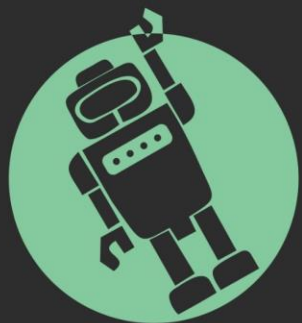




A Reflection



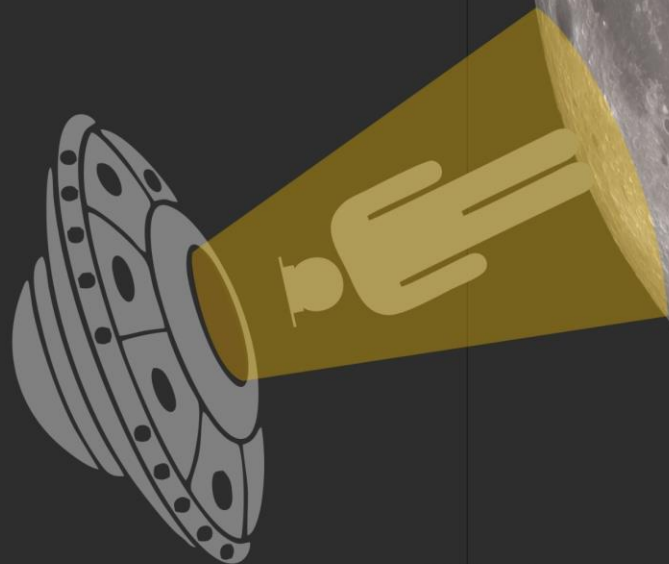
on **20** (ish) **years**

Robotics Education

&

~~playing with robots~~

**A quick guide
to getting started
with robotics.**



Stuart Windram | 24.06.21

JEFA 
EXPERIENCE LEARNING.

CRYSTAL PALACE.
FROM ITALIAN TERRACE.

The past is ahead of us.

