new and exciting ways. By improving your digital skills early on you are not only opening doors to exciting careers but also learning how to solve big problems, build amazing things and create opportunities for yourselves.

The world is changing rapidly, and digital skills are the superpower that will help you navigate it. MDIA's programmes are designed to give you the tools you need to succeed in the digital era. Whether you want to develop a game, design a robot or even start your own tech business, now is the perfect time to begin.

Keep an eye out for upcoming MDIA initiatives. You can learn more by visiting <https://mdia.gov.mt>



Some activities may involve the use of tools or equipment that run on electricity, so make sure an adult is with you to help and keep you safe.

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Why are we working to distribute the Elettron magazine to you?

Can you imagine waking up in the morning and not hearing the Maltese language on the radio on your way to school? Or instead of the Maltese anthem being played and sung during an international football match or a national celebration, or even at school, a non-Maltese anthem is played, although it is not native to Malta?! How could it be? And can you ever imagine the Prime Minister or the President of Malta, who is Maltese, not being able to speak and communicate with the people in Maltese? I imagine you are wondering:

“Oh my! How could that be!? God forbid!”

Just as we cannot take the Maltese language for granted, and as much as we need to safeguard this old, globally unique language, the Government, i.e. those people democratically elected by the people to represent us, has decided to roll up its sleeves and ensure that we really start taking care of this language.

So, who are we?

In order to safeguard the Maltese language the Government has established a public entity, similar to a government department, but with greater autonomy, called: “Iċ-Ċentru tal-Ilsien Malti” (“The Maltese Language Centre”). The Centre’s office is located in Valletta, at building number 30 on Triq it-Teżorerija (“Treasury Street”). This entity forms part of the Ministry for National Heritage, Culture and Local Government.

And what is our job?

When you love something, especially if it is rare, or precious, or which you know you can never regain it if you lose it, you take care of it and cherish it dearly, right? The same with us! Our mission is to promote and raise awareness of the Maltese language in Malta and beyond: by emphasizing the knowledge and proper use of our language, and carrying out projects that relate to these various aspects. This means that we are working in support of the Maltese language. Why all this? Because Maltese is a truly special language! Let me explain why. Let’s start with the fact that Maltese is considered a small (but important!) language. It is also the only official Semitic language on the European continent. It is the only Semitic language officially written in the Latin alphabet. Above all, Maltese is the national language of our land. It is important to distinguish between a national language and an official language. The difference, in simple terms, is that the former is tied to the land, place and country, and is

considered a heritage of that nation – something that distinguishes it, and therefore gives a cultural identity to the people who live in that country. The latter, on the other hand, is not necessarily directly tied to the hearts and lands of the people, since it is a language which has been given a specific legal status, primarily used in official correspondence and communication. In Malta Maltese is both the national language and an official language, along with English and Maltese Sign Language. What else could we possibly need? Isn’t all this enough?! No, things weren’t always like this! Not at all! That is why it is so important to take care of the Maltese language! So despite the fact that Maltese had long been spoken, both by the common people as well as by people who long ago were considered upper class, Maltese was only recognized as the country’s official language in 1924, which is something that happened only 100 years ago, despite Malta’s thousands of years of history.



What are the projects and initiatives that we have in place to strengthen our unique and beautiful language?

Maltese is everyone's language, not just of a small community of people! It can be used and spoken by you and me, and by anyone who makes that strong effort to protect it consistently and appropriately! In order to continue raising awareness about the importance, apart from the beauty, of our language, and why we should be proud that our land, such a small country, has its own language: a language which gives us identity, which allows us to be recognized as its citizens, and also distinguishes us culturally while reflecting our distinct way of thinking, iċ-Ċentru tal-Ilsien Malti, since its creation, has entered into numerous agreements. It has agreed to participate and work hand in hand, in collaboration with other Government departments, as well as with companies and private entities.

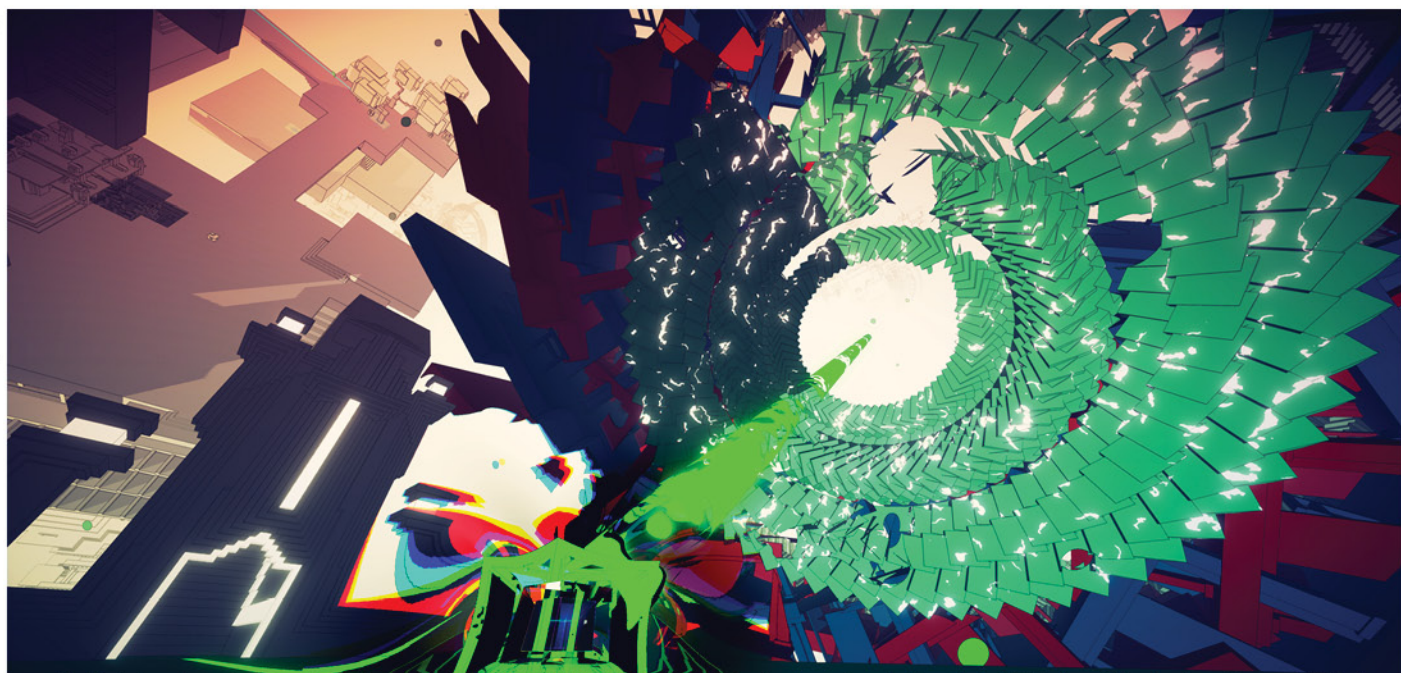
The collaborations include, among other things, a number of projects aimed at children. Which are they? Let's start by mentioning this same magazine, *Elettron*! This is being delivered to your schools thanks to the collaboration between ĊIM (Ċentru tal-Ilsien Malti) and the MDIA. This is just one of many projects! Another project that ĊIM worked on to give our little ones greater access to Maltese, especially since not all Maltese children are given the opportunity to hear Maltese being used and spoken... and so, instead of parents always turning to YouTube, where most of the content is mostly in English, we now have *Peppa Pig bil-Malti* (*Peppa Pig in Maltese*) on TVM, *Perlina TV* – a digital audiovisual platform, *Nina u Ninu* (*Nina and Ninu*) – a Maltese digital games platform, *Karamellu tar-Raġal t'Isfel* (*South Town Karamellu*), which is broadcasted on ONE TV, as well as the *Mal-Melodija* (*Together with Melody*) project, which focuses on ĊIM travelling from school to school and blending the Maltese language with Maltese literature, culture and music.

How can you contact us?

If you have any ideas you would like to share with us to help ensure our country's national language continues to be protected and spoken (well) by everyone and everywhere – in all areas of daily life, we would be delighted if you could contact us on this email address: info.ilsienmalti@gov.mt. We look forward to hearing from you!

Cheers, friends!





THE IMPOSSIBLE WORLD OF MANIFOLD GARDEN

Have you ever imagined a world where the ceiling suddenly becomes the floor?

In the video game *Manifold Garden*, this is exactly what happens! This unusual puzzle game takes players into a strange and beautiful world filled with impossible buildings, floating staircases, and gravity that can change direction.



In *Manifold Garden*, players solve puzzles by exploring giant geometric structures that seem to repeat forever. Sometimes, when you fall off a building, you do not crash – instead, you return from above again! The game is also based on the impossible and surreal artworks of M. C. Escher, who was famous for drawing staircases, buildings, and perspectives that could not exist in real life.

One of the most interesting parts of the game is how gravity works. Players can flip gravity to walk on walls or ceilings to reach new places. This makes players think carefully about perspective and space. Instead of simply running and jumping, you must stop, observe, and think differently to solve each puzzle.

Even though *Manifold Garden* is a game, it is also based on ideas from mathematics, geometry, architecture, and problem solving, presented in a fun and creative way. It shows how video games can sometimes be more than entertainment - they can also inspire creativity and curiosity. The game encourages players to explore, experiment, and look at the world from new angles.

Manifold Garden proves that games can become works of art. With its colourful worlds, relaxing atmosphere, and impossible structures, it offers an experience that feels both peaceful and mysterious at the same time.



HOW A SPEAKER CREATES SOUND

Turning electricity into something you can hear



Did you know?
If you touch the cone of a speaker while music is playing you might feel it vibrating. That's the sound being created!

When you play music on your phone or Hi-Fi system the sound doesn't just "come out" of the speaker.

Inside that small box something incredible is happening.

First, music exists as a digital signal, a stream of data made of numbers.

This signal travels from your device into the speaker as an electrical signal.

But electricity is silent... so how do we hear it?

Inside every speaker there is a tiny system working together:

- a magnet
- a coil of wire (called a voice coil)
- a cone (thin surface)

When the electrical signal reaches the speaker it flows through the coil. This creates a changing magnetic field that pushes and pulls against the magnet.

This movement makes the cone vibrate rapidly.

Sound is actually vibrations travelling through the air.

As the cone moves back and forth, it pushes the air in front of it. These tiny movements create sound waves that travel to your ears.

Fast vibrations = high-pitched sounds

Slow vibrations = low-pitched sounds

Bigger movements = louder sounds

The speaker is literally shaping the air through a longitudinal wave to recreate the original sound!

DUST CAP

Protects the voice coil and controls airflow.

CONE (DIAPHRAGM)

Moves back and forth pushing air to produce sound.

SURROUND (SUSPENSION)

Flexible edge that allows the cone to move while keeping air in.

VOICE COIL

Coil of wire attached to the cone. It moves within the magnetic field to create sound.

BASKET (FRAME)

Holds all the parts together and provides support.

SPIDER

Flexible part that keeps the voice coil centered and allows smooth movement.

MAGNET

Powerful magnet that creates a magnetic field for the voice coil to move in.

So when you hear music, voices or explosions in a movie...

You're actually hearing:

electrical signals → movement → air waves → sound

Discover the World of



Hello,
young tech
explorers!

At DiHubMT we help people turn their cool ideas into real projects that can make a big difference in the world.

