

Lesson 1.2: Make your own computer

Recommendations: 2 sessions of 35 mins

Objectives

In this lesson, students will:

- ❖ Understand the key components of a computer and their purpose
- ❖ See the big picture and realize that it is built of many small elements.
- ❖ Understand how they can personalize technology

Agenda

1. Introduction	10 mins
2. Create the Motherboard	20 mins
3. Create the Keyboard	20 mins
4. Create the Screen	10 mins
5. Final Touches	10 mins

Preparation

- Scrap paper for decoration
- Scissors, Tape, Glue
- Brightly colored pens or pencils
- Appendix A, D, E, F (one per student)
- Optional: Appendix G (one per student)

Resources & Links

- Video - What is a computer:
<https://youtu.be/9IVKcTNVD1Q>
- Building a computer:
https://www.youtube.com/watch?v=Pih_5TlpngY&feature=emb_logo
https://www.youtube.com/watch?v=QkyrC40w2j8&feature=emb_title
- Additional resource: [Hello Ruby Blog - My First Computer Activity](http://blog.helloruby.com/post/131553874873/for-educators-lesson-plan-for-my-first-computer)
<http://blog.helloruby.com/post/131553874873/for-educators-lesson-plan-for-my-first-computer>

Credits:



Alignment to CA CS Standards

Standards

- CS.2

Core Practices

- (Communication) Communicating About Computing

Glossary

CPU = The Central Processing Unit is the processor. It is very smart and fast at calculating things. It is super busy bossing around and telling the other components what to do.

Hard Drive = The hard drive stores data. It is slow, but it takes good care of your pictures and games.

RAM = The Random Access Memory remembers all immediate things and runs between the CPU and the Hard Drive but it forgets everything once the computer is shut down.

ROM = The Read Only Memory remembers all the important things and stuff you don't want to accidentally remove or disappear when the computer is shut down.

GPU = The Graphic Process Unit is showing things on the computer screen, but it has a bad memory and needs ROM and RAM help.

Motherboard = The motherboard is the main circuit where other components are attached and helps them communicate between each other.

1. Introduction



If you have not covered it with your class in previous sessions, have a conversation with the students about what a computer is. Students can share examples of computing devices they know. Then watch the following video with your students:

What is a computer: <https://youtu.be/9lVKcTNVD1Q>

Explain to students that they will create today their computer. If you wish to, you can watch this short [video](https://www.youtube.com/watch?v=Pih_5TlpngY&feature=emb_logo) with them. https://www.youtube.com/watch?v=Pih_5TlpngY&feature=emb_logo

2. Create the Motherboard

Today, students are going to start creating their computer using paper, glue, and imagination.

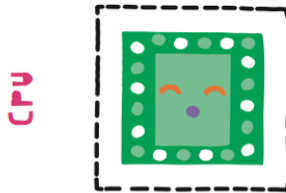
Explain to the students that inside a computer, there are important components that work together to make the computer function correctly. Can they remember from the video some of the names? All those components are attached to a big circuit called the **motherboard**.

Distribute a copy of Appendix A (Motherboard) to each of the students.

Ask them to cut around the different parts.

Explain each parts one by one, using the Appendix B as a visual help:

A. The CPU



The **CPU**: Central Processing Unit. This is the brain of the computer. It is very powerful and gives the computer the super power of computing things very very fast.

Students glue the CPU on their motherboard.

B. The GPU



The **GPU** is the graphics processing unit. The GPU is like an artist inside the computer. Just like how you draw pictures and make them look nice, the GPU helps the computer draw pictures and make everything on the screen look really good. It helps with playing games and showing videos by making sure all the images look great and move smoothly.

Students glue the GPU on their motherboard

C. The Hard Drive



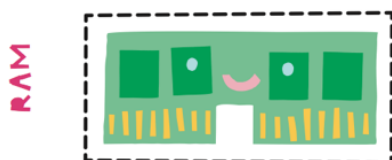
The **Hard Drive** is like a disk where we can store a lot of data like pictures, words, music, or movies.

Ask students to give examples of Discs in their life that store movies, or songs or video games? Similarly, the Hard Drive could store the same information but instead of having to insert a DVD or CD inside the computer, the Hard Drive stays inside the computer all the time. The superpower of the Hard Drive is to be able to remember a LOT of information. You can put all your pictures since you were born on a single hard drive.

