One Hundred Languages

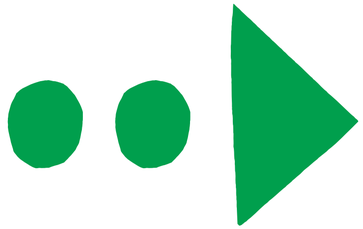
Linda Liukas
@lindaliukas

(Programmer)
Illustrator
Author



www.
helloruby.
com

If code is the new lingua franca, instead of grammar classes, we need poetry lessons.



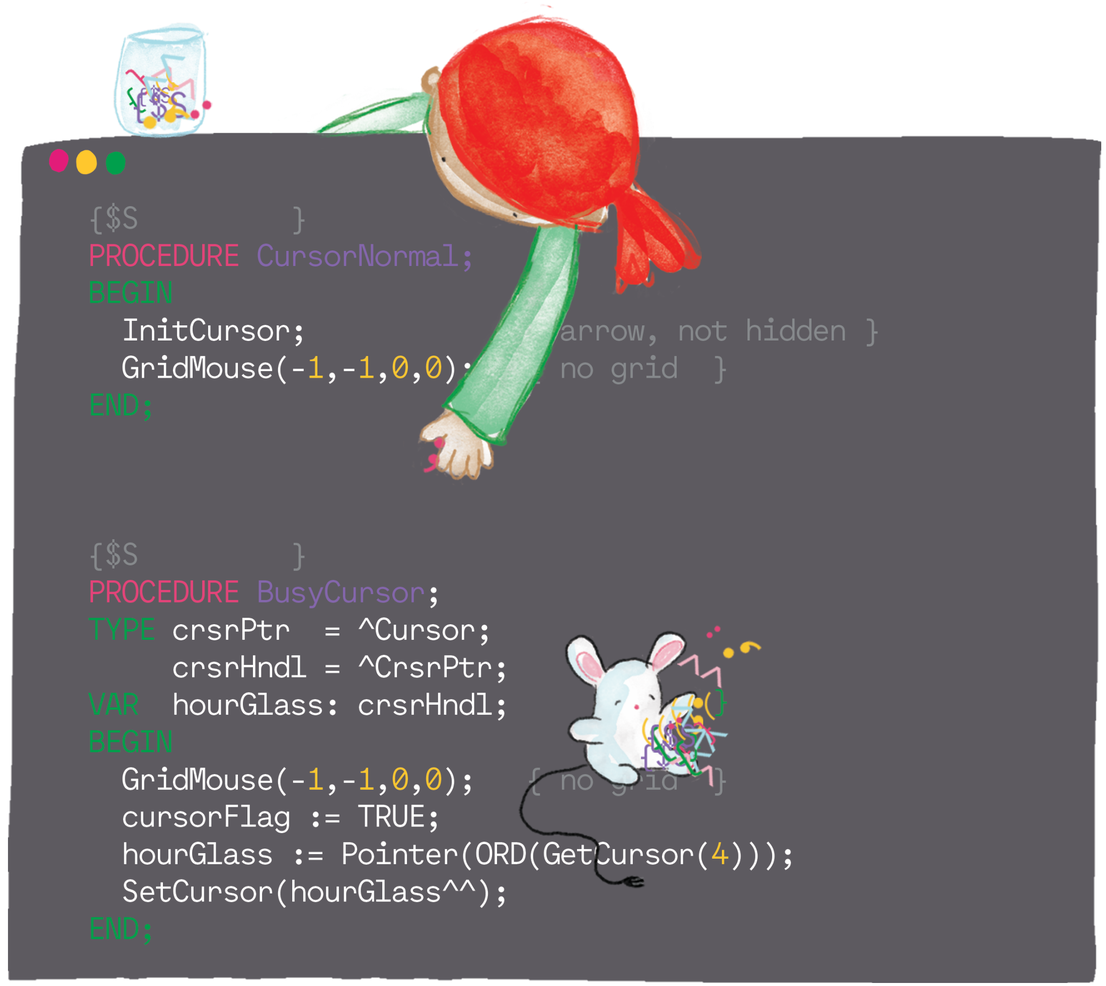

Hi



GAMIFIED TUTORIAL: STEP-BY-STEP INSTRUCTIONS, EASE OF ACCESS



OPEN-ENDED PLAYGROUND: LOW FLOOR, WIDE WALLS, HIGH CEILING



Stories..

..help us make sense of the world.

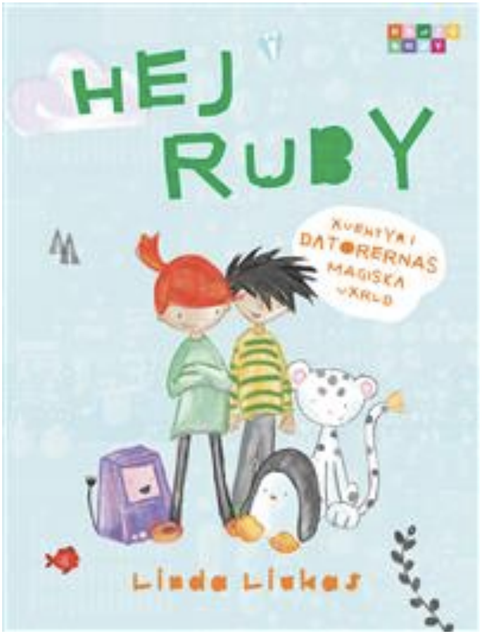
..connect us to ourselves and to each other.


헬로 루비: 코딩이랑 놀자!


ルビィの ぼうけん
こんにちは! プログラミング
リンダ・リウカス 作
島井雪 訳
親子で楽しむ!
世界中で大反響!
プログラマー的思考法を育む知育絵本
プログラマーである作者が、初めてプログラミングに触れる子どもたちのために作り上げた10のストーリー&アクティビティ
リンダ・リウカス

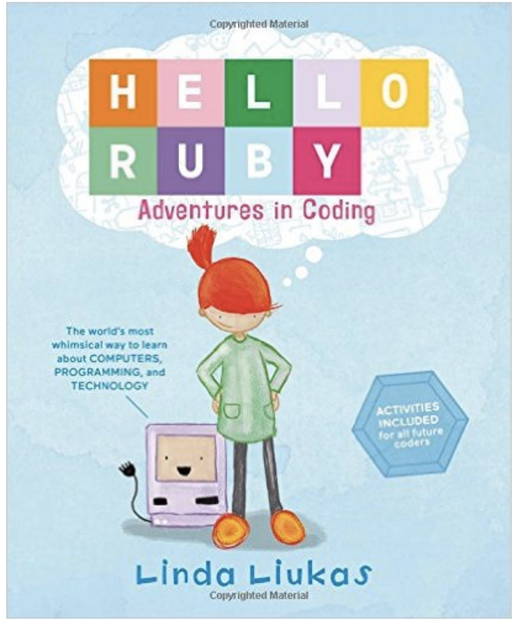

Linda Liukas
À la découverte du codage !
1re approche dès 5 ans
Glénat jeunesse


SVEIKA, RŪBIJ!
AIZRAUJOŠI UZDEVUMI VISIEM TOPOŠAJIEM PROGRAMMĒTĀJIEM
Linda Liukasa


HEJ RUBY
Äventyr i datorernas magiska värld
Linda Liukas


Een avontuurlijk sprookje over programmeren
Linda Liukas


MAAILMAN PARAS KOODI-SATUKIRJA!
Otava
Linda Liukas


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HELLO RUBY
Adventures in Coding
The world's most whimsical way to learn about COMPUTERS, PROGRAMMING, and TECHNOLOGY
ACTIVITIES INCLUDED for all future coders
Linda Liukas
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MATKA TIETO-KONEESEEN
Mukana askarreltava tietokone!
Otava
Linda Liukas


HELLO RUBY
TERE, RUBY!
Programmeerimis-seiklused
Sisaldab ülesandeid!
Linda Liukas



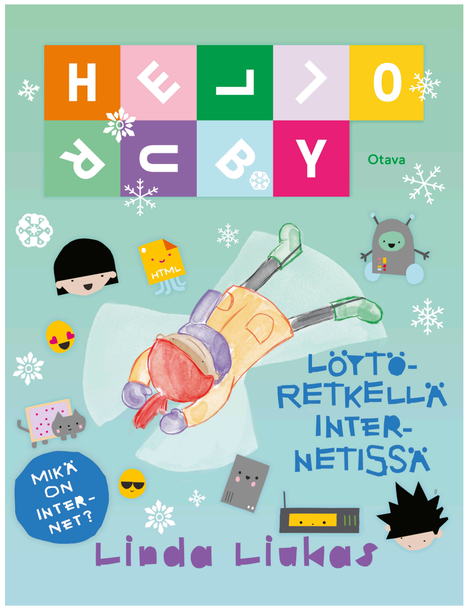
A story of a small girl and a big adventure in thinking like a computer.

- Computational Thinking
- Decomposition
- Algorithms
- Sequences



A twist on Alice in Wonderland: Ruby falls inside a computer!

- Hardware of computers
- Software of computers
- Input/output
- Sensors
- What are computers?



What if you could build the Internet out of snow?

- Networks and infrastructure
- Hardware of Internet
- Software of Internet
- Applications
- Staying safe online

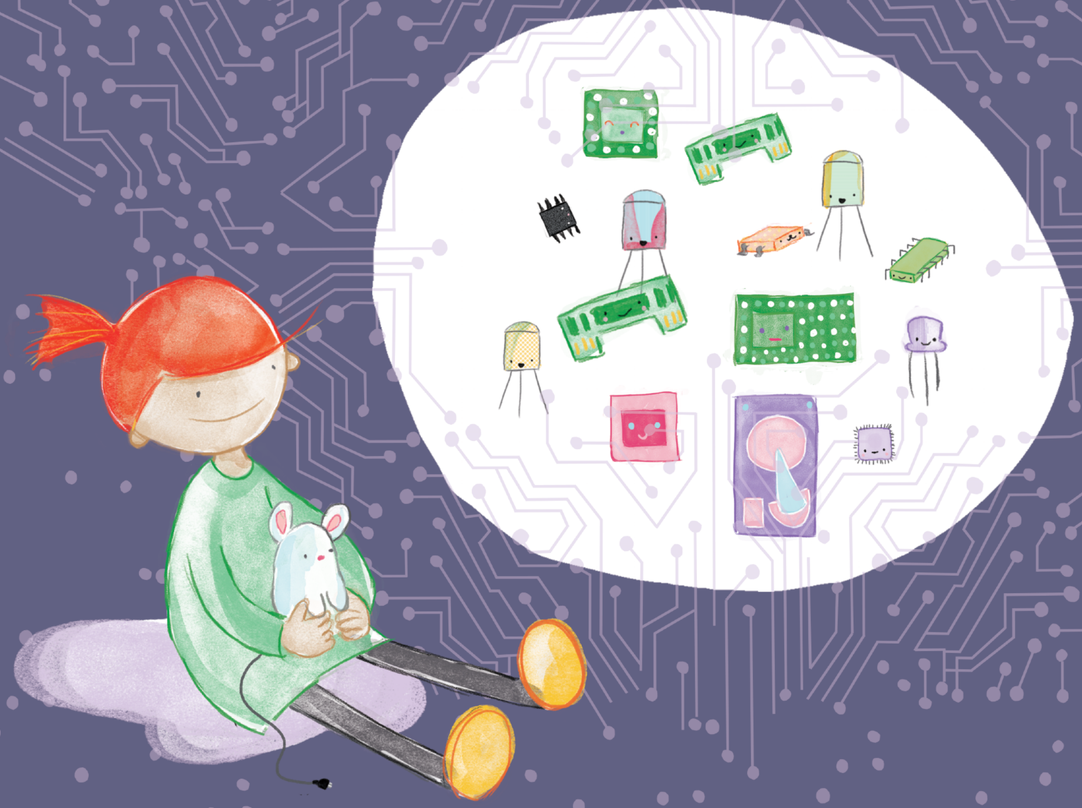


A modern Pinocchio: Ruby wants to take the robot to school to learn

- AI and Machine Learning
- Computers vs. Humans
- Bias in AI
- What AI can do?

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Preparing kids for a world where so many problems are computer problems.



"Computer Science is no more about computers than astronomy is about telescopes."
- Dijkstra





what did we learn?



1. Exact commands.
2. In the right order.
3. Naming things is important (and you can't make spelling mistakes)
4. Instructions should cover all scenarios and be modifiable.
5. **Even the biggest problems in the world are just tiny problems stuck together.**

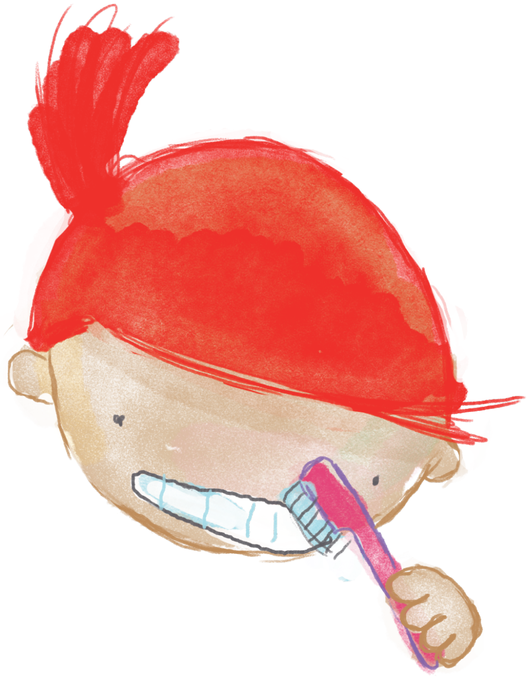
A is for algorithm

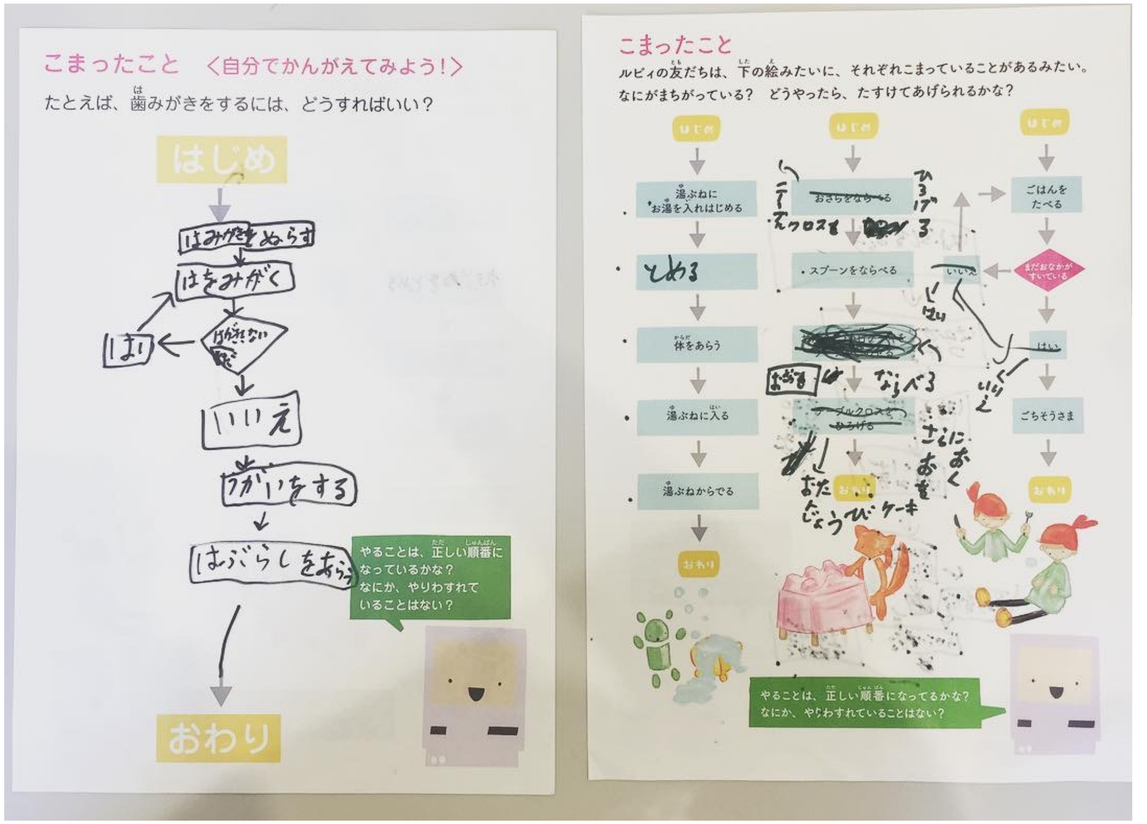


START

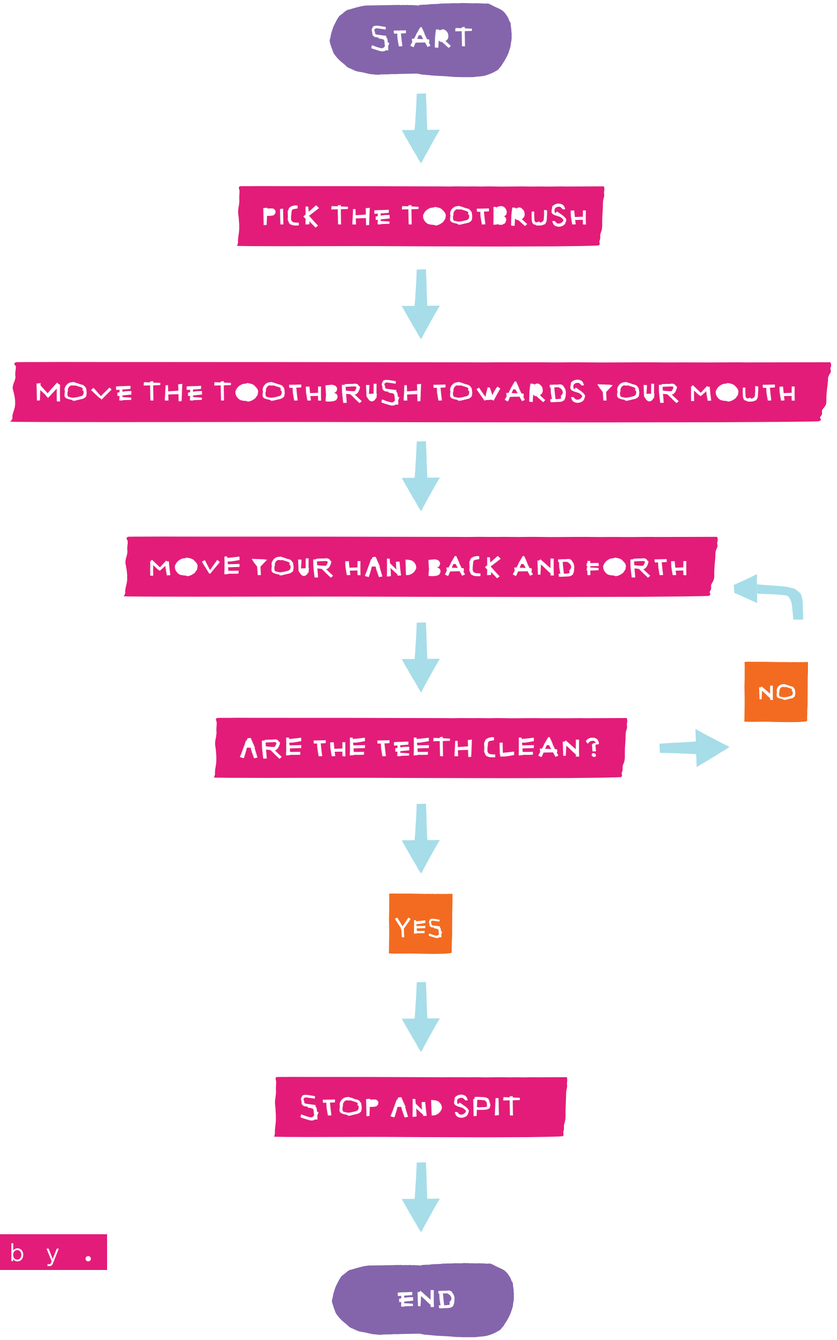
END

WASH YOUR TEETH




こまったこと　〈自分でかんがえてみよう!〉
たとえば、歯みがきをするには、どうすればいい？
はじめ
はみがきをぬらす
はをみがく
はい
いいえ
うがいをする
はぶらしをあらう
おわり
やることは、正しい順番になっているかな？
なにか、やりわすれていることはない？
こまったこと
ルビィの友だちは、下の絵みたいに、それぞれこまっていることがあるみたい。
なにがまちがっている？　どうやったら、たすけてあげられるかな？
はじめ
湯ぶねにお湯を入れはじめる
ためる
体をあらう
湯ぶねに入る
湯ぶねからでる
おわり
おさらをならべる
スプーンをならべる
ごはんをたべる
まだおなかがすいている
いいえ
はい
ごちそうさま
おわり
やることは、正しい順番になってるかな？
なにか、やりわすれていることはない？

HOW DID IT GO?



... do we know what a toothbrush is?

.. what about the toothpaste?

.. remember to open the toothpaste?

.. remember to stop moving your hand towards the mouth!