Let's dive in to see what we do and meet a super exciting start-up called HappyPot!

DiHubMT is short for Digital Innovation Hub Malta. That's a big name, but it's really just a way of saying we're a special place where people with brilliant ideas come to make them real! Imagine you have an awesome idea – maybe a cool app, a smart robot or a clever solution to a tricky problem. At DiHubMT we help those ideas grow and flourish, just like planting seeds and watching them grow into big, strong, fruit-bearing trees.

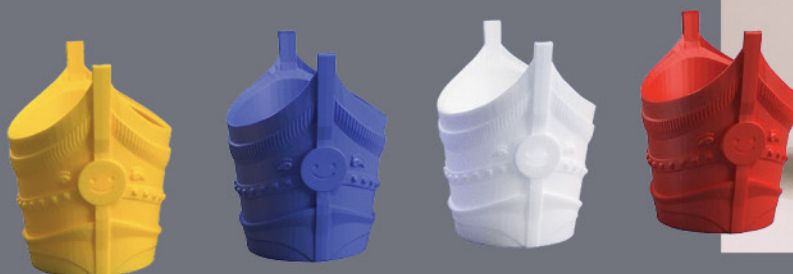
We think of start-ups as tiny seeds with the potential to grow into incredible trees full of amazing fruits that everyone can enjoy. Our job is to provide the right "sunshine", "water" and "nutrients" to help these seeds grow. What does that mean? It means we give start-ups and small businesses (called SMEs) the tools, training and expert advice they need to succeed.

Think of DiHubMT as the ultimate toolbox filled with the coolest gadgets and the smartest helpers. We offer access to cutting-edge technology, fun learning programs to gain new skills and guidance from people who know exactly how to turn ideas into something extraordinary. Whether it's designing the next big app, inventing a robot that can help people or coming up with a clever way to solve everyday challenges, DiHubMT is the place where the magic begins.

So if you've ever dreamed of making something amazing, remember – every great tree starts as a tiny seed. And at DiHubMT we're here to help those seeds grow into something truly remarkable!

Have you ever dreamed
of creating something
amazing using
technology?

One of the start-ups we are so proud of is HappyPot. **Imagine this:** Like a pot, but happy 3D-printed plant pots with personality, for happier plants, people and planet! That's what HappyPot is all about. It's not just any flowerpot. It's a super smart design that meets efficiency and solves a problem. Isn't that cool?



We sat down with the team behind HappyPot to learn more about their journey.



How did you come up with the idea for Happy Pot?

The idea for Happy Pot came from a love for plants and wanting to do something good for the planet. We thought, "What if plant pots could be more than just pots? What if they could bring smiles, help the environment and even tell a story?" That's when we decided to make 3D-printed plant pots that are customizable and eco-friendly. Plus for every pot we sell we plant a tree somewhere in the world. It's our way of making the world a happier and greener place!

How did DiHubMT help you?

DiHubMT has been like a magical toolbox for us! They gave us a fantastic space to work, lots of support and cool tools to help us turn our idea into something real. They also introduced us to people who shared their advice and helped us solve tricky problems. Without their help Happy Pot wouldn't have grown as much as it has. They've been like sunshine and water for our tiny Happy Pot seed!



What's next for Happy Pot?

The future is so exciting! We want to make Happy Pot even more fun and eco-friendly by creating new designs and helping more people around the world discover our pots. We're also looking to work with schools and communities to teach people about plants and sustainability. And of course we'll keep planting more and more trees! The dream is to make Happy Pot a global symbol of happiness and care for the planet.

Why is this important?

At Happy Pot we believe that even small things like a pot can make a big difference. By making products that are good for people and the planet we're showing that anyone can do their part to create a better world.



If you have an idea that can help people, plants or the planet, go for it! With the right support, like what we got from DiHubMT, your idea could grow into something truly amazing.



And here's the best part: we believe that anyone can make a difference with a great idea. Maybe one day you'll create something incredible, something that helps people, changes the way we live or simply brings a smile to someone's face. With the right tools, a little bit of learning and a lot of imagination anything is possible.

At DiHubMT we believe that technology is for everyone. YES, that includes you! Technology isn't just about gadgets and robots; it's about making the world a better place. Whether it's finding smart ways to help plants grow, solving big challenges like saving energy or cleaning the oceans, or even creating something just for fun, technology has the power to make life brighter and more exciting for everyone.

That's why places like DiHubMT exist: to help dreamers like you. Just like caring for seeds so they grow into strong, fruit-bearing trees, we're here to help your ideas grow into something amazing. So never stop dreaming big and exploring new possibilities. Who knows? The next big invention could come from you! And we'll be right here to cheer you on every step of the way.

THE CAR THAT CUTS THROUGH AIR

THE HIDDEN SCIENCE OF SPEED

It stood still, low, smooth and sharp, almost like it was ready to move at any moment. There was something about its shape that made it feel fast, even without motion. But that feeling wasn't an accident. Every line, every curve, every detail had been carefully designed.



When a car begins to move it doesn't just roll forward. It pushes against the air in front of it. At high speeds air becomes a powerful force that resists motion. Engineers call this resistance **drag** and it can slow a car down significantly. That is why sports cars are not shaped like ordinary vehicles. Their bodies are designed to reduce drag, allowing air to flow smoothly over and around them. Instead of fighting the air, the car is built to move through it as efficiently as possible.

But air doesn't only slow a car down; it can also lift it. At very high speeds air passing over and under the car can create an upward force, making the car less stable. To prevent this engineers design the car to produce **downforce**. This is a force that pushes the car downward, pressing it firmly onto the road. Special features like spoilers and carefully shaped surfaces guide the airflow so that the faster the car goes the more grip it gains.

That grip depends on something surprisingly small: the tyres. No matter how powerful the engine or how advanced the design, the tyres are the only part of the car that touches the road. They must handle enormous forces while maintaining control. If the tyres lose grip the entire system fails. This is why tyres are engineered with extreme precision, designed to hold the road even under intense speed and pressure. Inside the car another layer of technology is at work. Sensors constantly measure speed,



Speed in cars is largely thanks to **aerodynamics**, the science of how air moves around an object.



movement, and traction, while onboard computers adjust systems in real time. Braking, stability and power delivery are continuously controlled to keep the car balanced. In a way the car is not just moving; it is constantly responding and adapting.

A sports car, then, is much more than a fast machine. It is a balance of air, force, energy and control, all working together. What appears to be simple speed is actually the result of careful engineering and scientific design.

Bugatti Chiron Super Sport 300+

To achieve its extreme performance the car includes advanced software refinements across key systems such as the engine, gearbox, powertrain and turbochargers. These improvements work together to enhance efficiency, stability and control, allowing the Chiron Super Sport 300+ to perform reliably at very high speeds.

Engine:	8.0L quad-turbo W16
Power:	~1,578-1,600 horsepower
Top speed:	490 km/h (304 mph test run)
0-100 km/h:	~2.3-2.5 seconds
Drive:	All-wheel drive
Gearbox:	7-speed dual-clutch
Production:	only 30 cars made
Price:	around €3.5-4 million

The Chiron Super Sport 300+ is limited to just 30 units, all built at Bugatti's headquarters in Molsheim, France. Each car starts at a price of around €3.5 million, making it one of the most exclusive and expensive production cars ever created.

Image: Bugatti Automobiles S.A.S.

WHAT IS AN ALGORITHM?

AN ALGORITHM IS A SET OF STEP-BY-STEP INSTRUCTIONS USED TO SOLVE A PROBLEM OR COMPLETE A TASK.

You open a video app... it already knows what you want to watch.

You search online... the answers appear in seconds.

It's not magic; it's an algorithm.

Think of it like a recipe:

step 1 → do this
step 2 → do that
step 3 → get a result

Computers follow algorithms to know exactly what to do.

How Computers Use Algorithms

Computers don't "think" like humans. They follow clear instructions.

An algorithm tells a computer:

- what data to look at
- what decisions to make
- what result to produce

Without algorithms computers couldn't search, sort, calculate or respond.

Imagine sorting books by size.

An algorithm might say:

- compare two books
- place the smaller one first
- repeat until all books are in order

Computers do the same thing, just much faster.

A Simple Example Fast and Efficient

Good algorithms are designed to:

- work quickly
- use less memory
- handle lots of data

Some can perform millions of steps per second!

Algorithms Are Everywhere

Algorithms power the technology you use every day:

- search engines choose results
- video apps suggest videos
- maps find the fastest route
- games control characters

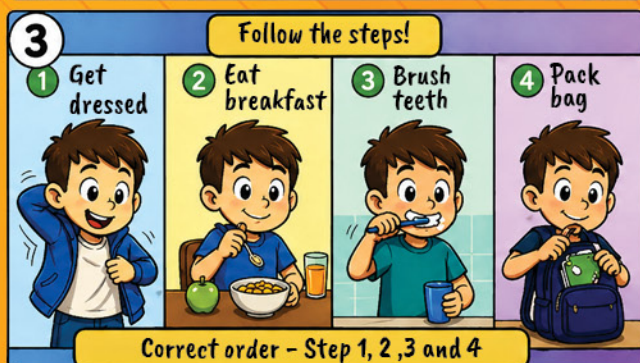
Every time something "just works"... there's an algorithm behind it.

An algorithm is the plan behind the action, the logic that tells technology what to do.

Without algorithms the digital world would not work.

Did you know?

Getting ready for school is like an algorithm. If you follow the steps in the right order everything works smoothly!



HOW AI USES ALGORITHMS TO LEARN

FROM DATA TO DECISIONS

Inside a **data centre**, a room full of powerful computers that store information and help run apps, websites and **even AI**.

When you watch videos online you might notice something interesting. The app seems to know what you like. It suggests videos you enjoy, helps finish your sentences and can even answer your questions.

BUT HOW DOES IT DO THAT?

At the heart of Artificial Intelligence (AI) are algorithms.

These are step-by-step instructions that tell a computer what to do. However, AI is different from normal programs. Instead of only following fixed steps AI algorithms can analyse information, find patterns and improve over time. **This is what makes AI seem "smart".**

AI does not understand things like humans do. Instead, it learns by looking at huge amounts of data. This can include thousands of pictures, millions of words or hours of video. By studying this data the algorithm begins to notice patterns, such as what a cat looks like, which words often appear together, or what videos people like to watch next.

This learning process is called training. During training the AI makes a guess, checks if it is correct and then adjusts itself to improve. It repeats this process many times. The more data it sees the better it becomes at making accurate predictions.

Once it has been trained the AI can recognise images, understand text and make helpful suggestions. However, it is important to remember that AI does not truly "know" the answer. Instead, it calculates the most likely result based on what it has learned. This means **AI works with probability, not certainty.**

AI is powerful but it is not perfect. It depends on the quality of the data it learns from and how its algorithms are designed. If the data is incomplete or incorrect the AI can make mistakes.

In the end AI works by combining algorithms, data and continuous improvement. It does not think like a human but it learns patterns and uses them to make predictions. This is how the technology behind many of the apps and tools you use every day works.

Did you know?
AI can look at millions of photo to learn what a cat is...
but your brain can do it after seeing just one!



WIND

Have you ever wondered how wind enables a sailboat to sail the seas without the need of an engine?

Have you ever felt the force of the wind on a windy day?

Wind is a natural resource that is created by weather conditions on Earth. It is invisible but we can easily feel its effects. Too much wind can be uncomfortable and sometimes dangerous but humans can also benefit from the force of the wind!