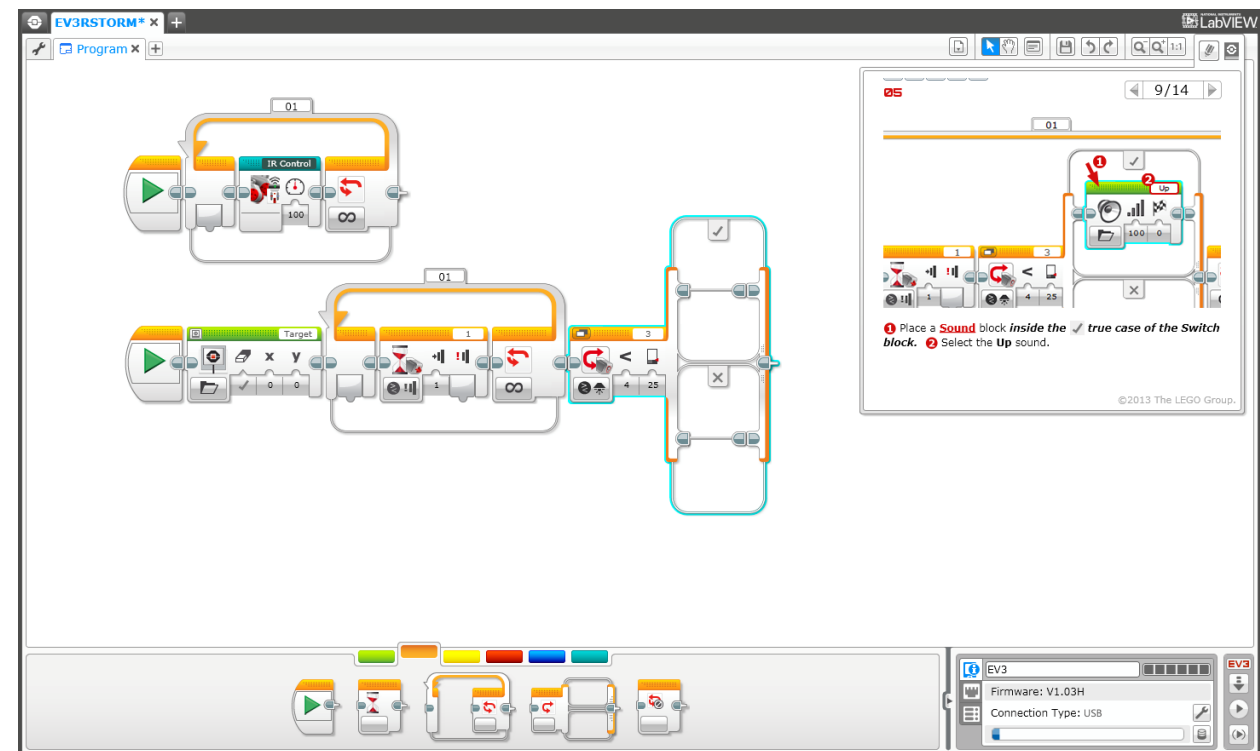
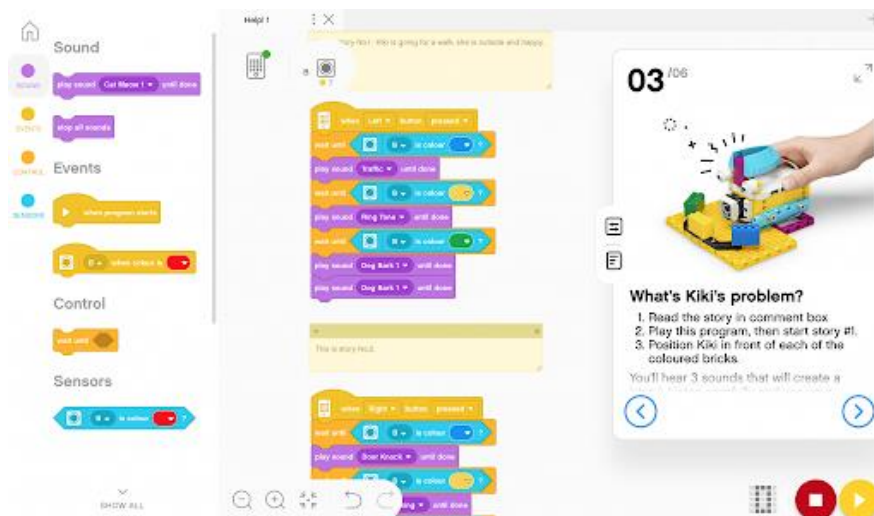
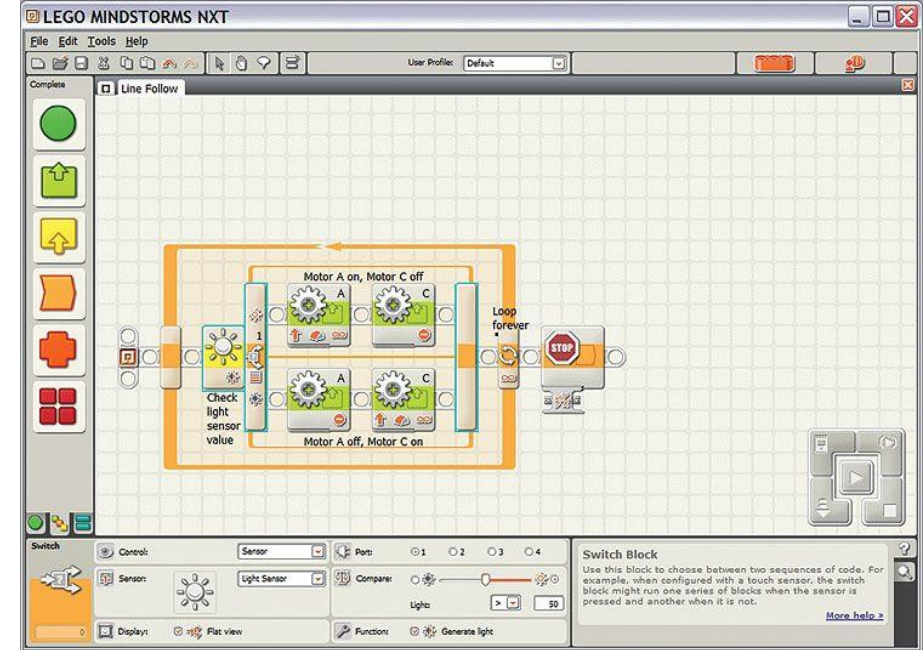
The only thing we can see clearly is what has already happened. We must learn from this and use it to equip us with the insight we need for the future.

The future is behind us.