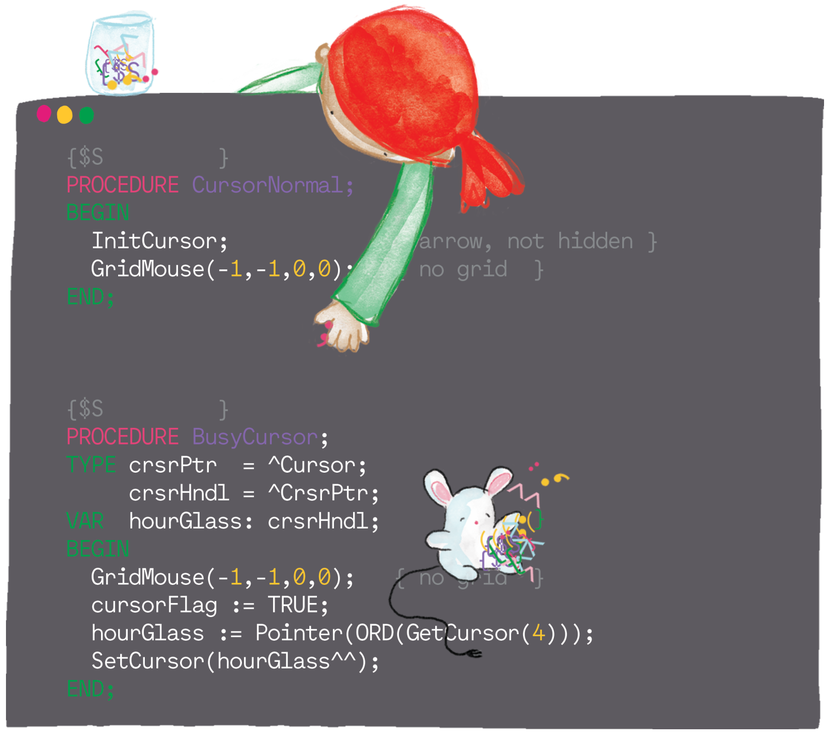
.. defining clean

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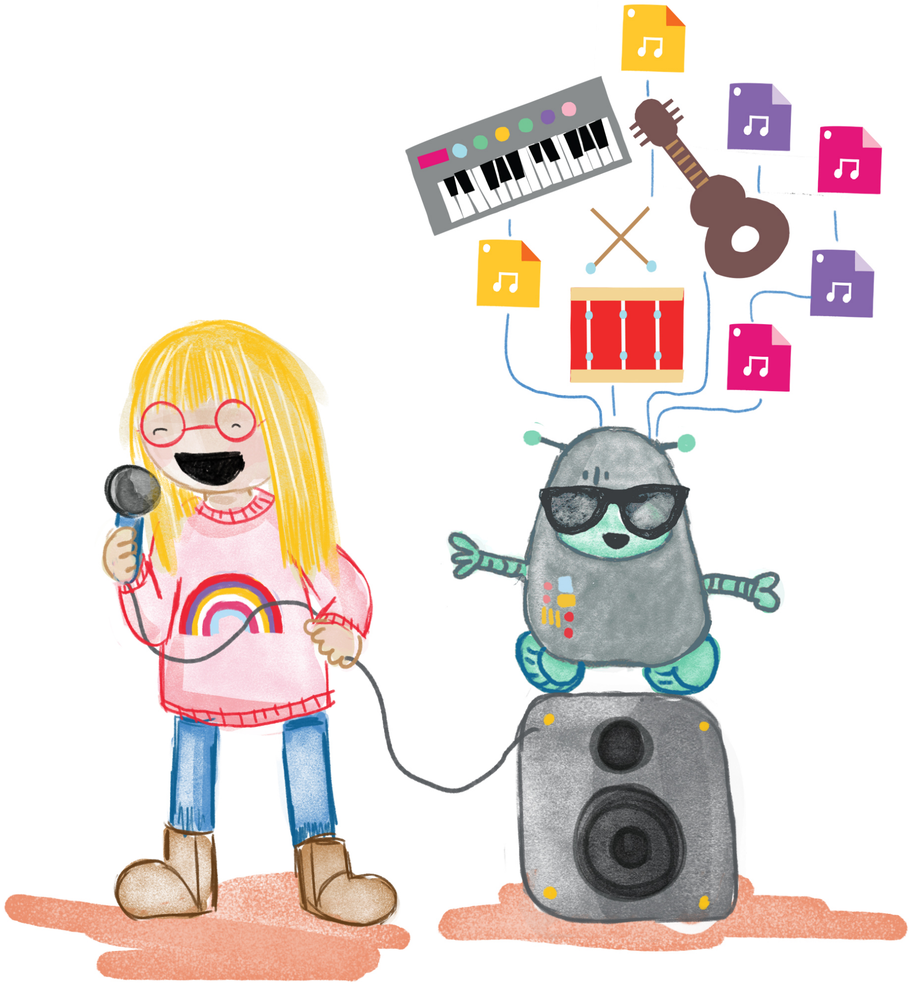
Pair programming

The other one drives, the other one gives instructions.

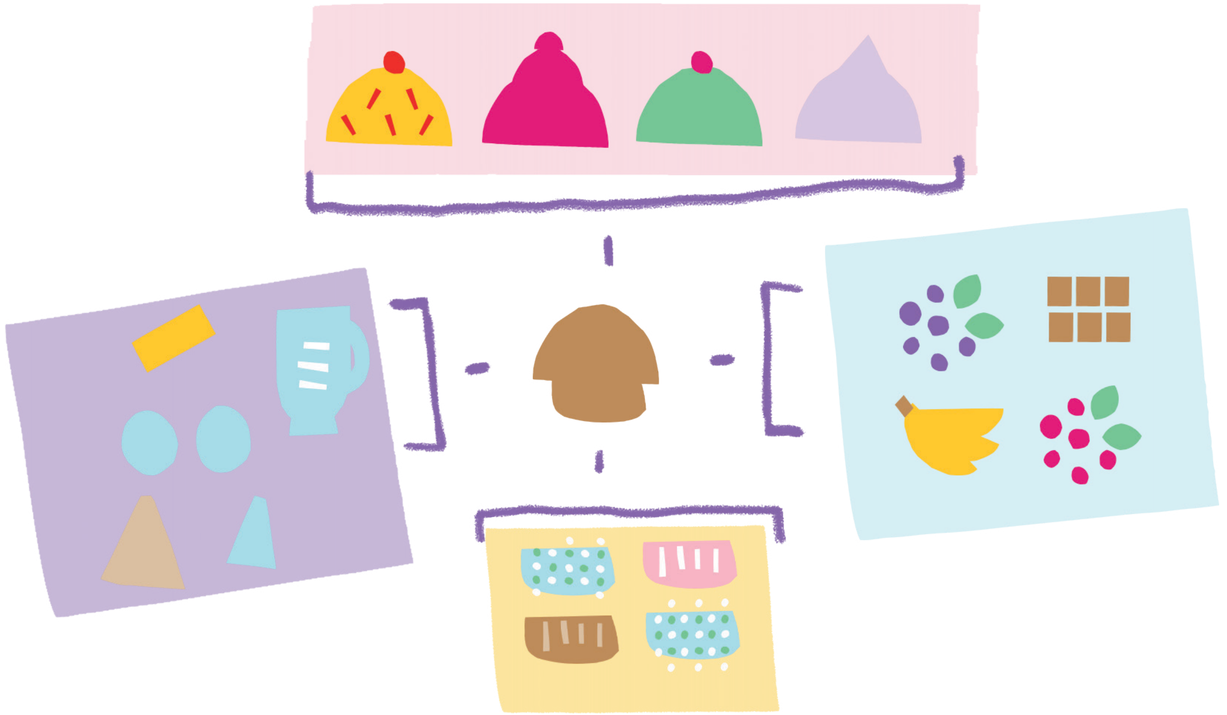


Debugging

1. Explain to three friends what you tried to do before asking teacher.
2. Explain in English. Draw. Act. Talk to a rubber duck.



Creativity



Go right

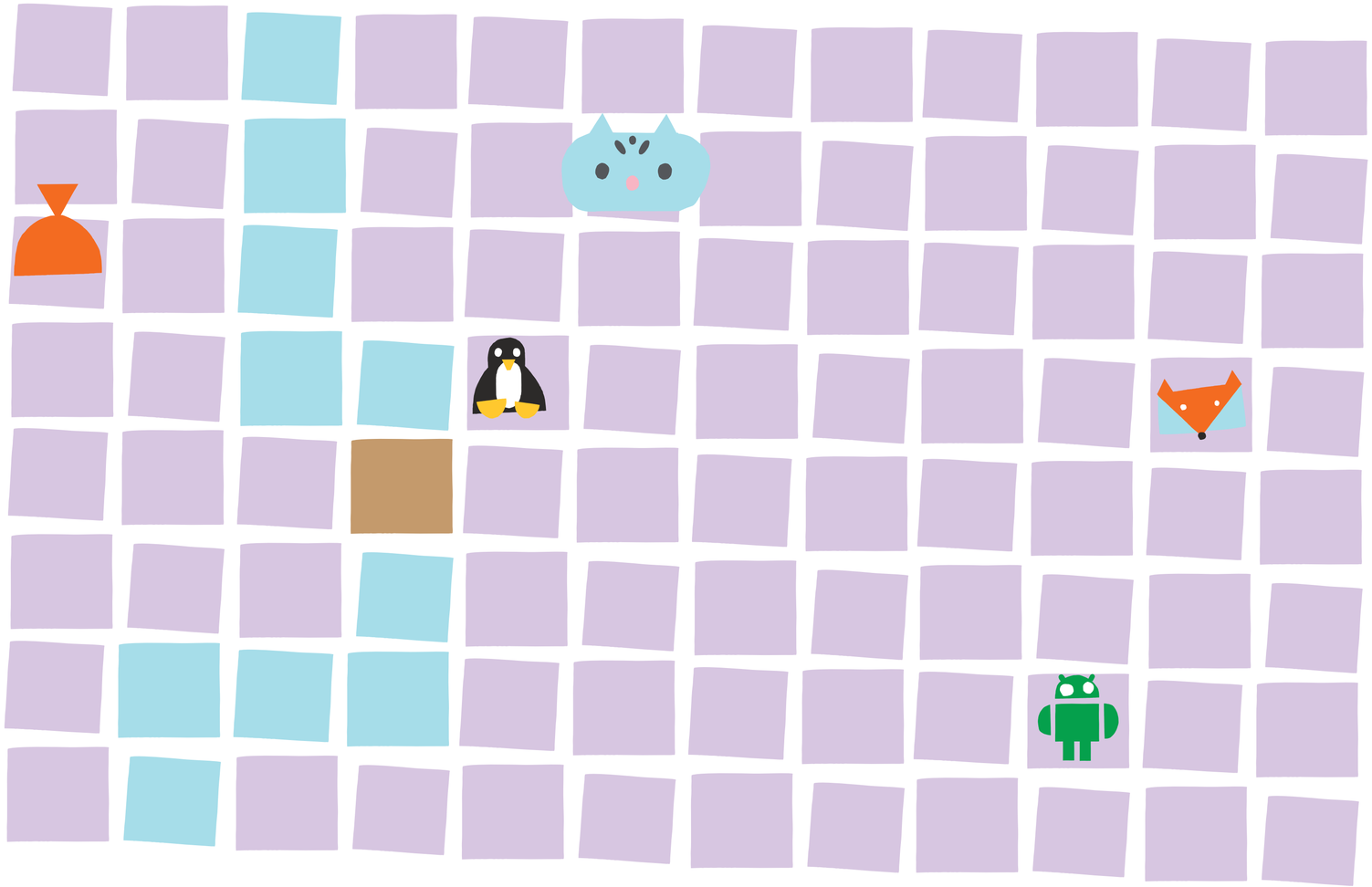
Go left

Go down

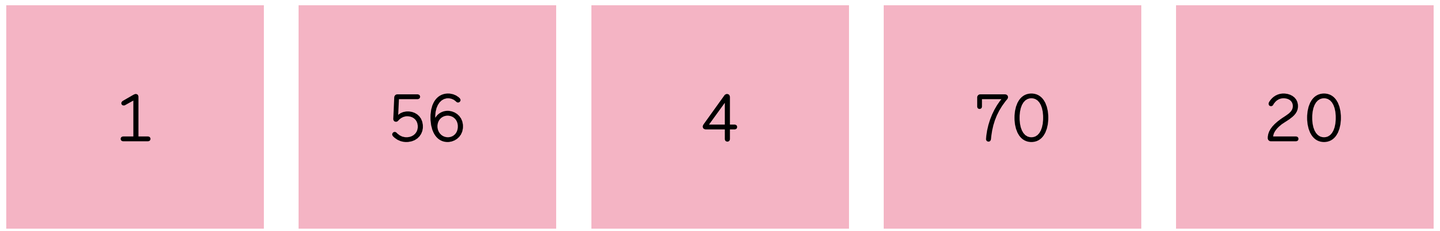
Go up

Stop and say hi!

3



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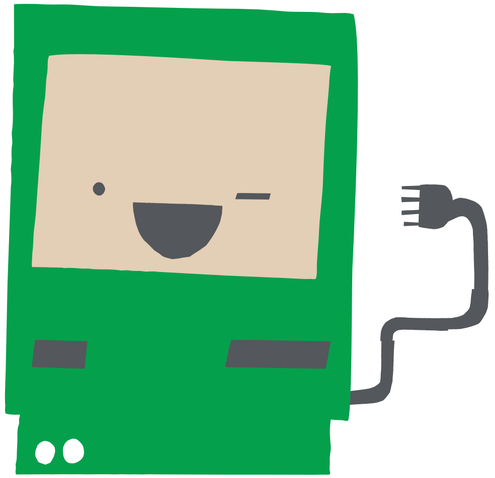

1
56
4
70
20

1	56	8	67	71
78	24	4	33	20
45	81	2	70	10
1	66	98	89	82

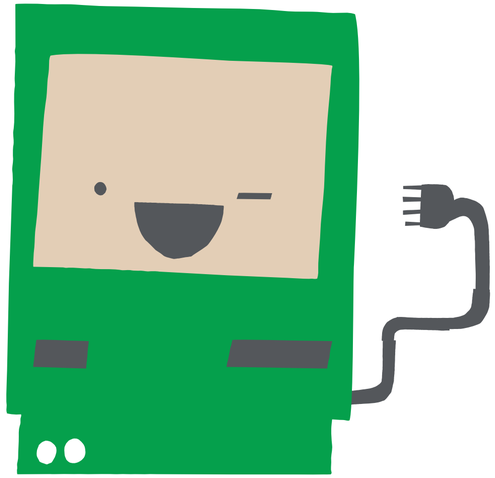


	715	1	56	8	67	71	820	71
71	71	455	56	8	67	71	677	712
20	20	78	24	343	433	20	201	20
10	348	45	81	2	470	670	10	10
322	821	1	66	98	89	82	82	82
		71	1	56	435	67	171	71

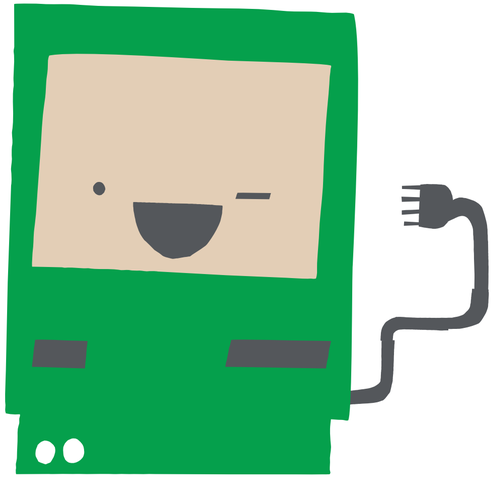
www.helloruby.com



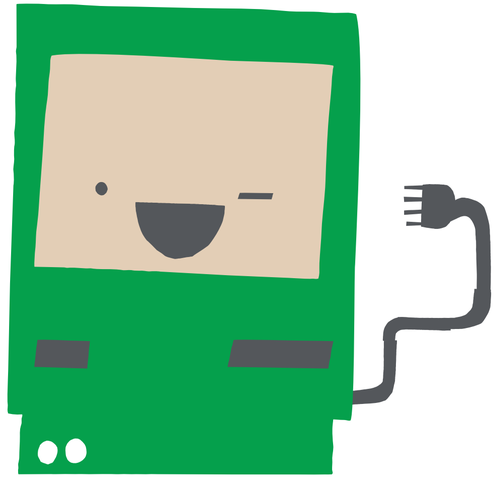
1	56	4	70	20



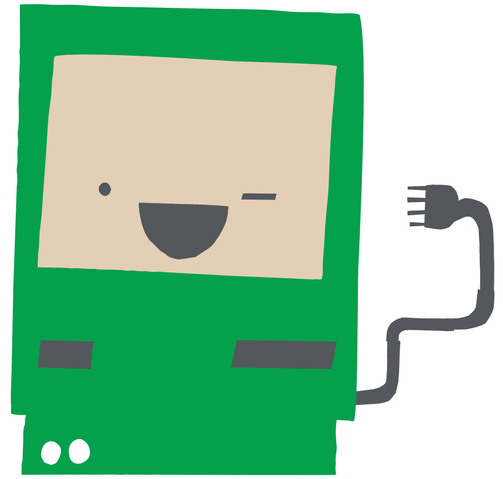
1	56	4	70	20



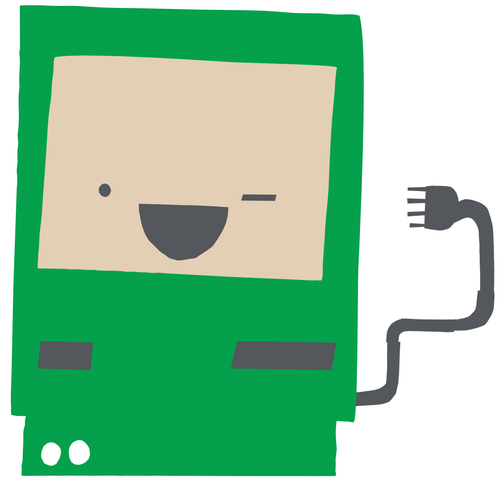
1	4	56	70	20



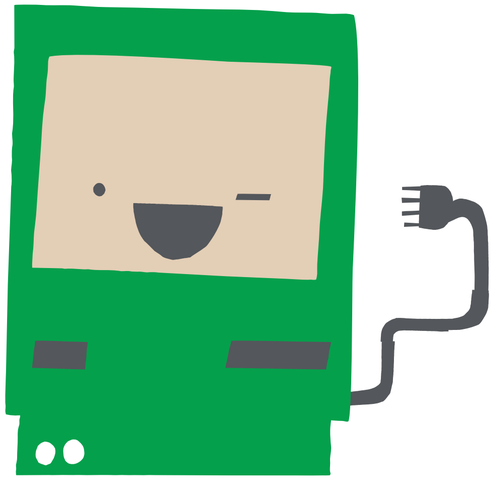
1	4	56	70	20



1	4	56	70	20



1	4	56	20	70



1	4	56	20	70

This is called bubble sort algorithm.

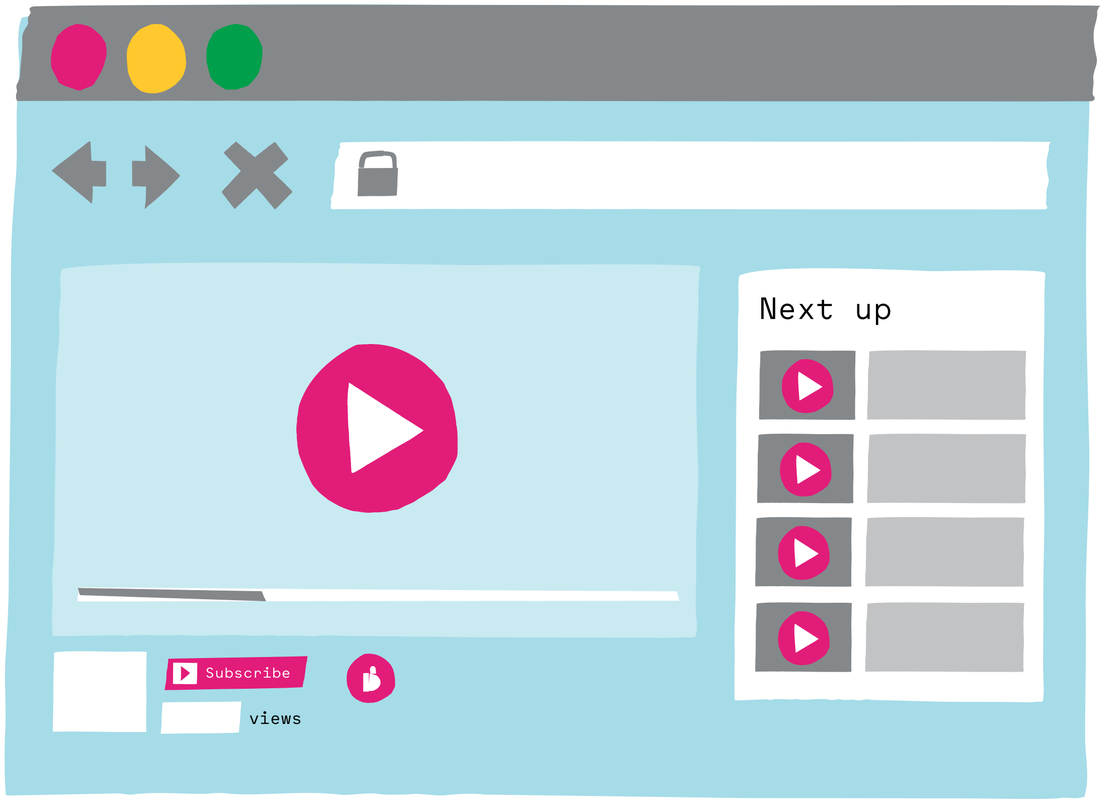
Where is the algorithm?



Where is the algorithm?



Where is the algorithm?



‘Surprise Play Doh Eggs Peppa Pig Stamper Cars Pocoyo Minecraft Smurfs Kinder Play Doh Sparkle Brilho’;



"In most mathematical lessons the whole difference lies in the fact that the student is asked to accept from outside an already **entirely organised intellectual discipline** which he may or may not understand"
- Jean Piaget

"Don't present students with **pre-organised vocabulary and concepts,** but rather provide students with a **learning environment grounded in action.**"
- Jean Piaget

Achievement	Social	Immersion
Advancement: Progress, power, accumulation, status	**Socialising:** Casual chat, helping others, making friends	**Discovery:** Exploration, lore, finding hidden things
Mechanics: Numbers, optimisation, templating, analysis	**Relationships:** Personal, self-disclosure, finding and giving support	**Role playing:** Story line, character history, roles, fantasy
Competition: Challenging others, provocation, domination	**Teamwork:** Collaboration, groups, group achievements	**Customisation:** appearances, accessories, style, color schemes
		Escapism: Relaxation, escape from real life, avoid real life problems

Lego Foundation: Systematic Creativity in the Digital Realm (2012)

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Lego Foundation: Systematic Creativity in the Digital Realm (2012)

How does a loop feel?

Computers are good at repeating tasks. They like performing the same task over and over again until specific criteria are met (or even infinitely if that is what is required). One thing that computers are very bad at, however, is doing anything without being told to do it.



This is one of Ruby's favorite dance routines. Can you dance it to the beat of your favorite song?

- Clap
- Clap
- Stomp
- Stomp
- Clap
- Clap
- Jump



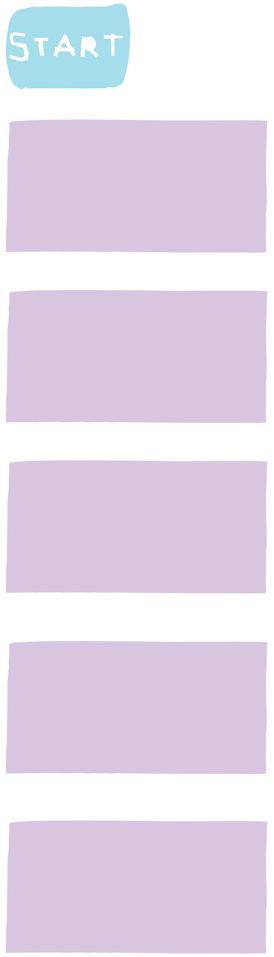
This is how Snowleopard loves to waltz.

- Swirl
- Jump
- Jump
- Clap
- Clap
- Clap



And this is how the penguins like to boogie.

- Clap
- Kick
- Stomp
- Stomp
- Jump



For loop!
While loop!
Until loop!



a FOR loop

When you know how many times
to repeat something.

Let’s repeat this three times!



a WHILE loop

Makes the loop repeat WHILE the condition is true.

Let’s repeat this code WHILE I’m standing on one leg.



an UNTIL loop

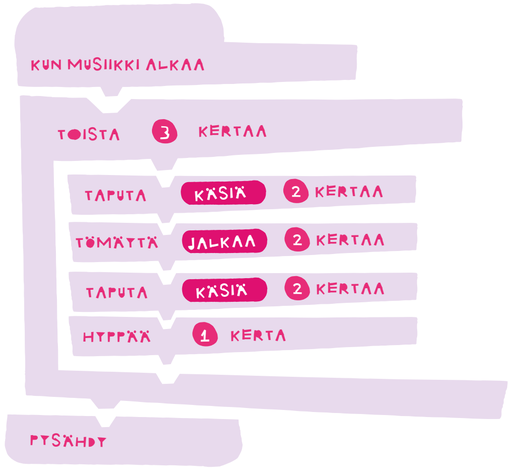
Makes the loop repeat UNTIL the condition is met.