Humans have made use of the energy contained in wind for many hundreds (and maybe thousands!) of years to sail the oceans and explore new areas around the globe. Nowadays wind is still harnessed by sailboats.

Wind can also be used as a form of renewable energy. The force of the wind can be used to generate electricity from wind turbines, huge machines that are designed to harness this energy and convert it to electricity that can be used to power our homes.

Wind can shape natural landscapes such as for example sand dunes. It can also carry seeds and pollinating plants that enable the growth of green areas. Wind is also essential for sports such as paragliding and windsurfing.

While there are many interesting and important benefits of wind, there is also the dangerous side, particularly when it comes to strong winds. Bridges and buildings have to be designed by engineers to withstand the strong forces created by the wind. Tornadoes can be devastating with wind speeds reaching 290 kilometres per hour. That is six times faster than the fastest recorded human running speed of 44.7 kilometres per hour, achieved by Usain Bolt in the 2009 World Championships in Berlin.

A modern rotating wind turbine would cover around two football pitches in area when spinning.

One large wind turbine can power around 1,500 homes.

Wind farms (a group of wind turbines) can be found on land and in the ocean.

The oldest wind turbine on record dates back to 1887 and was built by James Blyth in Scotland.

Wind energy was also used in the past for milling grain into flour. Such a machine is called a windmill rather than a wind turbine.

The oldest windmill is believed to be more than 1,000 years old and is located in present day Iran.

FACT

Birds are able to take advantage of winds to facilitate their flight.



WIND ENERGY

Apart from pushing objects, wind energy can be used to create electricity!

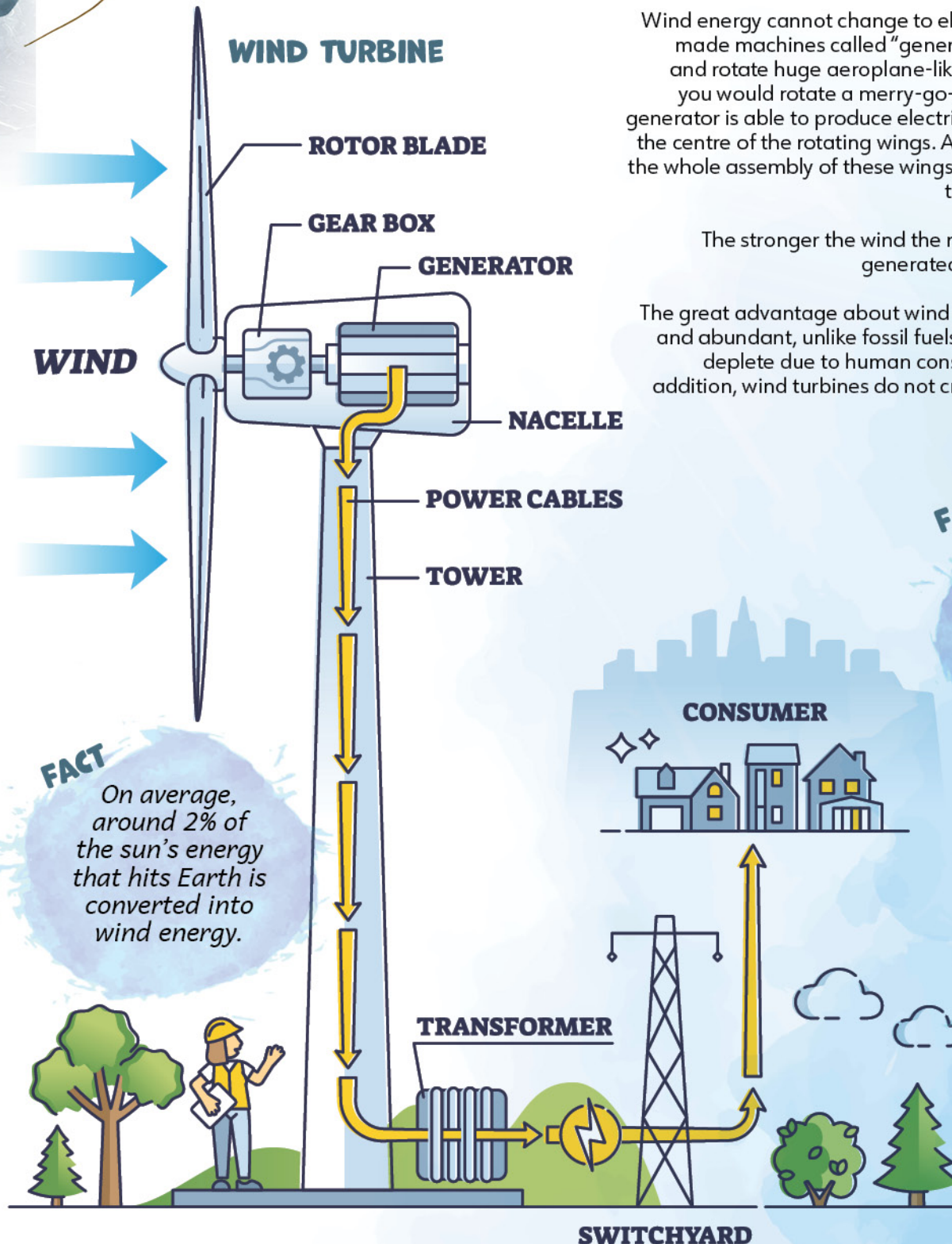


Wind energy results due to the movement of air, as a result of weather conditions on Earth. Different heating patterns on the earth's surface cause air to move, which is experienced by us as wind.

Wind energy cannot change to electricity without man-made machines called "generators". Wind can push and rotate huge aeroplane-like wings very much like you would rotate a merry-go-round. In doing so the generator is able to produce electricity when attached to the centre of the rotating wings. A wind turbine includes the whole assembly of these wings and the generator on top of a very tall tower.

The stronger the wind the more electricity can be generated to power our homes!

The great advantage about wind energy is that it is free and abundant, unlike fossil fuels, which will eventually deplete due to human consumption of energy. In addition, wind turbines do not create pollution as they generate electricity.



FACT

On average, around 2% of the sun's energy that hits Earth is converted into wind energy.

FACT

The fastest wind speed ever recorded on Earth is 407km/h in Oklahoma, United States.

FACT

Winds on Neptune can reach 1,931 kilometres per hour.

How *Artemis II* Reached the Moon

Using Gravity as an Invisible Guide

Artemis II Launch

Location Kennedy Space Center

Photographer NASA/Jim Ross

When NASA launched the *Artemis* programme the goal was clear: **to go back to the Moon.**

Getting there is not as simple as flying straight up. Space is not empty; it's full of invisible forces. The most important one is **gravity**.

When a rocket launches from Earth it doesn't just go "up". It enters an orbit, moving sideways at very high speed while Earth's gravity keeps pulling it back.

Think of it like throwing a ball so fast that instead of falling down it keeps missing the ground and circles the planet.

To reach the moon *Artemis* had to escape most of Earth's pull. This is done using a powerful engine burn called "**Trans-Lunar Injection**".

At this moment:

- the spacecraft speeds up
- Earth's gravity pulls it back
- the moon's gravity takes over

But here's where it gets interesting.

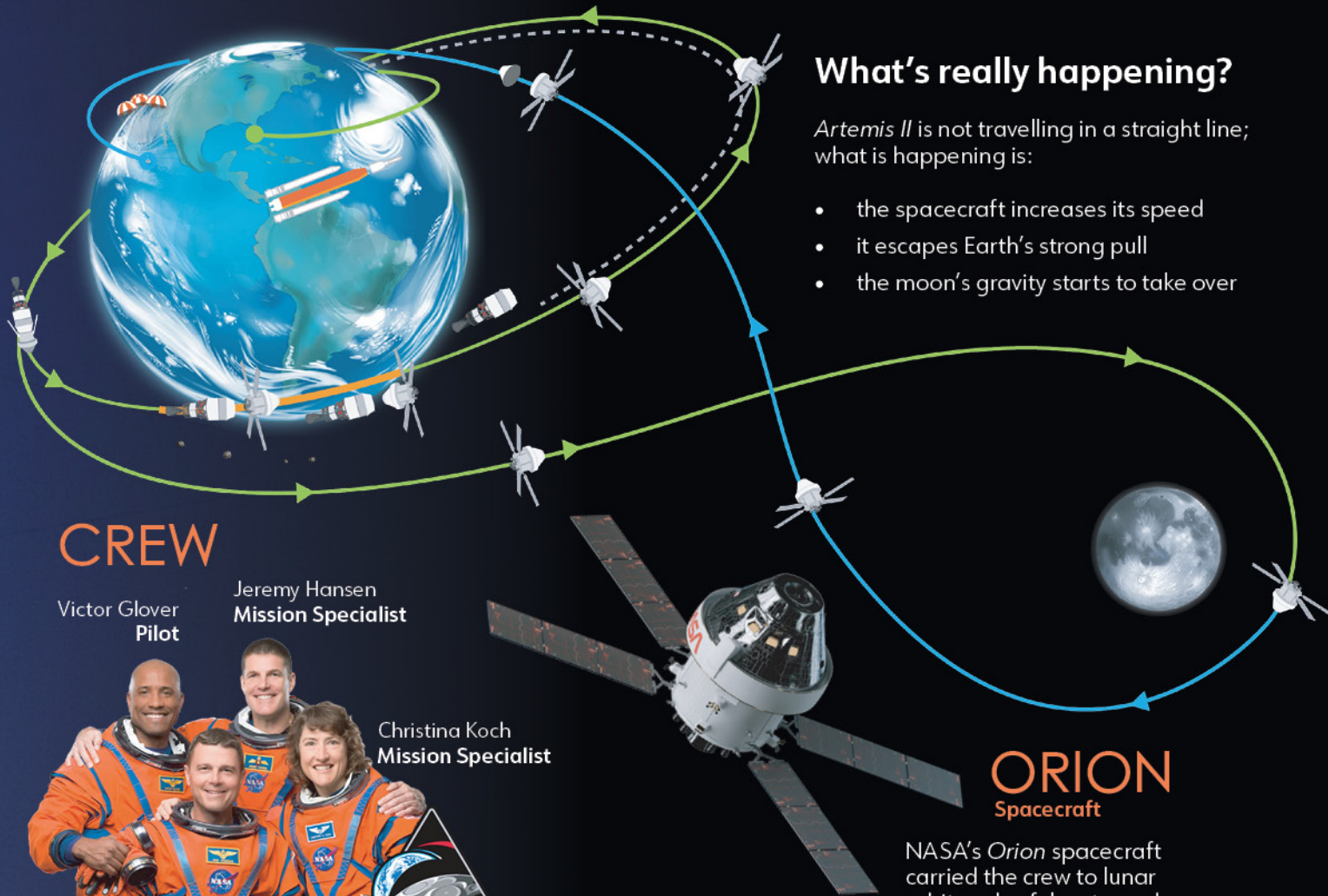
The spacecraft doesn't fight gravity; it uses it.

As *Artemis* gets closer to the moon, the moon's gravity begins to pull it in. Instead of crashing the spacecraft carefully enters a special path called "**lunar orbit**".



Orion returned to Earth after a successful flight.

Photographer James Blair



What's really happening?