Think about the Hard Drive as the memory of the computer, or a giant post-it where we can read and write things. Students find their Hard Drive paper component. Students glue the Hard Drive on their motherboard after cutting it.

However, there is a challenge for the Hard Drive: it is rather slow retrieving information, because of its size. To solve this problem, here comes the RAM

The RAM (Random Access Memory)



Nothing to do with the animal. The Random Access Memory is the component that passes information from

the Hard Drive to the CPU. The information stored in the RAM is not meant to stay there for a long time.

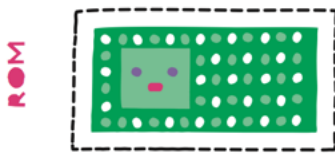
So why do we need RAM and why can't the information go from the Hard Disk to the CPU directly? Because the RAM is much faster, that's its superpower. For information that is used a lot or is manipulated while the CPU is doing a complicated calculation, it uses the RAM to keep track of its data.

Think about the Hard Drive as a box in the attic that we would access once in a while, and the RAM as your closet in your room that you need to access often.

What is the RAM's weakness? When the computer is shut down, its data disappears.

Students glue the RAM on their motherboard after cutting it out.

D. The ROM (Read Only Memory)



The Rom, (Read Only Memory) is also a component to store information. Very important information like the one that tells the computer how to wake up when we press the ON button. We put this information on a special component so that nobody can delete it by mistake. Because you can only read the information from the ROM and the computer cannot write in it,

we can think about it as a book

Students glue the ROM on their motherboard after cutting it out.

Once students have completed their motherboard, they can glue it on a thin piece of cardboard or a thick piece of paper folded in half

Show them the items in Appendix C so they can identify the hardware parts with pictures of what those parts look like in real life.

3. Create the Keyboard

Distribute Appendix D to each student. Students cut the keyboard and glue it on a thin cardboard or thick paper. Explain to students that if they want, they can customize their keys on the keyboard by cutting each letter with the drawing of an animal and place it on the corresponding part of the keyboard. Some of the keys are blank. Students can imagine what the key would do and write the name (or draw on it). For example: Internet, Game...

Students notice that the order of letters on the keyboard is different from the order from the alphabet. They can also write the letters themselves.

Once the keyboard is finished, they can attach it on top of their mother board with a strip of tape.

4. Create the screen:

Students will need scissors, glue, tape, markers

Distribute a copy of Appendix E to each student. Students cut the screen and glue it on a thin cardboard or thick paper. Explain to students that they are designing the computer of the future. Therefore, they need to think about what their computer would be able to do and draw a picture representing that functionality (For example: displaying the story and quiz about dinosaurs...)

Another idea for their screen is to discuss the students what software they would like installed on their computer and draw an icon representing the software. Talk with students that software and hardware are 2 different things for the computer: the hardware are the physical pieces that make up a computing device: a mouse, the RAM, the Hard Disk etc... The software is the applications or programs one can install on a computer to use: an internet browser, a game, a tool to make videos etc...They can brainstorm on what software they would like to invent in the future and come up with an icon for it.

Once the screen is finished, they can tape it on top of the keyboard so that it can flap open like a laptop.

5. Final touches

Distribute a copy of Appendix F to each student. Students cut the sticker from the paper.

Explain to students that a serial number is a unique number that helps companies which produces devices to identify each machine. If a machine is broken, the person who purchased it can call the engineer and provide the serial number. The engineer can look it up and will

automatically know when the device was created, the type of hardware that were used etc... It is easier to find replacement hardware.

Students come up with a serial number made up of letters and numbers and write it down on their sticker.

What are the names of computers students know? Have a discussion with them (Apple, MacBook, ChromeBook, Samsung). Students come up with a name for their own computer, using their imagination. They write the name on the sticker.

Finally, students write their own name as the Engineer.

6. Practice

Students can use Appendix G to identify the different components inside a computer.