ABSTRACTIONS OF COMPUTING

Kinetic



Visual



Code

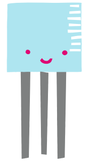
```
for i in 0..1
   puts "Clap"
end

for i in 0..1
   puts "Stomp
end

for i in 0..1
   puts "Clap"
end

puts "Jump"
```

Practice



A thermometer.



A game.



A website.

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Computational thinking

CONCEPTS

Data

Pattern recognition

Logical & critical thinking

Algorithms

Decomposition

Abstraction

PRACTICES

Automation

Persistency

Systems thinking

Tinkering

Collaboration

Debugging

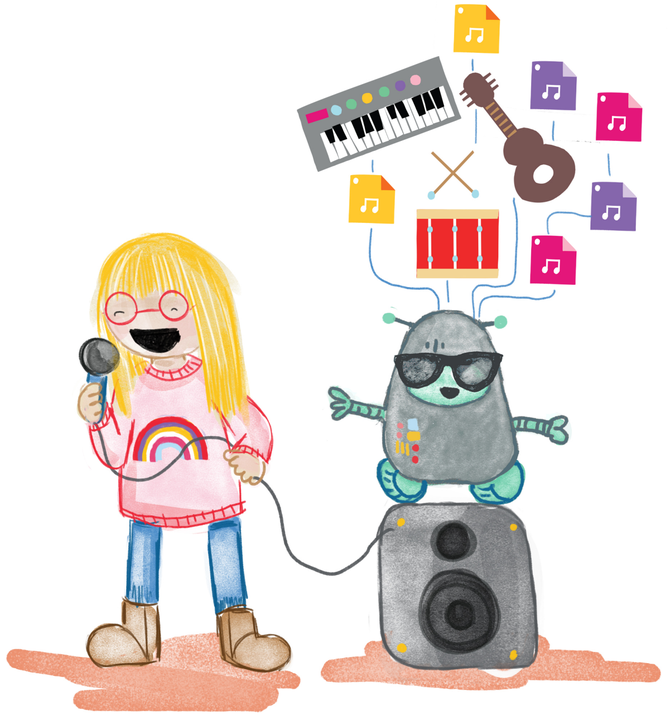
Creativity

Computational thinking

Thinking about problems in a way that allows computers to solve them. Computational thinking is something people do, not computers. It includes logical thinking and the ability to recognise patterns, think with algorithms, decompose a problem, and abstract a problem.

B is for

(boolean) logic



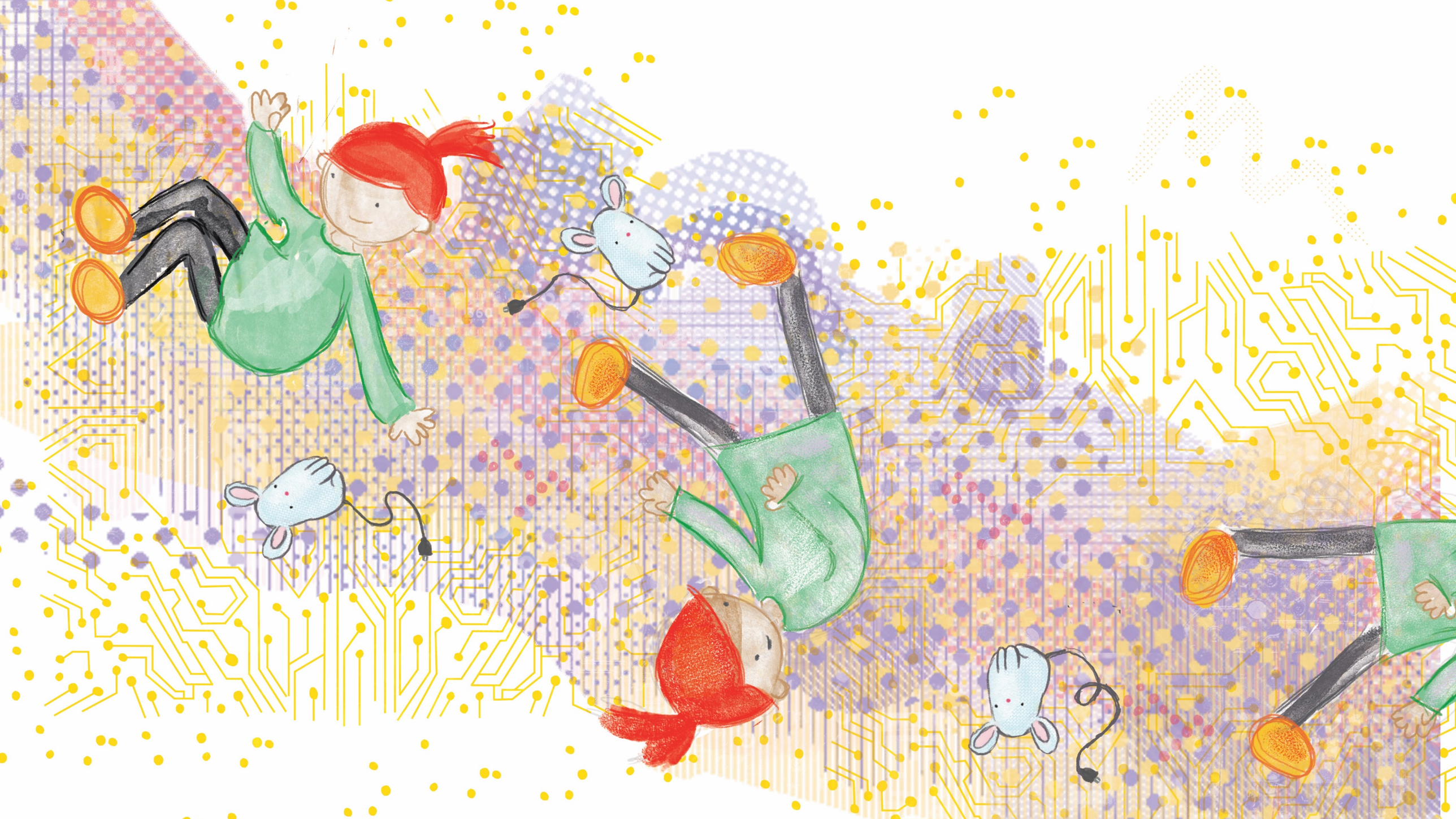


Computers
are
abstraction
machines.



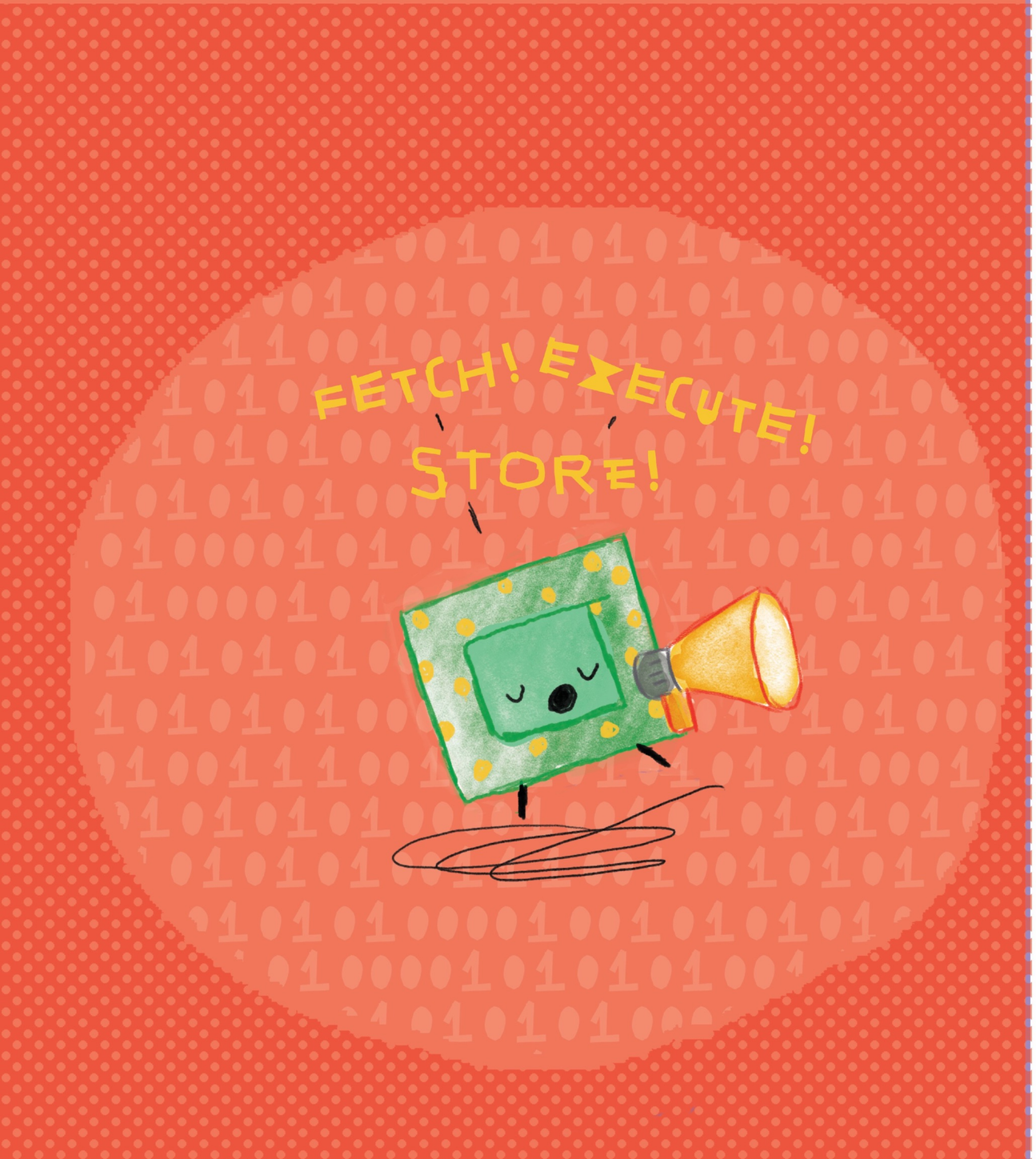


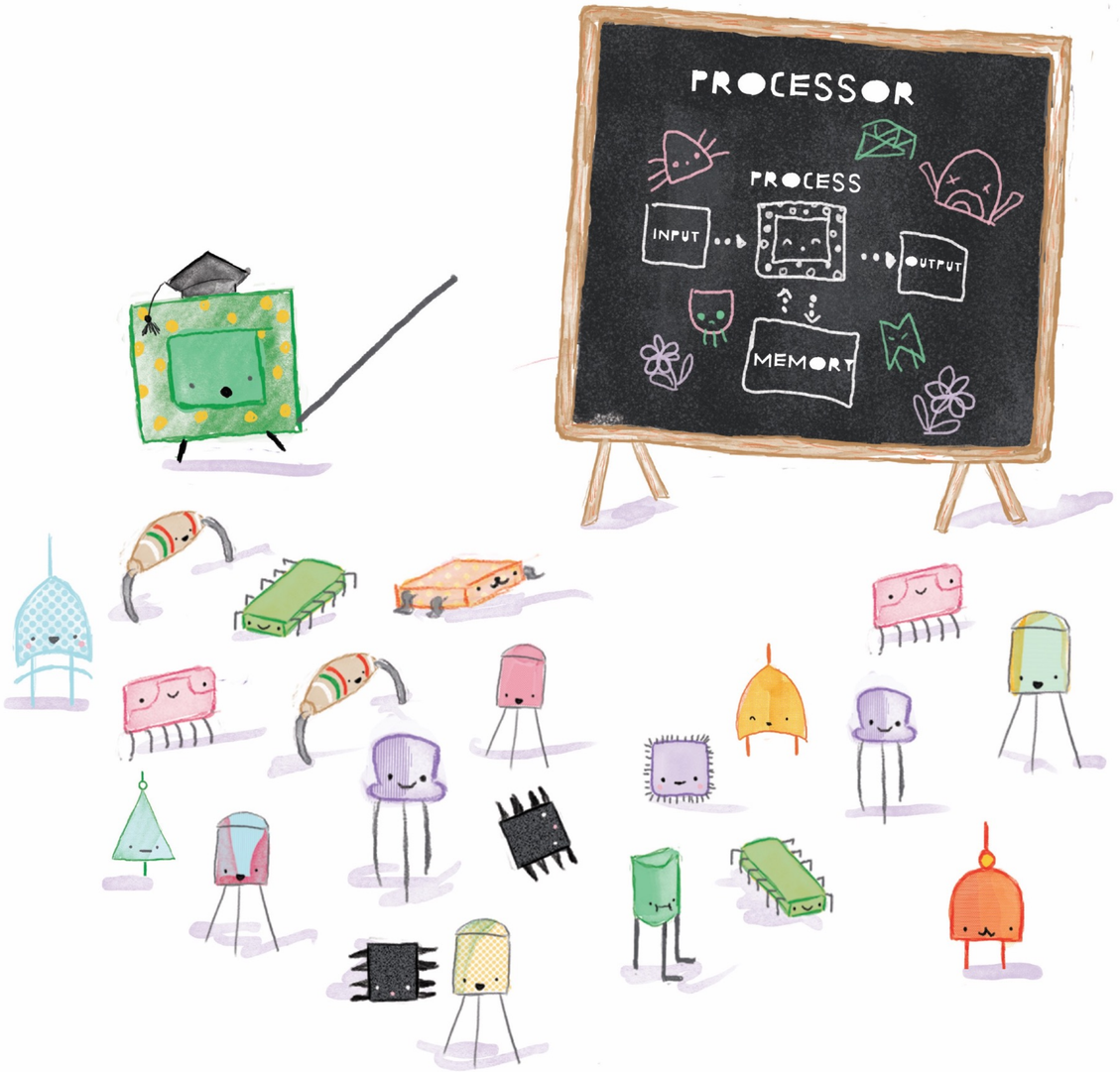


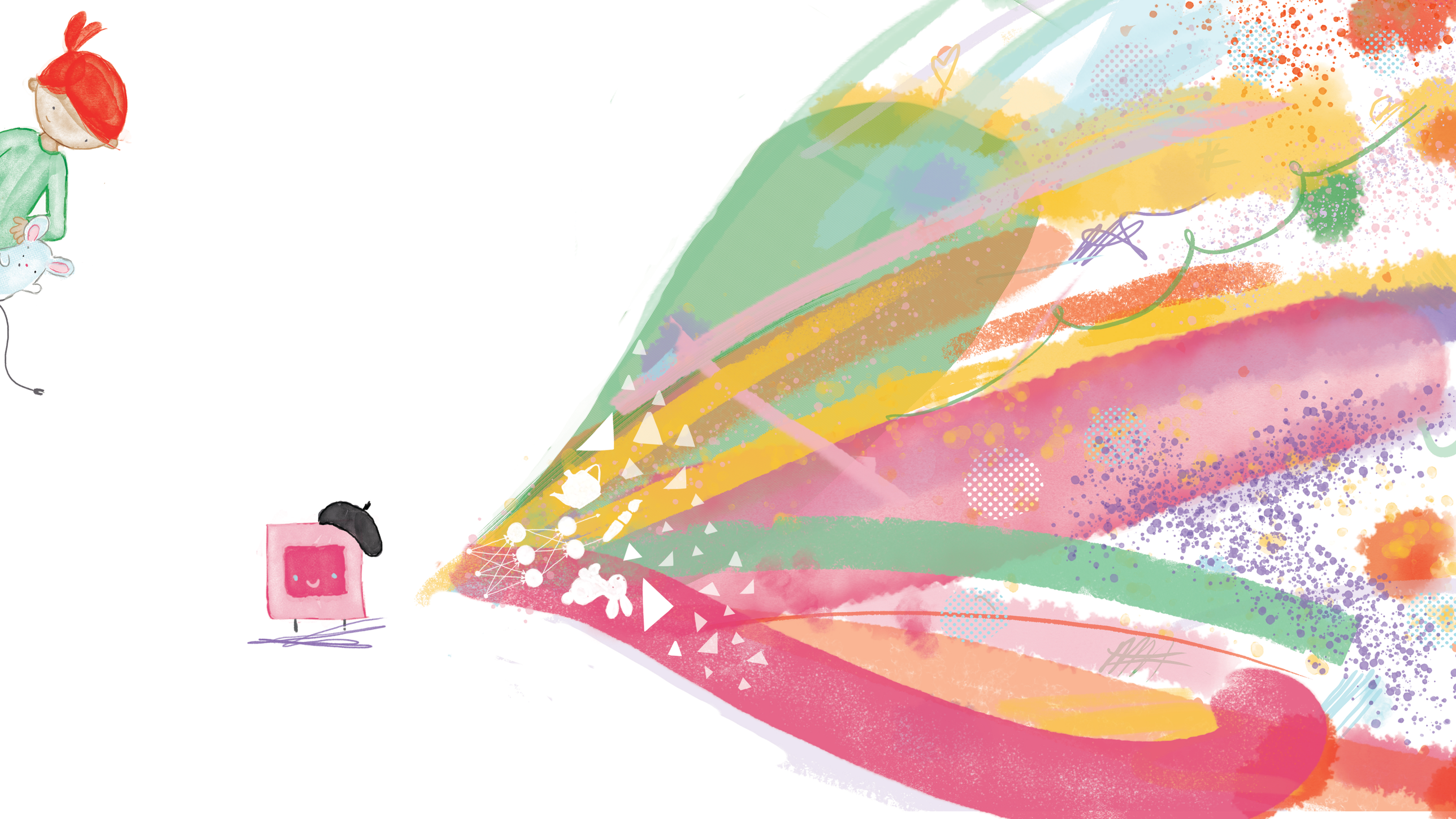




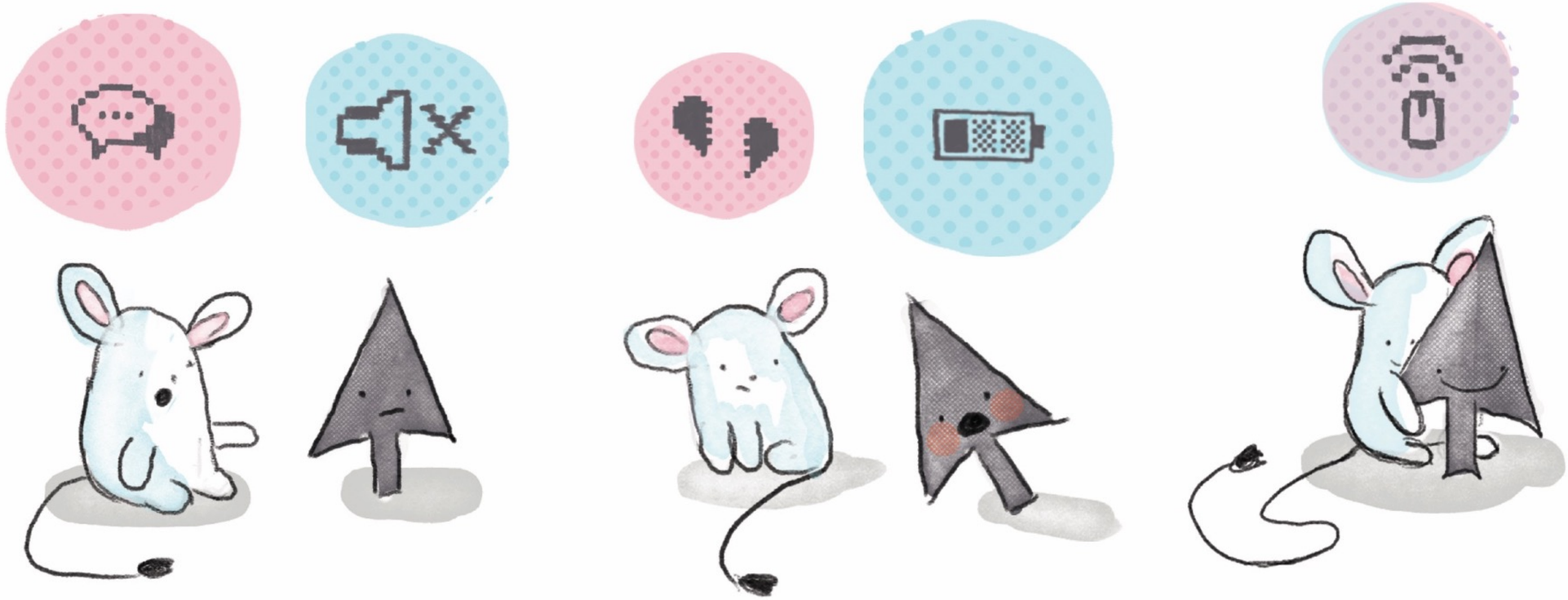

AND
TAI
EI


FETCH! EXECUTE!
STORE!


PROCESSOR
PROCESS
INPUT
OUTPUT
MEMORY



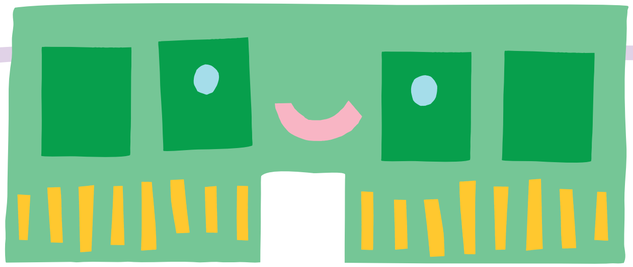

MISSING
SUDO
PROCESSOR
DEVICES
SECURITY
MEMORY
FILES
UTILITIES
HARDWARE
SOFTWARE





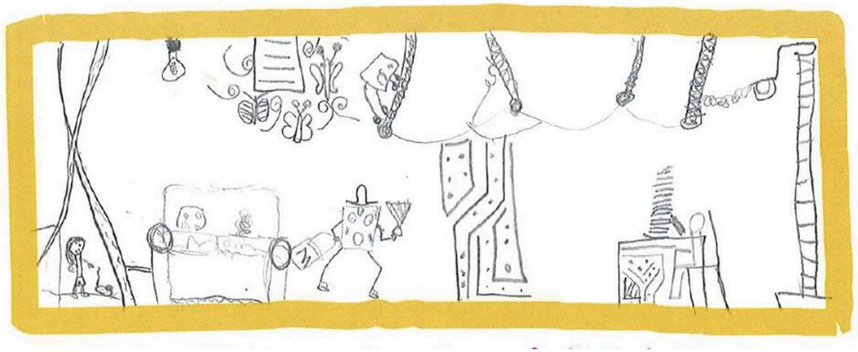
Computers
are
abstraction
machines.

WHAT IS INSIDE A COMPUTER?



Draw!

Draw how you imagine a computer works :)
What does the inside look like? How does it function? Is there magic?



