About Coding Kids and Screaming Carrots

Welcome to my talk

About CODING KIDS and SCREAMING CARROTS

And just to make sure. In this presentation I talk about kids in the age from 6 to 12 years.

I hope you enjoy it.

Georgios Kaleadis

- Living in Munich, born 1984
- Principal Frontend Developer for Sinnerschrader
- Kids Coding Trainer
- Origami addicted

My name is Georgios Kaleadis
I'm 34 years old
and I live in Munich working for Sinnerschrader as a Principal Frontend Developer
In my spare time I teach coding to kids
which inspired me so much that it brought me to this stage today.
I'm also Origami addicted...

...since Takeshi taught it to me in front of Osaka castle two years ago.

Today I fold nearly every day and I also created a project about virtual origami folding

Nostalgia Fun with The Coding Kid

Let's start.

First some nostalgia fun with me as the coding kid.

That's me

To make sure you have some inner picture. That's me. I'm ten years old.

1994

Magazine Hoarder

It's 1994. I call this chapter of my life Magazine Hoarder

For a reason.

At that time I love to play with my Super Nintendo and Sega Game Gear.

My favourite place to be, month by month, is the store with the huge shelf of magazines.

DRIVERS & PATCHES

Most magazines had some CD attached.

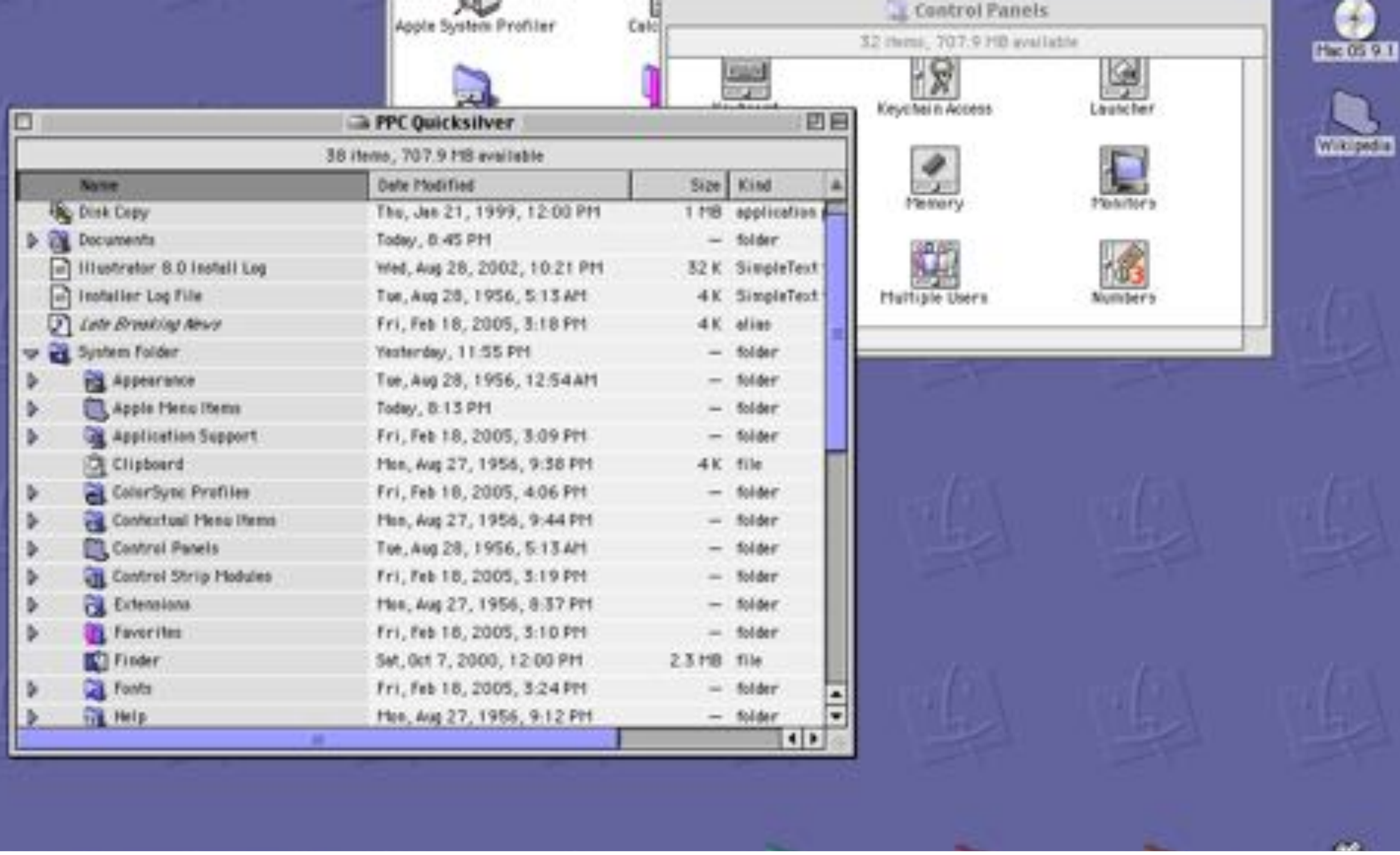
The ones about computers contained applications, trials, drivers & patches.

Why? Because internet was not available to everyone.

Could I use those CDs ?

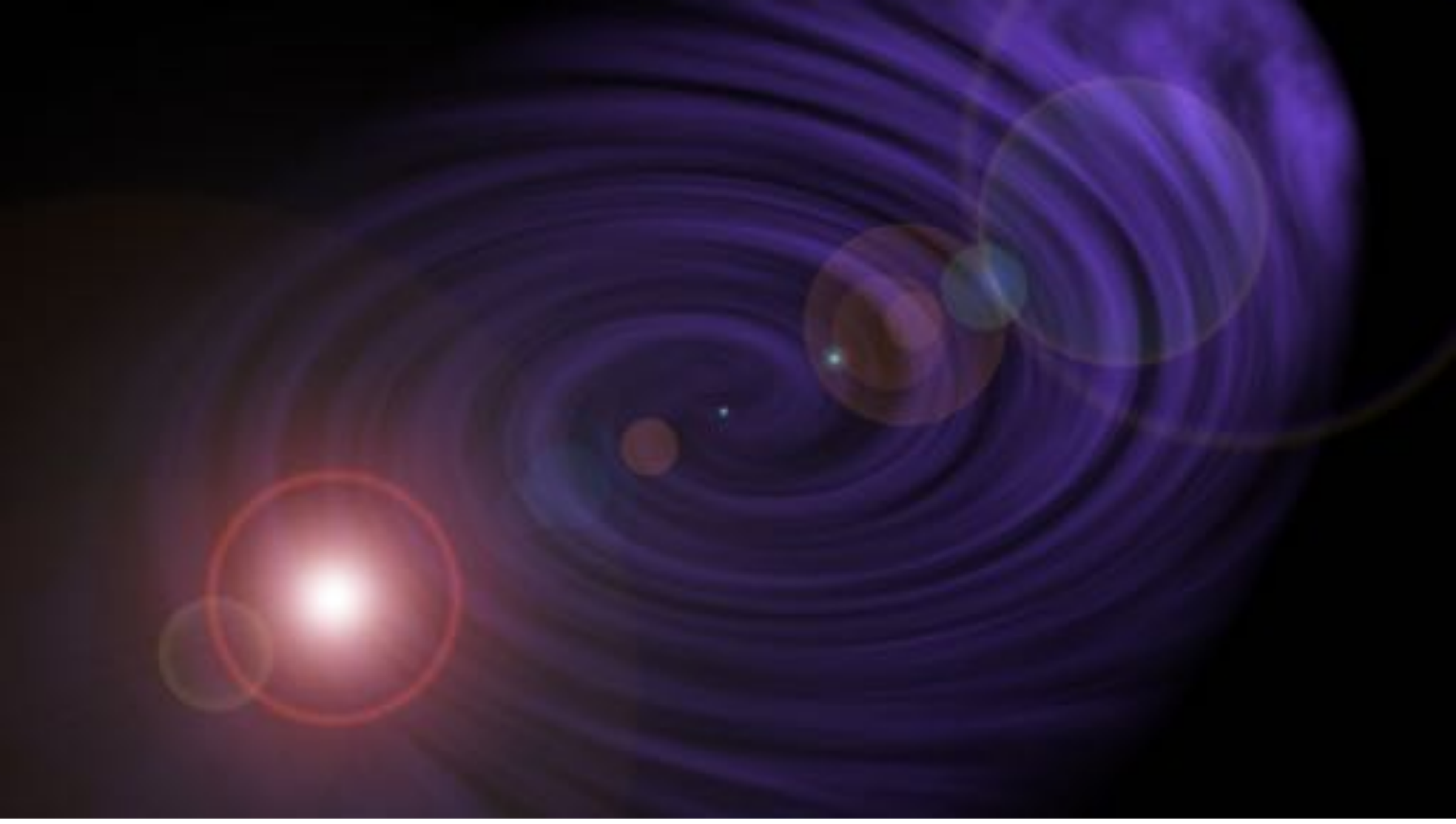
Not at all.

I didn't even owned a computer yet.



I only got in touch with real computers when my sister took me to her agency office.

There I had the opportunity to tinker around with a Mac running the wonderful OS 9.



Photoshop was my favourite application.

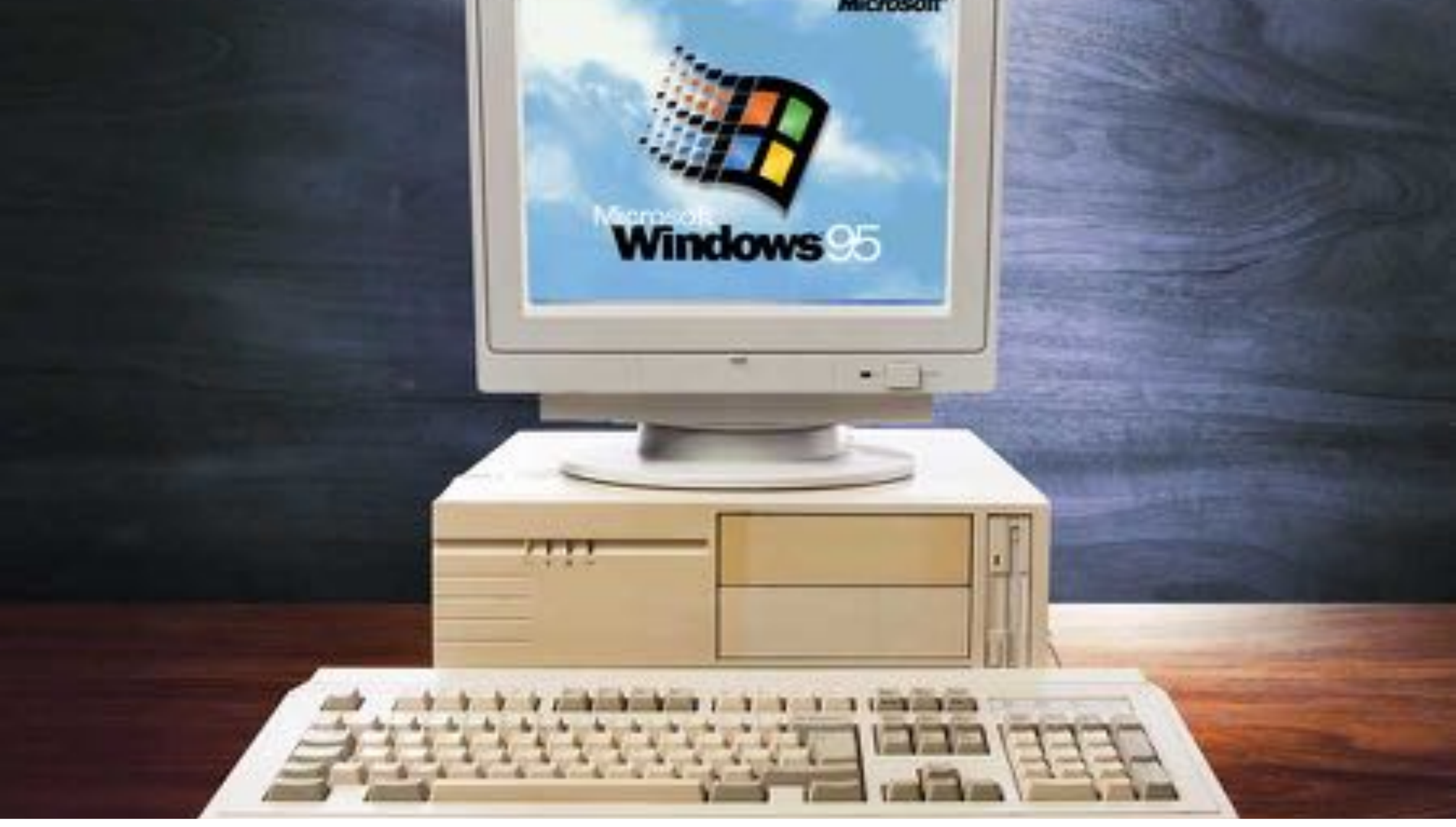
I created dozens of those galaxy spirals.