7. Wrap Up and Reflections

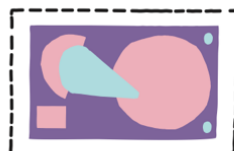
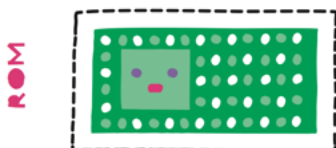
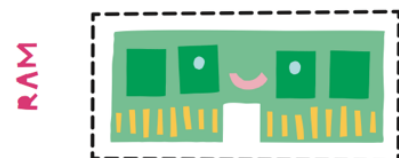
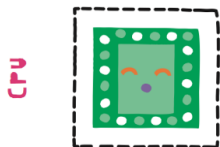
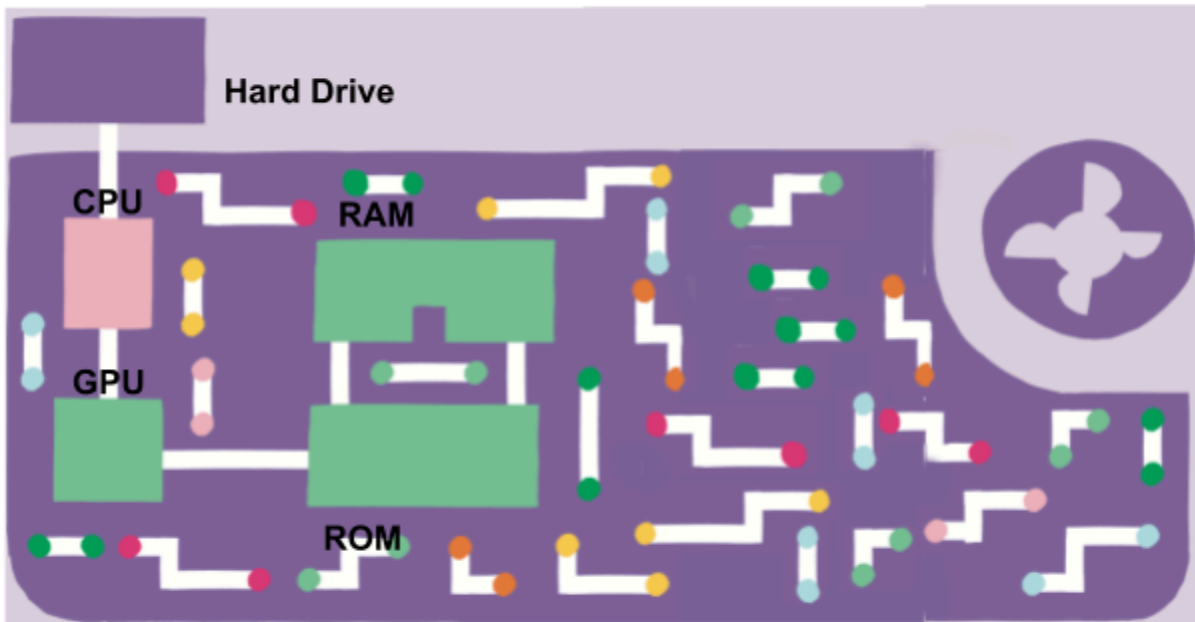


Reflection Points:

- What can your computer do?
- What problems will your computer solve?
- Your computer is small enough that you can put it in your backpack. Do you think the first computers invented were that small?

Appendix A

Motherboard

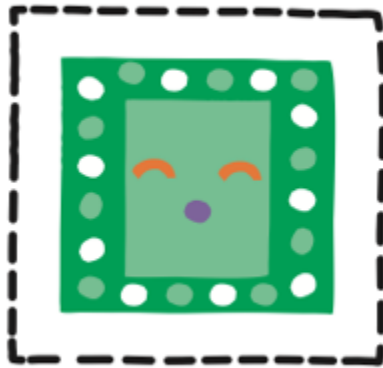


HARD
DRIVE

Appendix B

The components

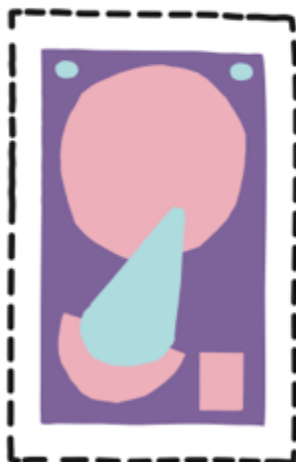
CPU



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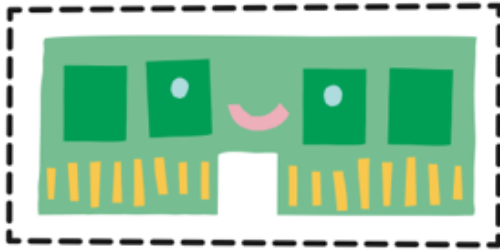
HARD
DRIVE