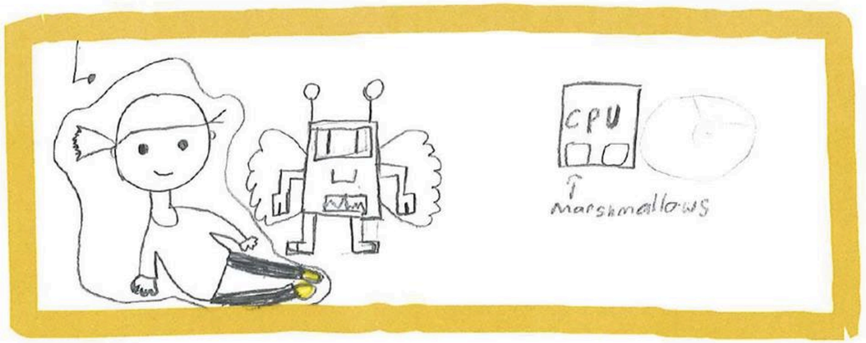
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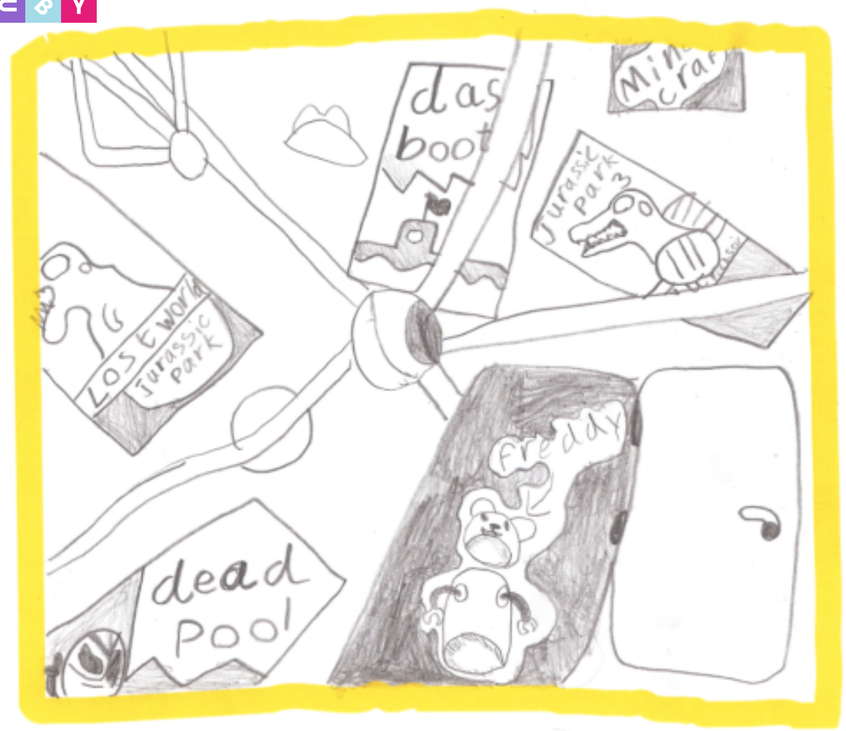


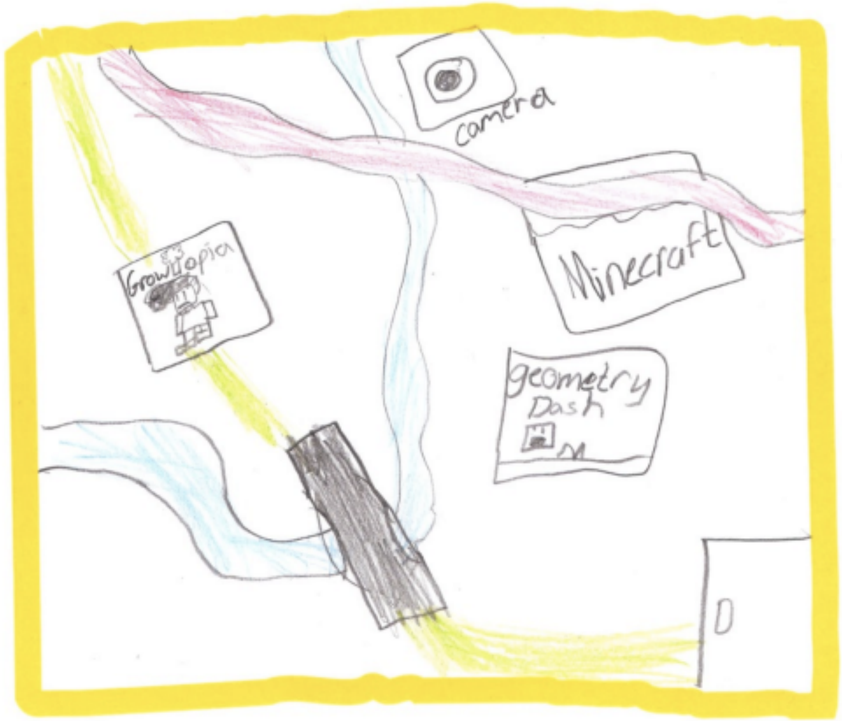
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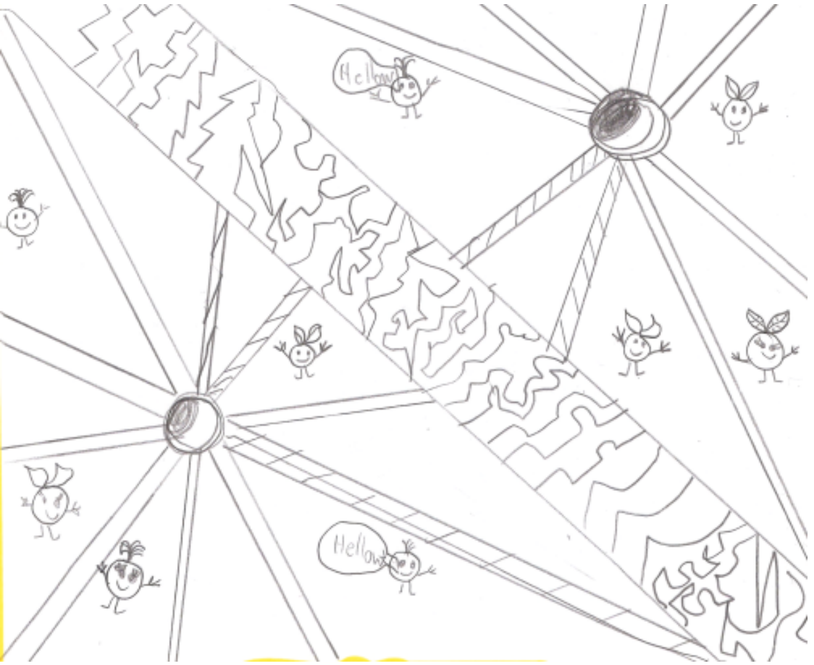
Matthew Scadding's students imaginations are always delightful. What's inside a computer by the Ravenswood year 2 students from Sydney, Australia!

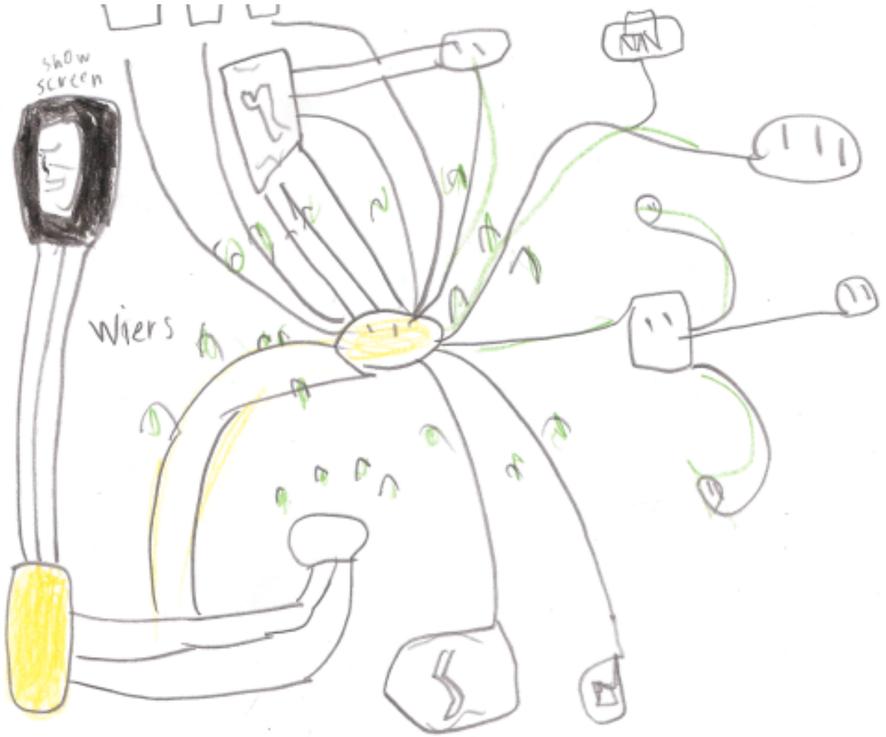


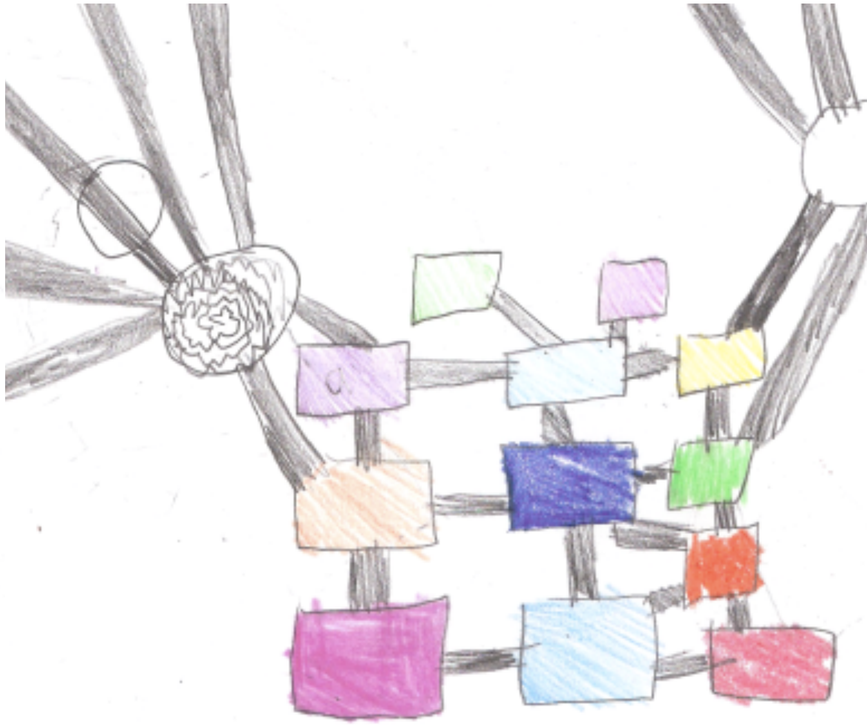


The Content Creators

Kids drawing their apps, games, camera, and files within.
A computer is a concrete place to hold your things inside of.

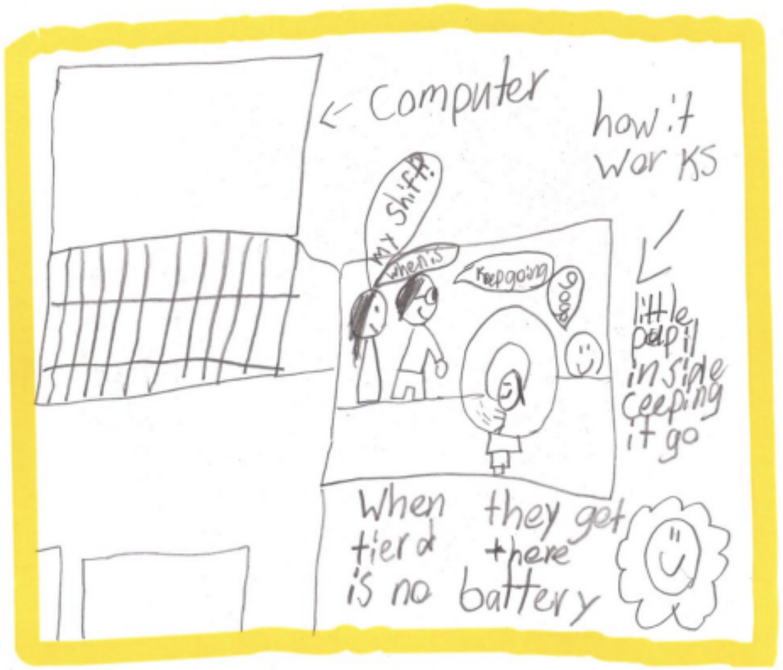






The Linkers

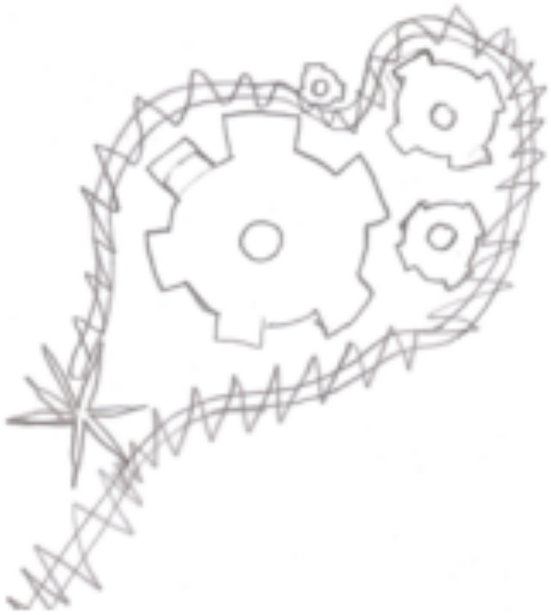
Drawings that expressed connected parts, components, networks and elements by abstract drawings of wire connections and boxes linked with lines.



The Scenographers

The scenographer -kids took the computer to the theatre stage. Carrying out functions was also a popular drawing theme, with some of the kids noting that people or bugs physically carry out functions from one part of the computer to the other.

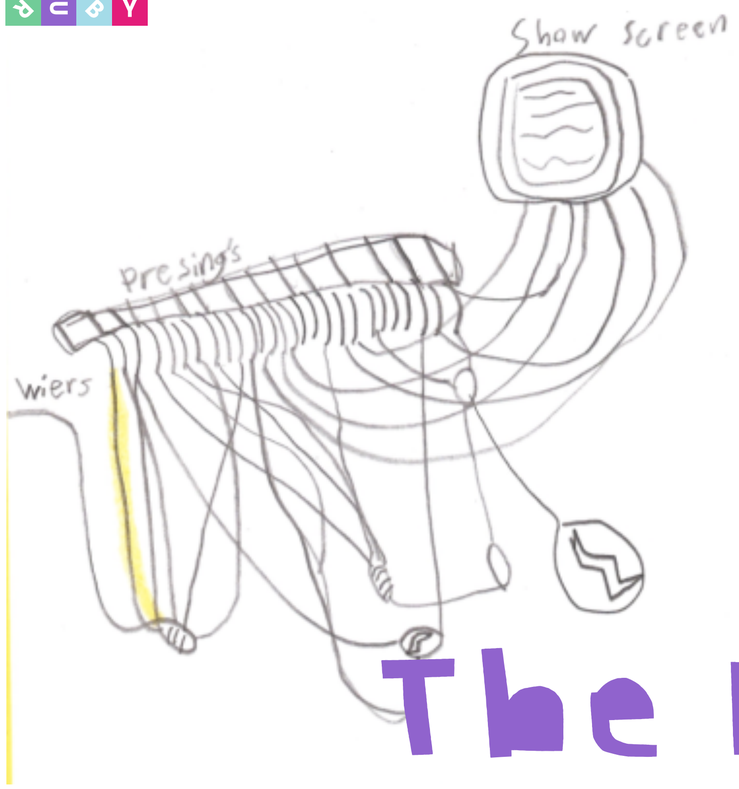






The Gear Gurus

Represented computers as gears interlocking for a mechanical action to be carried out.





The Drafters

Super technical drawings included resistors, wires, motherboards, and everything electronic to show that there exists nothing but elements which a current runs through. **To our interpretation of their drawing, a computer is based on logic not magic, on connections not abstract things.**

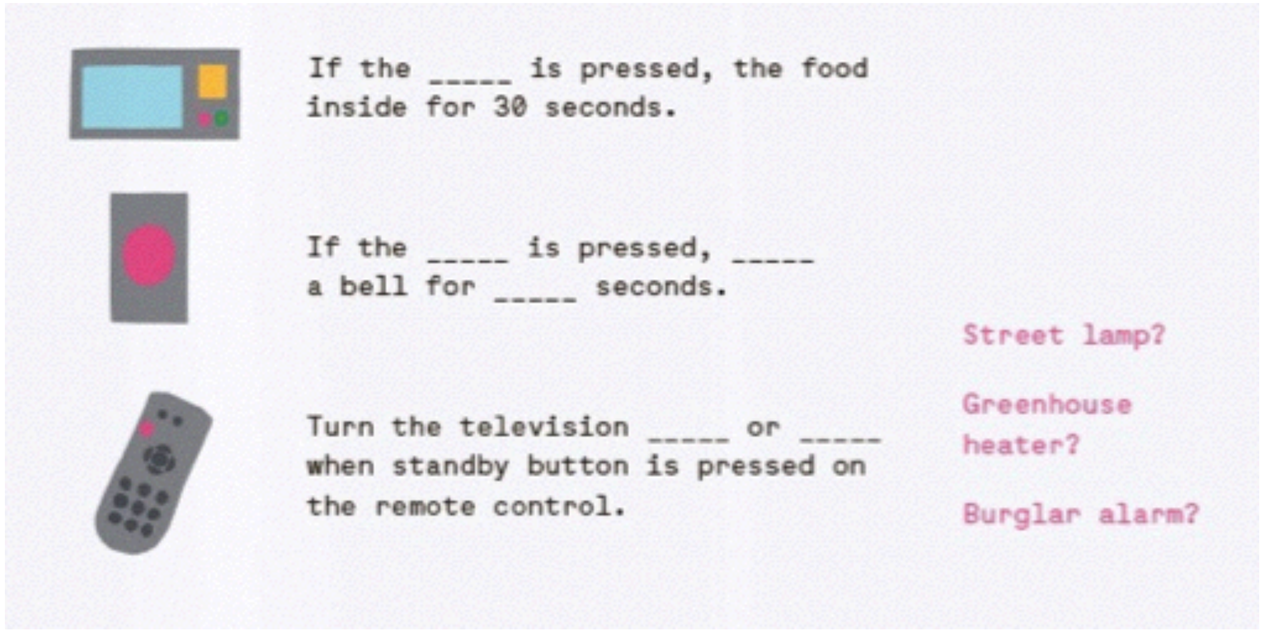


Computers
are
abstraction
machines.



www.helloruby.com

There’s hundreds of computers in every home.







My MagiCal ComPUTer

1 This is what I made into a computer:

2 The name of my computer:

3 When I press the on/off button my computer will:

Draw a picture of yourself using your new computer.

Computers have sensors that can recognize changes in the environment. Color the sensors your computer has and describe what they do.

- **Orientation.**
- **Temperature.**
- **Vibration.**
- **Moisture.**
- **Internet.**

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YOU ARe GREAT!