1997
My first PC

Let's jump to 1997, the year of my first PC.

Actually I had to wait until Christmas 1997.

It's now three years since I bought my first magazine.



My computer was running Windows 95 and had a 4GB hard disk.

This thing had of course no internet.

And what does a kid do with a computer ?

1998 PC GAMING

Of course. Playing games.

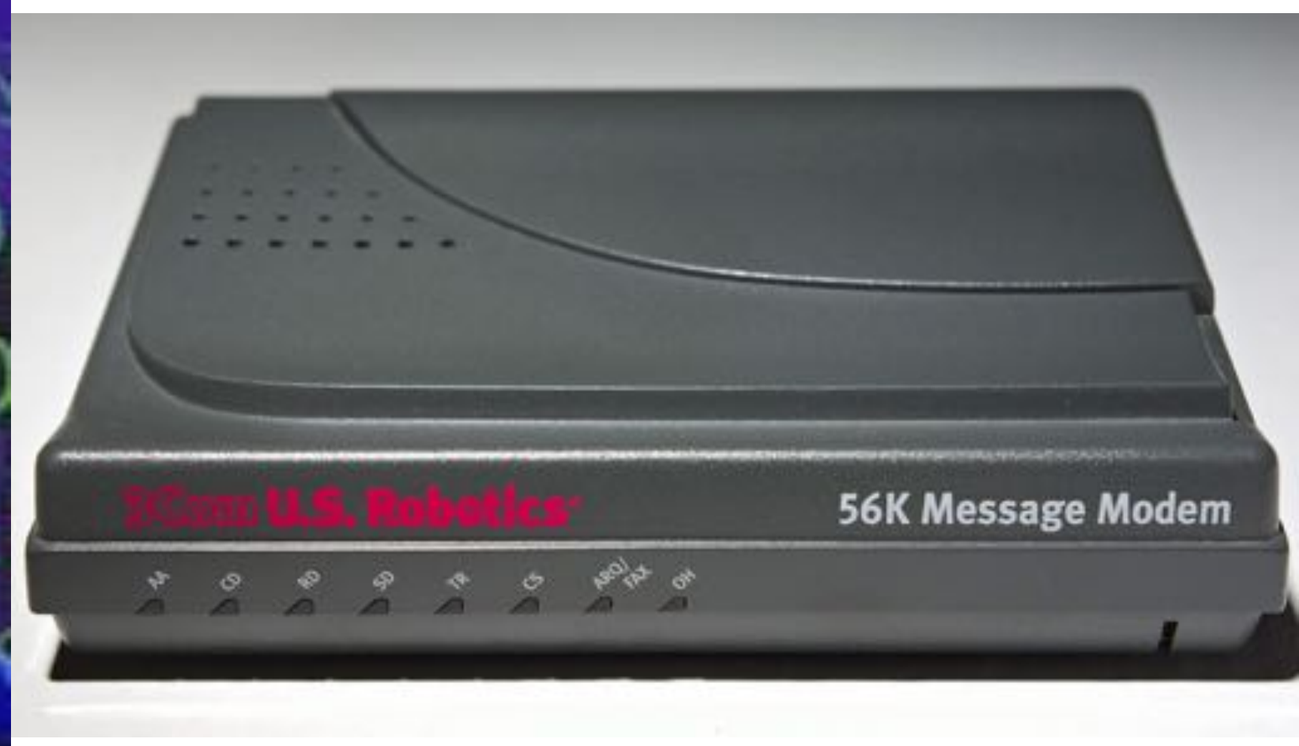
It's 1998 and I enjoyed my new computer day and night.

My very first game I bought was Blade Runner from Westwood Studios.

It was distributed on 4 CDs and consumed half of my disk space.

1999 INTERNET

Let's hurry to 1999. The year I got my internet access.



I had a 56k modem to connect.

Which was slower than your throttled dataplan on your smartphone.

Let's listen to the iconic sound for a quick flashback.

After Video: I still can’t believe the internet worked back then.

Some day in April 1999.

I was watching my favourite tv station **NBC Giga**

Where they talk about games and computers

This particular day two guys were showing a new application

They let a red ball bounce around.

It must have looked like this.

I WAS IMPRESSED

I was impressed

They mentioned the name of the application.

But I had to hurry back to afternoon school and didn't write it down.

After school I wanted to search for a trial version on all of my magazine cds.

I FORGOT THE NAME

But I forgot the name.

The week went by quickly.

It is Saturday

This means getting up as early as possible and watching series like Saber Rider, Captain Future or Duck Tales.

Around lunch time..

I watched Giga TV again

And I could not believe it.

It was the repeated show from earlier of the week.

---> I was frozen in front of my ..... TV

I holded my breath

I waited for the moment they would tell me that name I forgot.

and then

There it was.

It was Macromedia Flash 4.
Released just weeks before.

GENESIS OF MY PROGRAMMING CAREER

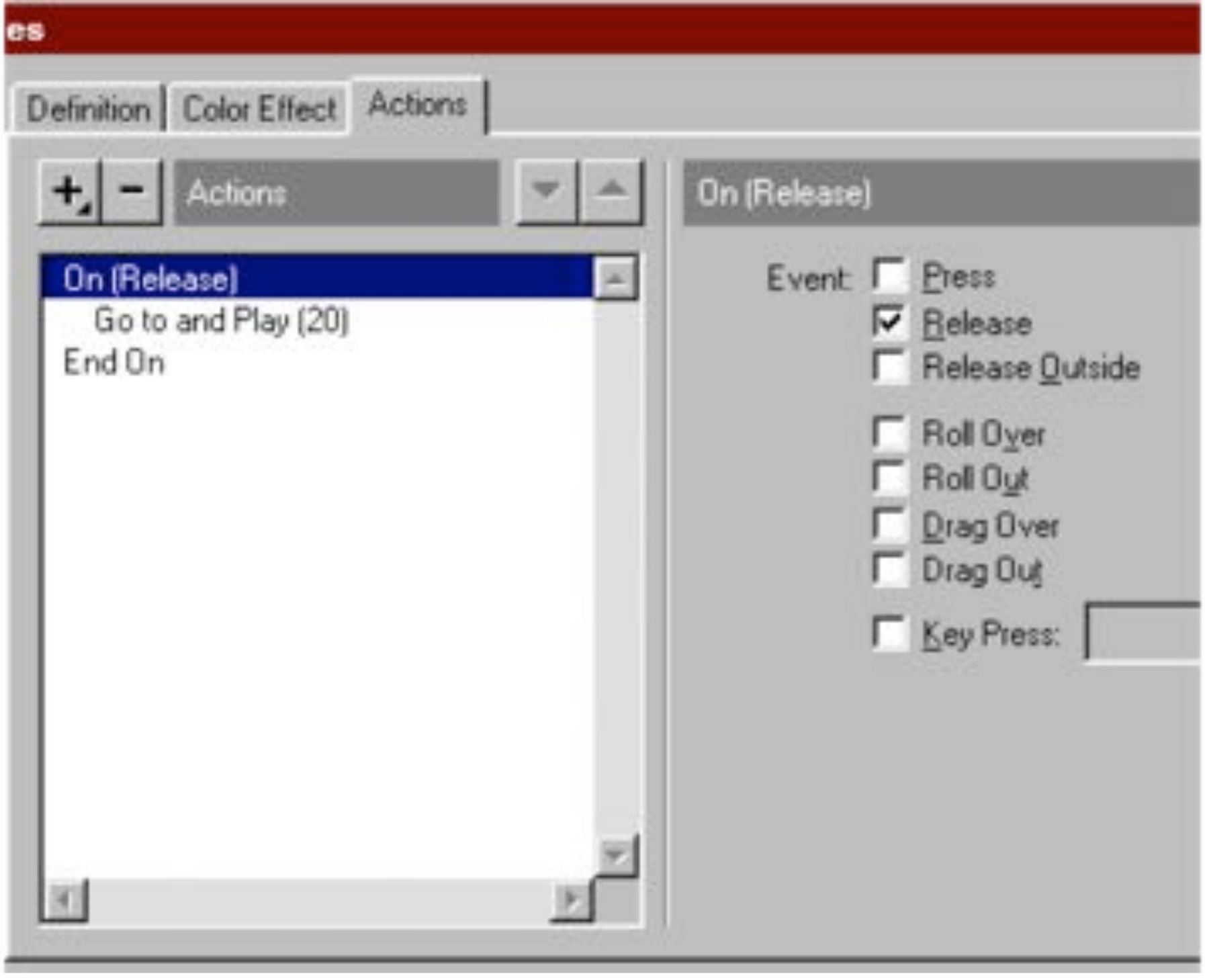
This moment just now?

This was the genesis of my programming career.

Flash looked like this.

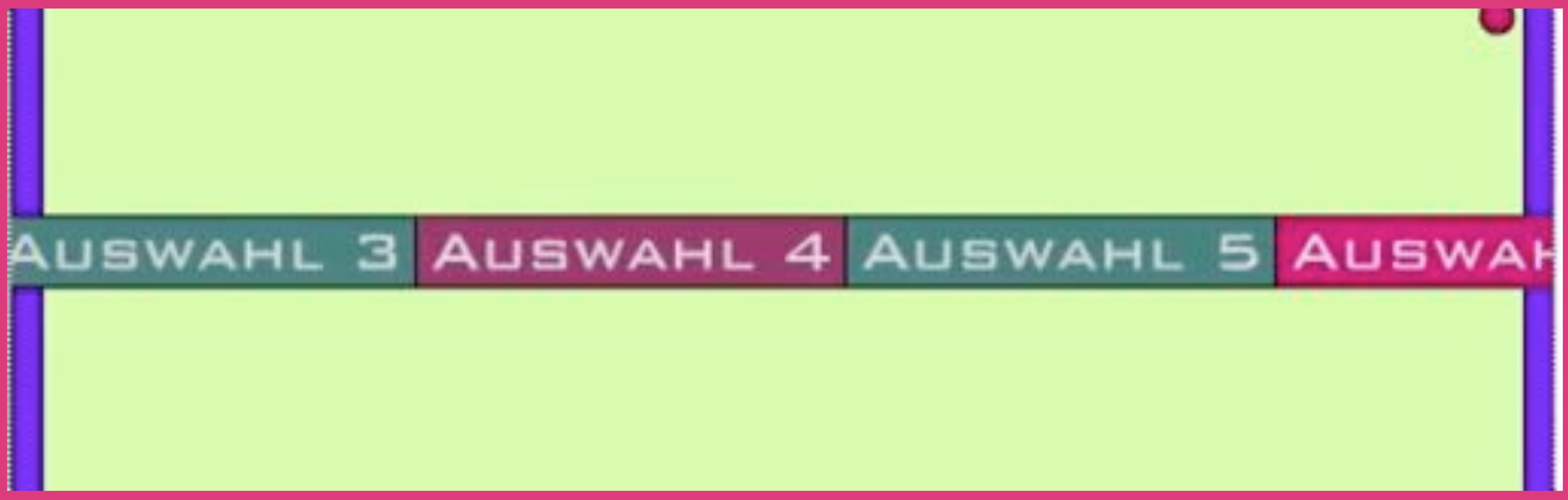
A timeline, some layers and tools.

And of course the stage where you can see things move around



I quickly found the place to code.

Yugop Navigation



Soon I was able to program the very famous Yugop Menu

It's an horizontal navigation with the illusion of infinity.

I was so good in programming this thing...

...that I could sell it to agencies.

To earn my first money with 15 years.

It was an amazing time full of amazing websites

What you see here is THE PORTAL from derbauer.

Yes this was a website.

Stuff like this drove my ambition to get me where I am today.

So what's my point you're asking?

Remember the genesis of my programming career in front of the TV ?

I wish I would have had some guidance during school

So that more than a single moment in front of the TV would have guided me to my career.

Instead

The most digital thing I had in primary school was this

Later the computer classes I remember were more like this.

Computer classes today are still bad.

The hardware, if any, outdated

Most teachers are not educated

The curriculum is boring

MAKE A DIFFERENCE

I want to make a difference
and change things

That's why I'm teaching kids coding in my spare time

And I want you to know why I am doing this

and that you can do it too.

