What is electronics?

Input → **Process** → **Output**

It's taking stuff from the real physical world (inputs),

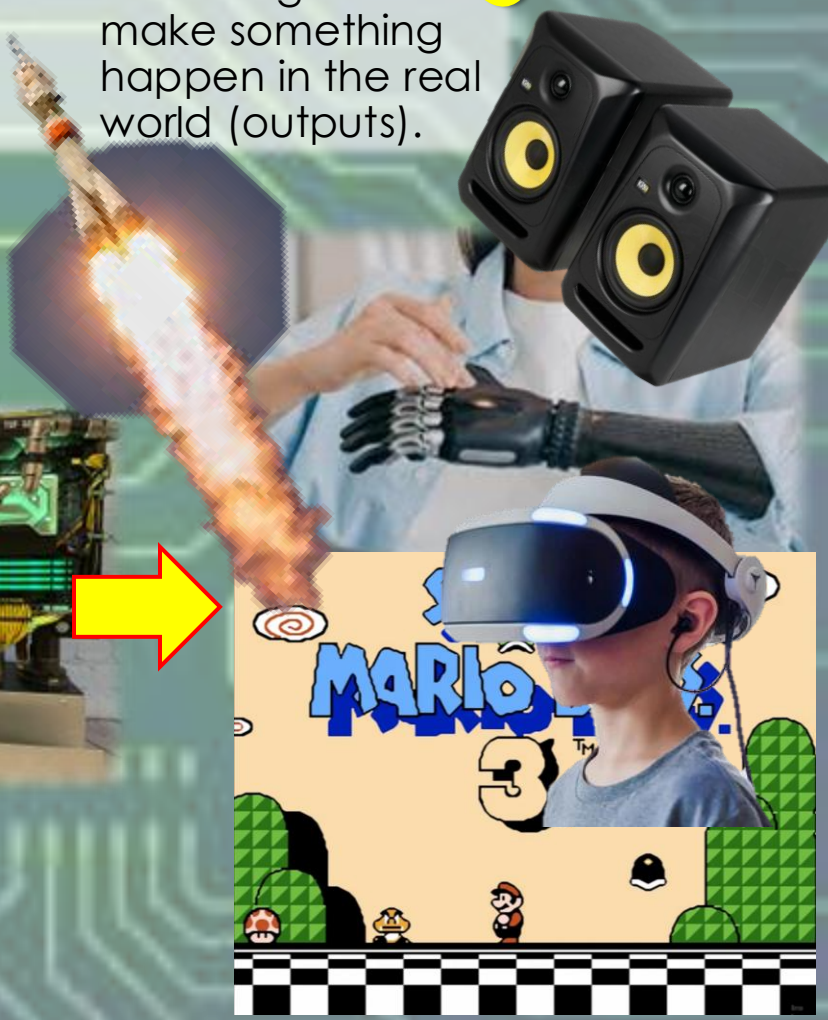
Doing something with that information (processes),

And using that to make something happen in the real world (outputs).