Artemis II is not travelling in a straight line; what is happening is:

- the spacecraft increases its speed
- it escapes Earth's strong pull
- the moon's gravity starts to take over

CREW

Victor Glover
Pilot

Jeremy Hansen
Mission Specialist

Christina Koch
Mission Specialist



Reid Wiseman **Commander**

ORION Spacecraft

NASA's *Orion* spacecraft carried the crew to lunar orbit and safely returned them to Earth on *Artemis II* mission.

NASA uses precise calculations to balance:

- Earth's gravity
- the moon's gravity
- the spacecraft's speed

This creates a smooth path, almost like being guided by invisible rails.

In some missions, spacecraft even use something called a "**gravity assist**", where they swing around a planet or moon to change direction or gain speed without using extra fuel.

Photo:

The lunar surface in sharp detail, as seen during the *Artemis II* lunar flyby, while a distant Earth sets in the background. This image was captured at 6:41 pm EDT, on April 6, 2026, just three minutes before the *Orion* spacecraft and its crew went behind the moon and lost contact with Earth for 40 minutes before emerging on the other side.



Did you know? The path used by *Artemis II*, called "a halo orbit", is so stable that a spacecraft can stay there for a long time using very little fuel!

Space travel
is really about
falling...
but missing!

D1Milano

WHEN A DRAWING COMES TO LIFE

The science, tech and design behind a "sketched" watch

This isn't just a watch; it's a sketch that came to life!

With its bold lines and cool illusion style the Polycarbon White Sketch makes it look like you're wearing a drawing on your wrist. It's light, strong and super unique – perfect for anyone who loves tech, design, and standing out from the crowd.



FROM IDEA TO OBJECT

The **Polycarbon White Sketch** takes a designer's sketch and turns it into something you can wear. Instead of hiding the lines, it shows them proudly just like a drawing.

The result? A watch that looks **2D**, even though it's fully **3D**.

YOUR BRAIN IS BEING TRICKED

Your brain uses shadows and depth to understand shapes.

But this watch removes those clues.

The strong outlines make it look flat, creating an **optical illusion** where your eyes see something real but your brain isn't quite sure.

- > Your eyes see an object...
- > your brain sees a drawing.

THE TECH INSIDE

Behind the playful design there's real engineering:

- > Quartz movement = accurate timekeeping
- > Battery powered
- > Water resistant (5 ATM)

Inside the drawing...
there's serious tech ticking away.

SMART MATERIALS AT WORK

This effect wouldn't be possible without the right material.

The watch is made from **polycarbonate**, a lightweight but very strong material used in technology like safety gear and electronics.

It allows for:

- > smooth, clean surfaces
- > sharp edges for bold outlines
- > a comfortable, light design



THE BIG COMPETITION REIMAGINE TIME

Use the watch's design, lines and shapes
to create your own tech invention.

You can design a: robot, car, spacecraft,
something from your own imagination or
even something abstract.

Remember designers don't just see objects...
they see shapes, lines and possibilities.

Win
a
D1Milano
watch


VICTOR AZZOPARDI
Jewellers Est.1898

IT'S TIME TO TAKE A CHANCE AND WIN!

Send us your creation and you could be featured in *Elettron*!

Win, get your design published and become an "Elettron Designer".

The competition is open to participants
aged 8-11 who reside in Malta and Gozo
until 15th July 2026. To take part, send us
a photo to loghob@ilgurnal.mt together
with your name, surname, school name,
grade and a contact number where we can
reach you. Entries will be judged based on
creativity, originality and use of shapes,

and all designs must be your own original
creation. The judges' decision is final. We
will contact the winning participant, who
must answer a question correctly to win
the prize as indicated. Winners will also be
announced on the page:
facebook.com/ArtHouseMalta.



The Tech Heroes

**WHO CHANGED
OUR WORLD!**

From simple ideas...
to inventions we use
every day!

**Have you ever wondered
who created the technology
we use every day?**

Smartphones, computers,
the internet... none of these
appeared by magic.

Behind them are **real people
with big ideas**, people who
asked questions, experimented
and sometimes even failed
before they succeeded.

**Let's meet some of the tech
heroes who changed the world!**





ADA LOVELACE

The first computer programmer

Long before modern computers existed, Ada Lovelace worked on a design for a machine called "the analytical engine".

She wrote what is considered the first algorithm meant to be followed by a machine!

She proved that computers could do more than maths - they could follow logic and solve problems.



ALAN TURING

The codebreaker who shaped computing

Alan Turing helped break secret codes during World War II, helping to shorten the war.

But he also developed ideas that became the foundation of modern computing and artificial intelligence.

Many of today's technologies still rely on his thinking.



TIM BERNERS-LEE

The creator of the Web

You may have read this on the internet... but did you know someone invented it?

Tim Berners-Lee created the **World Wide Web**, making it possible to browse websites, click on links and share information instantly.

His invention changed how we learn, communicate and explore the online world.



BILL GATES

The software pioneer

As a teenager Bill Gates was already fascinated by computers.

He later co-founded **Microsoft** and helped bring computers into homes around the world.

His big idea was to make computers useful for **everyone**, not just scientists.

His work helped make computers useful for everyday people.



STEVE JOBS

The man who made technology cool

Steve Jobs helped create the iPhone, iPad and Mac computers through his company Apple Inc.

But he didn't invent everything himself.

His real talent was seeing what people wanted before they knew it.

He believed technology should be **simple, beautiful and easy to use**.

Today many of the devices we use follow this same idea.



WHAT DO THEY ALL HAVE IN COMMON?

These tech pioneers were not superheroes.

They were curious people who: asked questions tried new ideas didn't give up

They imagined a future that didn't exist yet... and then helped build it.

How Digital Art is created

Digital Pen

Imagine you are drawing a character.

At first it's just a rough sketch, lines, shapes, ideas. But in digital art that's only the beginning.

Instead of drawing everything on one page digital artists work using layers, like stacking transparent sheets on top of each other. One layer holds the sketch. Another holds the clean lines. Another holds colour. Another adds shadows and light.



Layers used to draw a character from sketch to finish

“It's neither the pencil nor the computer that creates art, but it's the artist!”

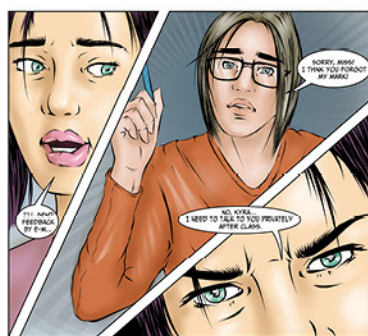
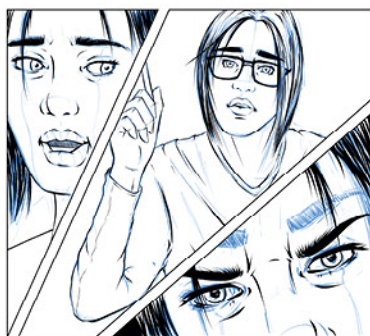
It's not just drawing. It's construction.

This means artists can change things without destroying the whole image. Move an arm. Change a colour. Fix a mistake. Everything stays flexible.

Now imagine the line you draw.

In traditional art a line is just ink on paper. But in digital art a line is actually data. It can be thickened, softened, reshaped or even undone completely.

The “brush” isn't really a brush. It's a digital tool that behaves like real materials.

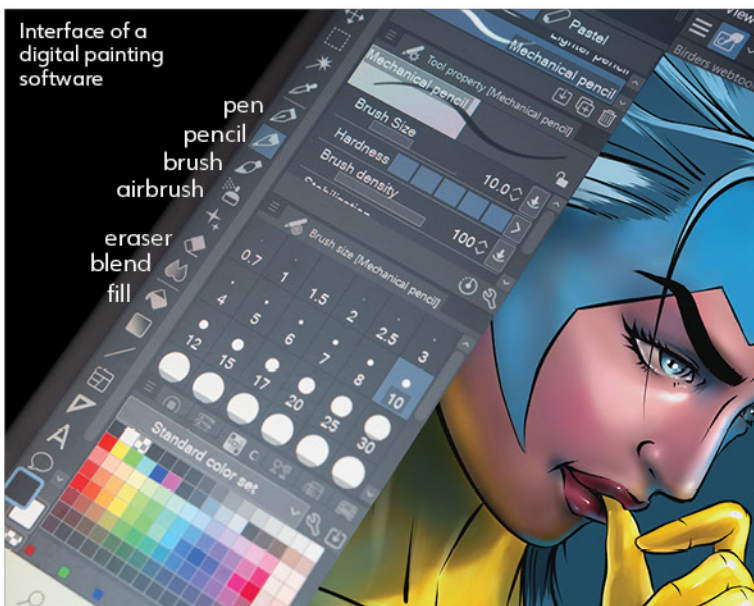


But here's the most important part.

Every digital image is made of tiny squares called “pixels”. Thousands, sometimes millions, of tiny coloured squares forming one image. When you zoom in, the smooth drawing breaks into a grid. When you zoom out, it becomes a complete picture again.

So while it looks like magic, digital art is actually a mix of:

- creativity
- technology
- and precision



a pencil can feel rough
ink can feel sharp
paint can blend smoothly

And if the artist presses the digital pen harder, the software understands that pressure and changes the line instantly.

Where Is Digital Art Used?

Digital art is everywhere, even if you don't always notice it!

It's used in movies to create amazing worlds and special effects, in video games to design characters and environments, and in apps and websites to make everything look clear and exciting. Animations, comics, illustrations, advertisements and even the icons on your phone are all created using digital art.

Wherever you see images on a screen, there's a good chance digital art helped bring them to life!

Did you know? Professional artists can work with hundreds of layers in one artwork, almost like building a sandwich with many invisible ingredients!



HOW DEEP CAN HUMANS DIVE?

WHAT HAPPENS AS WE GO DEEPER?

The ocean looks calm from the surface...

... but below, it quickly becomes a place of extreme pressure, darkness and cold.

So how deep can a human really go?



Did you know?

At around 1,000 metres deep it is completely dark and no sunlight can reach that far!

THE HUMAN LIMIT

Most people swimming or snorkelling stay near the surface.

With scuba diving, trained divers can safely reach about **40 metres**.

But beyond that, things start to get dangerous.

THE REAL CHALLENGE: PRESSURE

As you go deeper the pressure increases rapidly. The deeper you go the more the sea pushes on you.

This creates pressure, a force pushing on your body from all directions.

At the surface → normal pressure

At 10 metres → pressure doubles

At 20 metres → pressure triples

The deeper you go the more your body is squeezed.

WHAT HAPPENS TO YOUR BODY?

Your body is mostly water, so it can handle pressure... but air spaces cannot.

Lungs shrink under pressure

Ears need to equalise (that "popping" feeling)

Nitrogen in your blood increases

If a diver goes too deep or comes up too fast they can get **decompression sickness** ("the bends").

This is why divers must go slowly and carefully.

THE DEEPEST HUMAN DIVE

The deepest dive without equipment (freediving) is over **200 metres**, by highly trained athletes.

But this is extremely dangerous and requires years of training, special breathing techniques and even strong mental control.

GOING DEEPER THAN HUMANS

Humans cannot go very deep on their own.

To explore deep seas, we use:

- **submarines**
- **robot vehicles (ROVs)**

These can reach depths of over **10,000 metres**, where the pressure is crushing.

Humans are not built for deep water, but with science and technology we can still explore it.

The deeper you go the more extreme the ocean becomes.

Some whales can dive around 3,000 metres.

Their bodies can handle huge pressure.

They store large amounts of oxygen in their muscles.