1. Why it matters
2. How to teach
3. Where to teach

So for the next 20 minutes I will talk about

1. Why coding matters.
2. How to teach it.
3. and where to teach it.

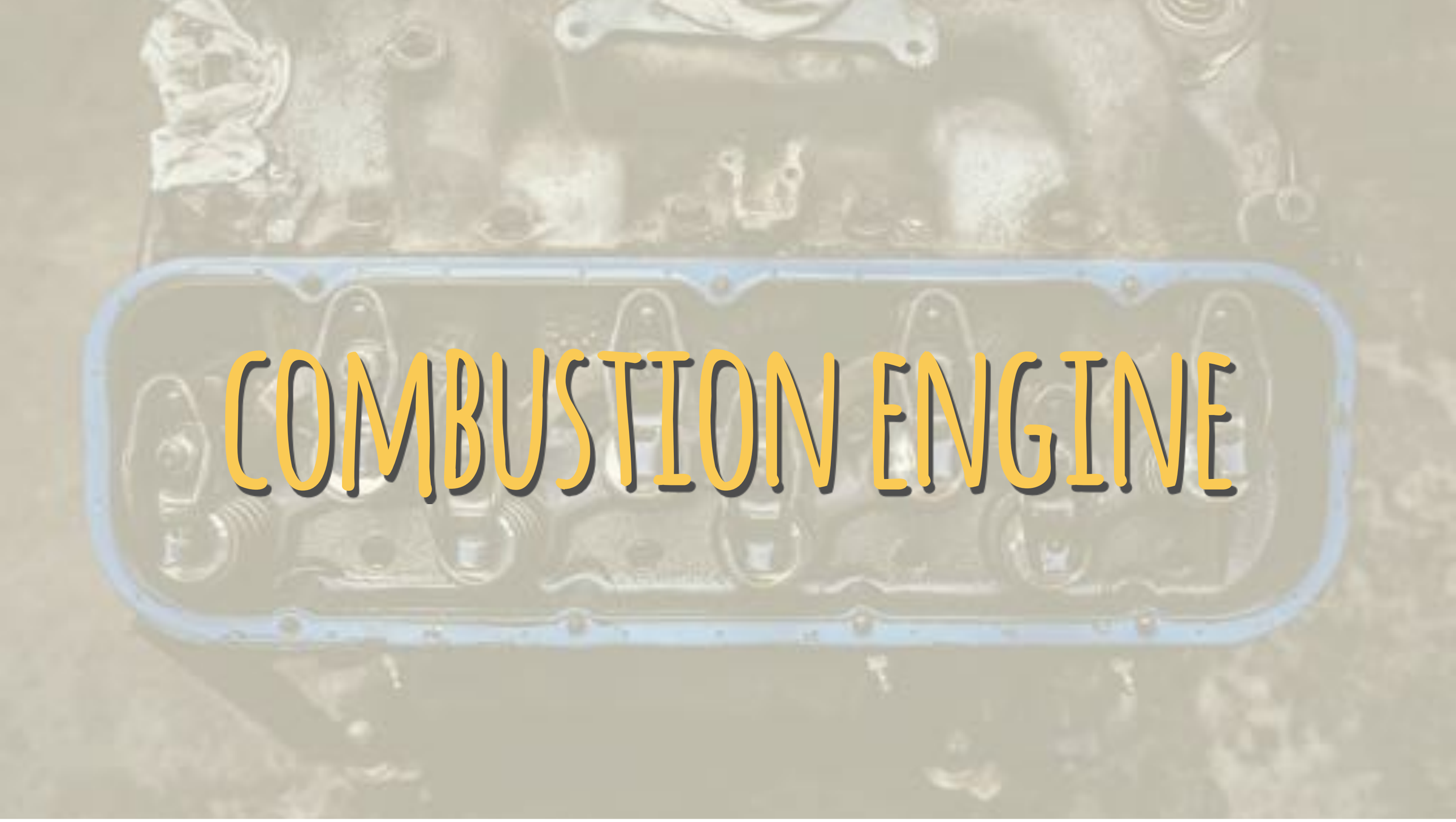
1. Why it matters

2. How to teach

3. Where to teach

So why does coding for kids matter at all?

Let's start with something easy.



We all can describe to a child how a combustion engine works more or less.

Right?

HUMAN BODY

We can tell how the human body works.

But when you a press the play button a youtube video.

WHAT WOULD YOU TELL THAT KID?

Yeah. What would you tell that kid :)

It's hard for many of us.

It's like something was missing in school.

So let's fix this for our children by...

"TEACHING - CODING - TO - KIDS"

— everybody talks like this

...teaching - coding - to - kids-

The whole world is talking about it.

It's like people are concerned about the future of our kids.

FEAR OF TECHNOLOGY

or that we fear that technology leaves us behind

No matter what, the demand is the same...

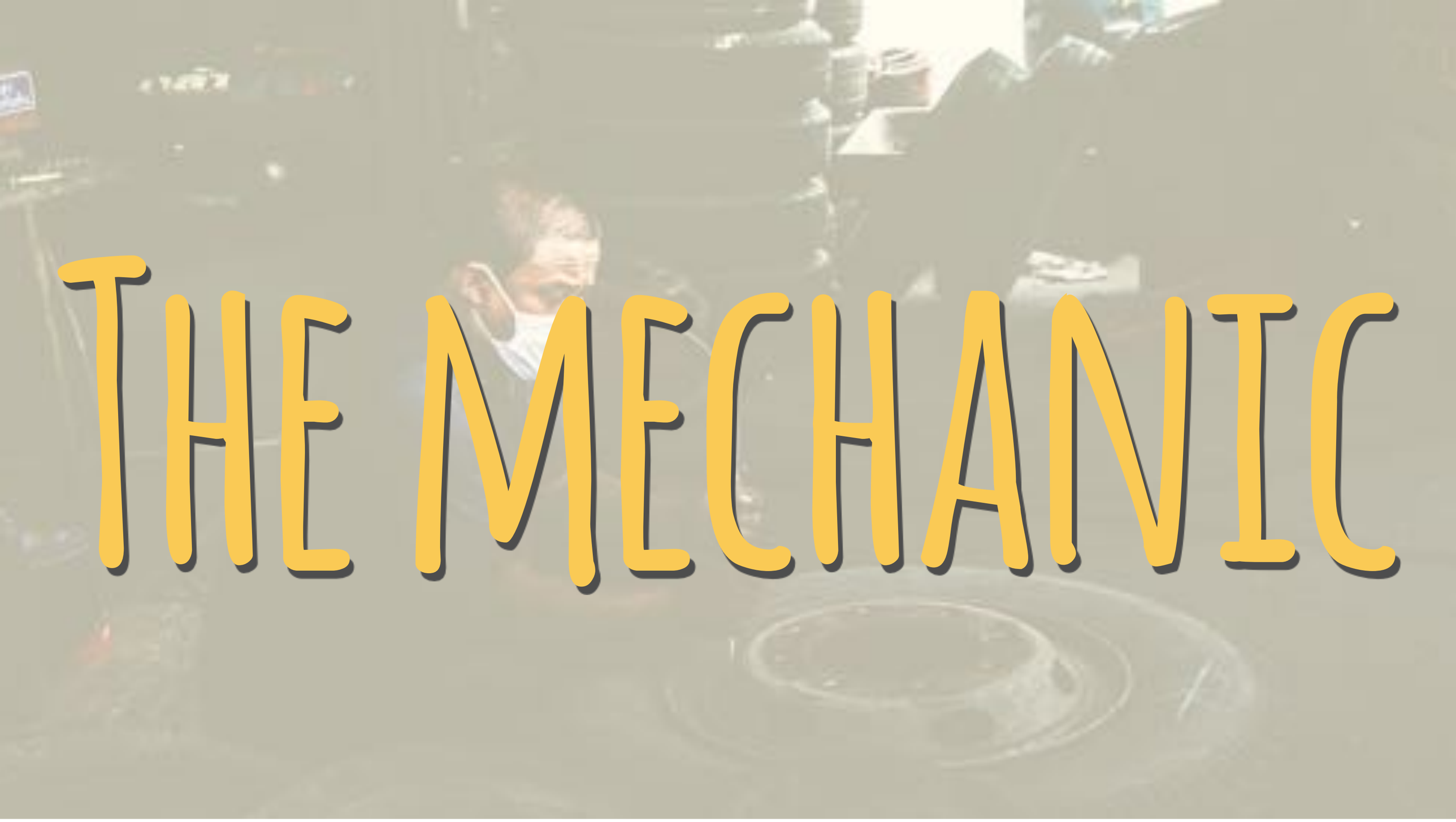
KIDS SHOULD LEARN CODING

...Our kids should learn coding.

Is this justified?

I'm biased in this question for obvious reasons.

So let's step back and take a look at the bigger picture.



The Mechanic

We start by looking at a mechanic

and apply the whole coding discussion onto it.

It goes like this:

It's sort of like an **obsession** with being an **auto mechanic**

TONS OF CARS

There are **tons of cars**, there's tons of **driving** ...

little

SILLY

but I think it's a little **silly** to go around saying

EVERYONE

that **everyone** should ***really*** learn to be an auto mechanic

ESSENTIAL

just because cars are so ***essential*** to the **functioning** of our society.

OH YEAH!

THAT WOULD BE SILLY INDEED

Yeah! That would be silly indeed.

But what do we do?

There is tons of technology and we go around and tell everybody how important coding is.

ARE WE SILLY?!

So are we silly then?

Or..

Are we just talking about something else than coding?

CODING

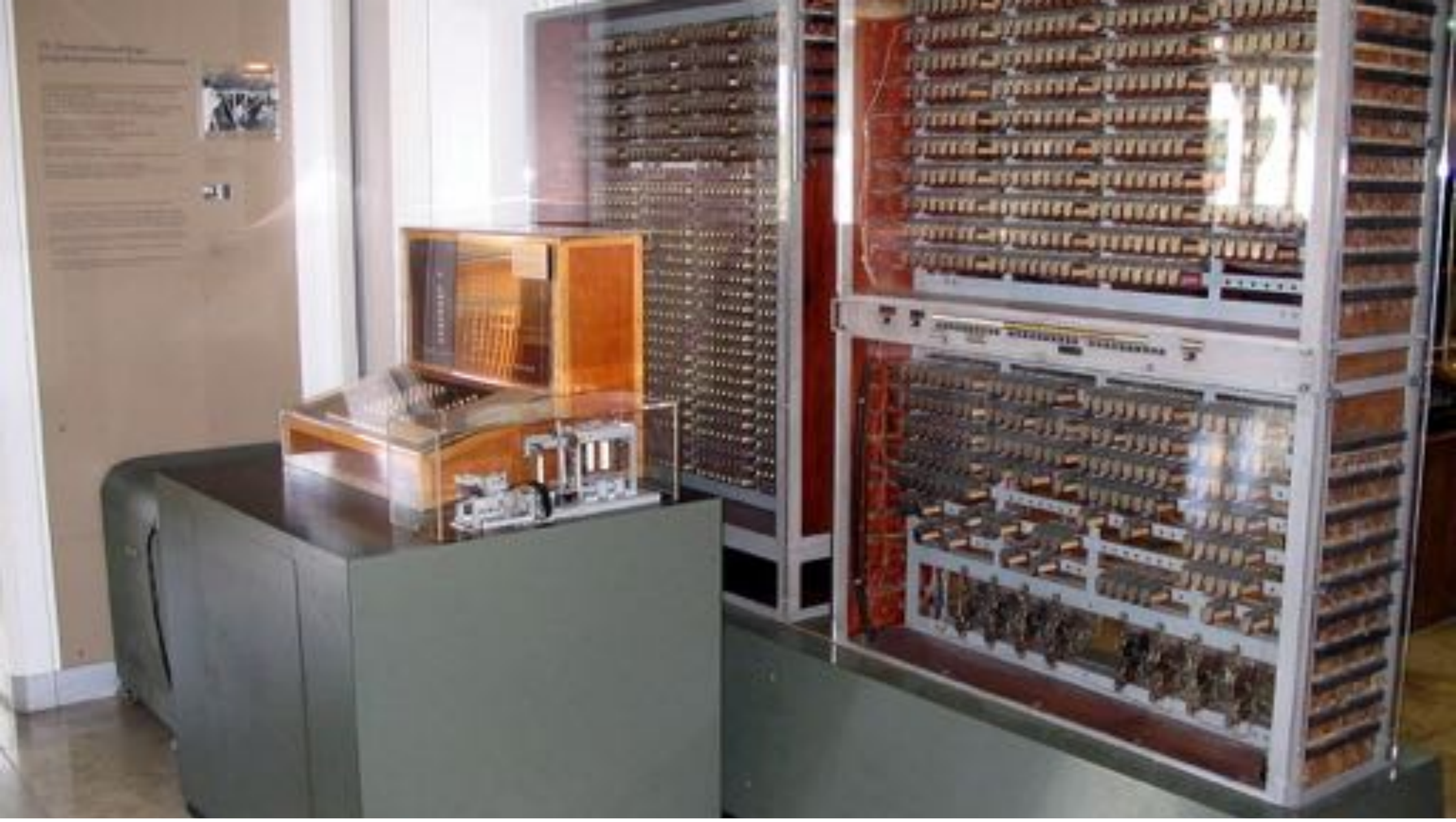
What if the **word coding** is born out of **confusion**?