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www.
helloruby.
com

I/O

Charles Babbage, Alan Turing, John von Neumann

CPU

Input

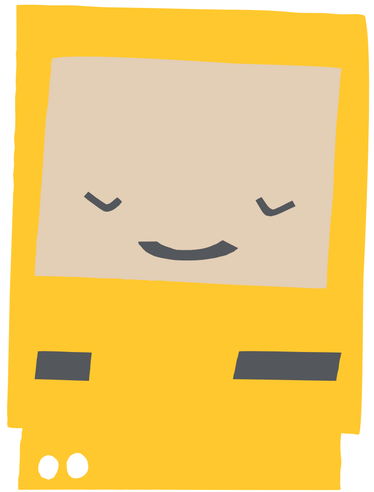
Control Unit

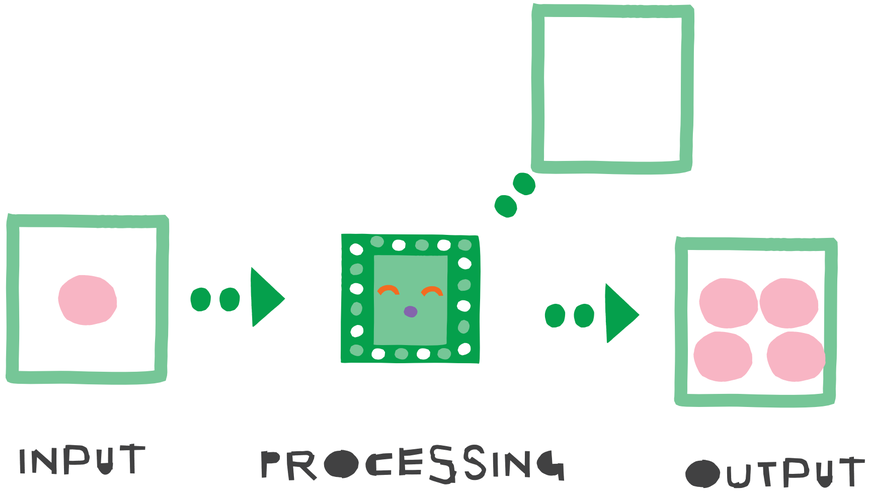
Arithmetic Logic Unit

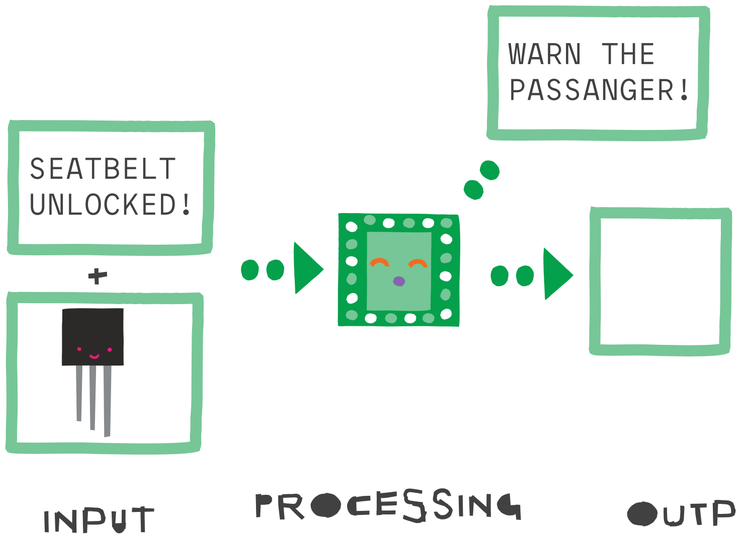
Immediate access store

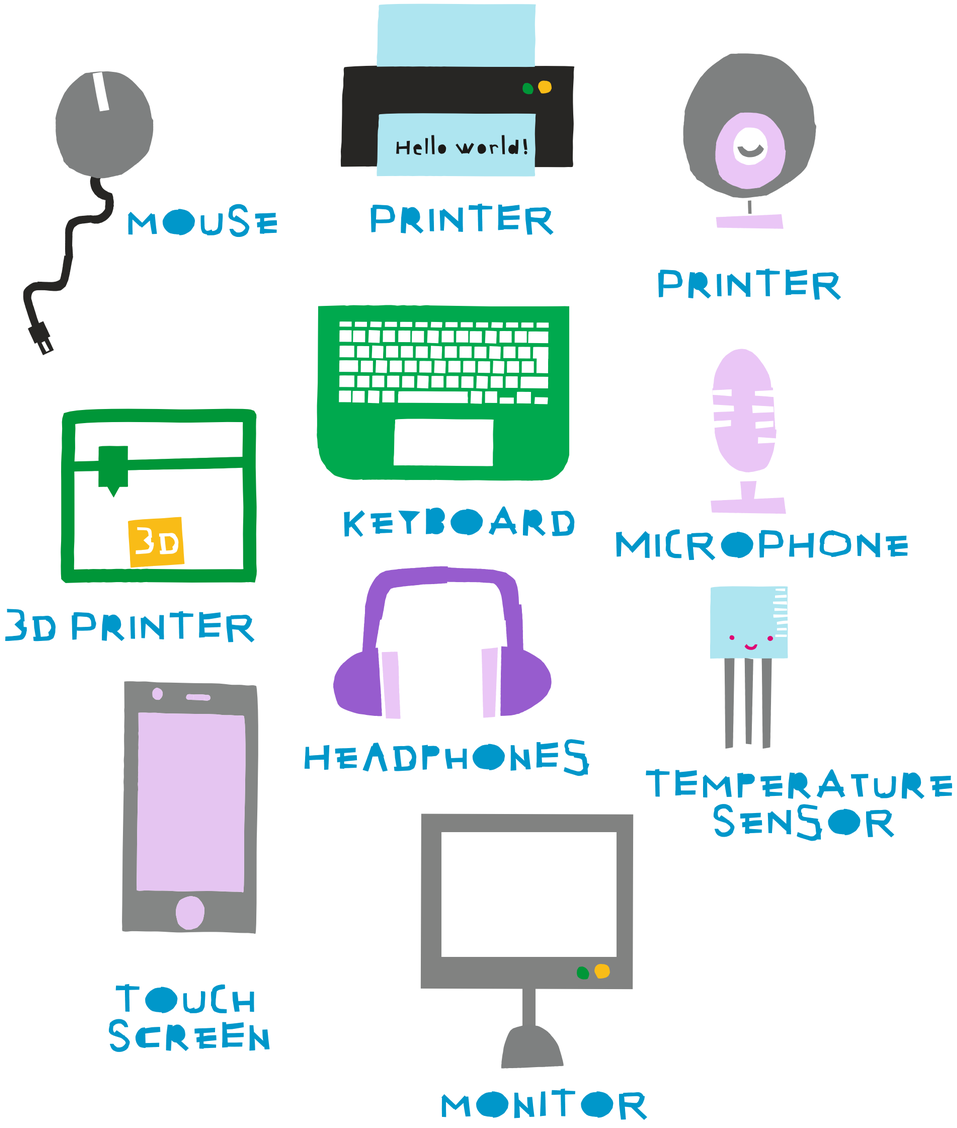
Program, Data and modified data

Output




INPUT
PROCESSING
OUTPUT


SEATBELT UNLOCKED!
+
WARN THE PASSANGER!
INPUT
PROCESSING
OUTPUT

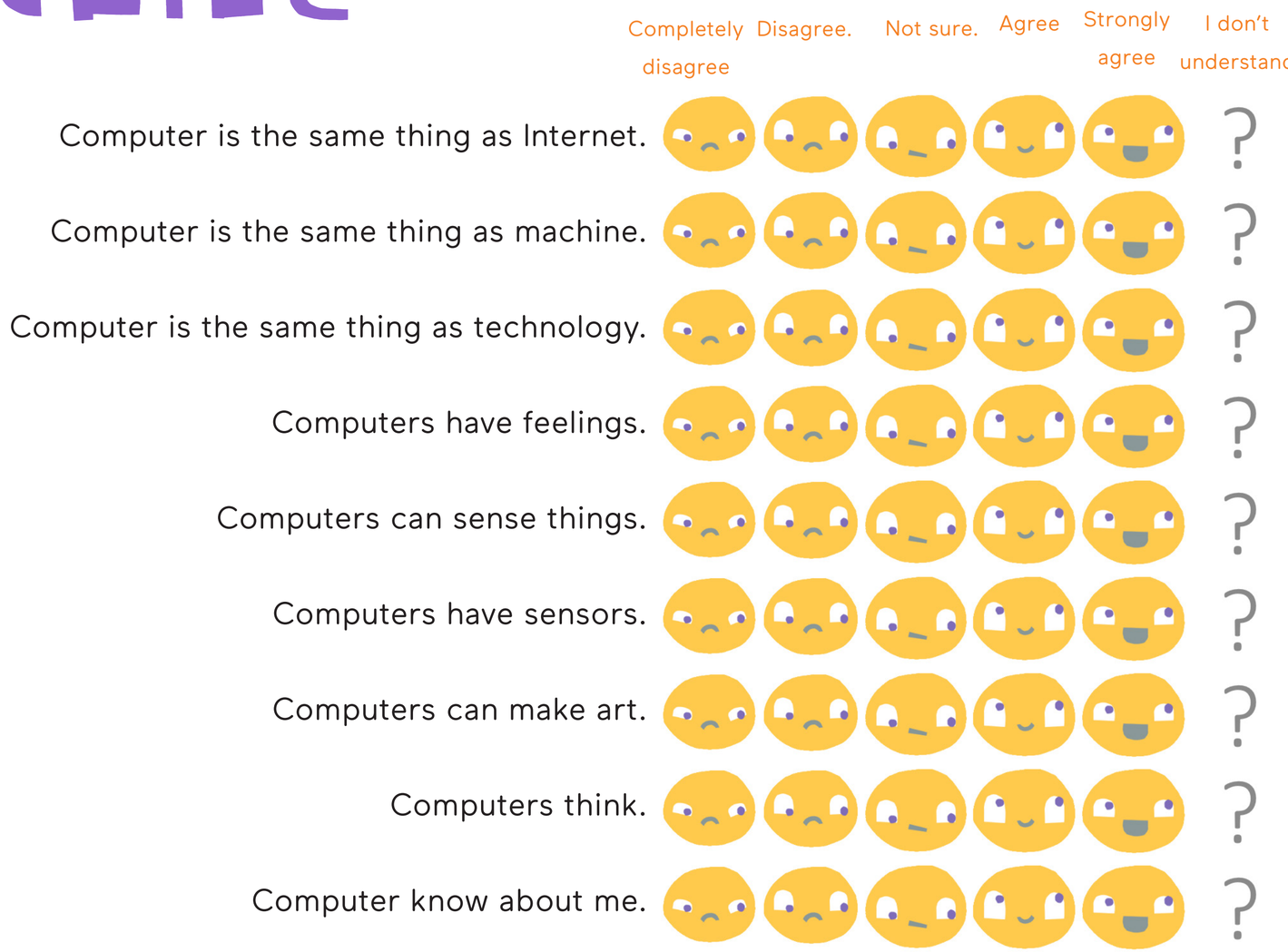

MOUSE
Hello world!
PRINTER
PRINTER
3D
3D PRINTER
KEYBOARD
MICROPHONE
HEADPHONES
TEMPERATURE SENSOR
TOUCH SCREEN
MONITOR


designguggenheimhelsinki.org/about.
Valintaprosessissa tunnistettiin joukko finaalikelpoisia ehdokkaita. Tuomaristo jatkoi
Ecclésiaamaan ja arvioi jatkoon päässeitä töitä seuraavin kriteerein: kaupunkikuvan mittakaava, jäsen-
telyn, vuorovaikutus ympäröivien julkisten tilojen kanssa, galleriatilojen käytön joustavuus, näyttävyys,
materiaalien käyttö, näyttävyys, kekseliäisyys tai kattavuus sekä ilmasto-olojen huomioon ottaminen
ja teknologian hyödyntäminen.
Valittuaan kuusi finalistia tuomaristo antoi kunniamaininnan 15:lle erityisen ansioituneelle
kilpailutyölle.
SV
Den elvahövdade tävlingsjuryn hade följande sam-
mansättning: sex finländska experter på arkitek-
tur, urbanism, teknik och hållbar utveckling,
fyra utländska arkitekter och huvudkuratorn vid
Solomon R. Guggenheim Foundation. Under fyra
dagar i Helsingfors i november 2014 bedömde
juryn varje bidrag enligt fem nyckelkriterier:
stadsbild, arkitektur, användbarhet, hållbarhet
och genomförbarhet.
Jutyn bedömde och återkom till varje bidrag
och kasserade sådana som inte i tillräcklig
utsträckning beaktade byggplatsen karaktär och
omgivning, byggregler, huvudplanen för områ-
det eller utställningsutrymmenas funktion och
anpassbarhet. En fullständig beskrivning av kri-
terierna finns i tävlingsreglerna (Competition
Conditions): designguggenheimhelsinki.org/about.
Genom utvalsprocessen utkristalliserades
en grupp finalistkandidater. Under sitt arbete
på det slutliga valet av finalister besökte jutyn
den tilltänkta byggplatsen i södra hamnen och
gick på nytt igenom förslagen på listan med föl-
jande kriterier: stadsbildens skala, organi-
satoriskt koncept, växelverkan med närliggande
offentliga rum, belysningens kvalitet och karak-
tär, disposition av museiutrymmen, användning
av material, designens uttryck, uppfinningsrike
dom eller karisma samt beaktande av klimat och
utnyttjande av teknik.
Efter att ha utsett de sex finalisterna, gav
juryn 15 särskilt förtjänstfulla tävlingsbidrag
ett hedersomnämnande.
EN
The competition jury is comprised of 11 members:
six Finnish experts on architecture, urbanism,
engineering, and sustainability; four inter-
national architects; and the chief curator of
the Solomon R. Guggenheim Foundation. Over the
course of four days in Helsinki in November
2014, the jury evaluated every entry by five key
criteria related to cityscape, architecture,
usability, sustainability, and feasibility.
The jury reviewed and reconsidered each
submission, ultimately discarding submissions
that demonstrated little or no sensitivity to
the site and its context; practical building
regulations; the site master plan; or the func-
tioning or flexibility of gallery spaces. A full
list of criteria can be found in the Competition
Conditions: designguggenheimhelsinki.org/about.
The selection process yielded an initial
list of viable candidates. As they approached
their decision, the jury visited the site on
the South Harbor and further reviewed this list
based on urban scale; organizational concept;
connections to civic spaces; quality and char-
acter of light; programming of museum space; use
of materials; intrinsic flair, insight, or design
charisma; and responsiveness to climate and
technology.
After selecting the six finalists, the jury
distinguished fifteen inspired submissions as
honorable mentions.

Notional machine

“An abstraction of the computer that one can use for thinking about what a computer can and will do.”
- Benedict DuBoulay

“We want students to understand what a computer can do, what a human can do, and why that’s different. To understand computing is to have a robust mental model of a notional machine.”
- Mark Guzdial

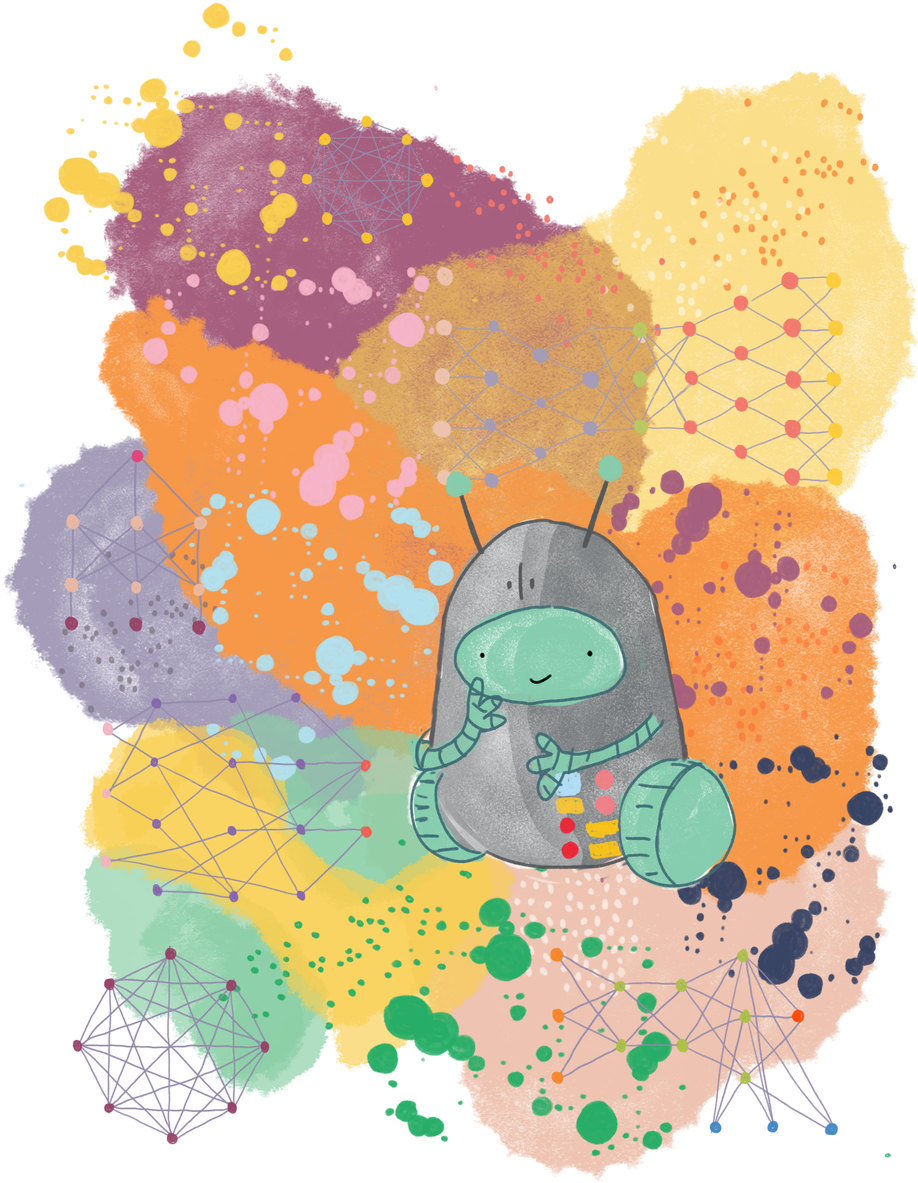


C

is for

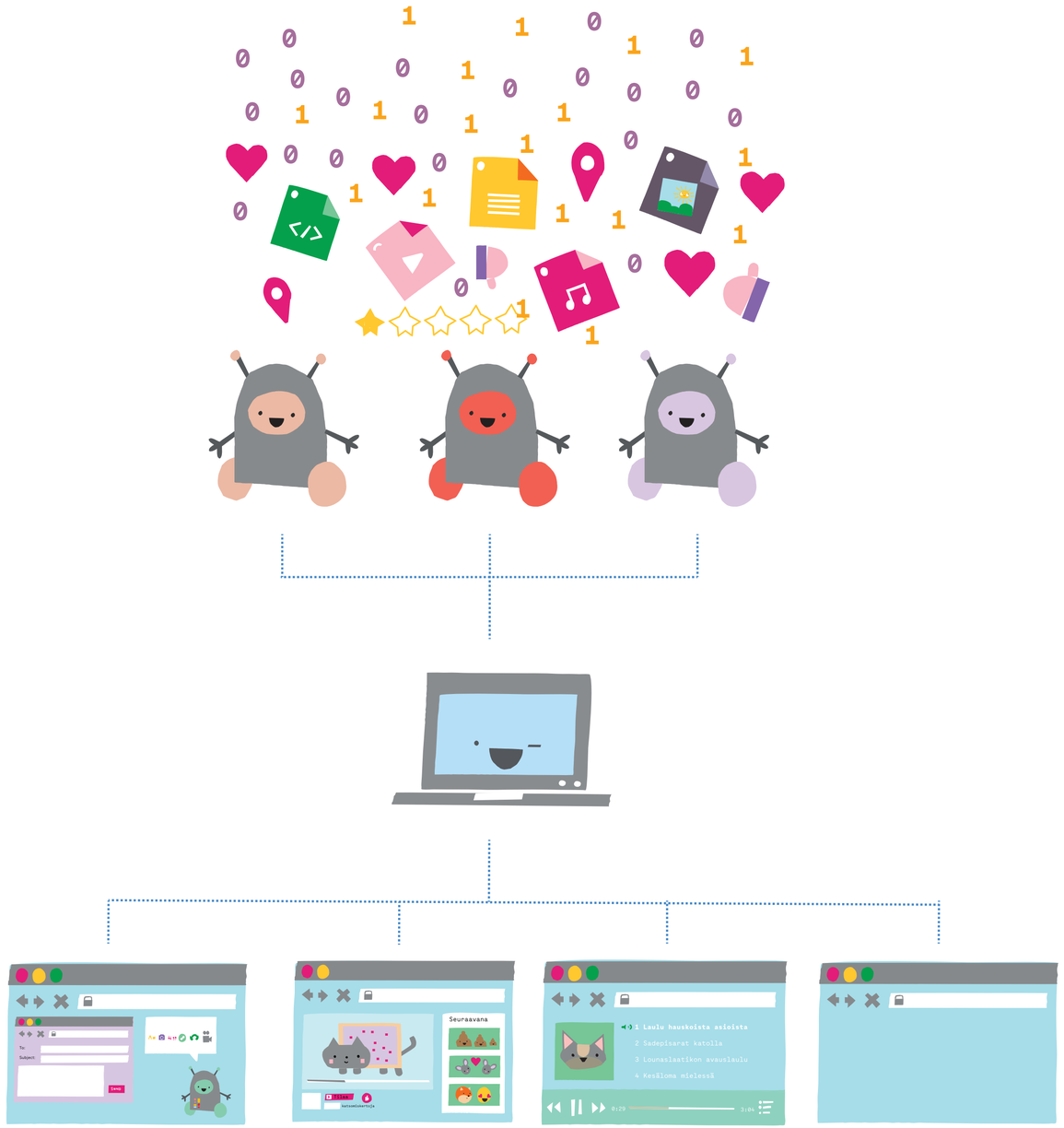
creativity anc
computers





Here be the dragons

www.helloruby.com

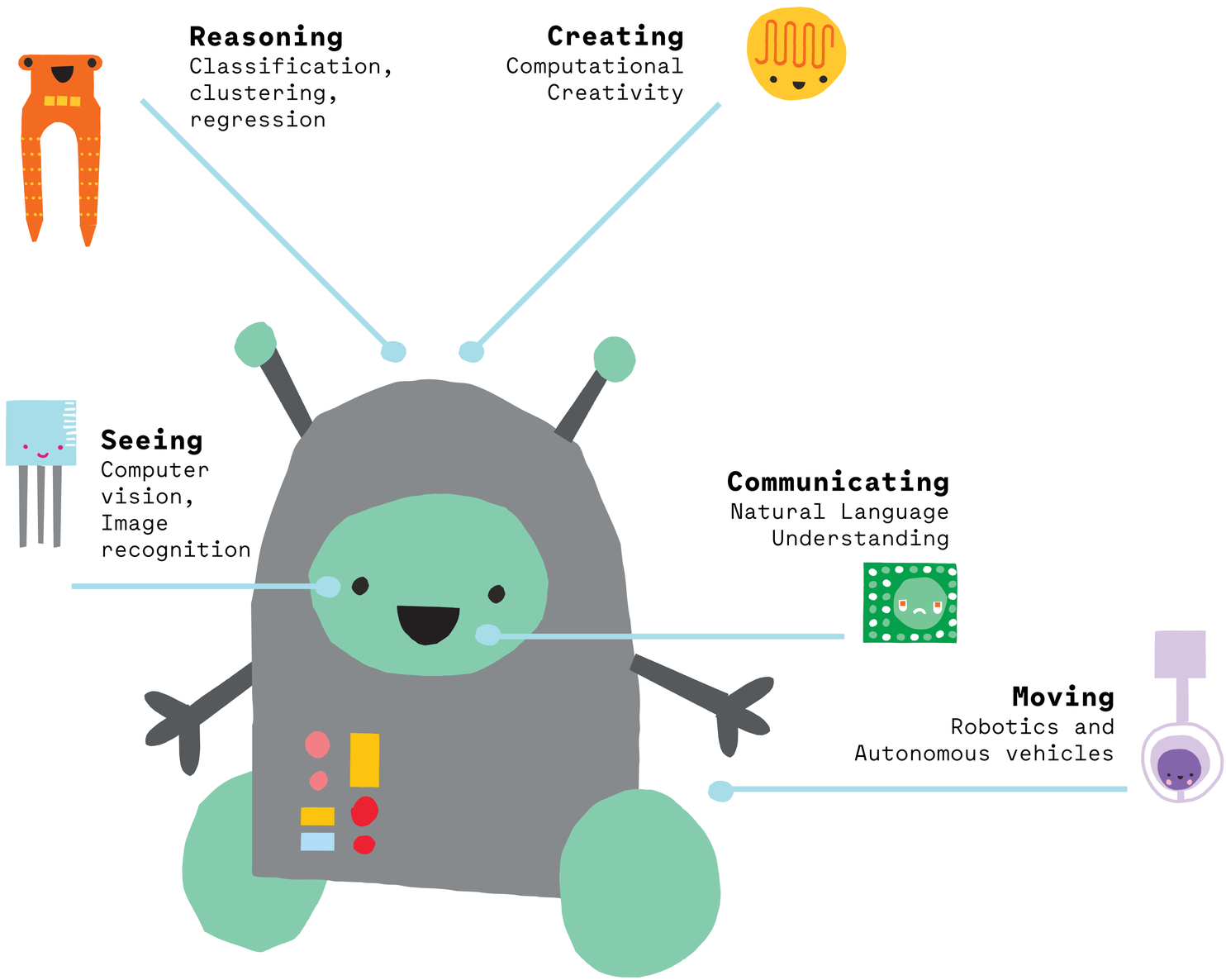

Seuraavana
1 Laulu hauskoista asioista
2 Sadepisarat katolla
3 Lounaslaatikon avauslaulu
4 Kesäloma mielessä



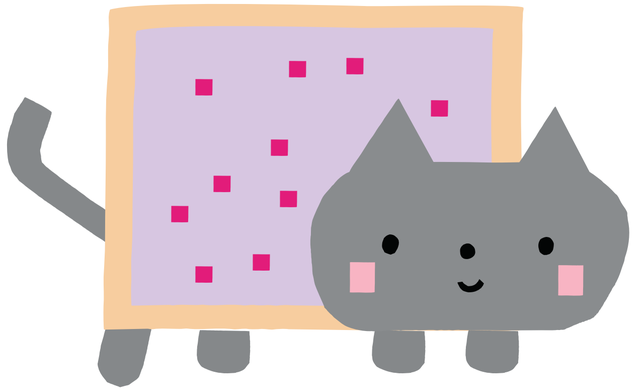
Data what?

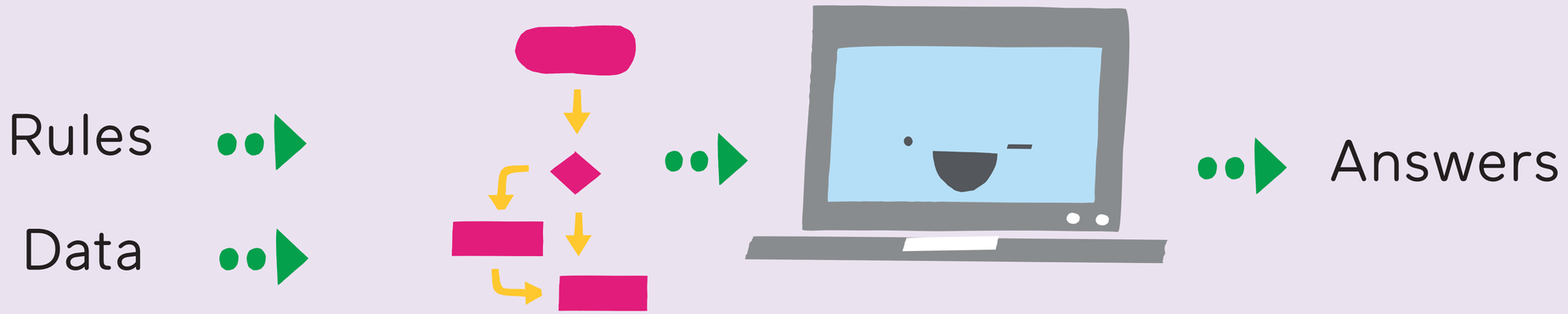
Behavioural, aggregated, big, incidental, demographic, derived, data.