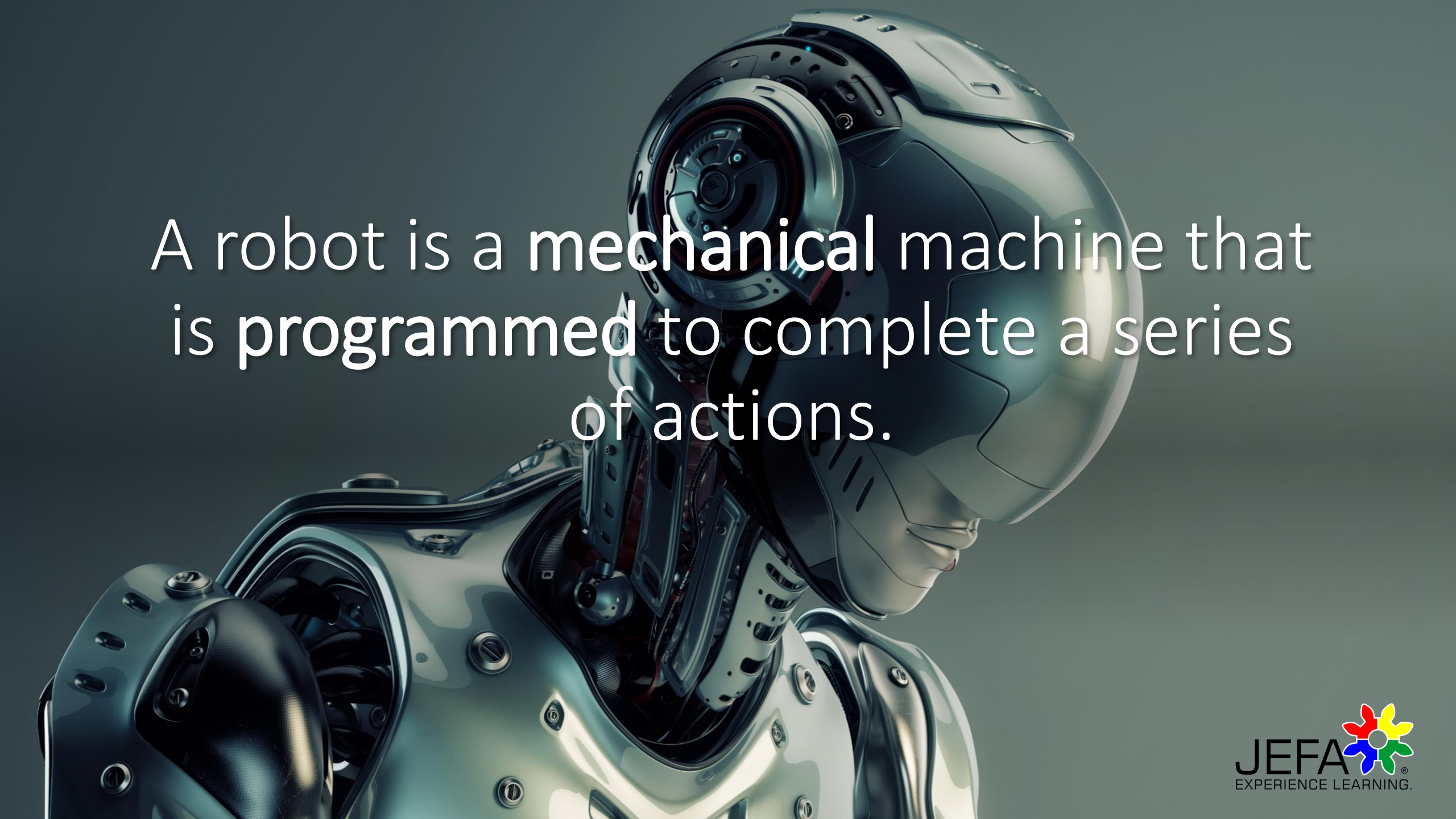
- Himba perspective on the future

Life is like a Kudu Horn by Margaret Jacobsohn (2019)









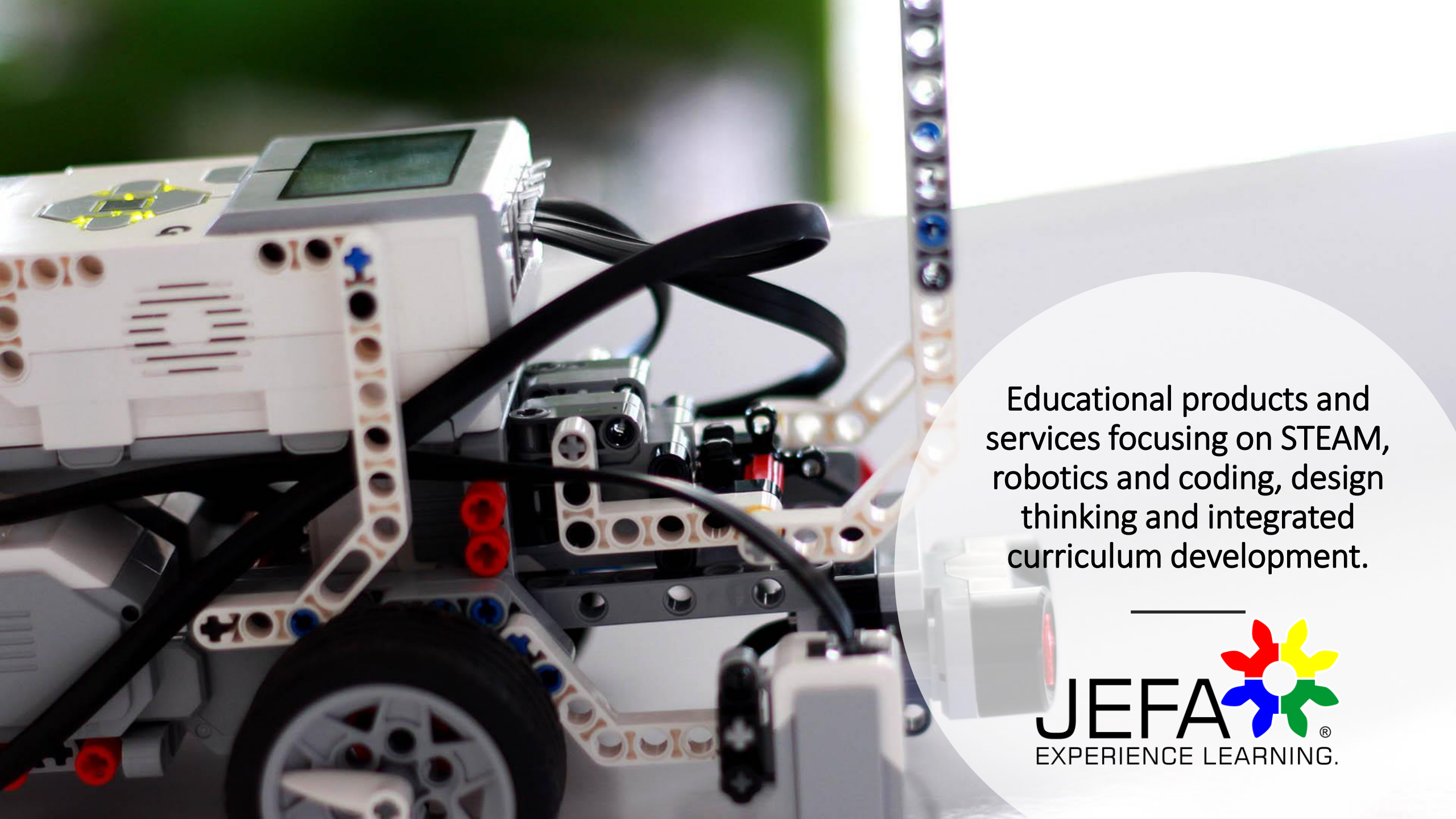
A robot is a **mechanical** machine that
is **programmed** to complete a series
of actions.