What do people actually mean with coding?

The question is: What do people actually mean with coding.

In 1943 Konrad Zuse built his famous Z3

And together with it the very first programming language called Plankalkuel



The Z3 looked like that.

Technology escalated then pretty quickly

70 years later

Technology is complex

With your smartphone you hold a device that combines everything we learned in the past 70 years.
That’s a lot and very complex
It makes computer science not easy to talk about.

CODING?

SURE, I KNOW THAT

Coding on the other side is easy to grasp.

Take someone

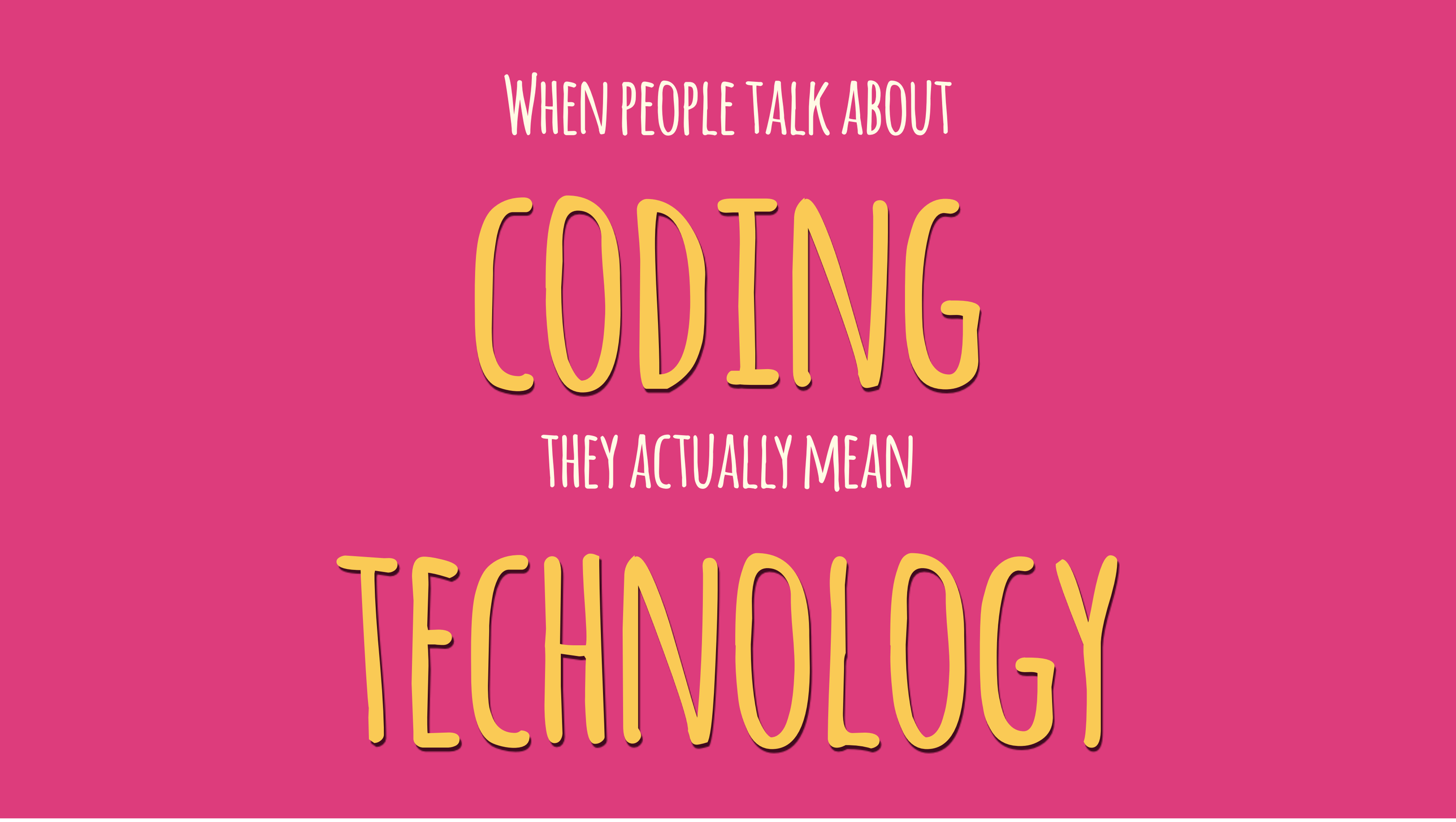
Add a keyboard

And watch that person giving commands to a computer.

That’s coding and the people understand it.

LET'S TRY A THEORY

If coding is such an easy word
Maybe that's why it's mixed up.
Let’s try a theory.



When people talk about coding they actually mean technology.

OUR KIDS NEED TO LEARN

~~CODING~~ TECHNOLOGY

And people demand our kids not to learn coding

they actually say "our kids need to learn technology"

The Discussion Suddenly Makes Sense

The whole coding discussion suddenly makes sense.

Exposure to technology, computer science and programming.

It's not about coding anymore

It's about exposure to technology, computer science and programming so kids can understand the bigger picture, the connecting lines.

Most of the kids will never be a coder anyway.

Our children should learn that smartphones and technology are not magical.

That there are limitations, benefits and possibilities from using them.

Learning to Code still makes sense

Teaching Coding still makes sense

It's only one part of understanding technology

but you benefit in many ways when you learn to code.

"Learning to write programs stretches your mind..."

— Bill Gates

It stretches your mind

and it creates a thinking which is useful in all domains.

BE A PRODUCER

NOT A CONSUMER

As a coder

you make the transition from being a consumer to a producer

who can tell stories and create own worlds in the computer

CODING IS LIKE PAINTING & MUSIC

The room for creativity is endless.

It’s like painting and music but often more accessible and affordable.

CHANCES

Speaking of affordable.

Coding gives you chances.

Computer's are cheap nowadays.

Even poor kids can afford it.

DIVERSITY

Diversity. The computer just don't care who you are.

Everybody can become a coder.

~~1. WHY IT MATTERS~~

2. HOW TO TEACH

3. WHERE TO TEACH

I hope I have convinced you by now why teaching coding matters

So let me show you some possibilities how to teach kids about technology and computer science.

My favourite toolset Tinkering, Robots, Coding

I will present you now a list of my favourite tools I love to use when teaching

It's about Tinkering, Robots and actual Coding

TINKERING

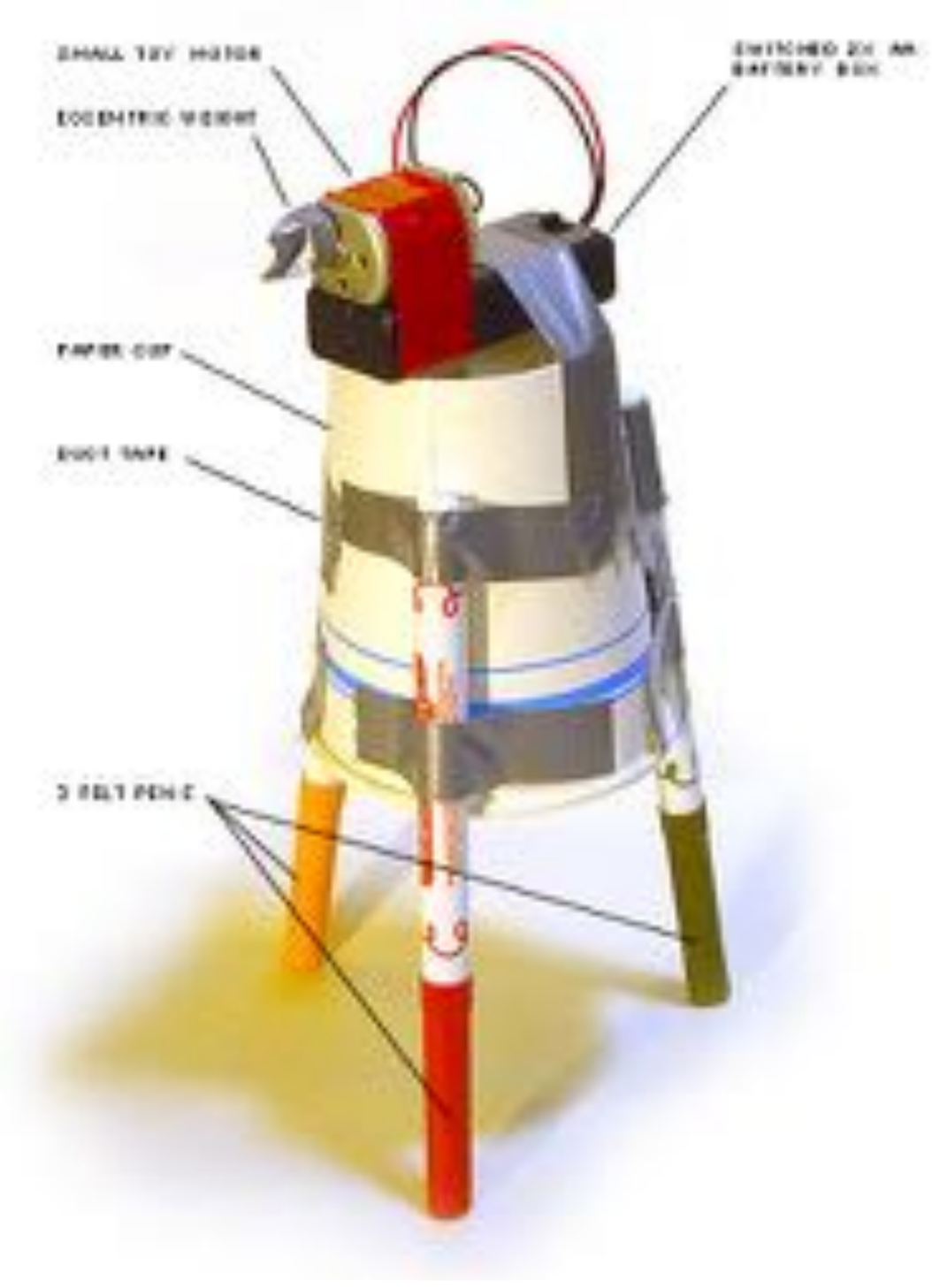
Let's have a look at Tinkering.

This is all about playing around with electronics.