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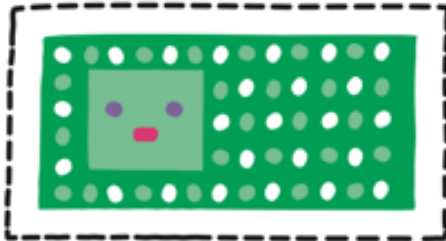
RAM



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ROM



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GPU



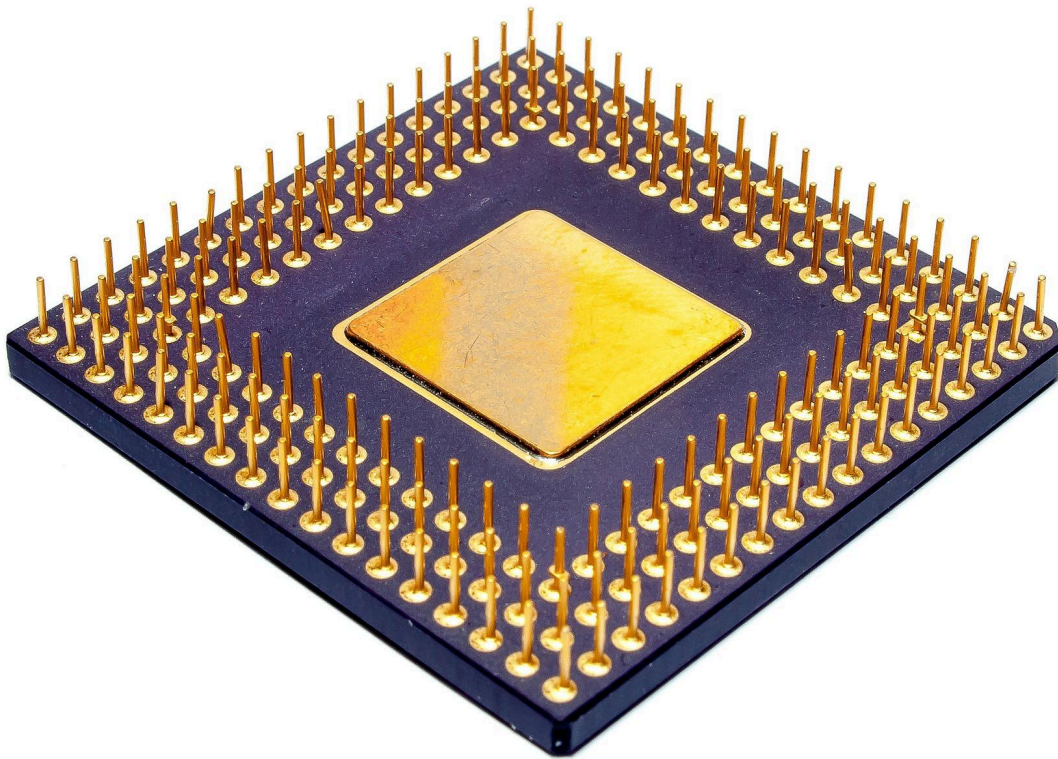
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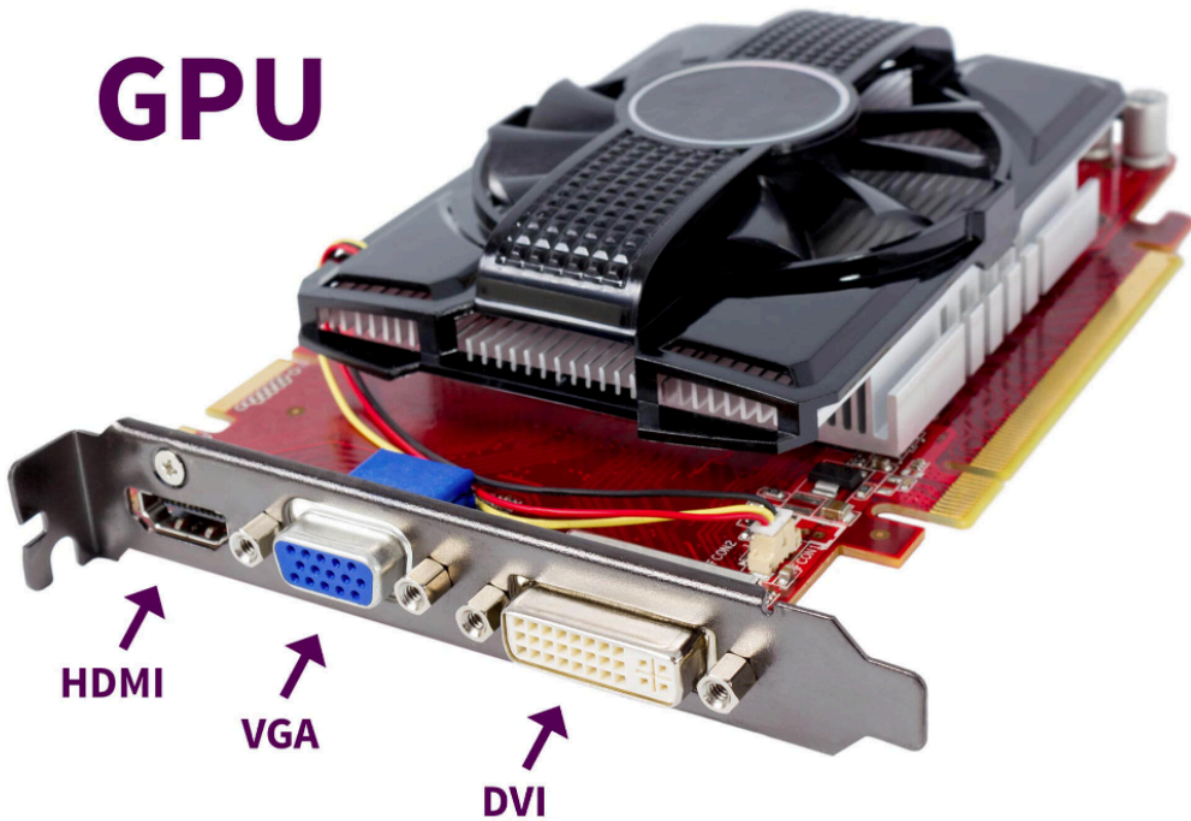
Appendix C