*The robot you didn't know you had.

A top-down view of a cluttered desk. In the upper left, a black computer keyboard is partially visible. To its right is a black computer mouse. A pair of red-handled scissors lies on a green cutting mat in the center. The mat has a grid pattern and is placed on a dark wooden desk. On the mat, there is a small, dark, rectangular object that looks like a model or a small electronic device. To the left of the mat, there is a roll of white tape with a red label that says "HSTRA.COM". A white mug is visible in the top left corner. In the bottom left, there is a piece of white paper with a large 'X' drawn on it. The background is filled with various papers, some of which are crumpled or torn, and a black leather bag is visible in the bottom right corner.

Design: The cognisant
process of creating order in
the world around us.



Educational products and services focusing on STEAM, robotics and coding, design thinking and integrated curriculum development.





STEAM & ROBOTICS EDUCATION SPECIALISTS

Est. 2006

A group of four young people, three girls and one boy, are sitting around a dark table in a room with wooden floors. They are all focused on their work. Each person has a laptop open in front of them. On the table, there are several small electronic devices, likely microcontrollers, with colorful wires connected to them. Some of these devices have small blue and red LEDs that are lit up. There are also several cardboard boxes on the table, some of which are open and labeled with the 'Curious' logo and the text 'STARTER KIT'. The girl in the foreground on the left is wearing a denim jacket over a white shirt. The boy on the right is wearing a grey t-shirt. The other two girls are in the background, one in a pink shirt and one in a blue shirt. The overall atmosphere is one of collaborative learning and hands-on experimentation.

JEFA takes a
hands-on
approach to
learning.



TEAM:
dynamic
professional
passionate
interdisciplinary
inspired



2006 - Jan 2018.
Home Business.



June 2018.
First Office!

July 2019.
Expansion!