DRAWBOT

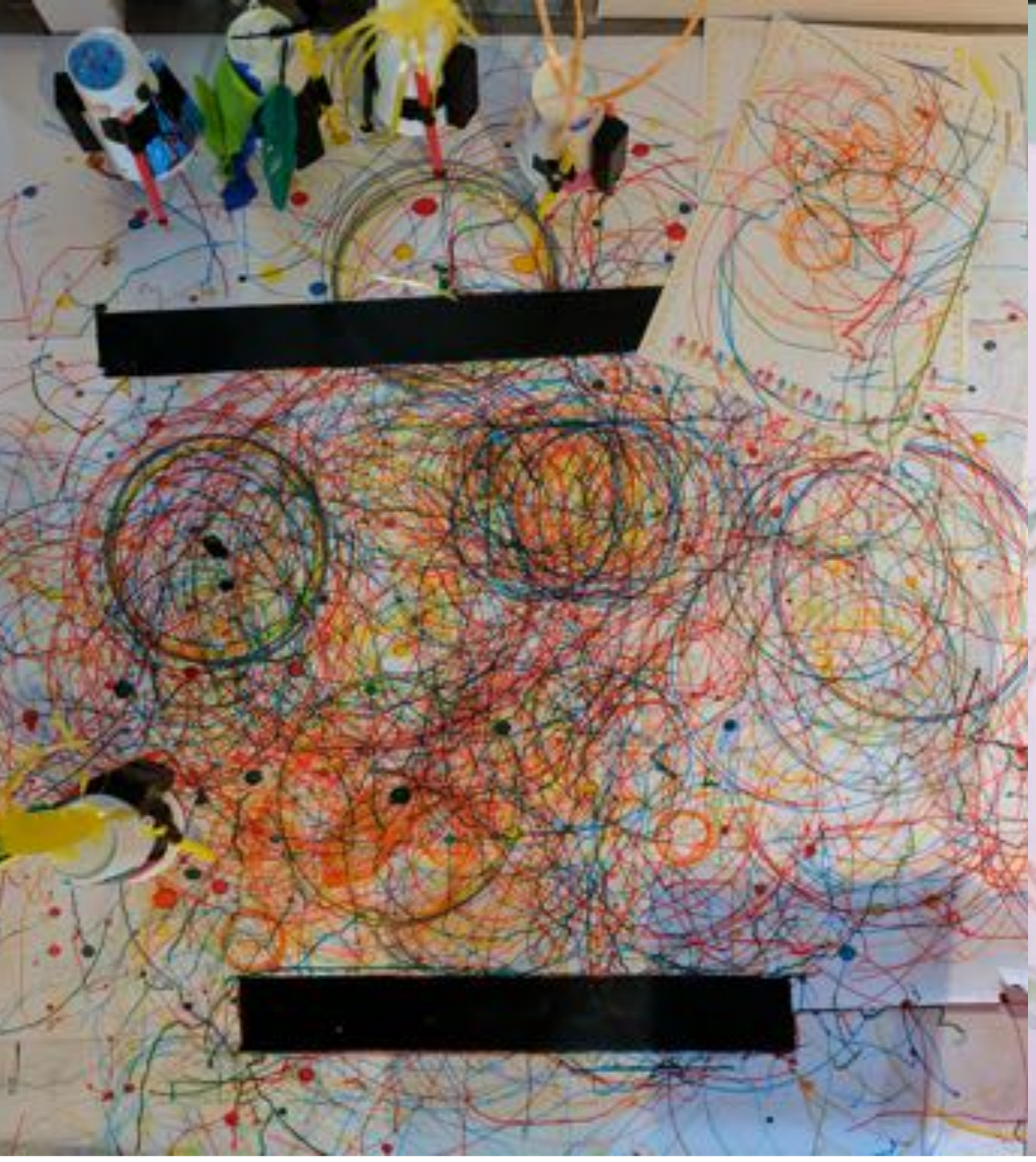
For example with a drawbot.

This is a toy that every kid starting with 4 years can build by himself.



The parts cost less than 2 EUR

You have three legs made of pens, a battery and a rotating motor.



When activated the robot will vibrate and start walking around drawing on the underlying surface

This looks like real art in the end

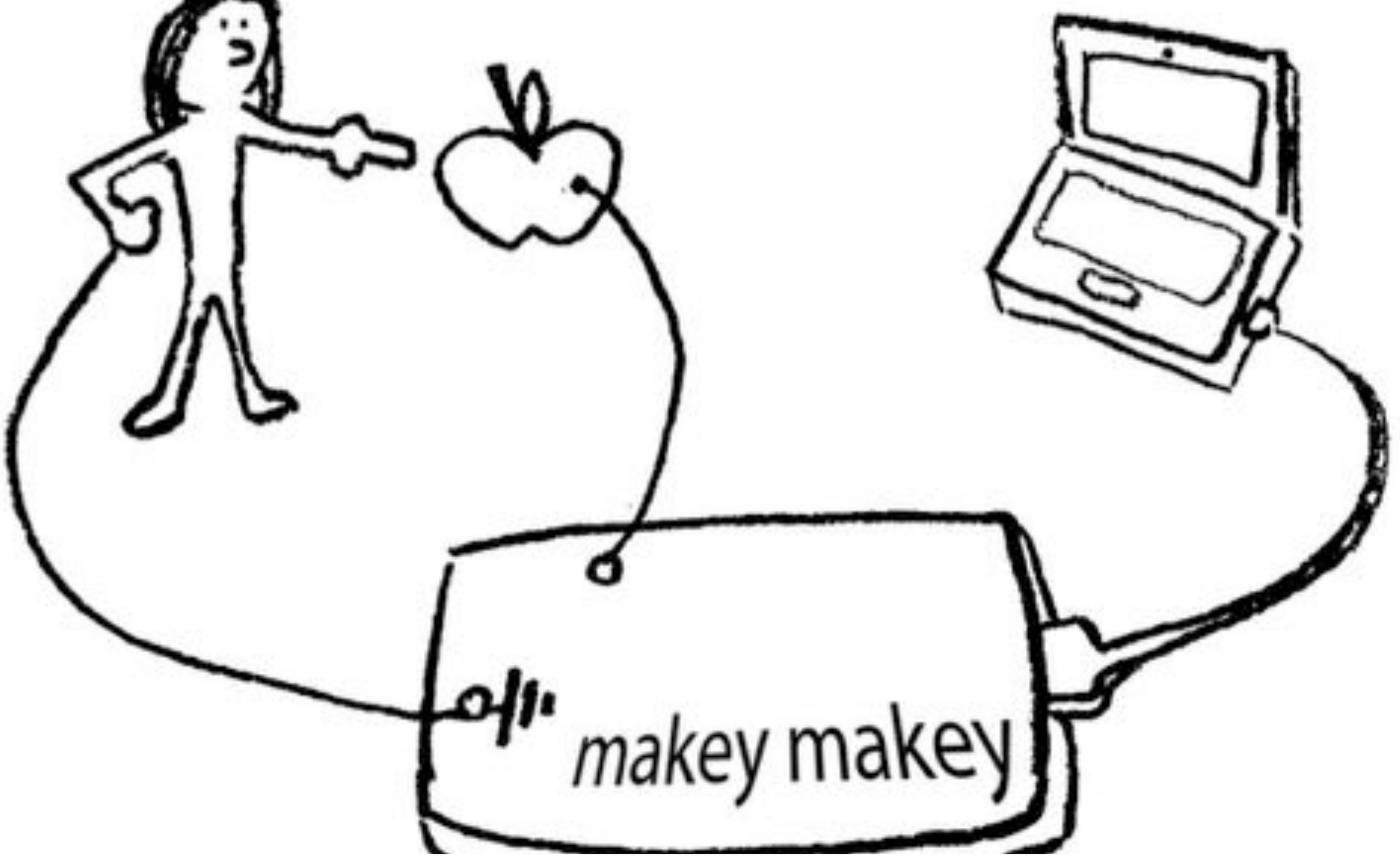
It's so much fun for the kids to watch their robot to be alive.

MAKEY MAKEY

A Makey Makey

Its simplicity is awesome.

It’s basically an electronic board that pretends to be a computer keyboard.



When two connected objects touch each other

they close a circuit on the MakeyMakey

and you virtually press a defined key

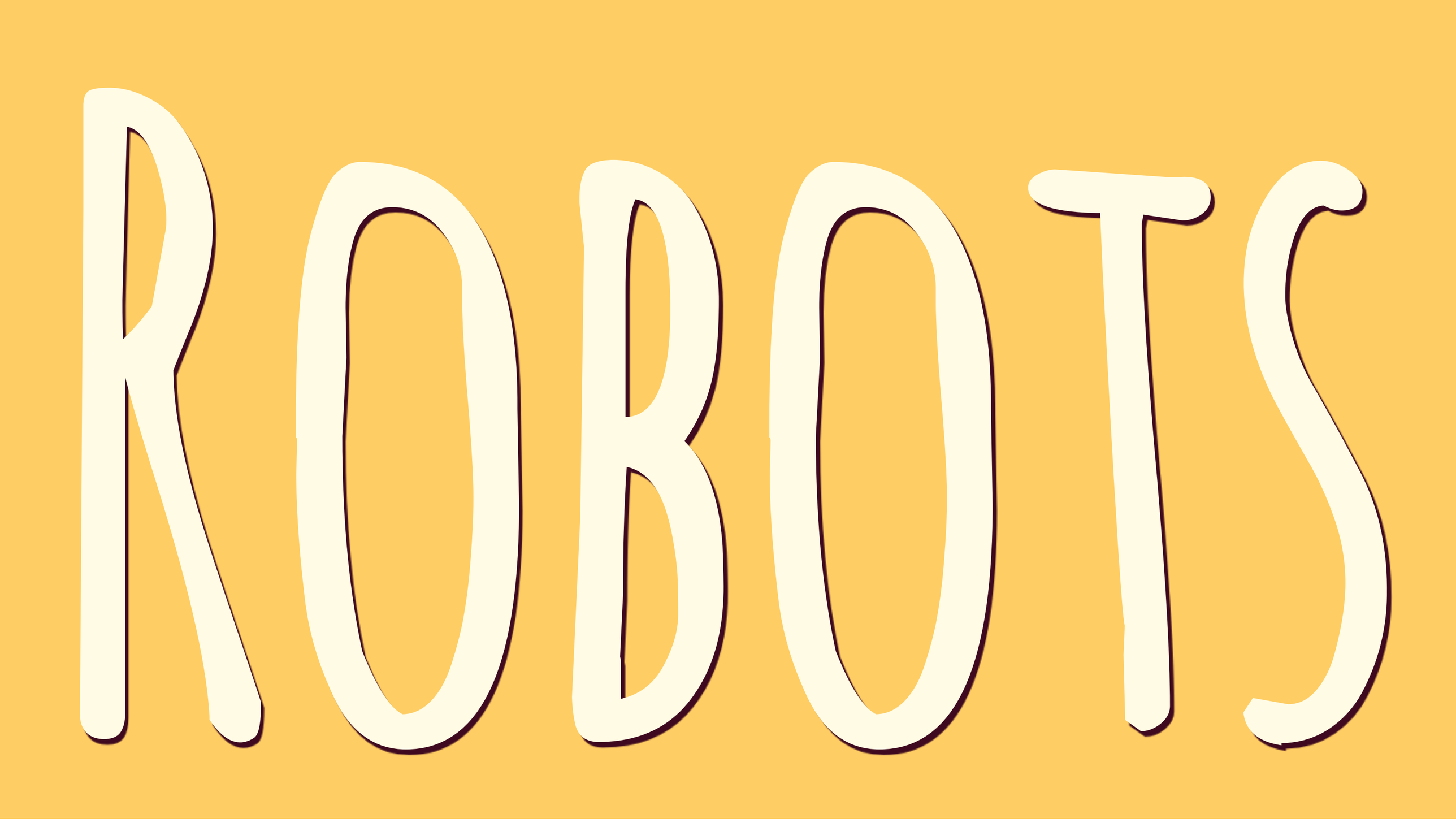
And what can you do with it?

Build a Super Mario Controller

Find a mario game that you can control with your keyboard

Take some play Dooh - which is suprisingly conductive

and design your own game controller to move and jump.

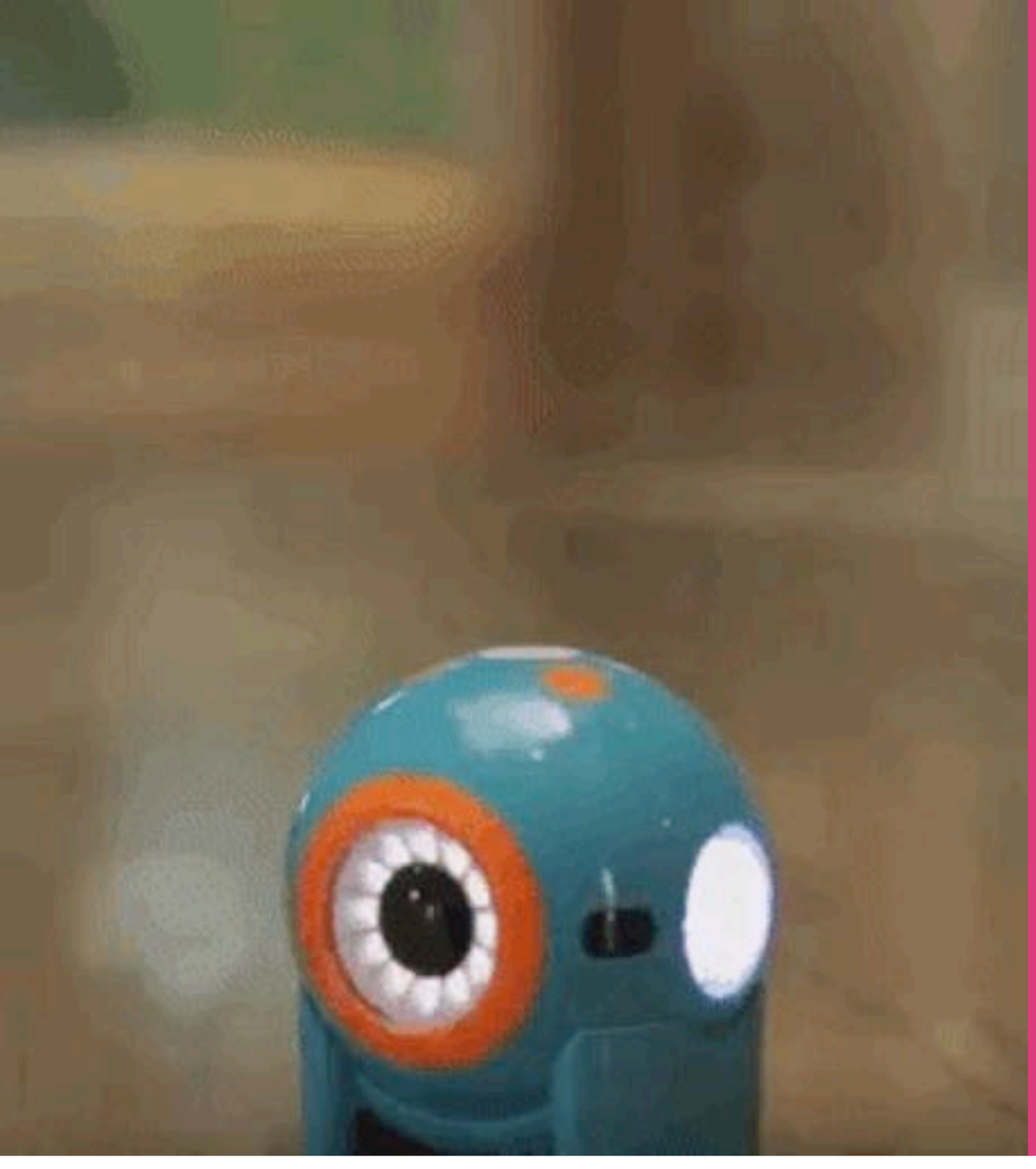


Programable Robots!