Machine Learning

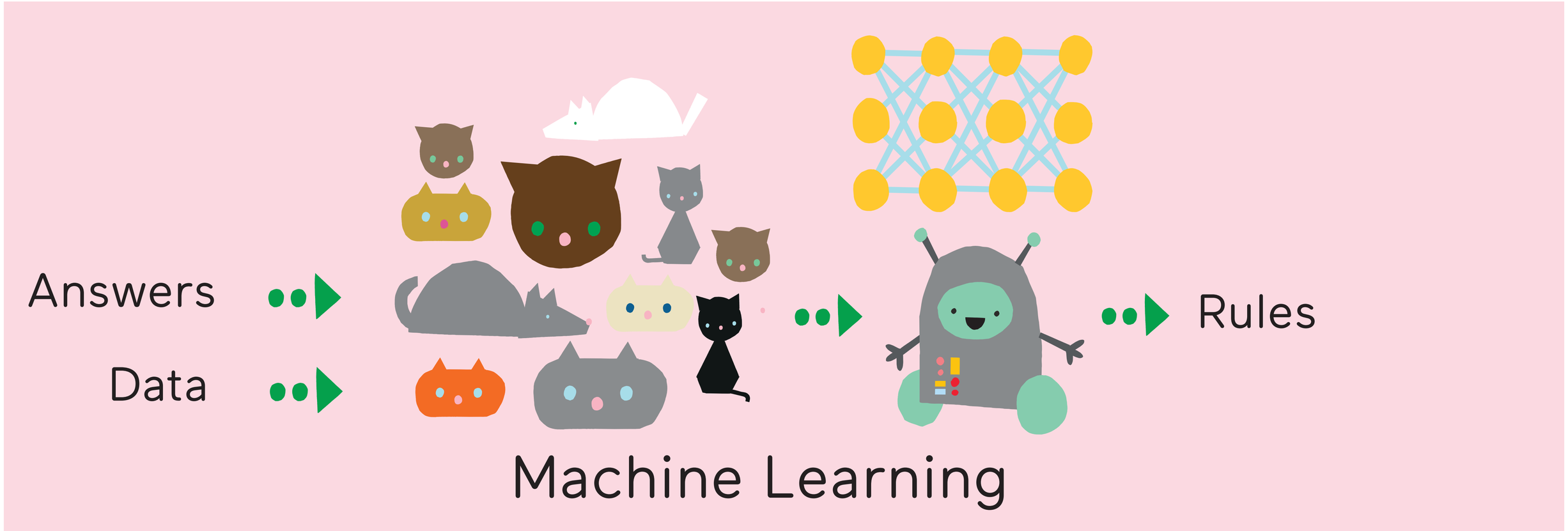


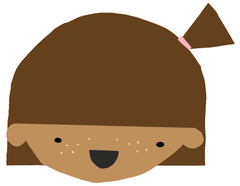
Is this a cat?





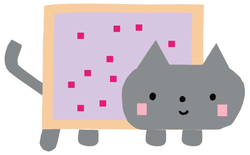
Traditional programming


Answers
Data
Rules
Machine Learning



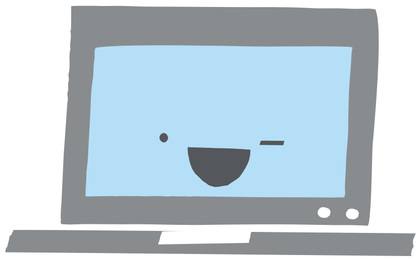
PROBLEM TO SOLVE

Is this a cat?





ANSWER THE QUESTION



GATHER DATA

Examples of cats

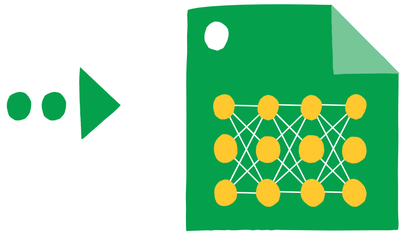


GATHER DATA

Examples of cats



BUILD A MODEL

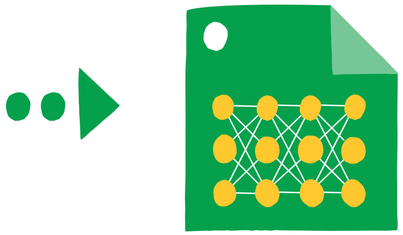


GATHER DATA

Examples of cats



BUILD A MODEL



ANSWER THE QUESTION

Yes!

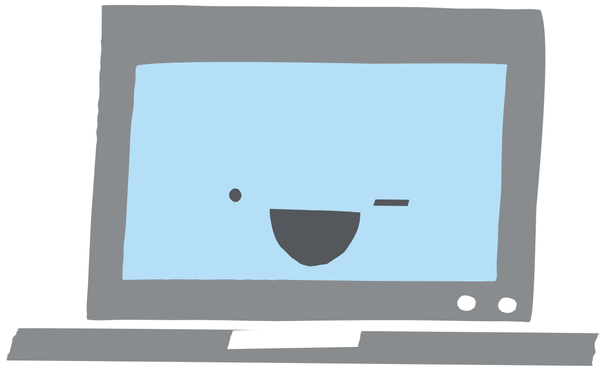


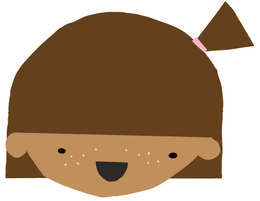
in



out

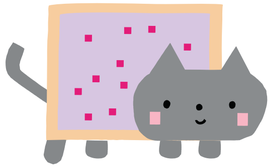
```
snowleopard  CERTAIN, 0.6
cat          LIKELY, 0.39
monkey       UNLIKELY, 0.01
```





PROBLEM TO SOLVE

Is this a cat?



ANSWER THE QUESTION

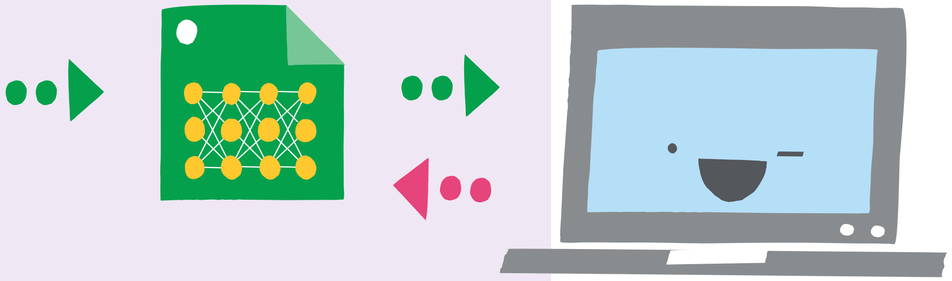
Yes!

GATHER DATA

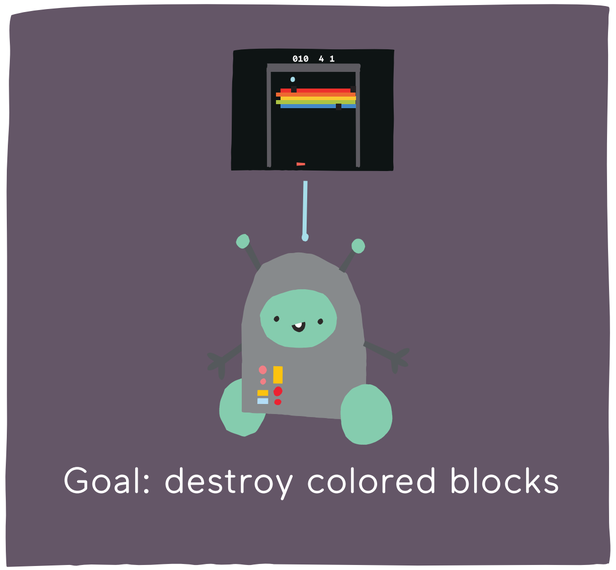
Examples of cats



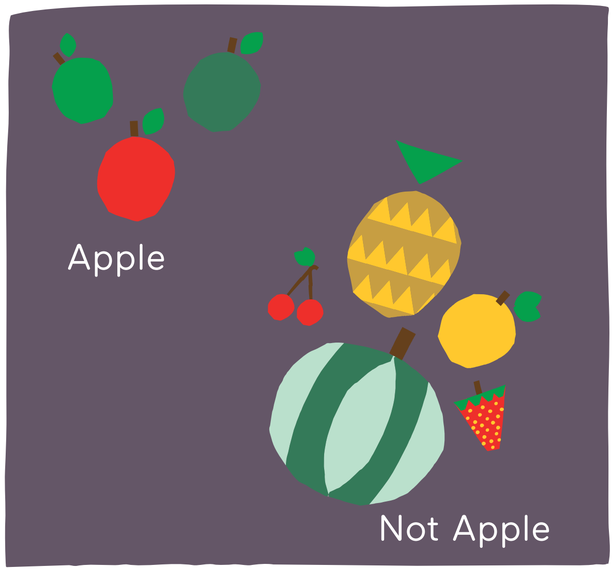
BUILD A MODEL



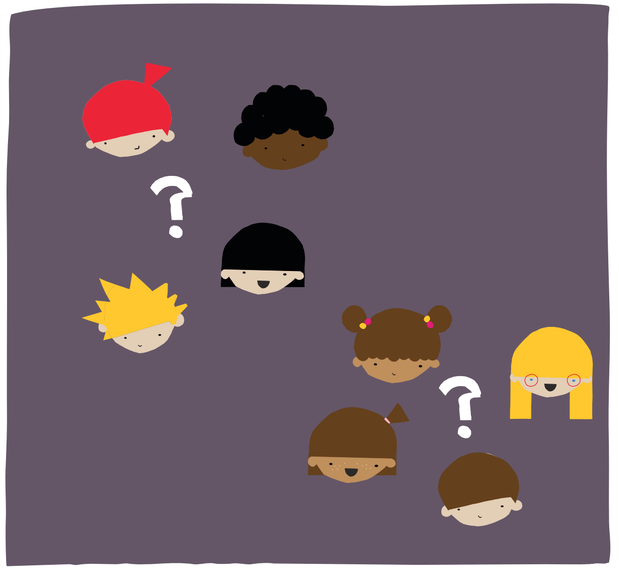
UPDATE MODEL



Reinforcement learning

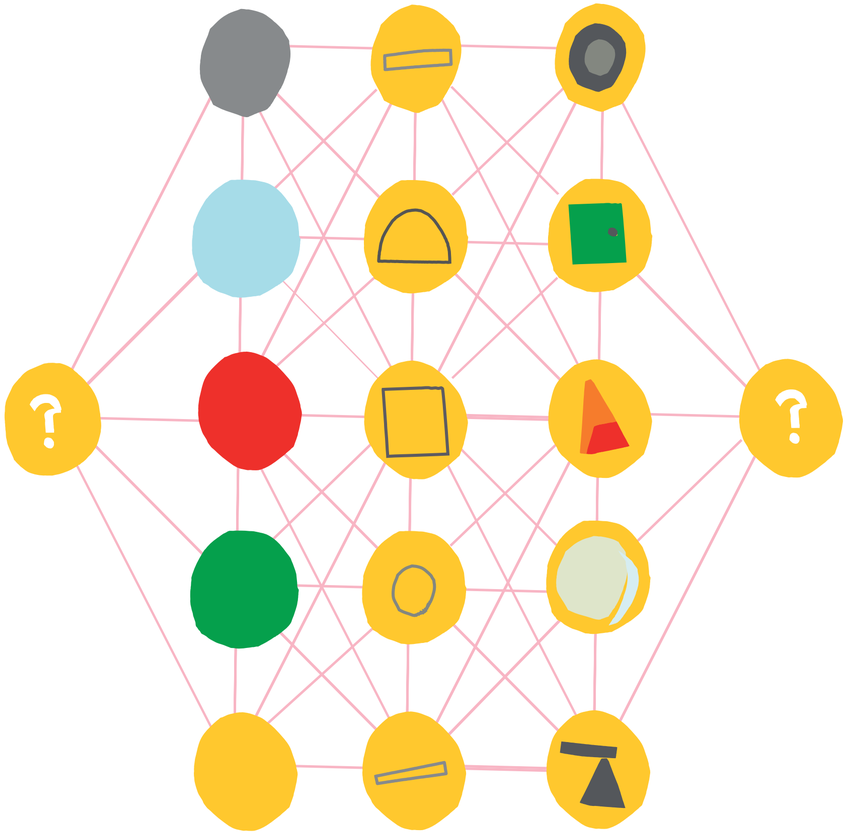


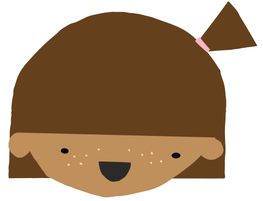
Supervised Learning Algorithms



Unsupervised Learning Algorithms

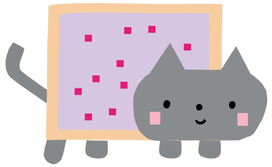



Colors
Edges
Parts
?
?



PROBLEM TO SOLVE

Is this a cat?



ANSWER THE QUESTION

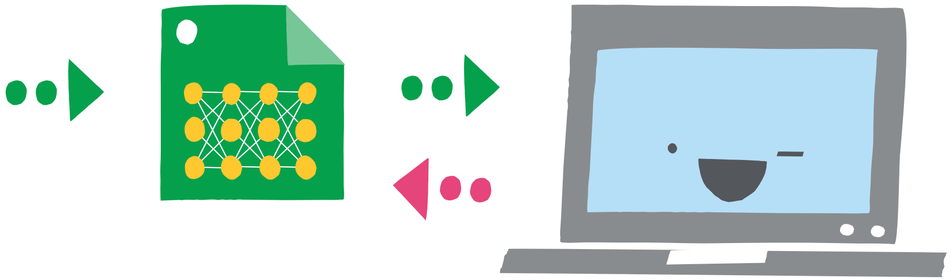
Yes!

GATHER DATA

Examples of cats



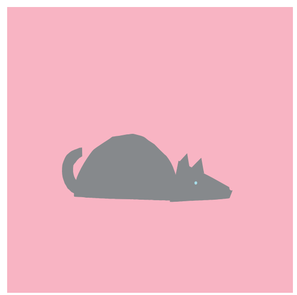
BUILD A MODEL

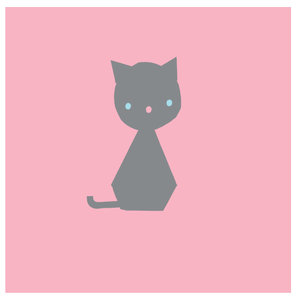


UPDATE MODEL

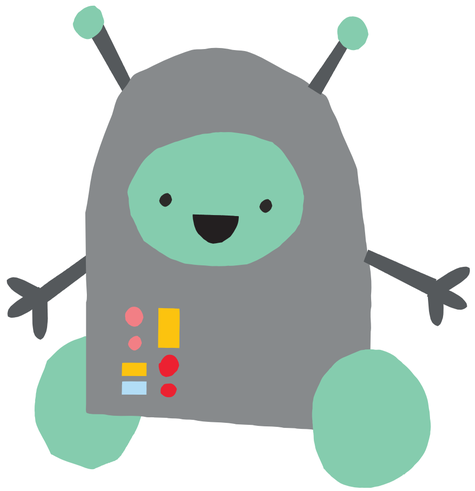
www.helloruby.com



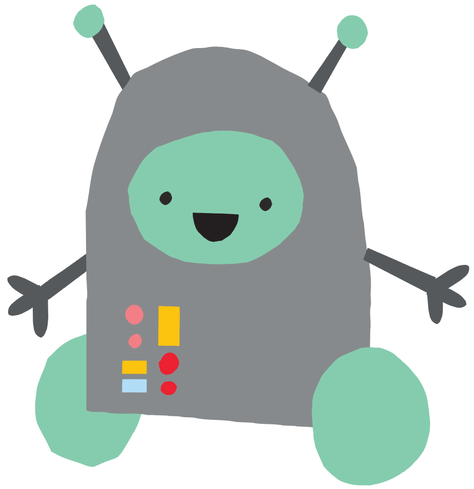


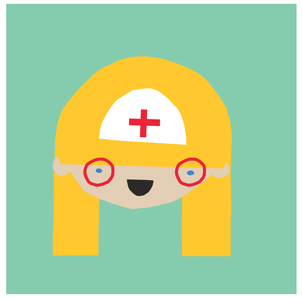
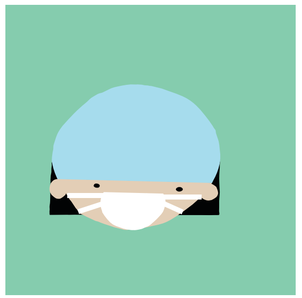


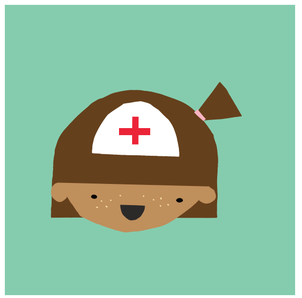
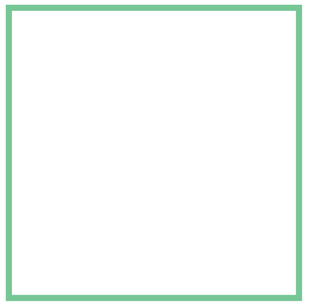
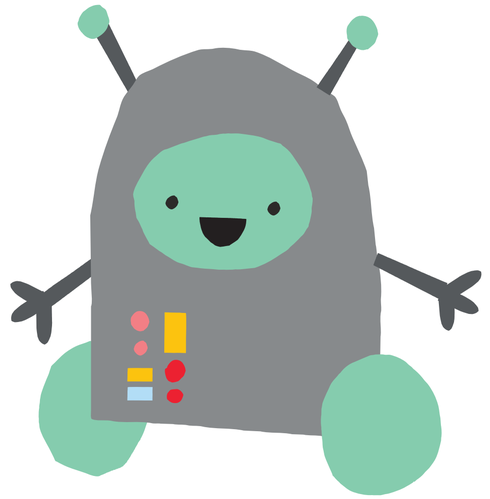




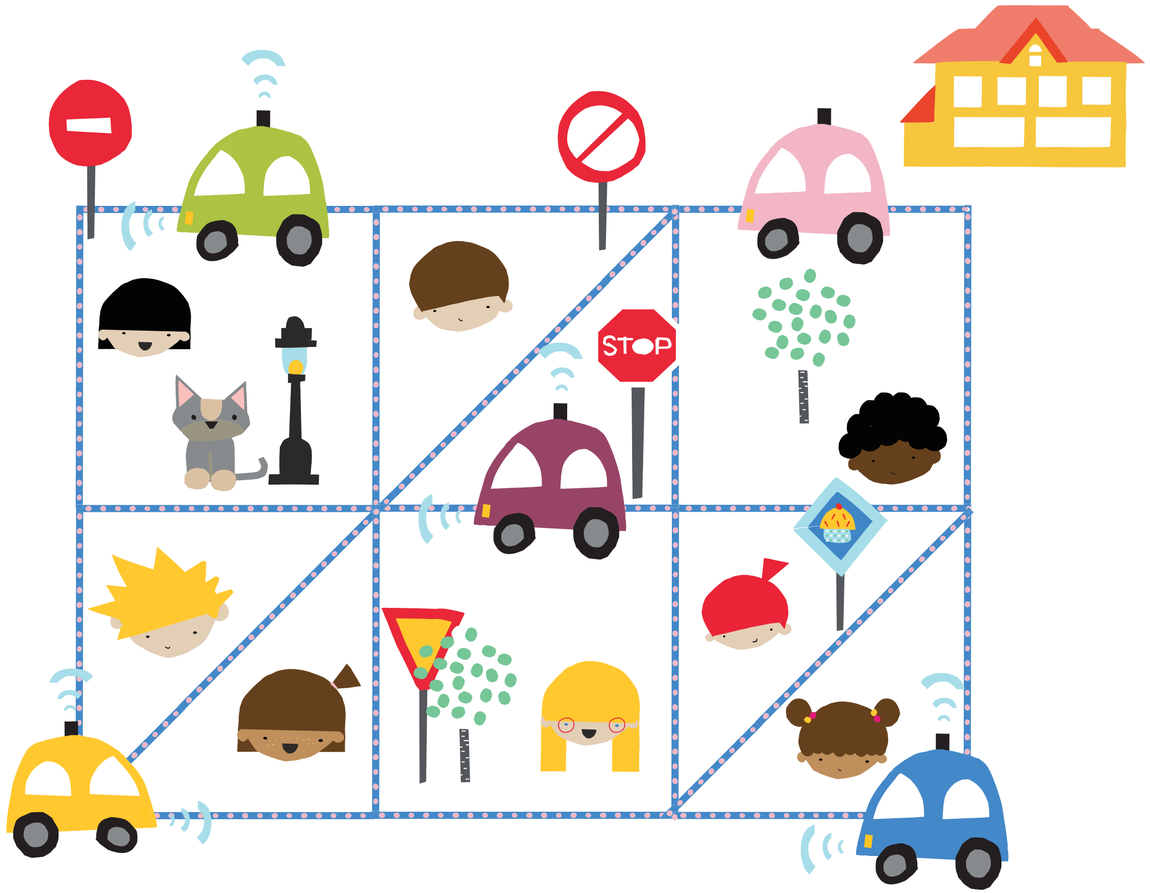




INPUT	OUTPUT	APPLICATION
Picture	Are there human faces (0 or 1)	Photo tagging
English sentence	French sentence	Translation
Car cameras	Position of other cars	Self-driving cars
Audioclip	Transcript of audio clip	Speech recognition

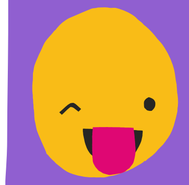


INPUT	PROCESS	OUTPUT
Car cameras	Map of position of other cars	Driving

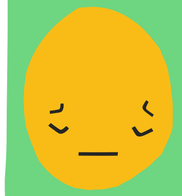
I'M GOOD AT:



MY COMPUTER IS GOOD AT:



I'M NOT SO GOOD AT:



MY COMPUTER IS NOT SO GOOD AT:



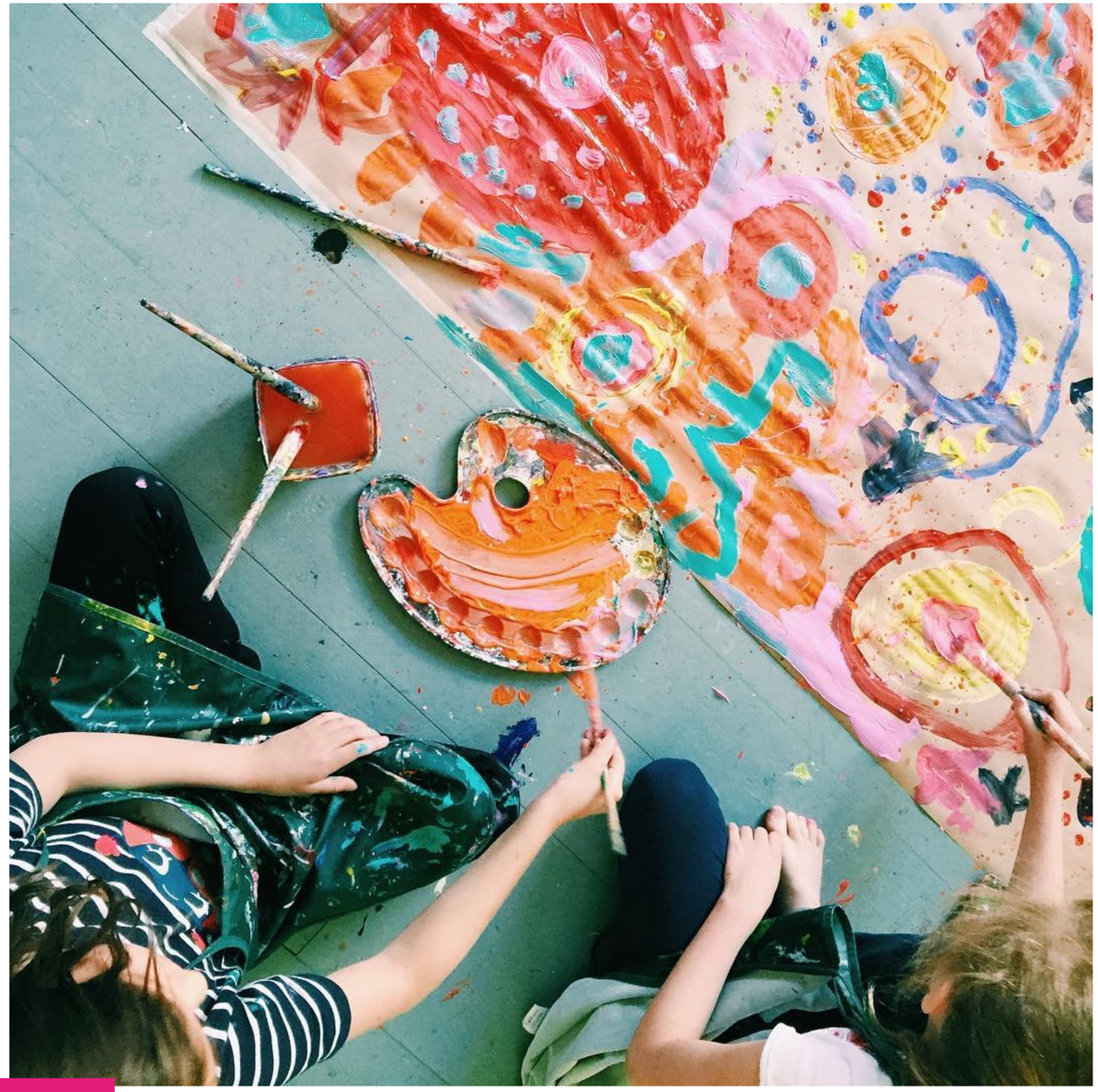
AFTER DOING THIS EXERCISE I FEEL:



AFTER DOING THIS EXERCISE MY COMPUTER FEELS:

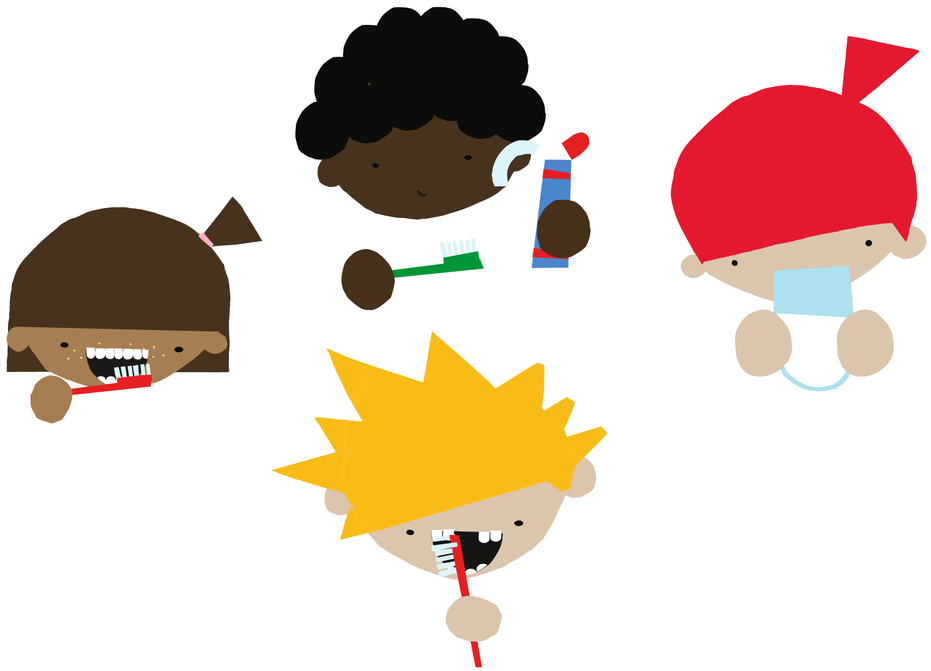


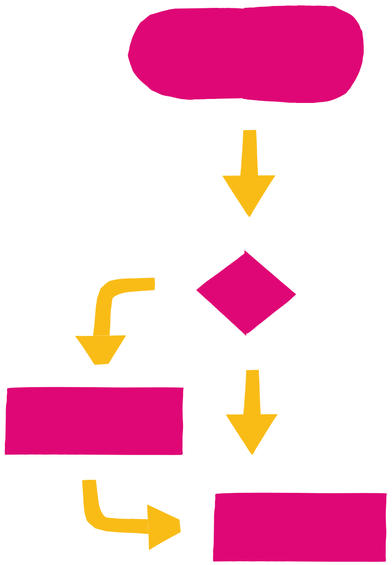
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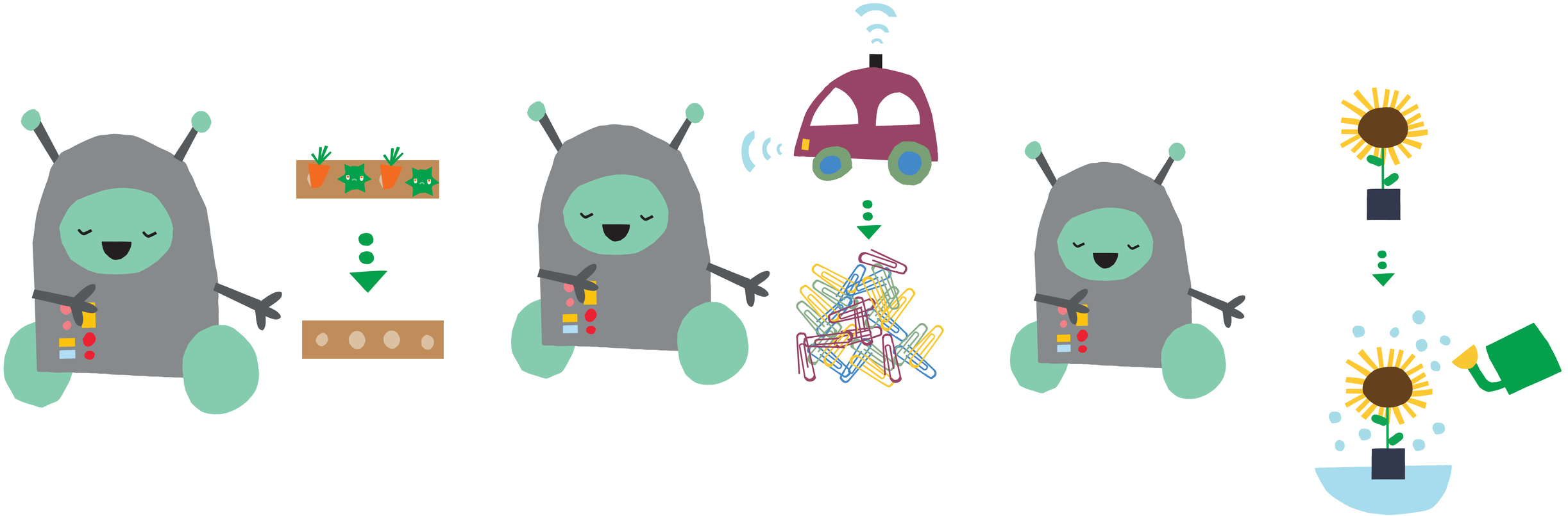





MOLOTOW







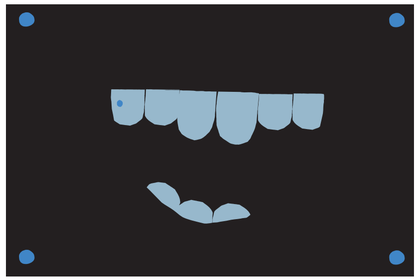




LINUS



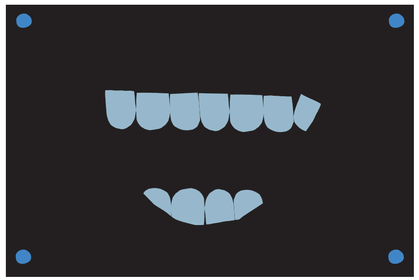
JULIA



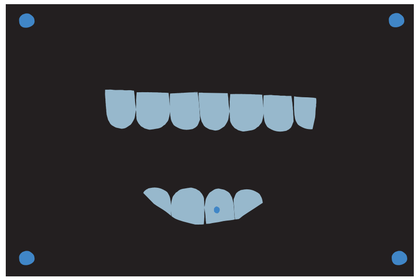
DJANGO



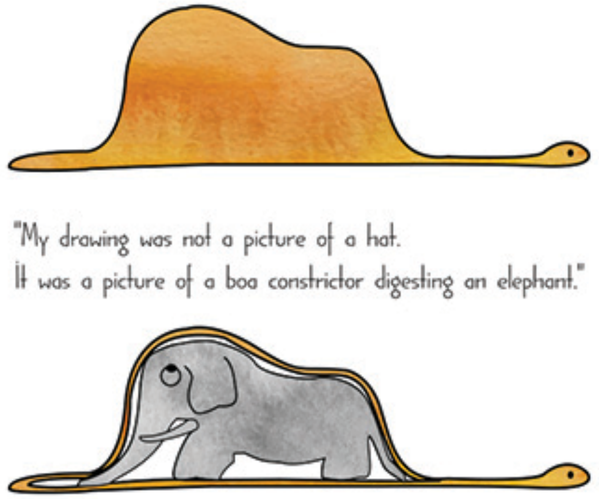
RUBY



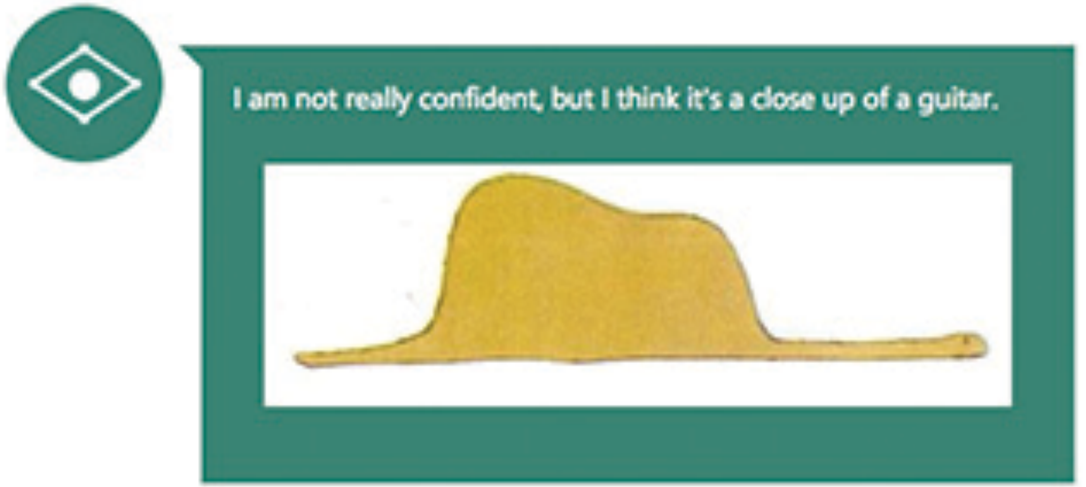
ADA

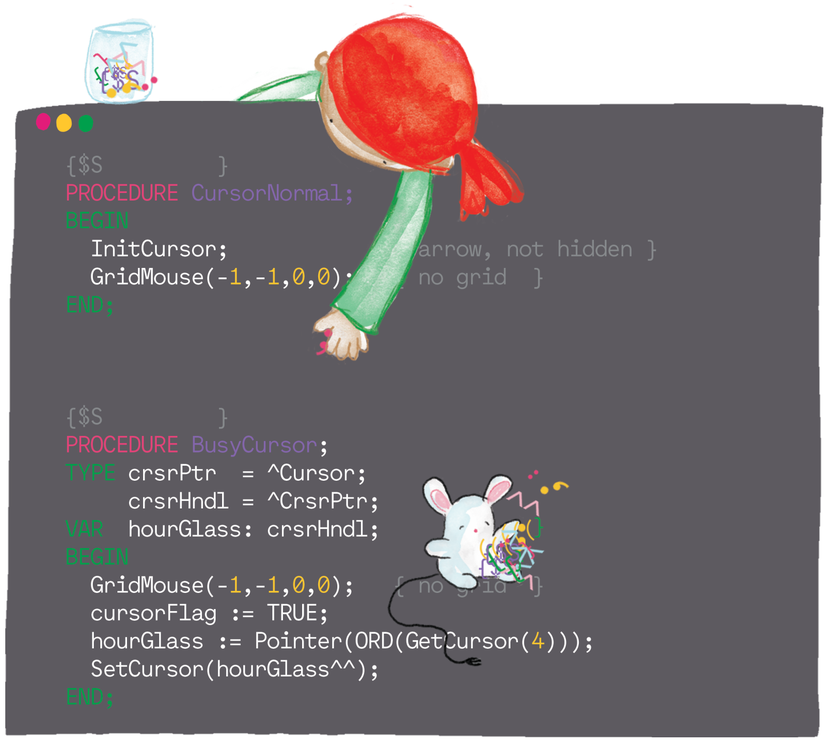


TEUVO

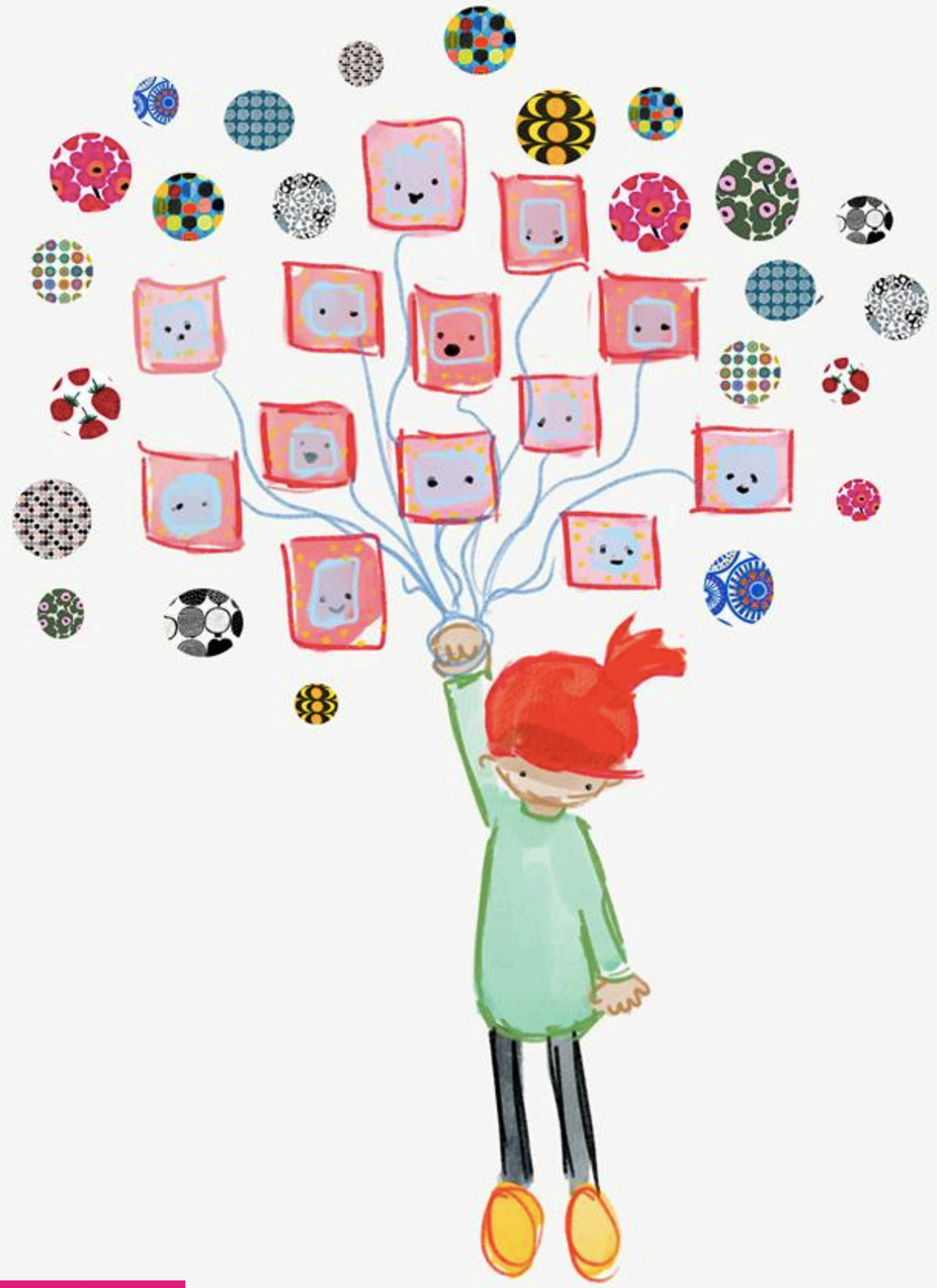


"Whenever I met one of them who seemed to me at all clear-sighted, I tried the experiment of showing him my Drawing Number One, which I have always kept. I would try to find out, so, if this was a person of true understanding. But, whoever it was, he, or she, would always say: 'That is a hat.' Then I would never talk to that person about boa constrictors, or val forests, or stars. I would bring myself down to his level. I would talk to him about bridge, and golf, and politics, and neckties. And the grown-up would be greatly pleased to have met such a sensible man.
- Antoine de Saint-Exupéry"

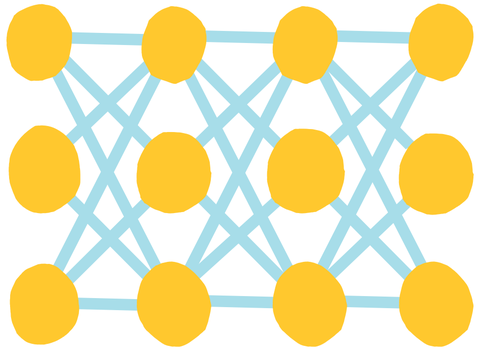

I am not really confident, but I think it's a close up of a guitar.



Not only about optimisation, efficiency and prediction

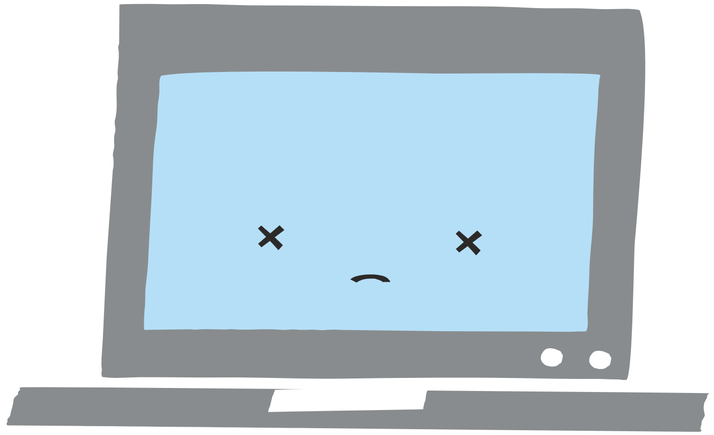


What if Armi Ratia of Marimekko was a programmer?

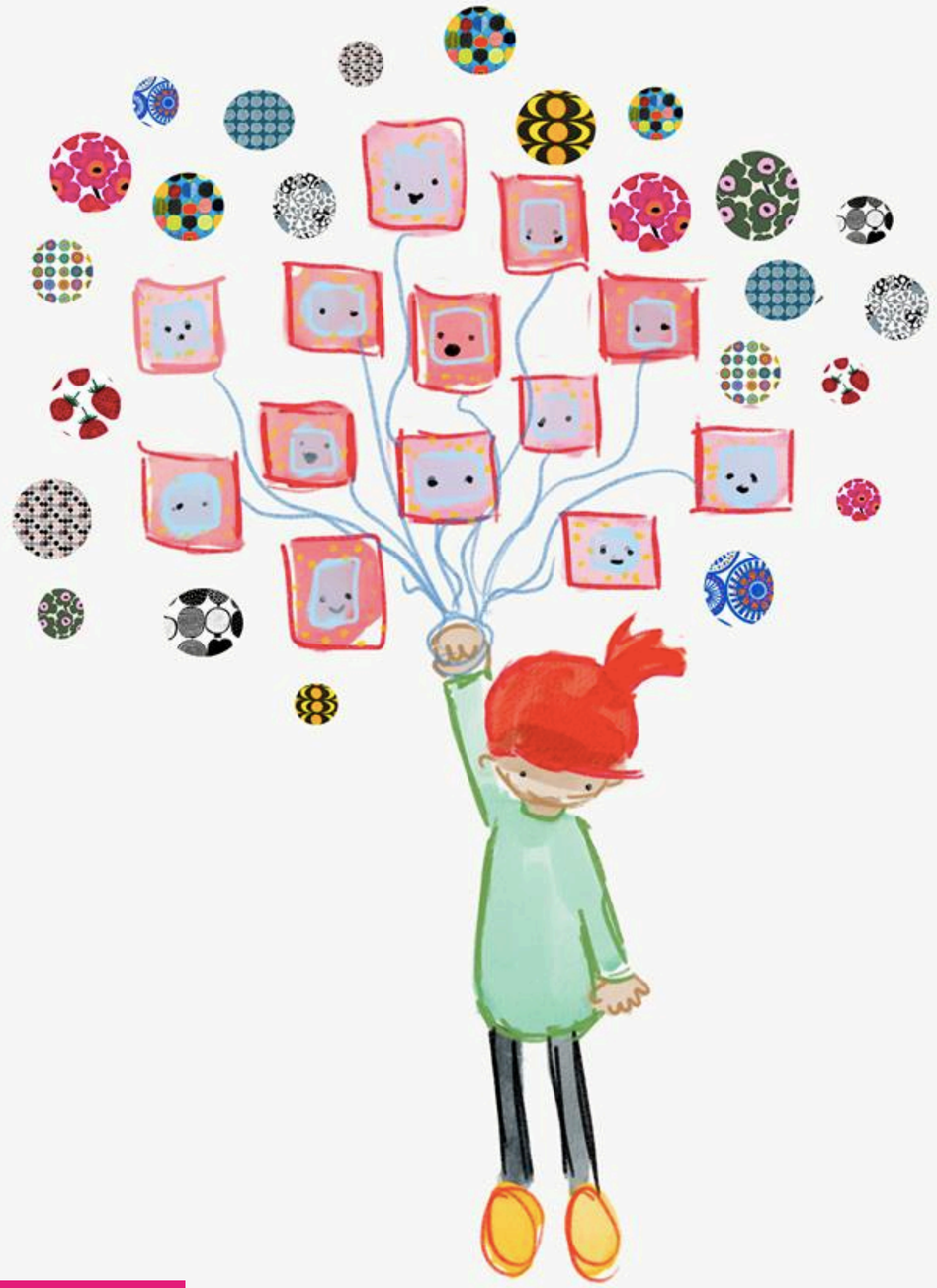


Multi-layer Recurrent Neural Networks
(LSTM, GRU, RNN) for character-level language model





Valos, Inislö,
Lahnililitanti,
Ona sot,
IkEkunit..