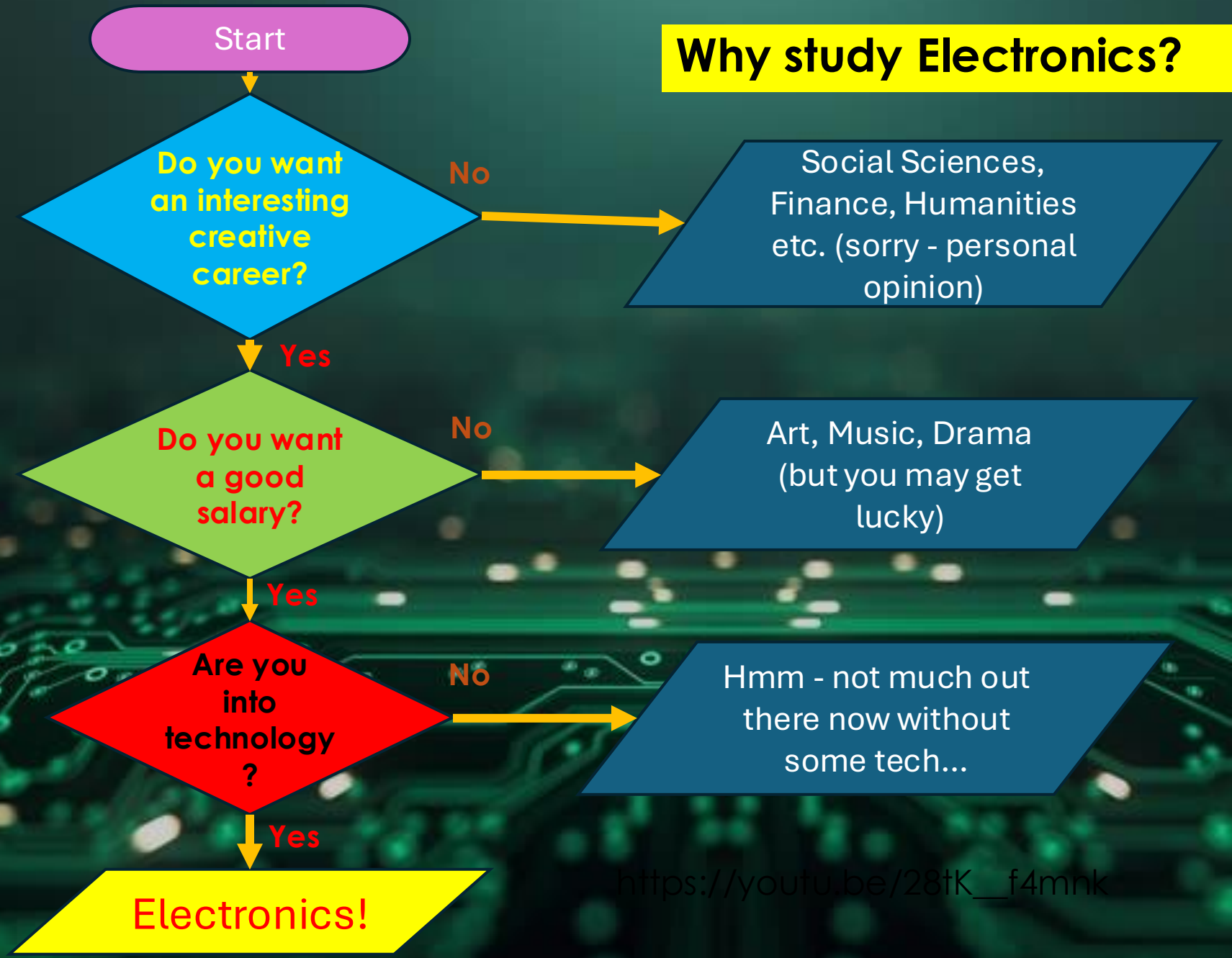
INPUTS

PROCESSES

OUTPUTS



Why study Electronics?



https://youtu.be/28tK__f4mnk

What careers can an Electronics A level lead to?

Most electronic systems involve some sort of computing.

Computers are everywhere, from smart watches, microwave ovens and mobile phones to data centres, finance, medicine and cutting edge science.

All computing systems rely on electronics to work, and to get the information in and out of the computing chips.

So a knowledge of how electronic systems work can be immensely useful in a massive number of careers beyond pure electronics.

A level Electronics
Will help getting into all of the careers listed here, and many more

Degree level Electronics
If you want to get into the design of systems

Chartered Electronic Engineer
Professional status as an engineer of the highest standing - entitles you letters after your name

Gaming
Hardware and software design, controllers

Engineering
A massive field, and electronics helps in every area

Aviation
Design, control, safety, automation

Robotics
Manufacturing, film (camera & special effects control)

Military & defence
Design, manufacture, testing, maintenance

Broadcasting
TV, radio, Vlogs

Computer Science
Hardware, software, systems design, networking

Audio & video
Film, HiFi, business & home design & installation

Automotive
Car and truck control systems, design & maintenance

Physics
design & data logging for research

Communications
Internet, satellites, data networking, mobile phones

Scientific research

Renewable energy
Systems design, installation, controllers

Software engineering
Apps, control software, data management

Space
Hardware, software, sensors, satellites

Transport
Railways, trams, busses, data systems, signalling

Manufacturing
Design, installation, operation & maintenance

Salaries & career information for Electronic Engineers in the UK - 2023 data

Demand for Electronics graduates is high and the rewards are great

87% of UK Engineering graduates go into employment

After completing their studies, 93% of UKESF Scholars work in the Electronics/Tech sectors

£72,000 is the mean salary of all **full-time employed Electronic Engineers**

£32,000 is the mean starting salary for a **graduate Electronic Engineer**

There has been a **25.7% increase in women working in engineering** since 2016

The UKESF is the only STEM charity in the UK solely focused on Electronics skills, connecting students, secondary schools, universities and industry.