The components (Pictures)

CPU (Central Processing Unit)



GPU



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Hard Drive



Photo by [William Warby](#)

Random Access Memory



Read-only Memory

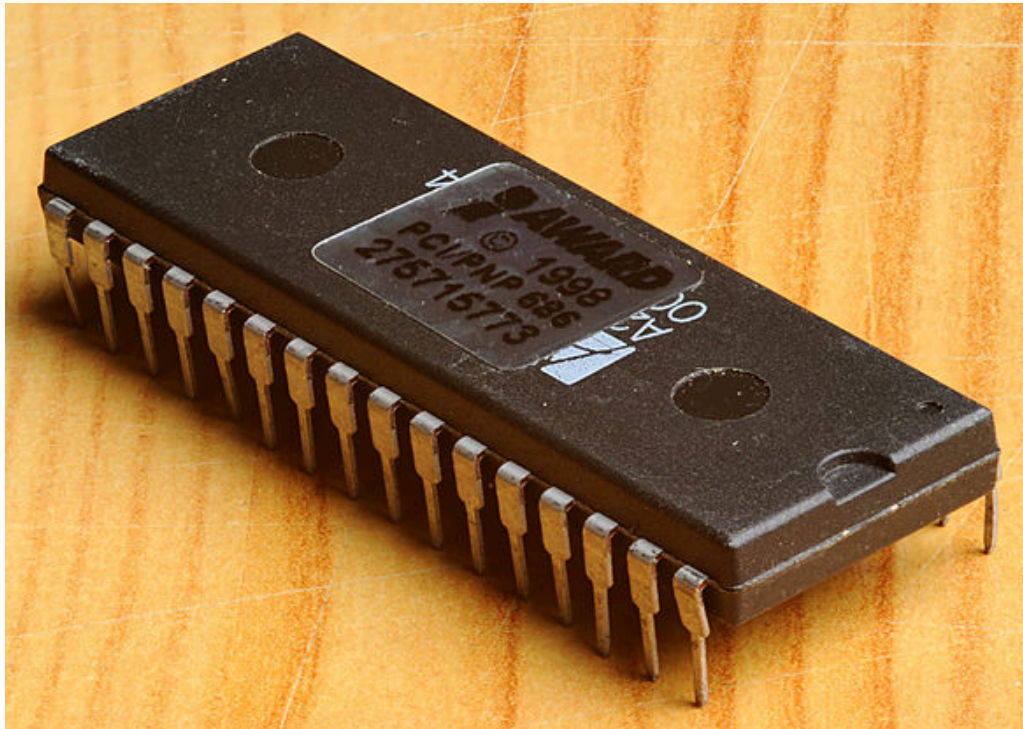
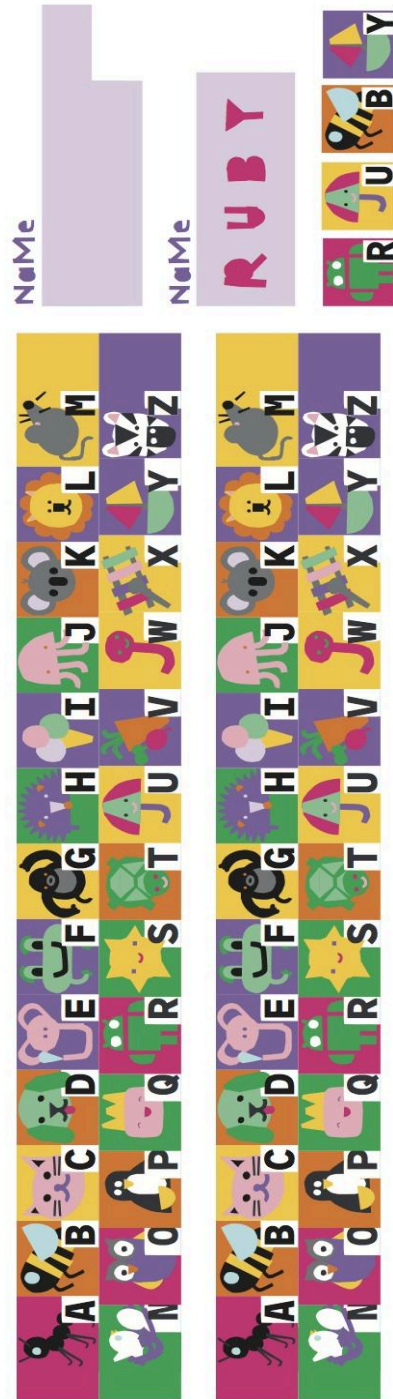
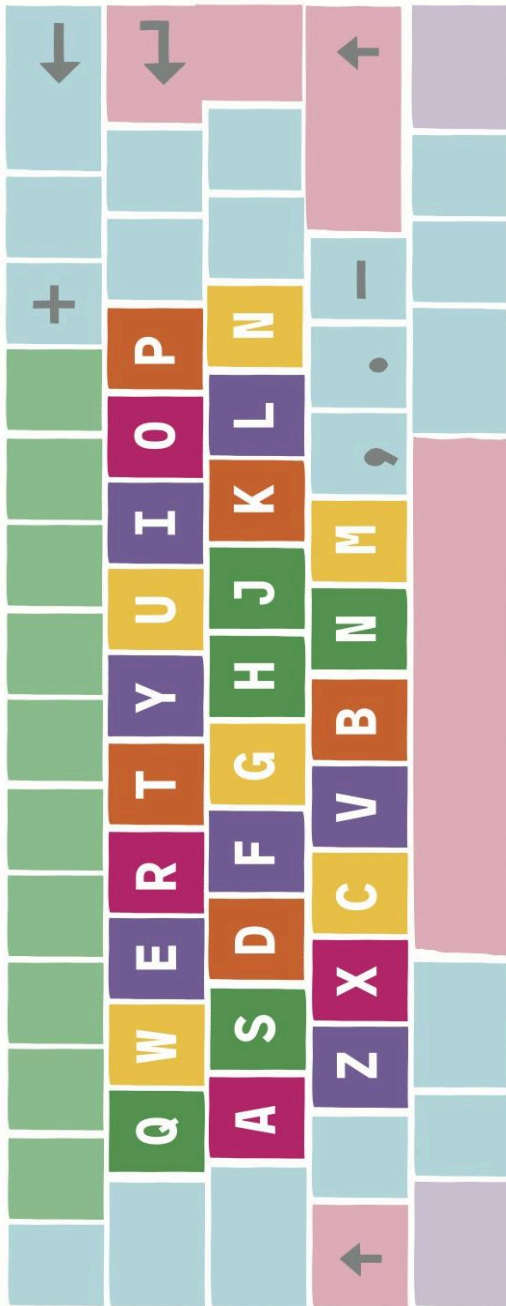