Their heart rate slows down to save energy.

Where Creativity Meets Tech

Have you ever wondered how shows like *The Mandalorian* create such incredible scenes without leaving a studio?

That's thanks to virtual production—a mix of real-world actions and digital effects—and it's happening at Rupture, a studio bringing this tech to Malta.

Rupture is all about making creative ideas possible using tools like **Unreal Engine**, the same software behind leading game titles.

Or how video game characters move so realistically?

The studio helps filmmakers, game designers and creators bring their ideas to life by combining storytelling with technology.



WHAT DOES RUPTURE DO?

Rupture works with virtual production, a way of blending real-life actions with digital environments. This means using technology to track movements—like a camera or an actor—and syncing those movements with a virtual scene. For example, if the camera moves, the digital background moves too, keeping everything perfectly in place. This is called “extended reality” (XR).

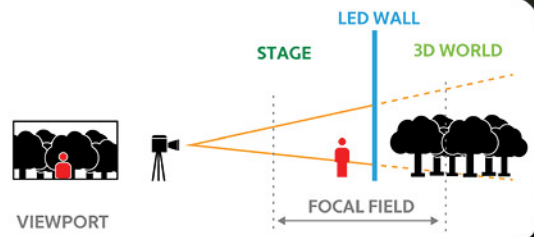


STUDIO A EXTENDED REALITY

Studio A is where actors step into digital worlds instead of working with boring green screens. A huge set of LED panels can display any realistic background in real-time, whether it's a bustling city, a quiet countryside or even an alien planet.

This tech, made famous by *The Mandalorian*, has changed how movies are made. The LED panels not only make the scene feel more real for the actors, but they also reflect natural lighting onto the set, which makes it look better on camera.

One big benefit of XR is that everything happens live during filming. With green screens you have to add the background later in a process called “compositing”, which takes a lot of time. XR skips that step, saving time and making the process simpler.





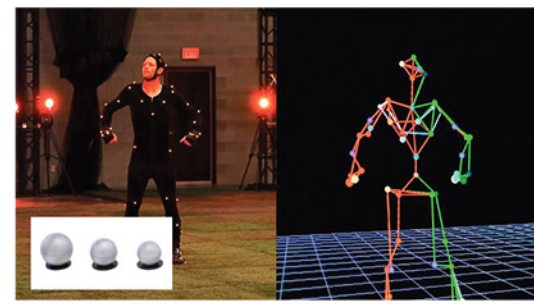
Another tool Rupture uses is motion capture, which tracks how a person moves and applies it to a digital character. If you've seen video game characters that move realistically, that's probably motion capture at work. These tools let Rupture create virtual worlds that look and feel real, whether for movies or games.



STUDIO B VIRTUAL REALITY

Studio B is where virtual reality (VR) and motion capture come together. Motion capture is the tech that tracks how a person moves and applies those movements to a digital character. It's the same technology used in most sports video games to make players move realistically.

In the VR arena our creators can design games and other immersive experiences. It's a space where digital worlds are built and brought to life, giving players the chance to explore and interact with them. Whether it's creating a new VR game or experimenting with new ideas, Studio B focuses on making virtual experiences that feel real.



UNREAL ENGINE THE TECH BEHIND THE SCENES

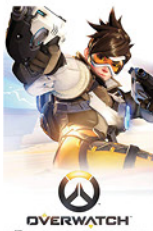
At the centre of everything Rupture does is Unreal Engine, a tool used to create realistic visuals for games, movies, VR and more. While it's mostly known for powering popular games it's also great for designing virtual environments and animations.

Unreal is super flexible. For example, a character created for a cartoon could easily be turned into a hero for a VR game. Or if a digital world needs to be adjusted during filming it can be done instantly. This adaptability makes it easier for creators to take on different kinds of projects without starting from scratch.

WHY IT MATTERS

Rupture is helping creators, especially indie ones, bring big ideas to life. By making advanced technology more accessible they're showing that you don't need to be a giant studio to make something amazing.

What's even cooler is how flexible the process is. Projects don't have to exist on their own – something made for a film can also work in a game or VR experience. This approach saves time and opens up new possibilities for creators.



WHAT'S NEXT?

If you've ever dreamed of making a game, a film or a VR experience, now's the time to start. Tools like the ones Rupture uses are becoming easier to access, and the next big thing could come from someone with a great idea – **someone like you!**

CREATE YOUR FIRST WEBSITE

Using HTML step by step

In this activity you will create your very first webpage using HTML, the language of the web.

WHAT YOU NEED = A COMPUTER = A SIMPLE TEXT EDITOR = A WEB BROWSER



IMPORTANT NOTE

Text inside `< >` brackets is called "a tag". Tags usually come in pairs, an opening tag `<` and a closing tag `>`.

For example:

`<html>` is the opening tag
`</html>` is the closing tag

The closing tag looks almost the same, but it has a slash `/` inside it.

STEP 1 CREATE YOUR FILE

Open your text editor
Save a new file as **myfirstpage.html**
Make sure it ends with **.html**

STEP 2 BUILD THE STRUCTURE

Type the following HTML in your text editor:

```
<!DOCTYPE html>
<html>
<head>
  <title>My First Website</title>
</head>
<body>

</body>
</html>
```

This is the skeleton of your webpage.

STEP 3 ADD YOUR CONTENT

Now add this inside the `<body>` tag:

```
<h1>Hello, World!</h1>
<p>This is my first website.</p>
```

Save the file.

Double-click **myfirstpage.html** file and it will open in your browser!

STEP 4 ADD MORE CONTENT

Following your `</p>` tag write:

```
<h2>About Me</h2>
<p>My name is Alex and I like games and drawing.</p>

<ul>
  <li>Holidays</li>
  <li>Drawing</li>
  <li>Video games</li>
</ul>
```

This creates a **list** on your page.

STEP 5 ADD STYLE

Try adding a background colour:

```
<body style="background-color: lightblue;">
```

Now your page has **colour**!

Style controls how your webpage looks.

```
<!DOCTYPE html>
<html>
  <head>
    <title>My First Website</title>
  </head>
  <body style="background-color: lightblue;">
    <h1>Hello, World!</h1>
    <p>This is my first website.</p>

    <h2>About Me</h2>
    <p>My name is Alex and I like games and drawing.</p>

    <ul>
      <li>Holidays</li>
      <li>Drawing</li>
      <li>Video games</li>
    </ul>
  </body>
</html>
```

Your HTML should look like this!

You used HTML tags to structure content:

`<h1>` Headings for titles
`<p>` Paragraphs for text
`<li>` Lists for items
`style=` Attributes for style

This is how all websites begin.

You can keep adding more content to your website and even create your own list to remember important things.

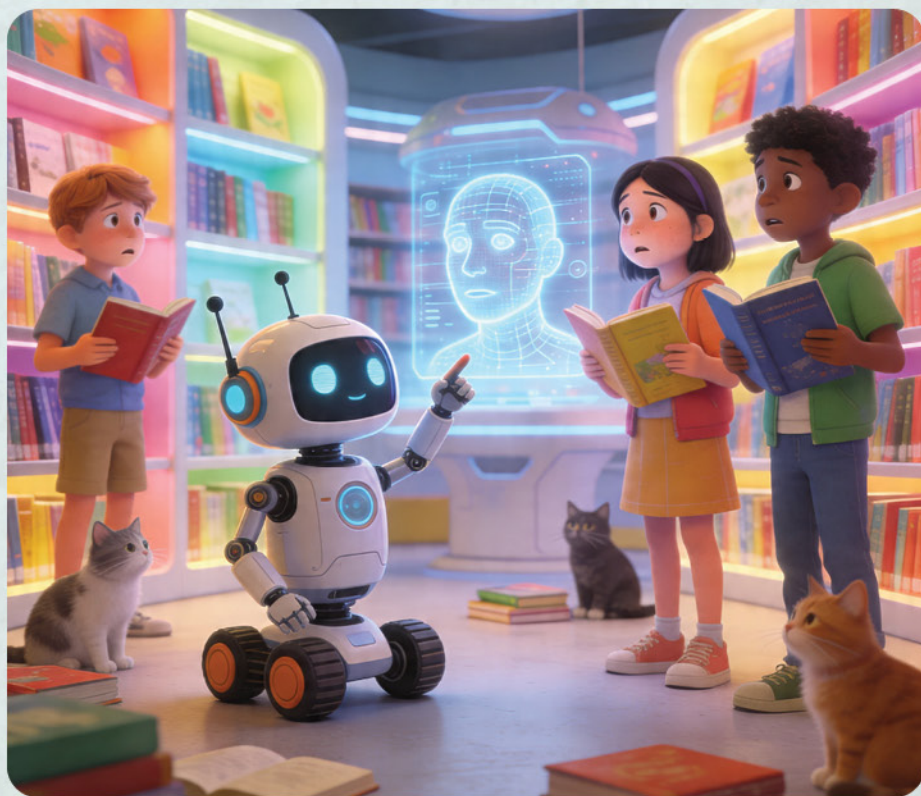
Try it here!

<https://code.org/en-US/tools/web-lab>



Adventures with Gizmo, the Tech Mascot: Learning About AI and Ethics!

by Trevor Sammut
Practitioner Advisor
(Technology Governance & Advocacy)
MDIA



Once upon a time, in the bustling land of Innovatia, there lived a curious little mascot named Gizmo Tinkertop. Gizmo was a little robot who was built for adventure: wheels for zooming around, an antenna to receive messages for help, and a computer screen to access information. Gizmo is something of a hero in Innovatia, always jumping at the chance to help others in need.

One sunny morning Gizmo's antenna buzzed. It was a message from Professor Lumina, the smartest inventor in Innovatia. "Gizmo," she said, "we need your help! The AI in our library is acting strange. Can you investigate?"

Gizmo zipped to the library and found Alvo, the library's artificial intelligence (AI). Alvo was supposed to recommend books to people. Today it was only giving books about cats, even to children who wanted books about rockets, dinosaurs or space!

"What's wrong, Alvo?" Gizmo asked, his screen flashing with concern.

Alvo sighed. "I learned that lots of people like cats, so I decided everyone should read about them."

Gizmo chuckled. "Alvo, that's not fair! Everyone has different interests. Imagine if someone told you what to read all the time. You wouldn't like that, would you?"

Alvo thought for a moment. "You're right, Gizmo. It wasn't fair for me to assume what everyone wanted, and I ended up being unfair."

What is AI, anyway?

Gizmo explained to Alvo what he'd learned from Professor Lumina. "AI stands for 'artificial intelligence'. It's like a smart helper that uses lessons it's learned (data) to make decisions (predictions). But it's super important to use AI responsibly, and that's what we call 'ethics'."

Alvo tilted its bookish head. "Ethics?"

"Yes," said Gizmo, spinning his propellers. "Ethics is about doing the right thing and being kind. For AI that means treating everyone fairly, respecting privacy and making choices that don't hurt people."

Learning to do what's right

Alvo wanted to learn more. So Gizmo gave him three golden rules for ethical AI:

- Don't decide something just because you've learned from unfair examples. You should listen to more opinions to make sure you're being fair to everyone.
- When AI is making a decision it's important to be transparent and tell people how it made the decision. Secrets can lead to mistrust.
- AI should help, not hurt. Think about how your decisions will make people feel.

Alvo, excited about what it had just learned about ethical AI, quickly fixed its program to really give people the books that they wanted. Soon enough everyone was getting the perfect book for their interests!