STEAM Education Specialists

7





March 2021



ANNUAL REACH: 10 000+

Ages 4+





Curious
Design It Yourself

Term 1 Technology Project Kit
Hydraulics: Jaws of Life

INSTRUCTION GUIDE

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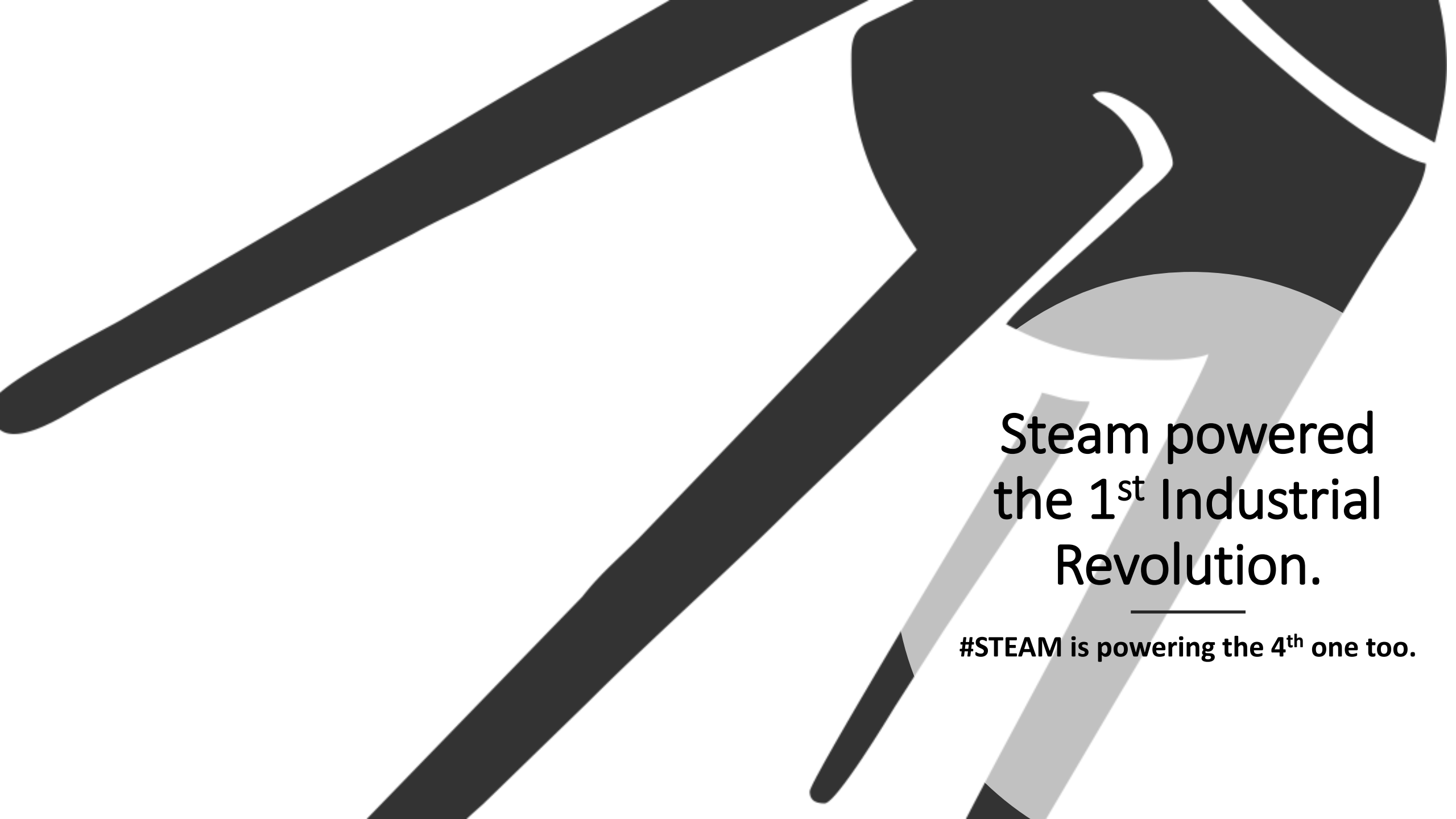
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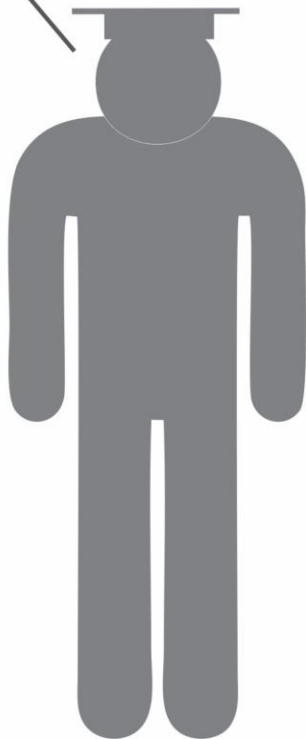


Steam powered
the 1st Industrial
Revolution.

#STEAM is powering the 4th one too.

“I’m just not very **Technical.**”

this (probably) means that Technology Education has failed you.



Fun game, replace with:
Mathematics
Science
English etc.

Lessons from History

Lesson 1: Germany

1907 – known for bad products.

Formation of Deutscher Werkbund

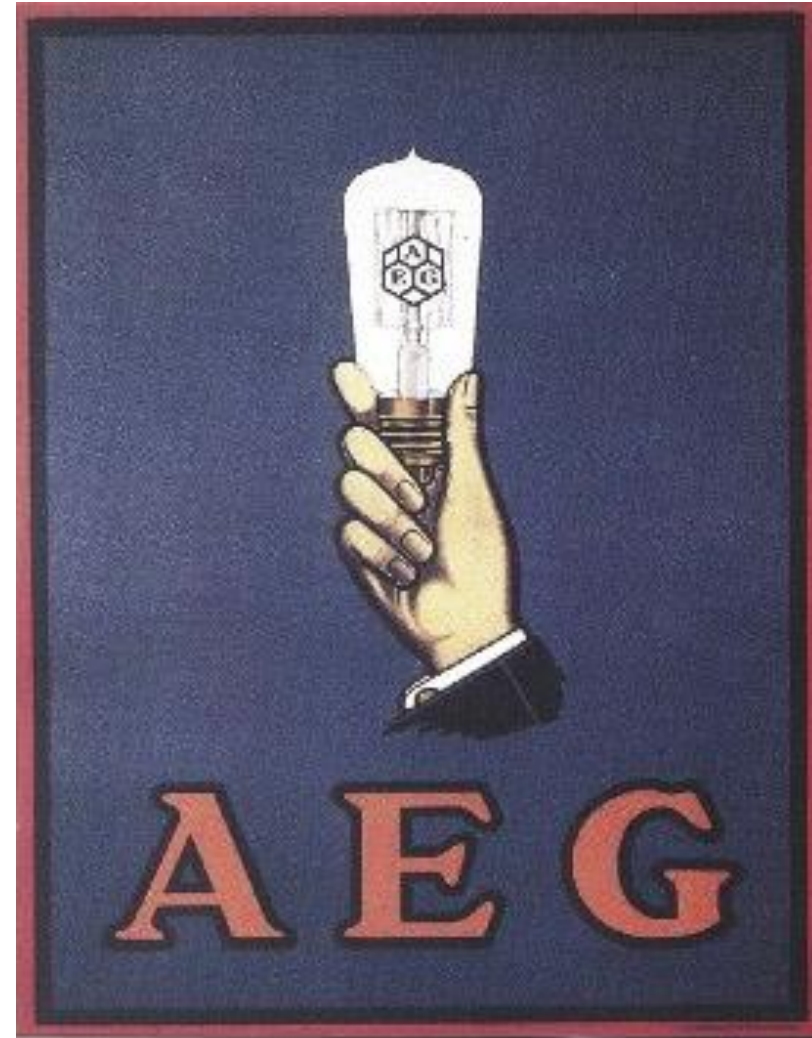
Now?