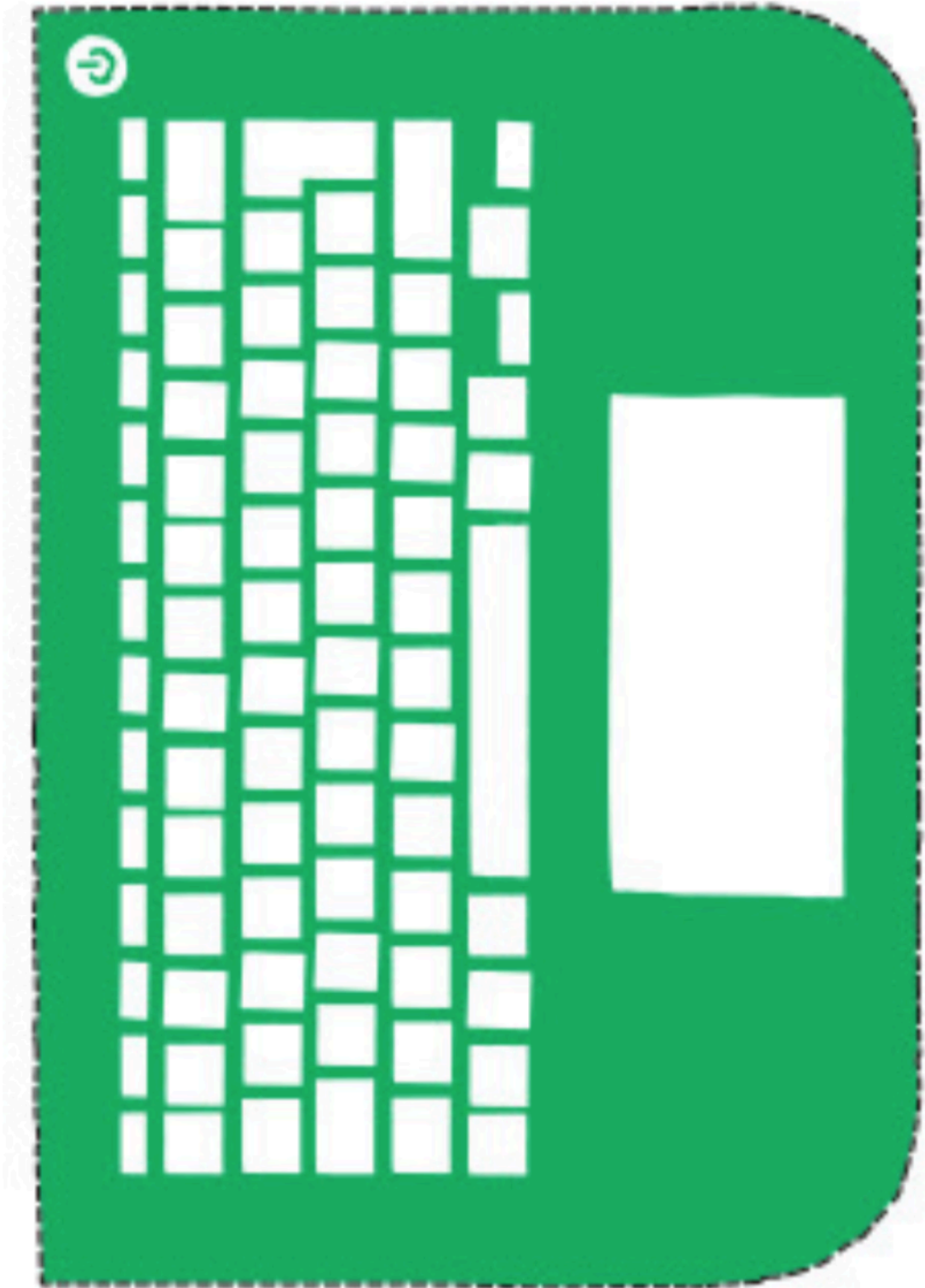
Photo by [Thomas](#)

[Bresson](#).