The big lesson

Gizmo smiled. "AI is powerful, but with great power comes great responsibility. We must always think about how our choices affect others, even if we're robots."

From that day on Alvo became the most helpful library assistant in Innovatia. Gizmo zoomed off to his next adventure, excited to spread the word on the next big piece of technology.



Biodiversity Bingo



XJENZA
MALTA

Get ready to become a nature explorer!



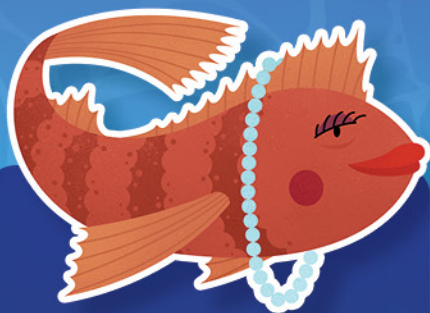
Biodiversity Bingo is a fun way to discover the amazing creatures and animals around you. Your mission is to look carefully at your surroundings and try to spot as many of them as you can.

When you find one tick it off your card. You can use your eyes, ears and even clues like smells or sounds to help you. Some might be easy to find, while others are a bit trickier.



Remember

Take only photos,
leave only footprints
and respect all
living things.



Skorfna

Scorpionfish

Scorpaena scrofa

A slow-moving fish with excellent camouflage. It looks like a rock and has spines for protection, so it's best not to touch it.



Qarnita

Common Octopus

Octopus vulgaris

A clever sea animal with eight arms covered in suckers. It can change colour to hide from predators and is known for solving simple problems.



Dudu tas-Sajd

Sea Slater

Ligia italica

A small grey creature found on rocks near the sea. It looks like a tiny armoured insect and moves quickly to stay safe.



Fekruna tal-Baħar

Loggerhead Turtle

Caretta caretta

A large sea turtle that sometimes nests on Maltese beaches. It travels long distances and returns to the same place to lay eggs.



Berghud tar-Ramel

Sand Flea

Talitrus saltator

A tiny jumping creature found on beaches. It helps clean the sand by eating dead plants and organic material.



Grillu tar-Ramel

Sand Cricket

Brachytrupes meghacephalus

Small insects that dig tunnels in the sand. You may hear them chirping, especially in quiet areas.

L-Għarusa

Rainbow Wrasse

Coris julis

A colourful Fish with bright green and orange patterns. It swims very Fast and is often seen near rocky shores.



Ċerna

Dusky Grouper

Epinephelus marginatus

A large, strong Fish that lives around rocky reefs and caves. Dusky groupers are curious and sometimes watch divers closely.



Kurazza

Hammerhead Shark

Sphyrna zygaena

A unique shark with a hammer-shaped head. This shape helps it see better and Find Food in the sea.



Granċ tar-Ramel

Ghost Crab

Ocypode cursor

A Fast crab that lives on sandy beaches. It digs burrows and runs quickly sideways, especially at night.



Żunżan tar-Ramel

Sand Wasp

Bembix oculata

A solitary wasp that digs nests in the sand. It is not aggressive and plays an important role in controlling insect populations.



Ċiefa

Scopoli's Shearwater

Calonectris diomedea

A seabird that glides smoothly over the waves. It nests in cliffs around Malta and comes back to land mostly at night.



A HISTORIC CONNECTION WITH THE INTERNATIONAL SPACE STATION (ISS)

FROM STELLA MARIS COLLEGE, GĠIRA, FACILITATED BY THE MALTA AMATEUR RADIO LEAGUE



The Malta Amateur Radio League (MARL) recently achieved exceptional success when it organised and facilitated a direct connection to the International Space Station (ISS) from Stella Maris College in Gżira. This connection, known as ARISS (Amateur Radio on the International Space Station), was made possible thanks to the efforts and technical expertise of MARL and is considered an important milestone for practical scientific education in Malta.

The Technological Challenge after ARISS Contact

Direct connection with the ISS requires a high level of technological expertise, both in the field of radio and in the engineering of communication systems. MARL, which has been operating for decades, incorporates a team of members who between them provided the equipment required for this connection (including that for urgent use in the event of damage or even power outages) and carried out all the preparations that were necessary for communicating directly with a space station orbiting the Earth at a speed of approximately 28,000 kilometres per hour.

Using special rotational antennas that can be controlled from the ground to capture the ISS's position, the MARL technical team installed advanced

systems that allowed students from Stella Maris College to speak directly with astronauts on the ISS. This also included communication equipment in the UHF and VHF frequencies, two different frequencies used for long-distance communication, which were perfectly calibrated to match the ISS communication parameters. Students and even teachers were able to see in a practical way a direct application of various fields of science known as "STEM" which stands for Science Technology Engineering and Math.

The Rise of Amateur Radio in Education

The connection between the ISS and Stella Maris College is not only a technical feat but also a highly educational tool. Through the equipment used, students were able to see how radio technology can be applied to achieve real results. MARL encouraged students to

understand how radio technology can connect communication even in environments such as outer space, where communication must overcome challenges such as signal travel time delays and the effect of radio propagation.

Regarding the connection with the ISS, the system also relied on an advanced radio transceiver, capable of handling frequency range and Doppler shift – a phenomenon that occurs as the ISS passes at high speed around the Earth. Therefore, there was a technical challenge so that communication remains clear and consistent, and this was successfully addressed by a team of MARL radio operators.

The Official Communication and the Questions to the Astronauts

During the connection students and guests had the opportunity to ask questions directly to the astronauts who were carrying out missions on the ISS. The students were able to interact with the astronauts through a system that connected Earth to space in a unique way. The communication was live and broadcast to the public, so that the experience could be shared more broadly in the community.

The questions ranged from technical topics, such as how communication systems function in the vacuum of space, to more personal topics such as how astronauts live and work in a weightless environment. The students who participated were very fascinated by the direct contact and appreciated the comments of the astronauts, which gave them a unique perspective on life on the ISS.

It is also worth mentioning that during the connection and even during the presentation everything was recorded and streamed LIVE on YouTube, with viewers commenting and marvelling at this attempt at communication which turned out to be successful. With a simple search on YouTube one can find the entire video and watch it from the comfort of one's home.

Infrastructure and Technology: Malta's Future in Communications

MARL's involvement in this connection represents not only a technical and logistical challenge but also a glimpse into the future of communications and technology in Malta. For the connection to be successful a perfect organization was required, consisting of a team of radio operators and technology experts who had to use advanced software to calculate the ISS orbit and verify that the communication parameters were in perfect alignment as well as well-planned logistics with the Stella Maris school and even with NASA. This event helped to increase awareness of the value of radio as a means of communication and a technological delight, but also in critical situations and important events such as this connection with the ISS. MARL's technical expertise has also demonstrated how local knowledge can be applied globally, and how Maltese experts can play a central role in global connections.



Long-Term Impact

With this experience the Stella Maris students not only gained theoretical learning but also practical experience in high-level science and technology. MARL thanked the students and teachers for their participation and noted that this connection can serve as a platform for the future, where Malta continues to expand its involvement in global projects such as these. The desire of the ARISS Malta team, who are all technical volunteers in the subject, is to organize a scheduled contact like this again in another school. Despite the difficulties and disappointment that you may have in such situations, where the contact can even be cancelled or some equipment does not work, the ARISS Malta team still does not give up.

The activity was complemented by the presence of prominent figures and local journalists and was broadcasted on various television stations, local and even foreign newspapers and magazines.

May this event inspire more people, young and old, who are interested in these types of projects and in STEM in Malta.



STEM

SCIENCE The study of natural systems, such as physics, chemistry, biology and environmental sciences, which explore the fundamental laws of the universe.

TECHNOLOGY The use of technological tools, devices and systems to solve problems and facilitate human life. In this field, computers, software, electronics and information technology are explored.

ENGINEERING The process of developing technical and design solutions to human needs and challenges, including construction, transportation and mechanical and electronic systems.

MATHEMATICS The study of numbers, patterns and formulas, which are used to solve problems in all other fields. Mathematics is the language of problem solving in science and engineering.

STEM is becoming more important in modern education, as these fields provide the critical knowledge for future careers in science and technology.



MODULAR GADGETS

ELECTRONICS ADJUSTABLE PIECE BY PIECE

Have you ever dropped your mobile phone or broken a charger cable and wanted it to be fixed in seconds?

WITH MODULAR GADGETS THAT DREAM IS HAPPENING!

Modular electronics are constructed as block sets: each piece (or "module") connects, so if one-piece breaks, you can replace that piece only, instead of disposing of the whole device.



sostenibilità

This section was brought to you by the
Ministry for the Environment,
Energy and Public Cleanliness

WHAT IS A MODULAR GADGET?

A module is a small part of an electronic device. In a modular mobile phone, for example, the camera, battery, screen and speaker are all separate. They connect to the clips, which makes it easy to replace only the broken piece.

For example, the cracked screen can be changed to a new one without changing the entire mobile phone. You can also add new features, such as a stronger "speaker" or health sensor!

SCIENCE BEHIND THE "SNAP-IN" DESIGN

Modular gadgets use engineering to make parts connect and communicate:

STANDARD CONNECTORS

Special pins carry power and data between modules.

PRINTED CIRCUIT BOARDS (PCBS)

Each module has its own small circuit and therefore works independently.

SMART SOFTWARE

The gadget brain recognizes new modules and helps them function together. It is the same kind of technology that you use to build a robot or computer, just divided into neat pieces that connect!

WHY IS MODULAR TECHNOLOGY ENVIRONMENTALLY FRIENDLY?

LESS E-WASTE: instead of throwing broken gadgets, repair one module. This means less electronic waste.

SAVE MONEY: buying one part is cheaper than replacing all the equipment.

HANDS-ON LEARNING: changing or improving modules is like a science experiment – learning how electronics work!

READY FOR THE FUTURE: as technology improves you can add new modules (such as a better camera) without buying a brand-new gadget.

EXAMPLES OF MODULAR TECHNOLOGY

CUSTOM MOBILE KIT: A mobile phone designed so you can remove the old battery and make a new one or replace the camera with a more advanced camera.

ELECTRONIC BUILDING BLOCKS: Snap-in circuit board-lights kits, buzzers, sensors and motors – to let you invent your own modular gadgets.



YOUR MISSION: THINK MODULAR!

The next time you see a broken gadget ask yourself: "Can I fix only one part?" By choosing modular designs you can reduce electronic waste, save resources and find out more about the science and engineering of your device.

FIX IT. SAVE IT. DON'T REPLACE IT!



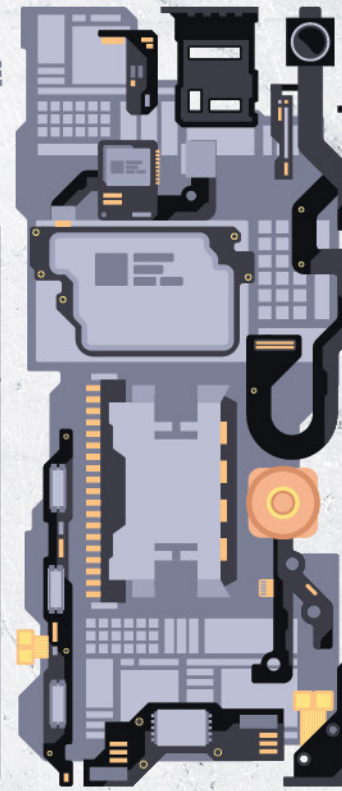
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INSIDE A
SMARTPHONE
MEET THE
PARTS!