They are everythere

Many of them can be programmed with child friendly programming language.

Let me show you some.



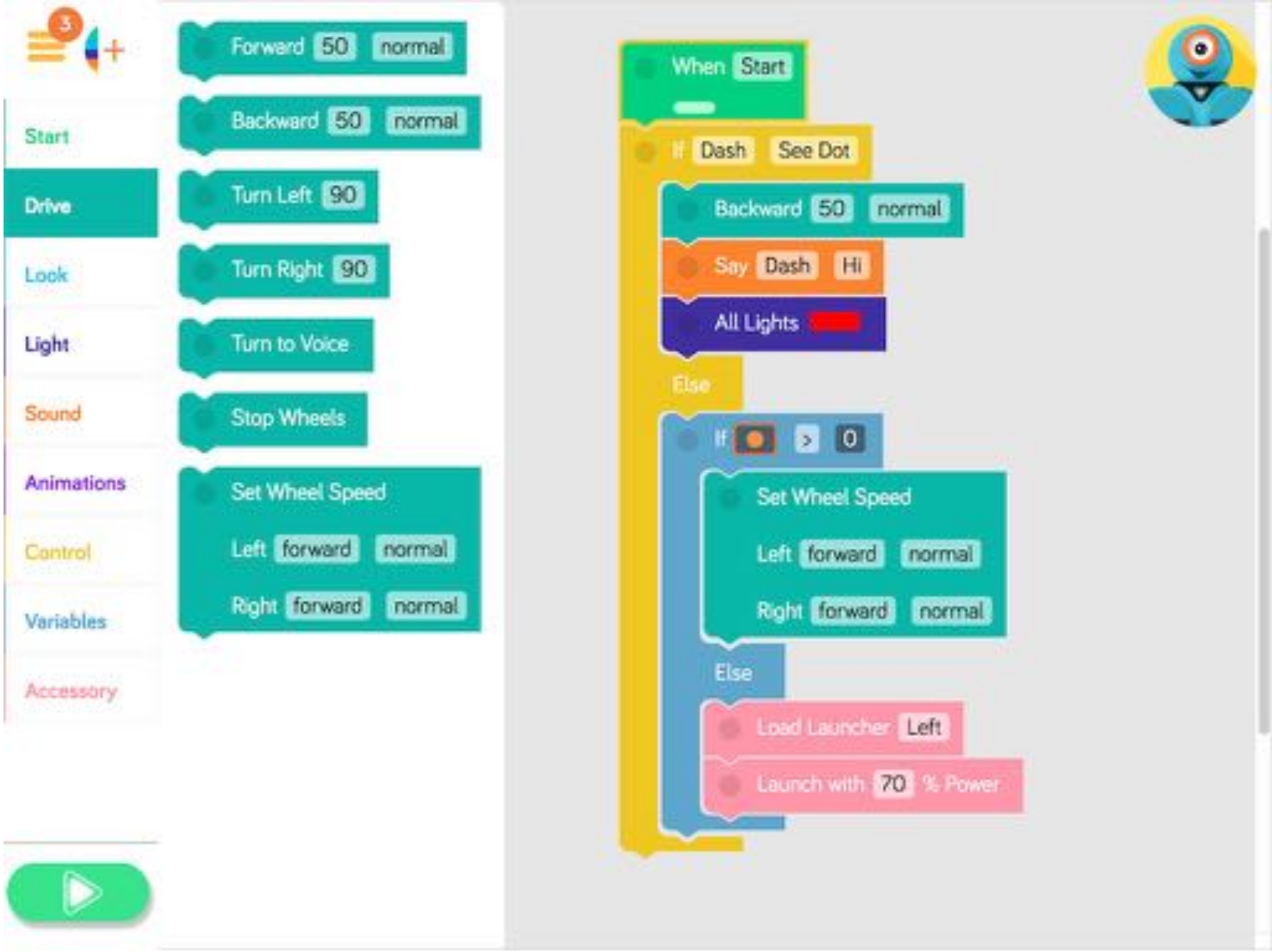
Say hello to Dash & Dot.

Those are robots with many sensors, LEDs and speakers.

Together they cost around 200 EUR

You can use the app WONDER where everything is about exploring and adventures.

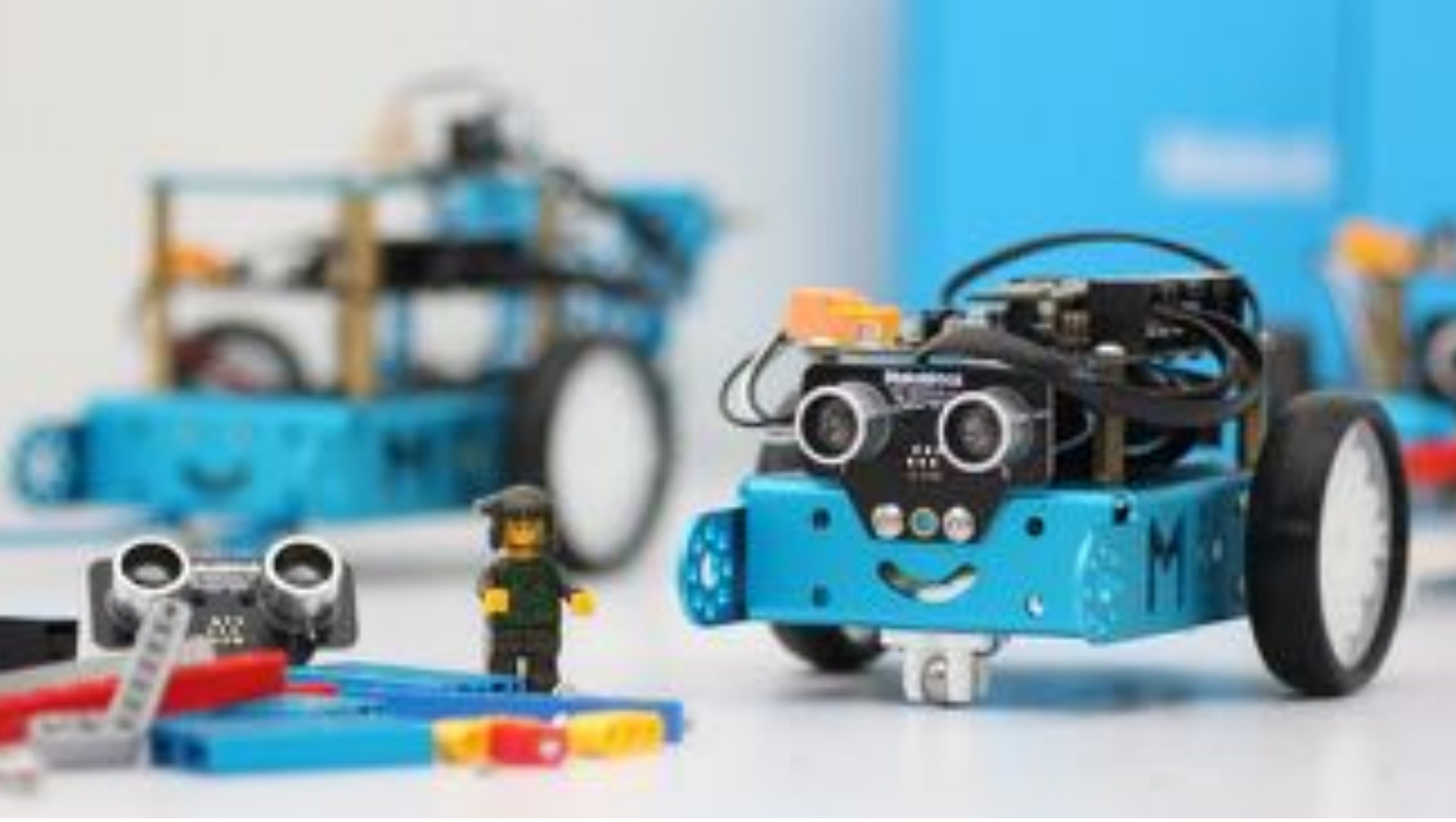
You don't create programs but you solve missions by using commands for light, sound or movement.



There is also an app where you have more of a coding experience.

This gives the kid a focus on their own creativity with the robots.

mbot- my favorite robot.



He's based on Arduino uno and OpenSource.

This means you could theoretically create all parts yourself and use the software for free.

You can of course buy it as a package for 80 EUR.

What's so special about it ?

That the kid will assemble it.

Usually within 20mins

You can then start an automatic program, use an app or code your own program.

When you activate the autonomous driving mode.

It will use its ultrasonic and special line sensor

to follow a line and avoid obstacles in front if it.

CODING

Let’s look how coding is being teached.

You usually tackle it in three different parts.

Analog activity, playing games and dive into the actual coding experience.

The Human Robot

Let's look at the analog activity.

If you want to control a robot you have to behave like a robot first.

So let's play the human robot game.

One kid or you dresses up as a robot.

A helmet is usually enough for the illusion but a full costume like this is never wrong.

You explain the kids in the round that they can only use five commands to control the robot.

forward, turn left, turn right, backward and stop

Let's begin

$ROBOT: <TURN RIGHT>

Imagine this task:

You want the robot to turn to the right and walk in that direction.

So you begin with a turn right, right?