Appendix D

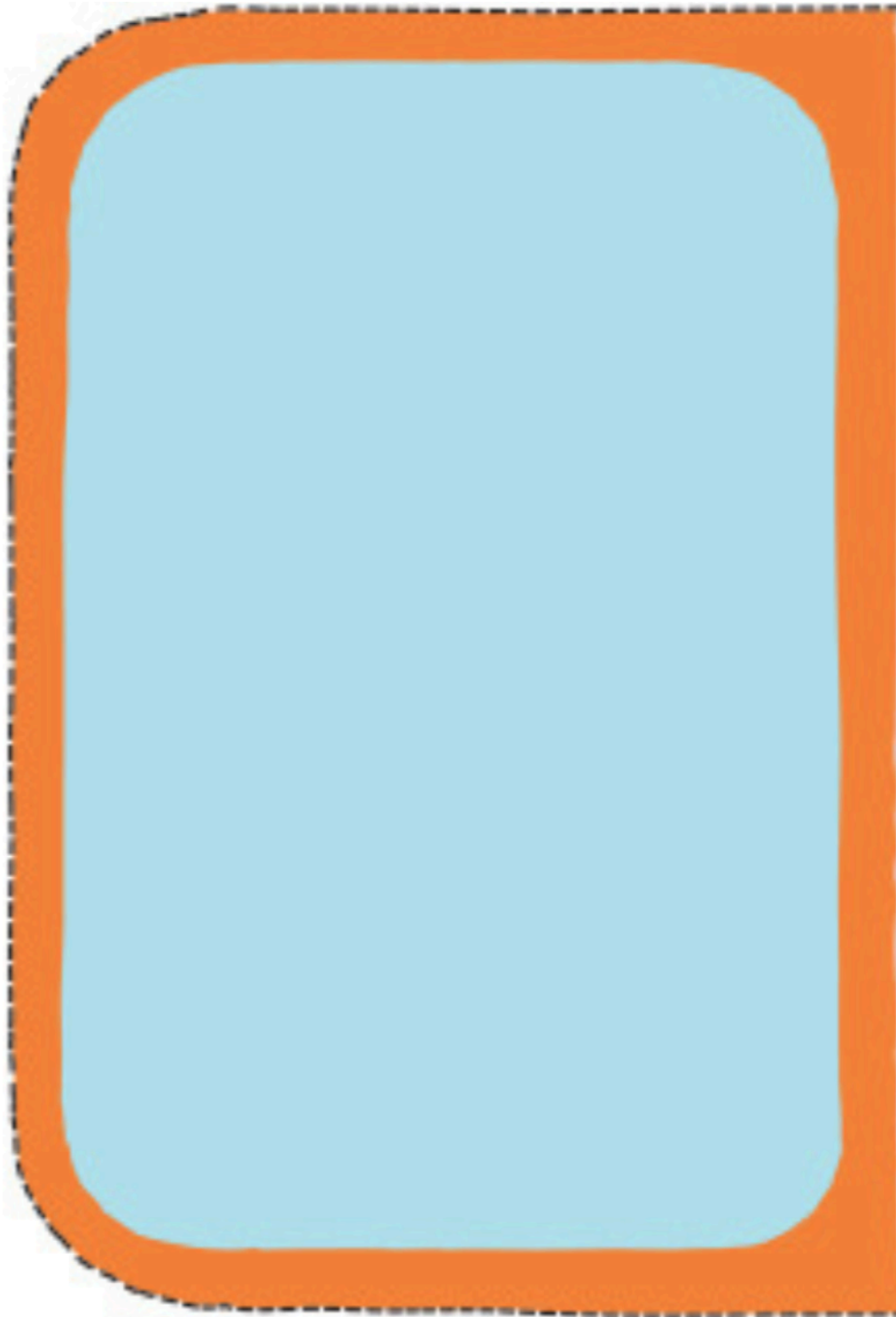
Keyboard





Appendix E

Screen



Appendix F

Sticker

YOU
ARE
GREAT!

NAME of your computer

serial Number

engineER

Appendix G

who's who?