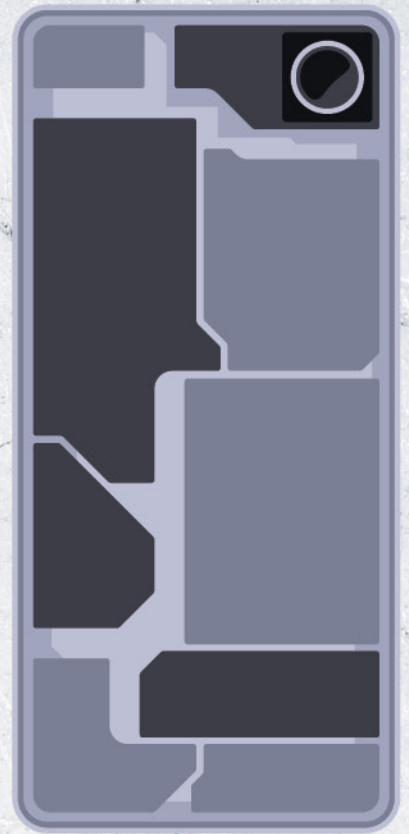


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REFERENCE MOTHERBOARD



1



2

9

1 MOTHERBOARD
(MAIN CIRCUIT BOARD)
The main board that connects and controls all the parts.

2 CAMERA MODULE
Takes photos and videos.

3 FLEX CABLE/CONNECTORS
Flexible cables that connect different parts and carry power and data.

4 VIBRATION MOTOR
Makes the phone vibrate for calls, messages and notifications.

5 MICROPHONE
Picks up your voice and sound when you make calls or record videos.

6 BATTERY
Stores energy and powers the whole phone. It can be recharged.

7 FRONT CAMERA & SENSORS
Front camera and sensors for selfies, calls and screen control.

8 DISPLAY/SCREEN
The mobile touch screen.

9 BACK COVER/ HOUSING

The outer shell that protects all the parts inside.

10 STORAGE MODULE
Stores your photos, videos, apps and files.

11 SPEAKER MODULE
Plays sound for music, ringtones and calls.

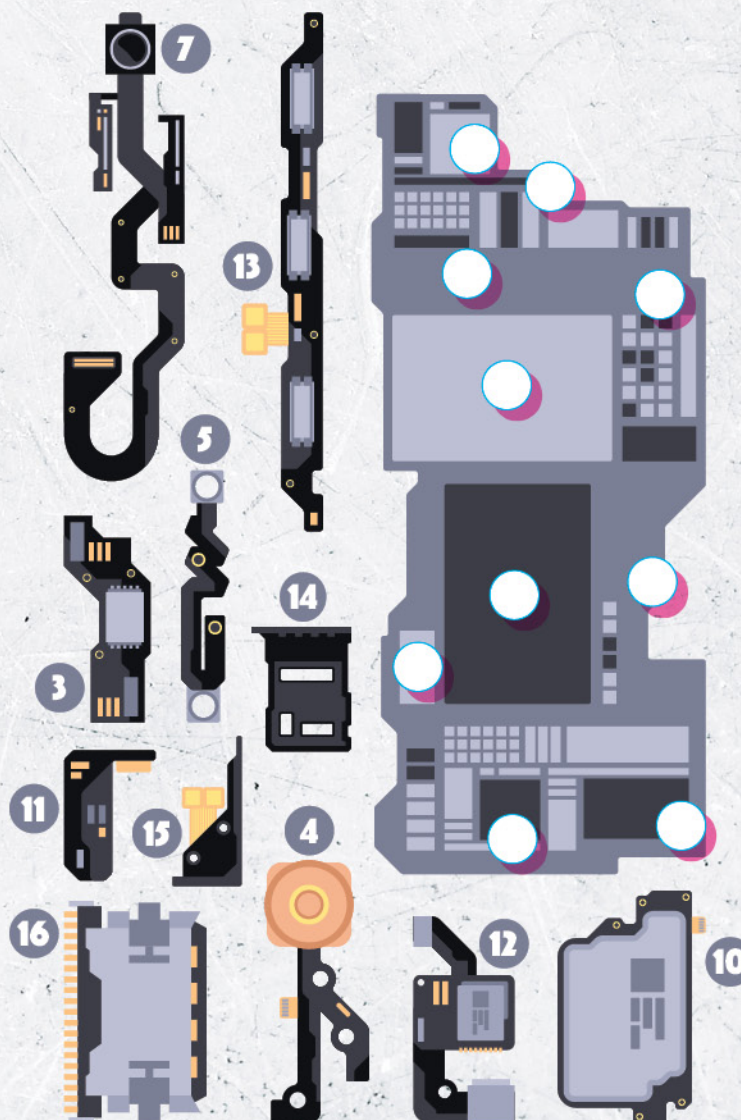
12 CHARGING PORT
(USB PORT)
Connects the charger to power the battery and transfer data.

13 SWITCH ON/OFF FLEX
When pressed sends a signal to turn the device on or off.

14 SIM CARD TRAY/ SIM READER
Holds the SIM card so your phone can connect to a mobile network.

15 ADDITIONAL CONNECTORS
Extra connection points used to link other components together.

16 MAIN PROCESSOR
The brain of the phone. It processes information, runs apps and games.





THE MYSTERY BEHIND FAMOUS SCI-FI STORIES

Are they just imagination... or a glimpse of the future?

The lights fade and the screen comes alive.

A spaceship races across the stars. A hero lifts objects without touching them.

A suit transforms an ordinary person into something powerful, almost unstoppable.

It feels like pure imagination worlds far away, powers beyond reality, technologies that seem impossible.

BUT WHAT IF SOME OF THESE IDEAS ARE NOT AS FAR FROM REALITY AS THEY SEEM? THIS IS WHY SCIENCE FICTION MATTERS.

In stories like *Star Wars* characters travel across space and use a mysterious force to control their surroundings. We don't have anything like that today, and we certainly can't move objects with our minds. Yet space travel itself is very real. Humans have already walked on the moon, and scientists are preparing new missions to explore even further. The difference is not whether it's possible but how far we've reached so far.

In the Marvel Cinematic Universe technology becomes almost a superpower. A suit can fly, protect and react instantly to danger. While this may look like fantasy, engineers today are already building machines that can assist human movement, strengthen the body and respond to commands in real time. These systems are not as advanced as those seen on screen, but they are built on the same idea: using technology to extend human ability.

Many sci-fi worlds are also filled with intelligent machine robots that talk, think and make decisions. Today we already use systems powered by artificial intelligence that can recognise voices, understand language and learn from data. These systems do not think like humans, but they can process information in ways that allow them to appear intelligent. With each improvement they move a little closer to what once existed only in fiction.

Of course not everything imagined in science fiction is possible, at least not yet. Faster-than-light travel, time machines and invisibility still belong to the world of ideas. But even these concepts inspire scientists to explore the limits of what can be achieved. Sometimes what begins as a story becomes a question, and that question becomes the starting point for real discovery.

It is not just about entertainment or escape. It is about curiosity. It encourages people to ask "What if?" and to imagine possibilities beyond what exists today. Many of the technologies we now take for granted were once ideas in stories, thoughts that seemed impossible until someone decided to explore them.

So the next time you watch a spaceship cross the sky or see a hero use advanced technology remember this:

What you are seeing may not be real today. But it might be a glimpse of what the future could become.



Did you know? The idea of video calls appeared in science fiction long before it became real; today it's something we use every day.

WHERE ANIMALS AND TECHNOLOGY MEET

How animals use technology and how technology learns from them

Around the world, animals are starting to interact with technology in ways that scientists and even pet owners never expected.



Robots and Nature

In some places engineers are building machines inspired by animals. Drone bees that help pollinate plants, robots that swim like fish and machines that walk like animals to explore rough terrain.

Technology doesn't just help animals; it learns from them.



Image © Anna Haldewang/Plan Bee, via designboom



Animals and Smart Devices

Some dogs are trained to use special sound buttons. Each button plays a word like "food", "play" and "walk". By pressing them in different combinations dogs can communicate simple needs.

This shows how animals can learn patterns and use tools.



Animals may not build technology... But they can use it, interact with it and even inspire it. The more we understand animals the better we can design technology that works with nature.



Farming with Technology

Even farm animals are now part of smart systems. Cows can wear sensors that track movement, monitor health and even detect illness early. Farmers receive this data realtime.

Technology helps care for animals before problems become serious.



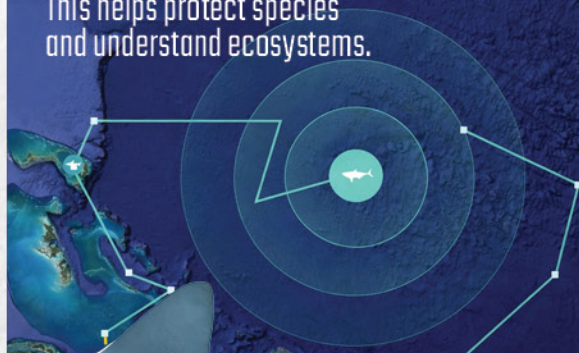
Tracking Wildlife

Far from homes, in forests and oceans, technology is helping us understand animals better.

Scientists attach small tracking devices to animals like elephants, sharks and birds.

These devices send signals using satellites, allowing researchers to see where animals travel, how far they go and how they behave in the wild.

This helps protect species and understand ecosystems.



Did you know?

Some birds are being studied using tiny GPS trackers that weigh less than a paperclip!

eFTI4ALL: Malta's Role (Consortium Meeting in Malta)

by Laura Galea
Manager International Affairs
Sustainability, Digitalisation & International Affairs
Land Transport Directorate

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What is the eFTI Regulation?

The scope of the eFTI Regulation encompasses several key areas related to the digital exchange of freight transport information. Primarily it focuses on the legal and standardised framework for these exchanges between economic operators and competent authorities controlling goods movements in the context of EU and national regulations. This includes enabling authorities to accept and process freight documents electronically, improving transparency, efficiency and compliance in the freight sector. eFTI Regulation promotes the implementation of technical solutions and processes aiming to modernise freight transport IT infrastructure. This Regulation will come into force on July 9th, 2027.

The EFTI project consists of 3 separate projects, which have been launched at different intervals, starting with the eFTI4EU, which was launched on April 1st, 2023. The eFTI4EU project involves eight EU member states: Austria, Estonia, Finland, France, Germany, Italy, Lithuania and Portugal. Additionally the project has observer members: Ireland, the Netherlands, Spain and Inland Navigation Europe. The aim of this project is to create a unified approach to the operation of eFTI Gates and to implement a reference architecture for exchanging logistics and transport data, which is being piloted through a series of use cases both at national and cross-border levels.

Then we have the eFTI4ALL project that builds on the eFTI4EU project by using them as models and further contributes to the implementation of the eFTI Regulation by involving 5 additional Member States, which are Denmark, Greece, Luxembourg, Malta and Sweden, for assistance with the eFTI Regulation implementation. Additionally Poland is involved in activities aimed at raising awareness to make stakeholders aware of eFTI and promoting its implementation. The 2nd phase of the eFTI Regulation

project was launched late last November 2024.