Lesson 2: China

2001 - known for bad products.

Subtle changes – now?

Excellence is something that is
worked toward, and not something
that happens by chance.



Anuncio para AEG por Peter Behrens, 1912



What is VET?

Vocational Education and Training is training that aims to equip people with knowledge and skills relevant for industry employment.



Crystal Balls.
Do we know the future
requirements for 4IR /
Robotics (technical)
Education?

Two (main) camps.



Yes.

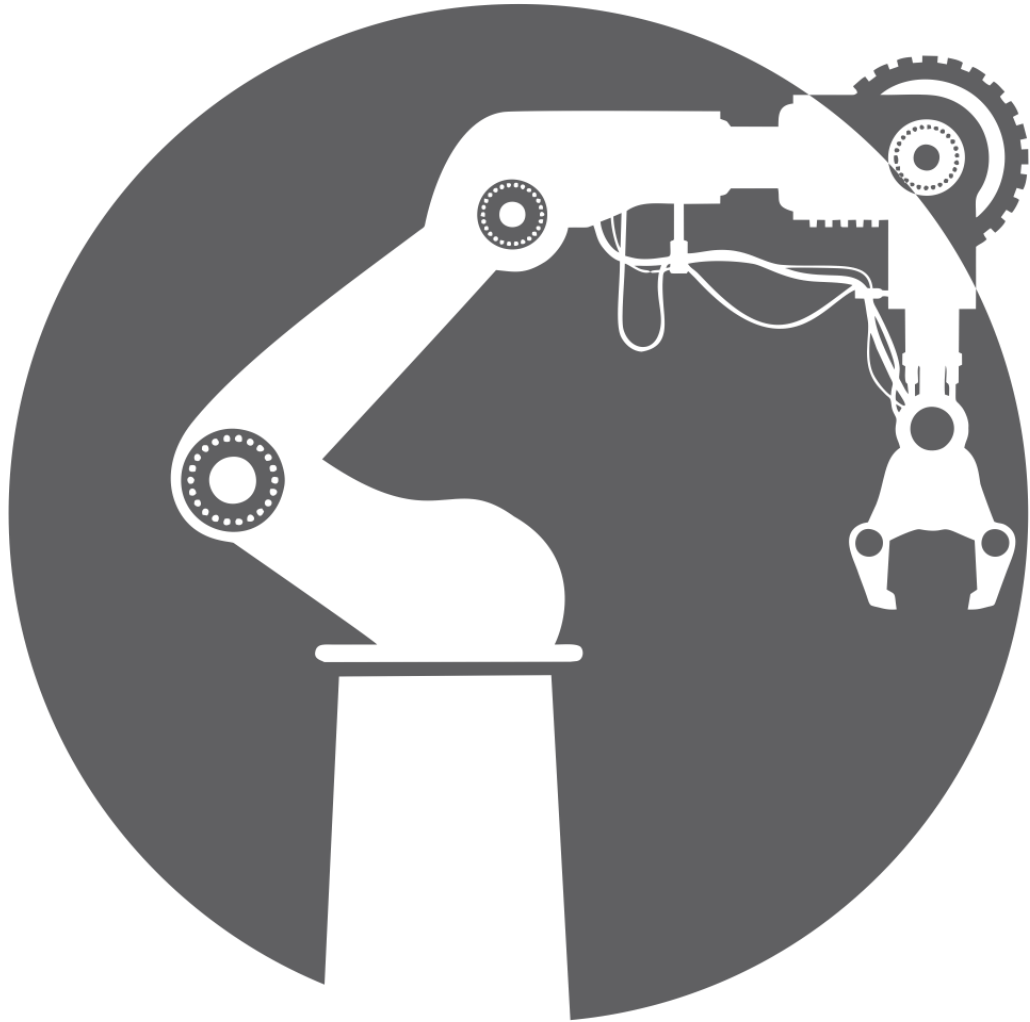
People have fundamental needs, and these will not change. Therefore, we can safely assume that while technology may augment and improve what is done, it will not replace the requirement of human involvement.

No.

There is no knowing what the future technologies will replace and how these will affect the economy and employment. Dramatic re-skilling and major economic restructuring will be required.



**NO YOU
CAN'T**



Upside-Front & Back-to-Down

Our understanding of where robots/technology will impact.