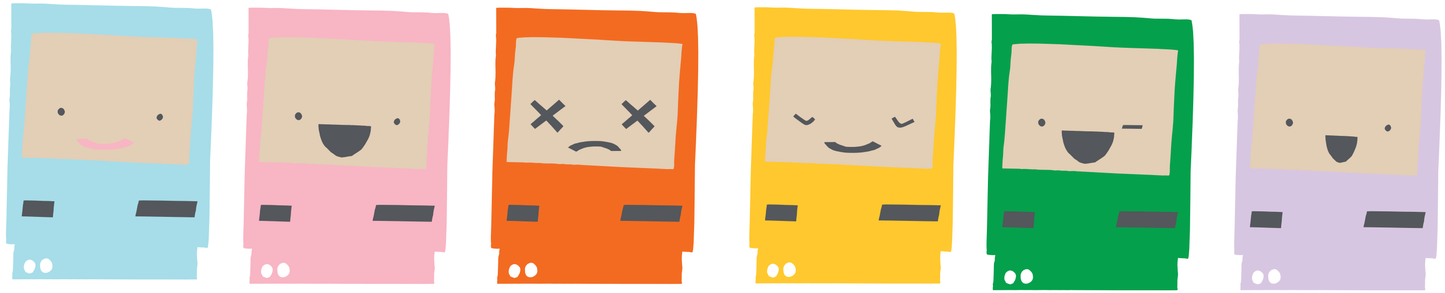


Pyininpakka, Tanohalti, Putti, Pukukka, Tirkka, Ruitintullo..



The next big thing?

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Informatica 37 (2013) 3–8 3

The Child Machine vs the World Brain

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Keywords: Turing, Machine Learning

Received: December 17, 2012

Machine learning research can be thought of as building two different types of entities: Turing's Child Machine and H.G. Wells' World Brain. The former is a machine that learns incrementally by receiving instruction from a trainer or by its own trial-and-error. The latter is a permanent repository that makes all human knowledge accessible to anyone in the world. While machine learning began following the Child Machine model, recent research has been more focussed on "organising the world's knowledge"

Povzetek: Raziskovanje strojnega učenja je predstavljeno skozi dve paradigmi: Turingov Child Machine in H.G. Wellsov World Brain.

1 Encountering Alan Turing through Donald Michie

My most immediate knowledge of Alan Turing is through many entertaining and informative conversations with Donald Michie. As a young man, barely out of school, Donald went to work at Bletchley Park as a code breaker. He became Alan Turing's chess partner because they both enjoyed playing but neither was in the same league as the other excellent players at Bletchley. Possessing similar mediocre abilities, they were a good match for each other. This was fortunate for young Donald because, when not playing chess, he learned much from Turing about computation and intelligence. AlthoughTuring's investigation of machine intelligence was cut short by his tragic death, Donald continued his legacy. After an extraordinarily successful career in genetics, Donald founded the first AI group in Britain and made Edinburgh one of the top laboratories in the world, and, through a shared interest in chess with Ivan Bratko, established a connection with Slovenian AI.

I first met Donald when I was as a visiting assistant professor at the University of Illinois at Urbana-Champaign, working with Ryszard Michalski. Much of the team that Donald had assembled in Edinburgh had dispersed as a result of the Lighthill report. This was a misguided and damning report on machine intelligence research in the UK. Following the release of the report, Donald was given the choice of either teaching or finding his own means of funding himself. He chose the latter. Part of his strategy was to spend a semester each year at Illinois, at Michalski's invitation, because the university was trying to build up its research in AI at that time. The topic of a seminar that Donald gave in 1983 was "Artificial Intelligence: The first 2,400 years". He traced the history of ideas that lead to the current state of AI, dating back to Aristotle. Of course, Alan Turing played a prominent role in that story. His 1950 Mind paper [1] is rightly remembered as a landmark in the history AI and famously describes the imitation game. However, Donald always lamented that the final section of the paper was largely ignored even though, in his opinion, that was the most important part. In it, Turing suggested that to build a computer system capable of achieving the level of intelligence required to pass the imitation game, it would have to be educated, much like a human child.

> Instead of trying to produce a programme to simulate the adult mind, why not rather try to produce one which simulates the child's? If this were then subjected to an appropriate course of education one would obtain the adult brain. Presumably the child-brain is something like a notebook as one buys from the stationers. Rather little mechanism, and lots of blank sheets... Our hope is that there is so little mechanism in the child-brain that something like it can be easily programmed. The amount of work in the education we can assume, as a first approximation, to be much the same as for the human child.

He went on to speculate about the kinds of learning mechanisms needed for the child machine's training. The style of learning was always incremental. That is, the machine acquires knowledge by being told or by its own exploration and this knowledge accumulates so that it can learn increasingly complex concepts and solve increasingly complex problems.

Early efforts in Machine Learning adopted this paradigm. For example, the Michie and Chambers [2] BOXES program learned to balance a pole and cart system by trial-and-error receiving punishments are rewards, much as Turing described, and like subsequent reinforcement learning systems. My own efforts, much later, with the Marvin program [3] were directed towards building a system that could accumulate learn and accumulate concepts expressed in a form of first order logic. More recent

Alan Turing & The Child Machine 1950s

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
A.I. LABORATORY

June 1971

Artificial Intelligence
Memo No. 248

LOGO
Memo No. 3

TWENTY THINGS TO DO WITH A COMPUTER[1]

Seymour Papert

and

Cynthia Solomon

This report describes research done at the Artificial Intelligence Laboratory of the Massachusetts Institute of Technology. Support for the laboratory's education research is provided in part by the National Science Foundation under grant GJ-1049.

[1] To be published in Educational Technology Magazine (Englewood Cliffs, N.J.: 1972).

Twenty things to do with a Computer (Seymour Papert & Cynthia Solomon)

1970s

AUG '72
2487

A Personal Computer for Children of All Ages

Alan C. Kay
Xerox Palo Alto Research Center

Abstract

This note speculates about the emergence of personal, portable information manipulators and their effects when used by both children and adults. Although it should be read as science fiction, current trends in miniaturization and price reduction almost guarantee that many of the notions discussed will actually happen in the near future.

"To know the world one must construct it."
-Pavese

For many years it has been a tradition to attempt to cure our society's ills through technology: "You have slums? Let's build low-cost housing!" "You can't afford that TV? We'll build a cheaper one and you can buy it on time, even though it will break before you've finished paying for it!" "Your kids aren't learning and education is too expensive? We'll build you a teaching machine for less which will guarantee your kids will pass tests!"

Unfortunately, most of these "cures" are no more than paint over rust; the sources of the initial problems still remain. Educational goals are even more obscured by the diverse models of the "end product" which exist: the society wants more members of the society (cultural genetics), the parents may want success, conformity, fame, or don't care; the Kid is not asked (he may just want to plant beans and watch them come up). What about the teachers? They, of course, range from enlightened human beings (who have a good model of themselves, what it is that they are trying to communicate, and what the child's current model of the situation is), to those well-intentioned people who would like to teach (but lack talent), to those who take it as a job, or worse, drifted into it because "ed" was the easiest way through college and now begrudge their fate through their young charges.

Technologists point out that at least the bottom categories would be eliminated through a teaching machine. What they seldom understand is that what is delivered is a box which at best squarely fits the middle category: well intentioned but lacking talent! Can technology ever deliver a box with the attributes of the first category of teacher? Maybe. But first, it must decide that it is a necessary and desirable goal to do so.

What we would like to do in this brief note is to discuss some aspects of the learning process which we feel can be augmented through technological media. Most of the notions have at their root a number of theories about the child that lie much closer to Piaget than to Skinner. We feel that a child is a "verb" rather than a "noun", an actor rather than an object; he is not a scaled-up pigeon or rat; he is trying to acquire a model of his surrounding environment in order to deal with it; his theories are "practical" notions of how to get from idea A to idea B rather than "consistent" branches of formal logic, etc. We would like to hook into his current modes of thought in order to influence him rather than just trying to replace his model with one of our own.

We do not feel that technology is a necessary constituent for this process any more than is the book. It may, however, provide us with a better "book", one which is active (like the child) rather than passive. It may be something with the attention grabbing powers of TV, but controllable by the child rather than the networks. It can be like a piano: (a product of technology, yes), but one which can be a tool, a toy, a medium of expression, a source of unending pleasure and delight...and, as with most gadgets in unenlightened hands, a terrible drudge!!

This new medium will not "save the world" from disaster. Just as with the book, it brings a new set of horizons and a new set of problems. The book did, however, allow centuries of human knowledge to be encapsulated and transmitted to everybody; perhaps an active medium can also convey some of the excitement of thought and creation!

Personal Computer for Children of All Ages (Alan Kay)

1970s

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Reggio Emilia

The 100 languages



The child is made of one hundred.
The child has
a hundred languages
a hundred hands
a hundred thoughts
a hundred ways of thinking
of playing, of speaking.

A hundred.

Always a hundred
ways of listening
of marveling, of loving
a hundred joys
for singing and understanding
a hundred worlds
to discover
a hundred worlds
to invent
a hundred worlds
to dream.

The child has
a hundred languages
(and a hundred hundred hundred more)
but they steal ninety-nine.
The school and the culture
separate the head from the body.
They tell the child:
to think without hands
to do without head
to listen and not to speak
to understand without joy
to love and to marvel
only at Easter and at Christmas.

They tell the child:
to discover the world already there
and of the hundred
they steal ninety-nine.

They tell the child:
that work and play
reality and fantasy
science and imagination
sky and earth
reason and dream
are things
that do not belong together.

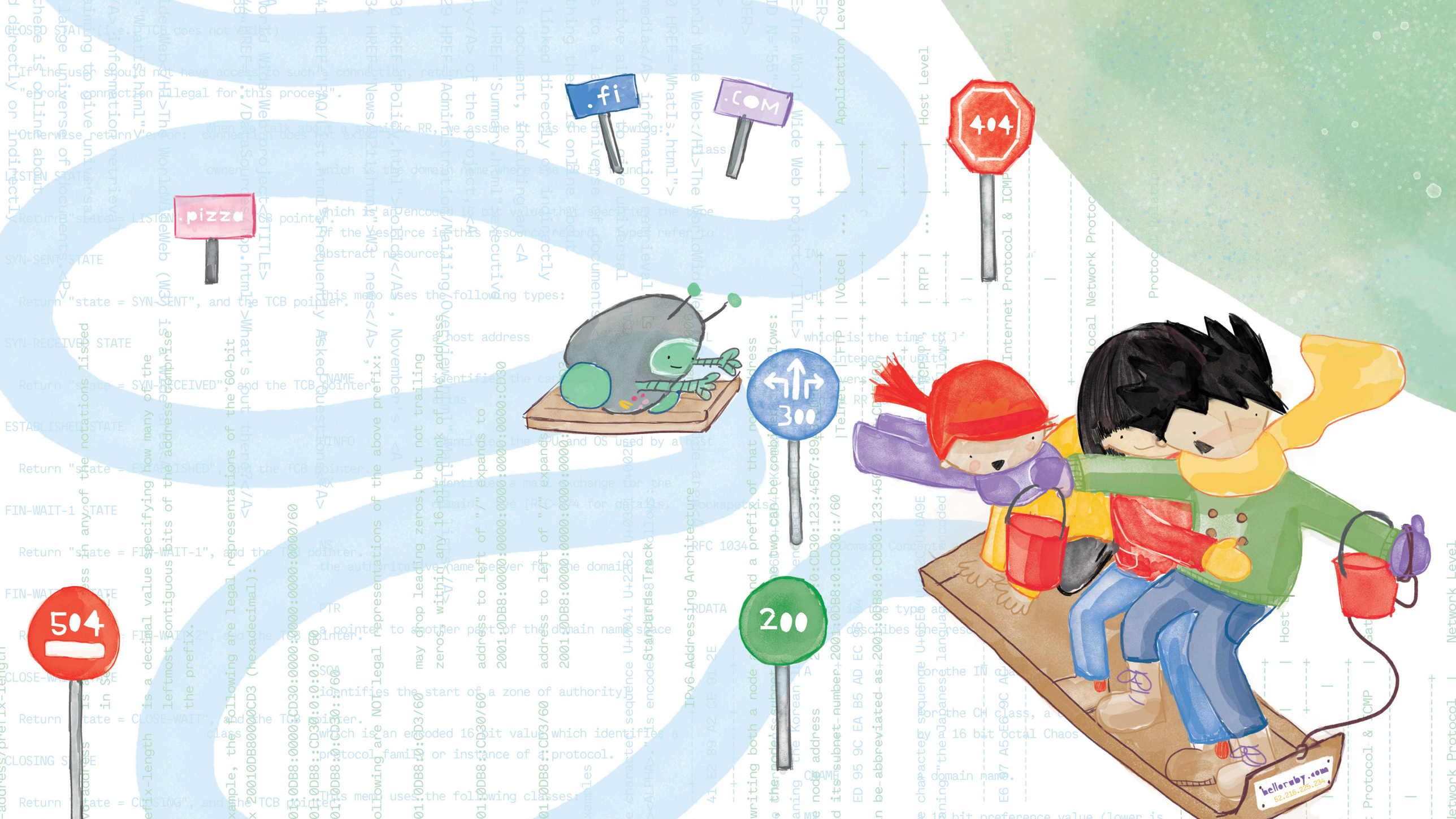
And thus they tell the child
that the hundred is not there.
The child says:
No way. The hundred is there.

- -Loris Malaguzzi
- (translated by Lella Gandini)
Founder of the
Reggio Emilia Approach

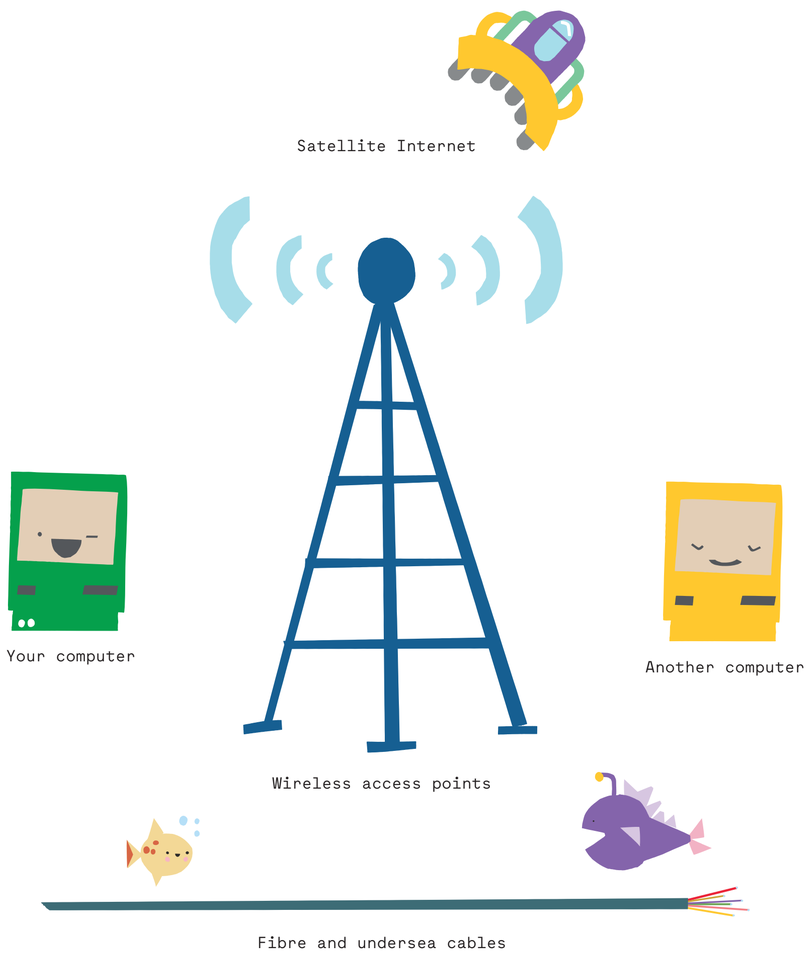


What happens in a world where we don’t have the vocabulary to express what is around us?

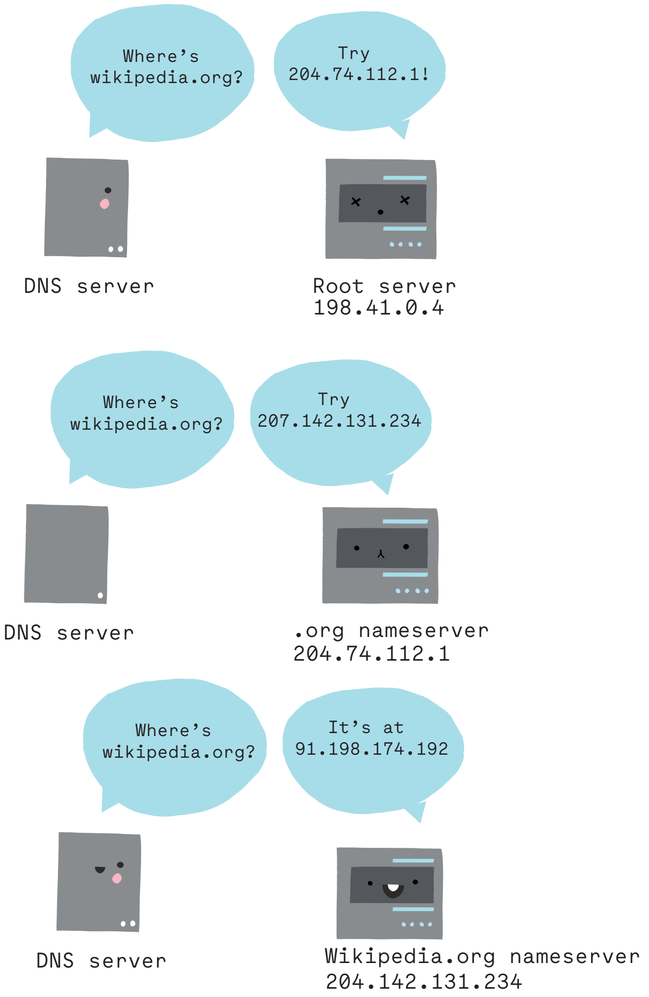



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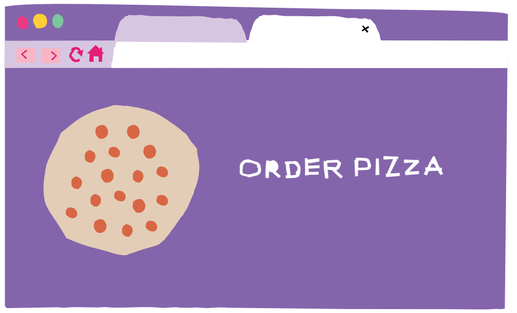




Hardware

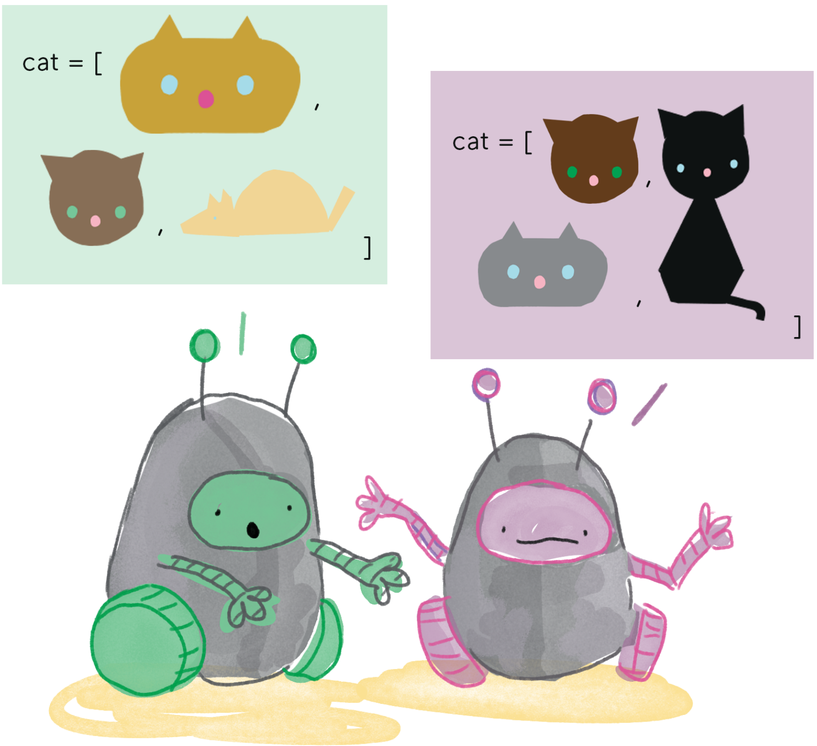


Software



Impact

Bringing Philosophy Down to Earth.





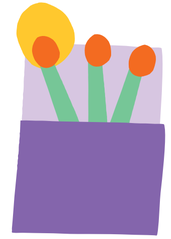
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George Hinton  George Boole  Aristotle

The Analytical Engine weaves algebraic patterns, just as the Jacquard loom weaves flowers and leaves.

Ada Lovelace
worlds first programmer







Technology is built on humanity.

Computer *(km-pytr)*
n.
person who makes calculations or computations; a calculator, a reckoner; spec. a person employed to make calculations in an observatory, in surveying.

Technology (from Greek τέχνη)
Techne, "art, skill, cunning of hand"; and -λογία, -logia[1]. Techniques, skills and competencies alongside the tools needed to do the job. Agriculture is a technology; democracy is a technology.

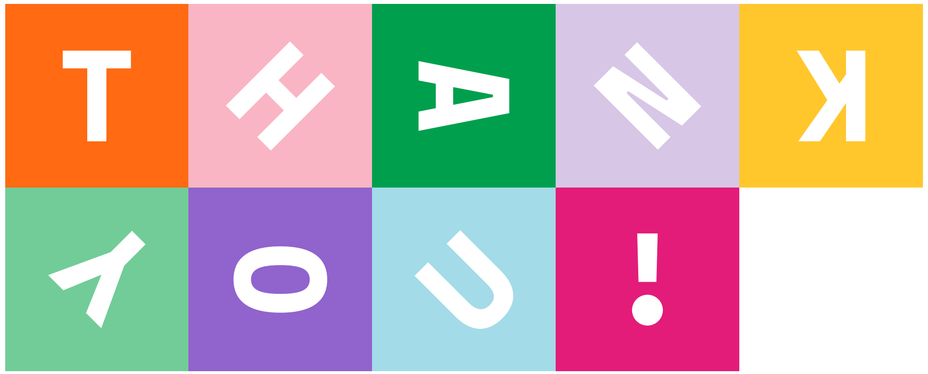
Exercise 3

Explain!

What is technology? What is it used for?
And who uses it?

Technology is electricity that moves. It is used to play. I use it to have a conversation with my mom, we use a WhatsApp application. People uses technology.


else
if
else
else
else



Linda
Liukas
Author
&
Illustrator
Hello
Ruby
+358415143405
linda@helloruby.com
twitter:@lindaliukas
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