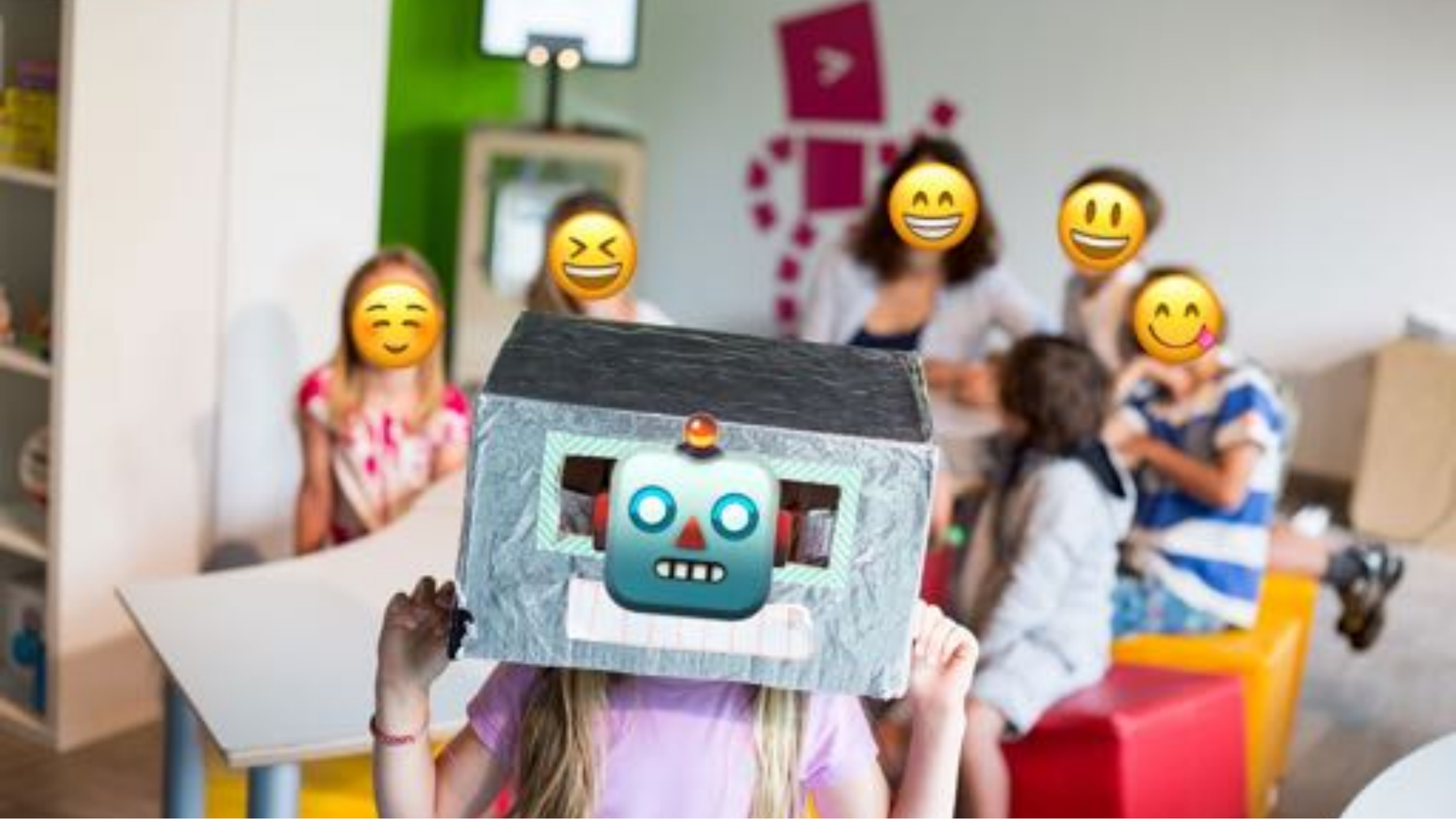
Let's see what happens after the kids yell that command to the robot.

The robot will spin forever and ever and ever of course.

The command was correct but not exact enough.

They should have said turn right - a quarter.

While spinning around, somebody will hopefully scream a `stooooop` to the desperate robot



In the end kids really love that game, collaborate and understand the limits of a machine

They also understand the requirement of exact commands

And to put one command after another - just like in programming.

CODING GAMES

Your crowd is ready for some more fun.

Let’s play some coding games.

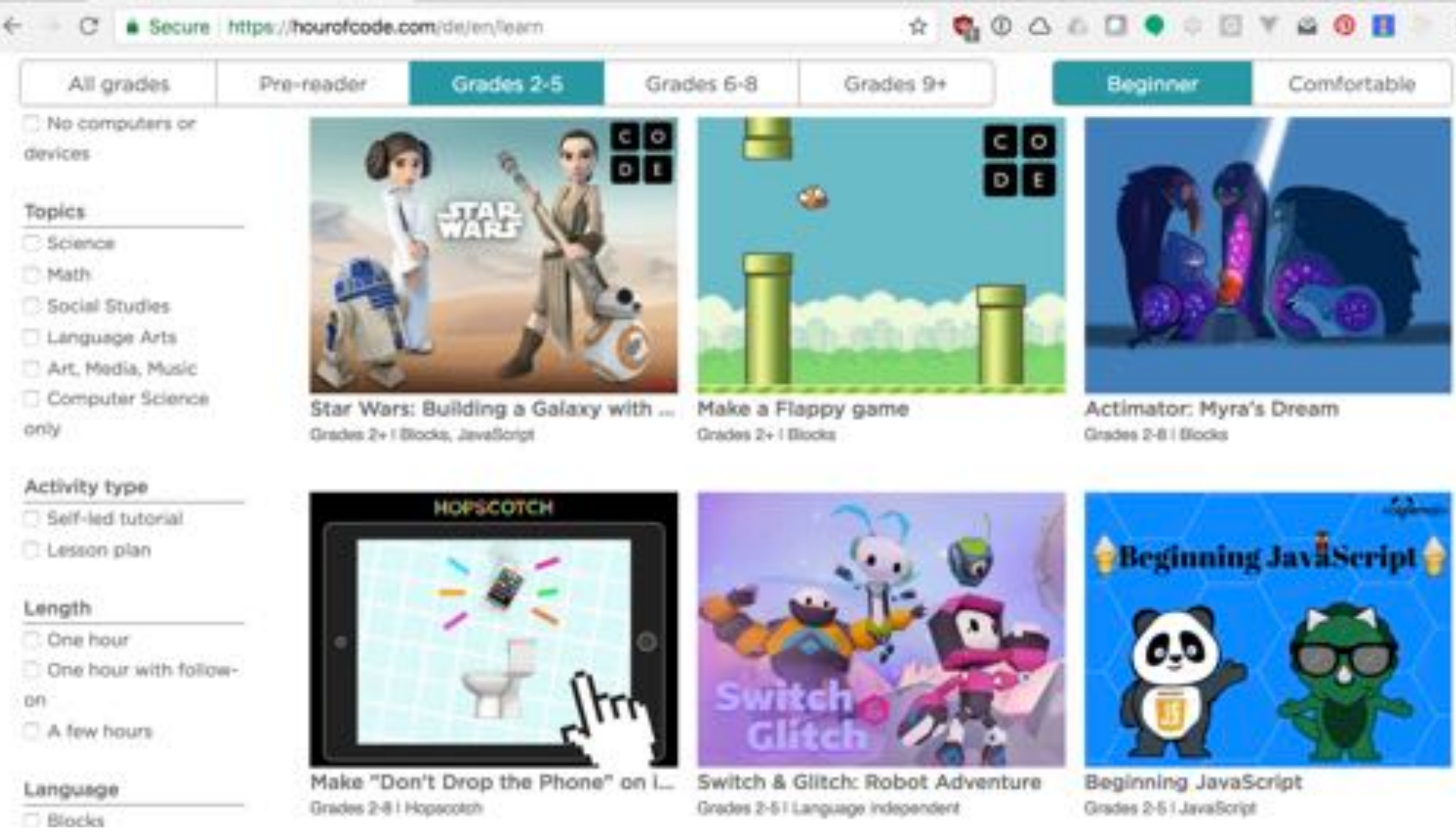
Hour of Code

One-hour tutorials

There is a movement called Hour of Code to do so

There are dozens of one-hour games and tutorial translated in 45 languages.

Everybody is encouraged to try it out.



The games are themed after kid's darlings like Ice Princess Elsa, Minecraft or Angry Birds.

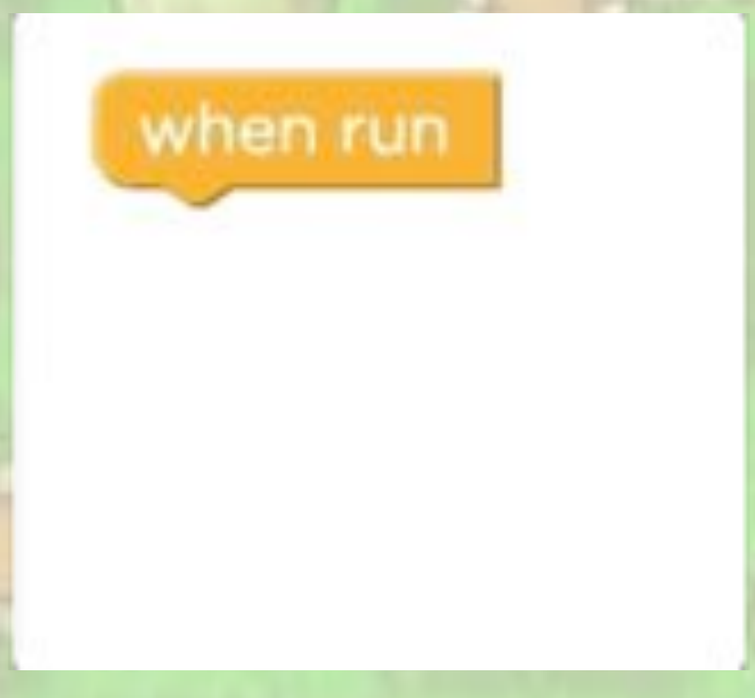
And they teach the principals of programming while playing.

I usually pick a labyrinth style game to follow up with the human robot example.

This is the Zombie Level where a zombie has to be guided to his favorite food.

A sunflower of course!

Commands



Commands are given with colorful blocks and snapped together like in a puzzle.

You use a simple set of commands to do so.

Like move forward, turn left, turn right

Kids will usually place one command after the other

That's simple and it's working

But it results in a huge list

They can’t even complete the level as they are forced to use a new block.

The pink one here which is used to repeat commands.

I then show them the pattern of 4 blocks they can repeat instead of the huge list.

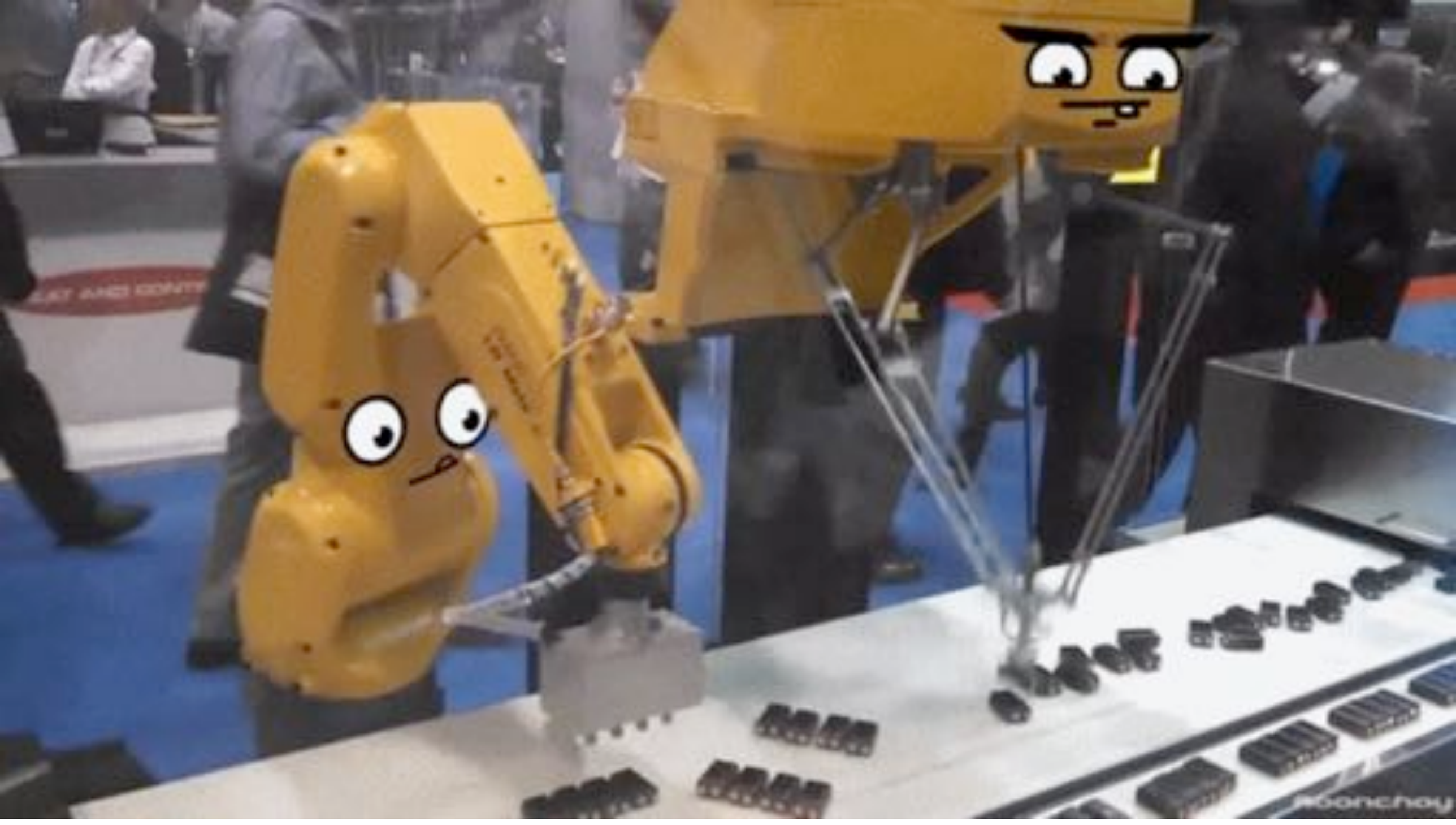
forward, left, forward, right

and let them reorganize their code

And success! They usually just know what to do.