What is easier for a robot to do:

- A. Actuarial Sciences
- B. Book-keeping
- C. Farm labour
- D. Surgery

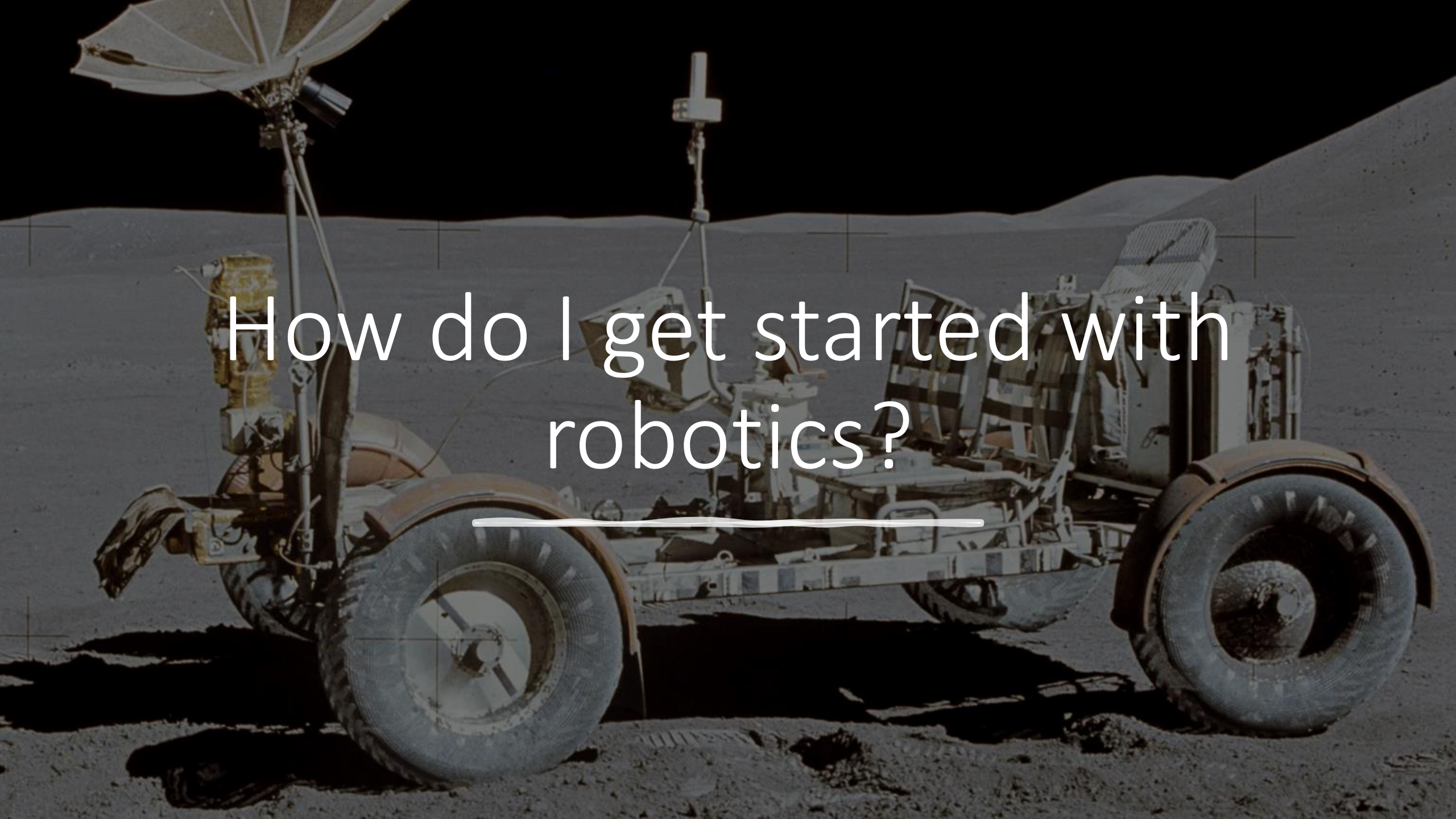
What is cheaper for a robot to do:

- A. Actuarial Sciences
- B. Book-keeping
- C. Farm labour
- D. Surgery

Teachers are Pragmatists.

Cultivating the habits that reinforce skills in Technical vocational education

- **Practice.** Equipping students to not give up too easily, nothing worth learning is going to come easy.
- **Clear goals.** How can we be practical about what our industry needs over the next 20-30 years?
- **Maintenance.** Technology is great when it works (+ Decolonisation win).
- **De-stigmatising of VET.** Correcting the negative overreaction from our Apartheid past.
- **Excellence.** A culture of excellence and pride in good work is vital for the success of any industry.

A photograph of a Mars rover, likely the Curiosity rover, on a sandy, desert-like landscape. The rover is equipped with large, treaded wheels, a solar panel, and various scientific instruments. The background shows rolling sand dunes under a clear sky. The text "How do I get started with robotics?" is overlaid in white, centered on the image.

How do I get started with
robotics?

1. Get help.

Technical subjects aren't generally that difficult to get into, but they tend to have high walls that need to be climbed before you can start playing in the playground. Here are some common factors that are often part of this barrier:

- a. Cost
- b. Choosing the right equipment (at the right cost)
- c. Choosing the most appropriate learning platform
- d. Time

Key: Find experienced people who can give guidance on above.