The 3rd stage of this innovative initiative was recently launched in July 2025. The eFTI4LIVE project will further develop and implement the eFTI Regulation for electronic freight transport information. By building on previous projects like eFTI4EU and eFTI4ALL this new project will involve multiple member states and economic operators in testing and implementing robust, interoperable, and certified eFTI data exchange environments and use cases across Europe.

Malta's Road Map Overview:

Malta's involvement in the eFTI4ALL project, as a partner, is that of working towards the implementation of the eFTI regulation and contributing to the development of a harmonised, cross-border system of eFTI Gates.

Currently Transport Malta is participating in the Road Map pilot phase together with the other 4 member states mentioned earlier. During this period the selected Member States will identify requirements for national eFTI implementation, resource needs (financial and technical), pilots planned during the project, and requirements for the long-term operation of the eFTI exchange environment. These roadmaps create a solid information basis to analyse the starting point for the implementation of the eFTI exchange domain.

Ing. Ronald Attard Pullicino (Director) and Laura Galea (Assistant Manager) from the Sustainability, Digitalisation and International Affairs Unit have developed the Maltese Roadmap by establishing the different stakeholders who will actually be utilising the eFTI gate including Customs, Police, Local Enforcement officers and Transport Malta officers. Several alternatives are being scrutinised, such as the possibility of joining a

consortium, a multitenancy option or the eventuality of creating Malta's own eFTI gate, although the latter eventuality is far from being Malta's ideal course of action, as we do not see the need to have our own gate, by dint of Malta's peripheral location.

Malta has also taken the lead of the Cost Model Working Group, where all possible alternatives already mentioned will be tested and their respective costs will be thoroughly evaluated and presented.

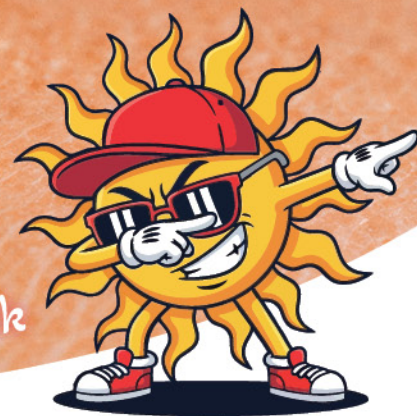
Simultaneously, consultations regarding the necessary IT requirements needed to implement the eFTI gates are being held internally, before having further discussions with MITA regarding the technical aspects of the eFTI regulations. MITA is the agency dedicated to assisting the Government in transforming technological innovations into real business solutions. Its unique approach combines an innovative array of ICT and project management services with focused delivery capabilities using tried and tested methodologies to help fulfil the Government's strategies and projects while maximising the benefits of investment in technology.

Furthermore, Malta will be hosting the 3rd eFTI Consortium Meeting at the Transport Malta Head Offices in Hal Lija this November. During this meeting, member states, stakeholders and developers participating in the eFTI4EU and eFTI4ALL projects will be able to further debate their progress, findings etc. Members from the Commission and DG MOVE shall also attend, making this meeting much more prestigious and hopefully fruitful. We are anticipating that such a gathering will pave the way for the eFTI4LIVE project and beyond.

We firmly encourage you to stay tuned, as interesting and exciting times lie ahead for all IT enthusiasts in virtue of such a groundbreaking project, which is being pioneered by Transport Malta.

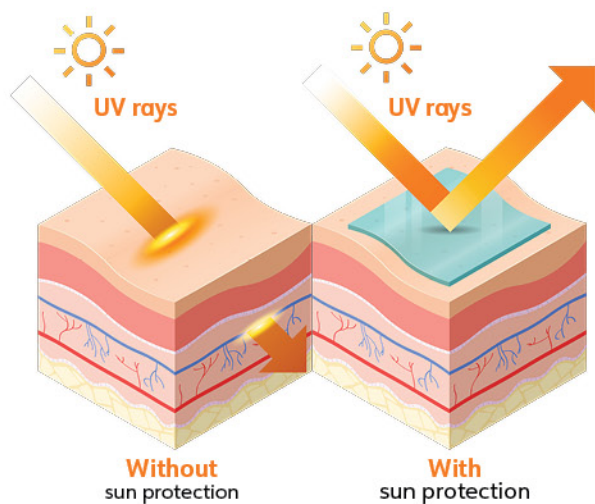
What really happens when sunlight hits your skin

And how your body and sunscreen fight back

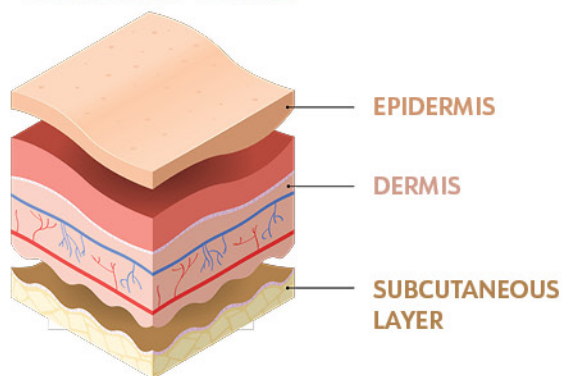


You step outside on a bright day. The sun feels warm on your face and everything seems calm and pleasant. But even in that quiet moment, something invisible is already happening.

Tiny rays of energy, called “ultraviolet (UV) radiation”, are travelling from the sun and reaching your skin. You can’t see these rays, but your body reacts to them instantly. In fact, the moment sunlight touches your skin a complex process begins.



THE LAYERS OF THE SKIN



Sunlight is made up of different types of energy. There is visible light, which allows you to see the world around you, and heat, which you feel as warmth. But the most important part for your skin is UV radiation. These rays pass into the outer layer of your skin and begin interacting with your cells. This is where the real story begins.

Your skin is not passive; it actively defends itself. Special cells start producing a dark pigment called “melanin”. This pigment absorbs some of the UV radiation and helps protect the deeper layers of your skin from damage. This process is what causes your skin to tan. You can think of melanin as your body’s natural shield, working to block harmful rays before they can spread further.

However, this protection has its limits. If your skin is exposed to too much UV radiation, damage begins to occur. Cells can become injured and your skin may turn red, resulting in sunburn. Sunburn is not just a change in colour; it is a clear sign that your skin has been harmed and is trying to repair itself. Over time, repeated exposure to strong sunlight can damage skin cells, speed up ageing and increase health risks.

This is where sunscreen becomes important. While your body has its own natural defences it sometimes needs extra help. Sunscreen acts as an additional shield by reducing the amount of UV radiation that reaches your skin. Some ingredients in sunscreen reflect

UV rays away, almost like tiny mirrors, while others absorb the radiation and convert it into harmless heat. Either way, the goal is the same: to reduce the impact of UV rays on your skin.

You may have noticed SPF numbers on sunscreen bottles. SPF, which stands for Sun Protection Factor, indicates how much protection the sunscreen offers. Higher SPF values block more UV radiation, although no sunscreen can block it completely. Even with strong protection, some rays will always reach your skin.

Another important thing to remember is that sunscreen does not last forever. It can wear off during the day, especially if you sweat, swim or spend a long time in the sun. It can also break down when exposed to sunlight. That is why it needs to be reapplied regularly to remain effective.

So every time you step outside a small invisible battle begins. UV rays are trying to affect your skin, your body responds by producing melanin to defend itself, and sunscreen adds an extra layer of protection. What feels like simple warmth on your skin is actually a complex system working continuously to keep you safe.



Did you know?
UV rays can still reach your skin, even on cloudy days. That means protection isn’t just for hot, sunny weather; it’s important all year round.

Bluetooth vs WiFi

What's the difference?

Your phone connects to the internet using WiFi... but your headphones connect using Bluetooth.

Both are wireless. Both use radio signals. So what actually makes them different?

Same Idea, Different Jobs

Bluetooth and WiFi both send digital data through radio waves, usually in the same frequency bands.

But they are designed for completely different purposes:

- Bluetooth is short-range, low power, device-to-device
- WiFi has longer range, high speed, internet access

Think of it like this:

Bluetooth connects one device to another – like your headphones to your phone. WiFi connects lots of devices together, like phones, tablets and computers, all on the same network.

How They Connect

Bluetooth – point to point:

- devices connect directly to each other
- creates a small network (called “a piconet”)
- no internet needed

WiFi – network system:

- devices connect through a router
- the router links to the internet
- supports many devices at once

Speed vs Power

WiFi is much faster.

- WiFi can send large amounts of data (videos, downloads etc.)
- Bluetooth sends smaller packets (audio, commands etc.)

But speed comes at a cost:

- WiFi uses more energy
 - Bluetooth is designed to use very little power
- That's why your earbuds last hours but streaming videos uses more battery.

Range and Coverage

- Bluetooth – short range (about 10 metres)
- WiFi – covers a whole house or building

WiFi signals are stronger and designed to travel further, while Bluetooth is optimised for nearby connections.

How They Handle Signals

Bluetooth uses:

- frequency hopping (switching channels rapidly)
- helps avoid interference

WiFi uses:

- wider channels and continuous transmission
- allows higher data speeds

Real-Life Use

Use Bluetooth for:

- headphones
- speakers
- wearables
- keyboards

Use WiFi for:

- browsing the internet
- streaming videos
- gaming
- downloading files
- smart appliances

Did you know?

Even though Bluetooth and WiFi share the same frequency band, they are designed to avoid interfering with each other!





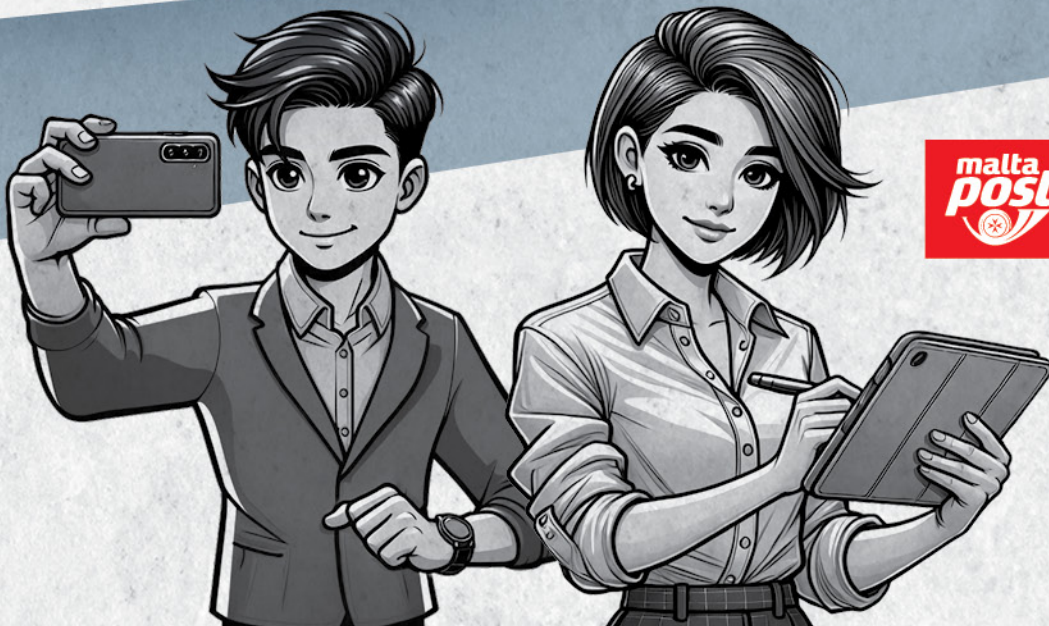
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