Find out more at **www.ukesf.org**

The UK is a world leader in semiconductors and Electronics

The UK has the **7th largest** Electronics industry **in the world**

UK technology industry is worth **$1 trillion** and employs **3 million people**

7 of the world's **top 10 semiconductor design companies** operate in the UK

£2.3 billion

The **UK Electronic Component** Manufacturing industry will be worth **£2.3 billion in 2023**

All technology trends depend on semiconductors and Electronics:

healthcare • artificial intelligence • green energy • autonomous and electrical vehicles • aerospace • consumer electronics

More information: https://www.ukesf.org/

The UK electronics Skills Foundation also offers scholarships for Electronics degrees:

https://www.ukesf.org/scholarship-scheme/

UK Electronics Skills Foundation

Source: https://www.ukesf.org/wp-content/uploads/UKESF-Infographic-2023.pdf

Entrance requirements

To get onto any post 16 course at Beths you must have:

- **7 or more GCSEs at grades 9-4,**
- **Must include English and Mathematics at grade 5 or above, and**
- **Average GCSE grade of 6 or more across your 7 best subjects.**

To study Electronics at Beths you must have:

- **A minimum grade 6 in Mathematics**
- **A minumum grade 6 in Physics or DT**

To study Electronics at Beths you should have an interest in:

- **Technology**
- **Solving puzzles**
- **How things work**

Please note you do not have to have studied Electronics at GCSE, but if you haven't, you must be prepared to work hard at catching up with the basics.

How to get an idea of the course:

Click on the links below to visit specific parts of the exam board website.

The "AS" text book ≈ year 1

The "A2" text book ≈ year 2

The course fine detail

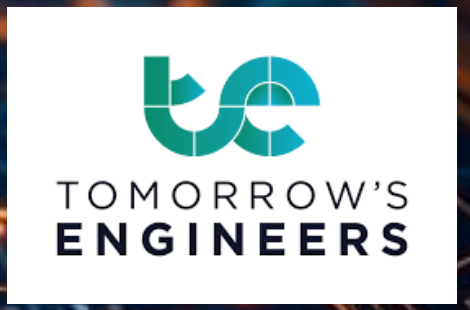
Other course documents

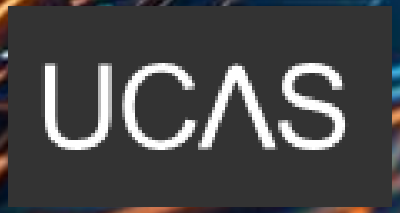
The GCSE textbook

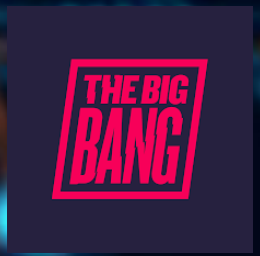
Careers in electronics

Electronic & Electronics Engineering is hugely significant in the UK, European and World Economy.

Click on the links below to explore some of the currently available information







The Royal Academy of Engineering (RAEng)

The RAEng 'This is Engineering' programme also provides some inspirational information about the diverse range of opportunities in engineering as well as a range of free resources for schools.

This is Engineering

https://www.thisisengineering.org.uk/

STEM Learning

STEM Learning provide a wealth of information about STEM careers more widely and there are links to many opportunities on their site as well as access to STEM ambassadors who are communicators and relatable role models who can help to provide careers guidance.

Surprising Facts: Helping Society

Electronics Helps Others

- Improving people's health
  - Diagnosis and treatment of illness, for example:
    - Cancer treatment using radiation, new nanobot technology to target individual cancer cells
    - Body imaging using X-rays, ultrasound, NMR and PET scans
    - New methods using infrared light to monitor our blood
- Addressing environmental issues
  - Energy needs and climate change effects, for example:
    - New renewable energy technology
    - Climate change effects on humans, animals (e.g. penguin populations), and land (size of the Sahara Desert)
    - Environmentally friendly transportation methods
- And many more…

Surprising Facts: Helping Society

- Careers that help use Electronics knowledge!

Healthcare

Entertainment
Internet, film, video, TV, Radio

Sustainability
Zero carbon power and transport, control and monitoring

Communications (mobile phones, internet, data)

And many more…

Summary

Students who earn a degree in Electronics:

- Have high employment and job satisfaction
- Work in many different sectors (STEM/non-STEM)
- Gain skills that give them a competitive edge in many fields
- Have the opportunity to help society in substantial ways

Questions

What surprised you about the:

- Areas in which Electronics Engineers work?
- Skills Electronic Engineers apply working in such diverse areas?
- Benefit Electronic Engineers can have on the lives of others?