2.

**Start small,
keep it simple.**

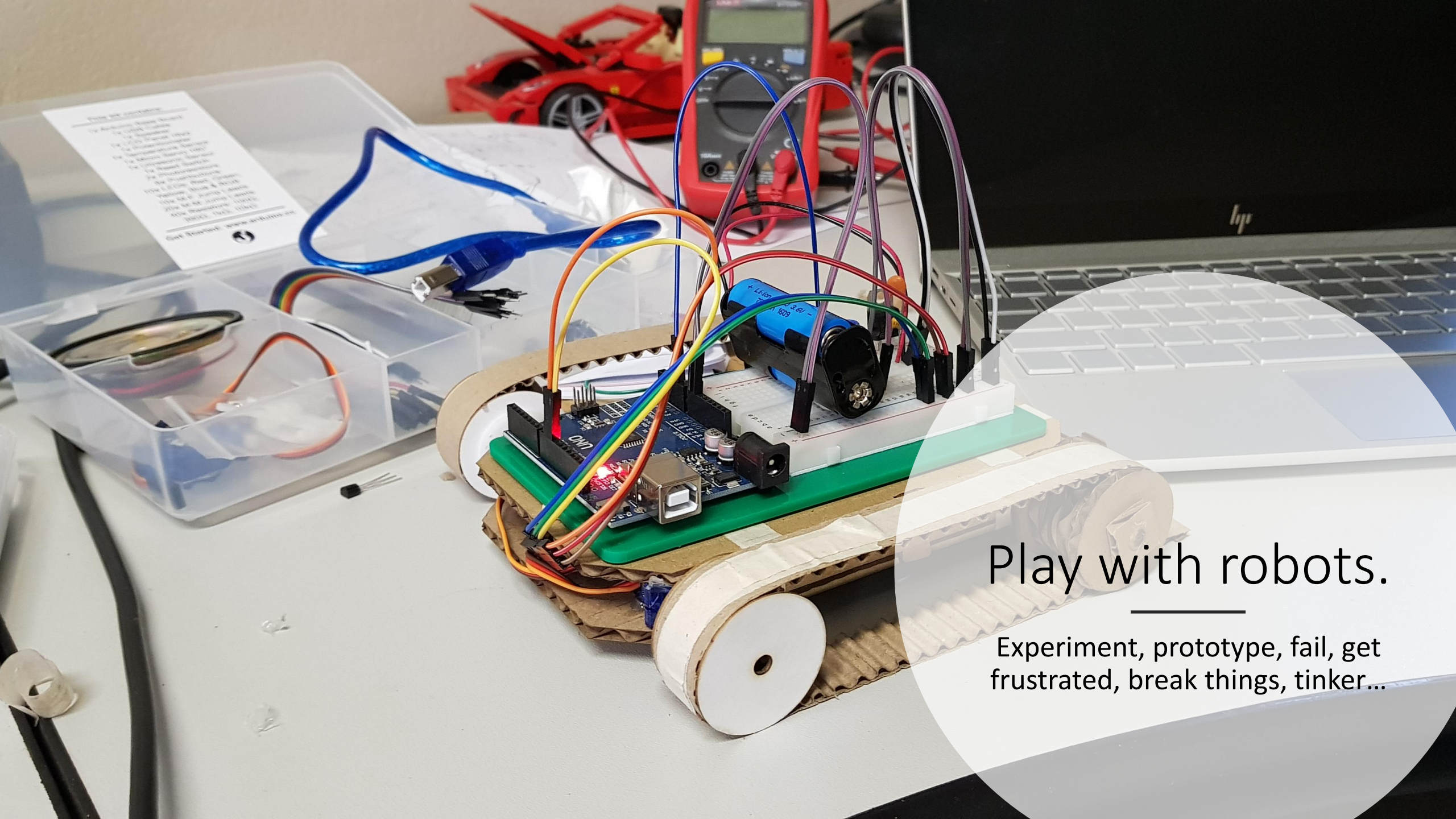
This is big.

3. Open Source.

Software – Scratch, Python, Blender, Tinkercad, GIMP, Audacity, Thunderbird, LibreOffice, Shotcut, Linux

Hardware – Robots/Microcontrollers: Arduino, RPi. 3D printing: Ultimaker, Thingiverse, Sparkfun, Adafruit

Key resource: Online Communities.



Play with robots.

Experiment, prototype, fail, get
frustrated, break things, tinker...

Here are some useful robotics links:

- Int Phase & High School: Use microcontrollers from Arduino to build and code your own robots: <https://www.arduino.cc/>
 - Build and code a virtual Arduino robot on TinkerCAD: <https://www.tinkercad.com/learn/circuits>
- Need to get your hands on a LEGO Education Robot? www.handsontech.co.za
- For more info on getting started on robotics in the classroom: www.JEFA.co.za

Here are some great coding links:

- Get coding with Scratch: <https://scratch.mit.edu/>
- Python programming: <https://www.python.org/>
- Courses for all ages with Code.org: <https://code.org/>
- Play Minecraft, learn to Code! <https://education.minecraft.net/>



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info@JEFA.co.za



Until we get to
the future...

#work_hard_play_hard