Pick the pink loop block and place the repeating pattern inside.

I love this moment.



I explain that this is what a computer is for.

The computer should repeat the boring stuff, it's not your task.

After an hour the kids should have internalized those block based commands...

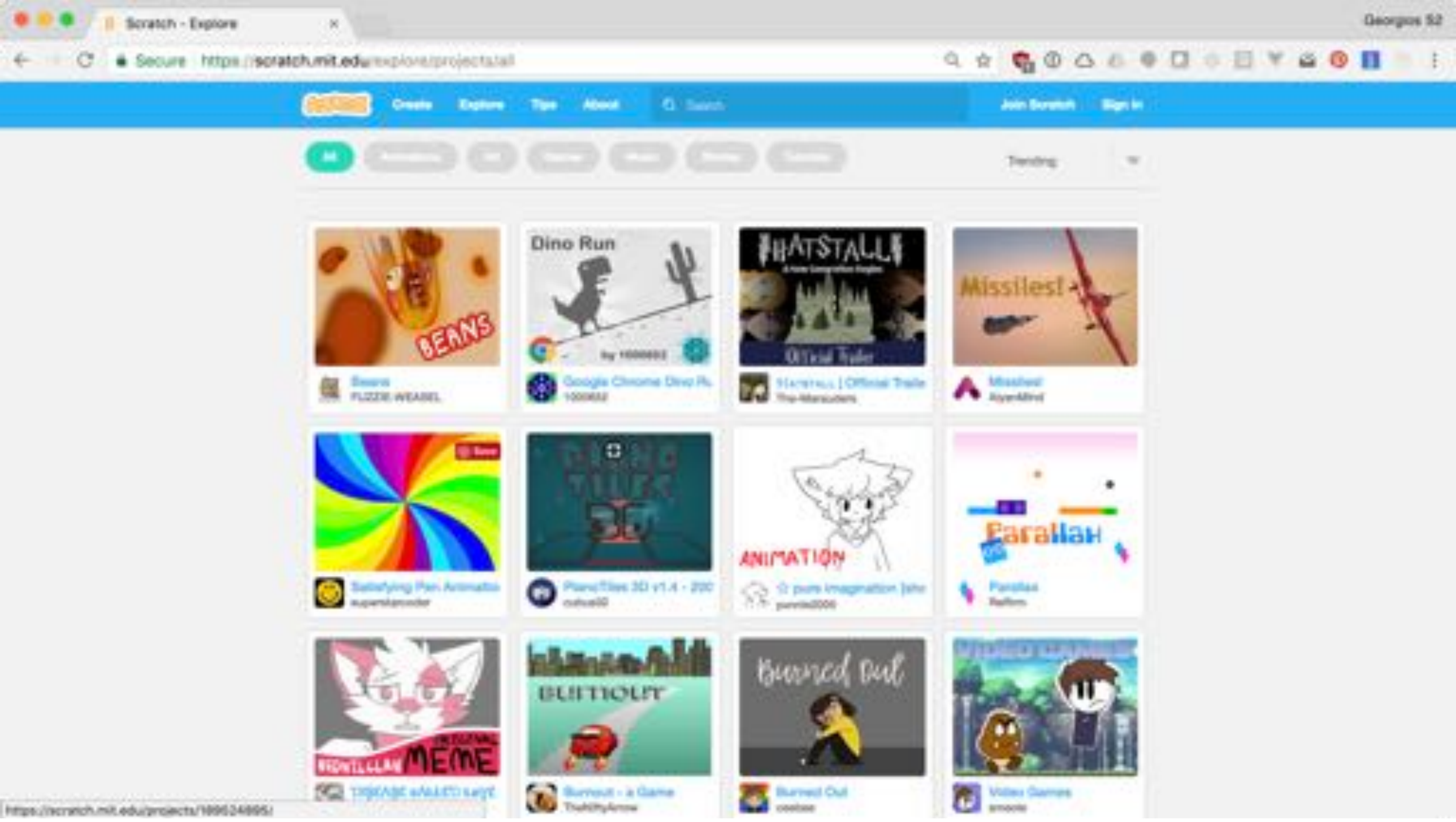
and they are ready for Scratch to do some real coding.

Scratch is the most famous tool in kids programming.

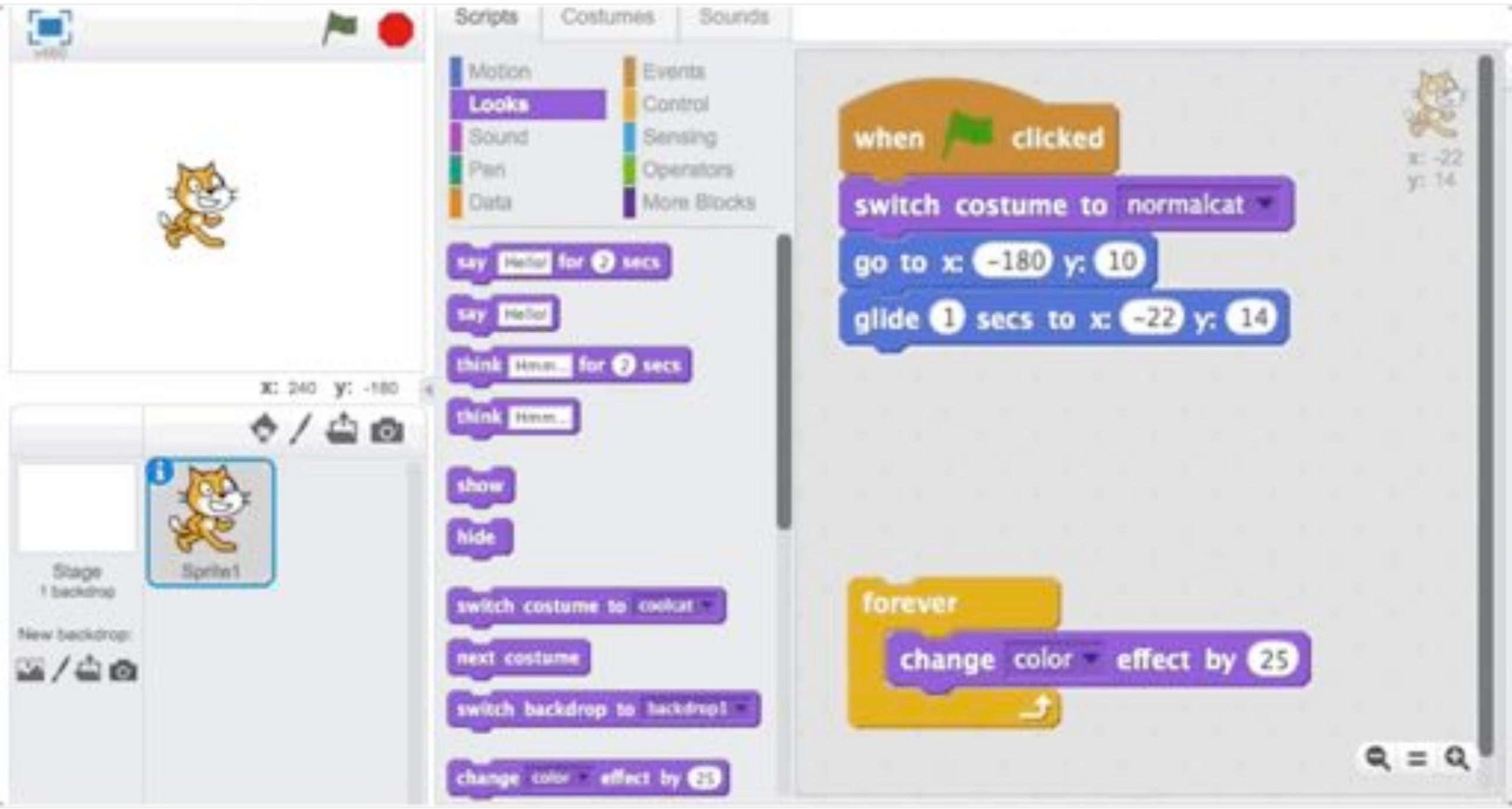
It was invented by Mitchel Resnick at the MIT Media Lab in 2002.

Scratch can be used as an application or online in the web browser through flash.

The next version 3 is based on HTML5 and will be released this August.



Everything you code can be shared on the Scratch website and remixed by others as the `source code` is always accessible.



Let's have a look inside Scratch

1. On the left you have a stage where everything will move around.

2. And on the right you see the coding editor.

That's where you code with colorful blocks

This is called block based programming.

SCREAMING CARROT

and to complete this section I brought you something special

> A screaming carrot <

It's programed in Scratch, will make use of MakeyMakey

and is the obvious reason for the sensational title of this talk

~~1. WHY IT MATTERS~~

~~2. HOW TO TEACH~~

3. WHERE TO TEACH

That was fun, wasn't it ?

What’s left is the question where **everybody** could try teaching coding.

EVERYBODY CAN TEACH

I want to stress the word everybody.

You don’t have to be a programmer

Everybody can learn coding and everybody can teach about coding or robots.

Digitalwerkstatt

I started teaching coding to kids in my spare time exactly one and a half year ago at Haba Digitalwerkstatt.

They started in Berlin in 2016 and opened an office in Munich in 2017

Their schedule is about coding with Scratch, Robotics, Stop Motion movies and exploring worlds in Minecraft.

If you want to try it, just drop them a mail like I did.

Hour of Code

You could also host an Hour of Code event

Where you play games like the zombie game and explain the basics of programming to interested people

You might even find some Hour of Code in your hometown.

Try to join and get in touch with the organizers.

AT HOME

Don't forget your family at home.

You can start teaching your own kids and relatives easily with the tools I have shown you.

OFFICE

You won't believe it but designers, project managers or maybe your clients are eager to learn coding too.

They will have fun and understand you better the next time you talk about bits & bytes

.....BUT

WHAT ABOUT ME?

YOUR BENEFITS

What about me, the teacher?
What do I get??

Entertain the kid inside you

Well. When did you play with toys for no reason the last time?

It's healthy and relaxes your mind.

It entertains the kid inside you.

BE MORE CREATIVE

Teaching coding makes not only the kids but you creative.

You need to think about what to do with a MakeyMakey

Or create coding challenges in Scratch

And maybe you will use Scratch for yourself to surprise someone special on their birthday.

SUPERCHARGE YOUR MENTOR SKILLS

If you're a coder, did you ever try to explain someone programming?

Yes it's very difficult.

You have to reflect on the very, very basics of programming

But once you have mastered this.

It will help you throughout your whole mentoring career!

Working with kids is fun.

I always have an amazing time and I'm still surprised about all the funny ideas they have!

Conclusion

You have a bag full of knowledge now. Use it.

A quick recap of what I have told you

1. Coding matters

Coding matters because..

IT WAS NEVER ABOUT CODING ONLY

it was never about coding only.

EXPOSURE

... it's about being exposed to technology, computer science and programming.

BIG PICTURE

...to see the big picture and connecting the lines between technologies

Coding useful

diversity, chances, creativity, thinking

Coding still makes sense

Computers don't care who you are and are cheap so many can afford it.

It also boosts your creativity and learns a thinking useful in all domains

2. YOU KNOW HOW

You know how to do it.

TINKERING

WITH MAKEY MAKEY AND DRAWBOT

By building Drawbots
and using a MakeyMakey to
make carrots scream

ROBOTS

LIKE DASH, DOT & MBOT

You also know that there a robots for kids

Robots like dash & dot or mbot that are easily programmable.

Coding

Human robot, Maze Games and Scratch

And finally let the kids play the human robot game

followed by some zombie mazes

to prepare them for coding in Scratch

where they can unleash their creativity

3. YOU KNOW WHERE

And you know where you can teach too!

Digitalwerkstatt & Hour of Code

At Digitalwerkstatt, the place I started with locations around germany
or you decide to host or join an hour of code event.

HOME & OFFICE

Don't forget you can always start teaching your family at home

and also make your designers happy by teaching them a bit about coding.

ONE LAST THING

One last thing I want to tell
I still remember my very first
time I teached kids.

The glowing in their eyes when they connected the pieces and finally understood what I teached them.

This is the reason I stand in front of you today

I want you to experience the same and help some kids finding their way through technology.

About Coding Kids and Screaming Carrots

Thanks

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You can find the slides and linklist under this URL.

Thanks a lot for listening!